PlasticFreeDanube

LEGAL FRAMEWORK OF WASTE MANAGEMENT IN AUSTRIA & SLOVAKIA

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List of Abbreviations:

BMLFUW BMNT	Federal Ministry of Agriculture, Forestry, Environment and Water Management, now
BMNT	Ministry of Sustainability and Tourism
CEP	Circular Economy Package
EPR	Extended Producer Responsibility
EC	European Commission
ELVs	End-of-Life Vehicles
EP	European Parliament
EU	European Union
MA22	Municipal Administration, City of Vienna
MA 48	Municipal Administration, City of Vienna
PPWD	Packaging and Packaging Waste Directive
PRO	Producer Responsibility Organisation
PVC	Polyvinylchloride
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
SAŽP	Slovak EnvironmentalAgency (Slovenská agentúra životného prostredia)
SIŽP	Slovak Environmental Inspectorate (Slovenská inšpekcia životného prost)
SUPs	Single-use plastic products
VZN	General Binding regulations (in SK: všeobecne záväz nénariadenia)
WEEE	Waste electrical and electronic equipment
WFD	Waste Framework Directive
WMP SR	Waste Management Programme of the Slovak Republic (in SK: Program odpadovéh ohospodárstva Slovenskej republiky, POH SR)
WKO	Austrian Economic Chamber (Wirtschaftskammer Österreich)
WM	Waste Management
UBA	Austrian Environmental Agency (Umweltbundesamt)

1. Overall Background

1.1. Austria

Austria is a landlocked country of 8,822,300 inhabitants (in 2018) in Central Europe (1.7% of EU-28). The GDP was 386.1 billion EUR in 2018, which is 43,660 EUR per inhabitant and 2.2% of the EU-28.The territory of Austria covers 83,878 km² with a population density of 105.2 people per km². In 2017, the Austrian urban population accounted for 58.09 %. Since 1995, Austria is a Member State of the European Union (Statistics Austria 2018, Worldbank 2018).

1.1.1. City of Vienna

Vienna (Wien) is the capital and largest city of Austria by area and population. It has a population of 1.8 million people, a population density of 4,326 people per square kilometre and a total area of 414.65 square kilometres. The city is the cultural, economic, and political centre of the country, accounting for 35% of the national population and 37% of GDP in 2016 (Euromonitor, 2017). Vienna is located in north-eastern Austria, at the easternmost extension of the Alps in the Vienna Basin and includes both sides of the Danube River. Since Vienna has a federal state status, the city council is also the state parliament, and the mayor also holds the function of the state governor. Vienna is a highly touristic city with about 15 million visitors in 2016.

Figure 1: Map of the City of Vienna

1.1.2. Province Lower Austria

The **province Lower Austria** (Niederösterreich) has the largest area and the second largest population (after Vienna) of the nine federal provinces in Austria. It has a total area of 19,186 km^2, a population of 1,653,419 people (in 2016) and population density of 86 people per km^2. It is bordered to the north by the Czech Republic and to the east by Slovakia, where the river system of Thaya and March marks the frontier line. In the south, the foothills of the Eastern Alps form a natural boundary with the province Styria (Steiermark). In the south-east, Lower Austria borders the province Burgenland. Administratively, the state is divided into 20 districts (Bezirke), four independent towns and 573 municipalities.

Figure 2: a) Map of province Lower Austria; b) the Danube river in Lower Austria (Source: Google maps;www.donau.com/en/the-danube-in-lower-austria)

The Danube plays a prominent role in both topographical and historical terms. This river, which was once the northern boundary of the Roman Empire, is the lifeline of the region and divides Lower Austria into a northern part with the “Wald- and Weinviertel” and a southern part with the “Most- and Industrieviertel”. The Danube has been of great importance since historical times as a transport artery,

and today it forms part of the Rhine-Main-Danube canal, linking the Atlantic to the Black Sea (Federal Ministry of Sustainability and Tourism, 2018).

The section of the Danube River flowing through Lower Austria is 260 km long. Parts of the Danube in Eastern Lower Austria and Vienna belong to the "Donau-Auen" (Danube wetlands) National Park, which was established in 1996 and is covering more than 9,300 ha. It is the "green lung" and climate regulator between Vienna and Bratislava and the largest contiguous, ecologically most intact natural wetland landscape of its kind in Central Europe. The length of the Danube in the "Donau-Auen" National Park is 36 km with an average width of 350 m. Approximately 23 km of the Danube flow through Vienna (Federal Ministry of Sustainability and Tourism, 2018).

1.2. Slovakia

Slovakia, officially the Slovak Republic (SR), is an inland state in Central Europe. It has an area of 49 036 km² and has about 5 435 343 inhabitants with a population density of 110, 84 inhabitants per km². The capital and most populous city is Bratislava. The GDP for 2019 was estimated at $203.244 billion.[1] Since 1 May 2004, Slovakia is part of the European Union.

Territorial breakdown:

8 regions:

- Bratislavskýkraj
- Trnavskýkraj
- Nitrianskykraj
- Trenčianskykraj
- Žilinskýkraj,
- Banskobystrickýkraj
- Prešovskýkraj
- Košickýkraj

In the past years, the Slovak economy has reached an above average pace of growth from a European perspective. As one of the first European countries in the aftermath of the crisis, the record-breaking GDP outpaced in 2008 has exceeded its GDP. The structure of its economy has not changed significantly for the decade. An exception is the systematic increase in the share of industrial production and selected professional activities and, on the contrary, the decline in public services to GDP.[2]

[1] "World Economic Outlook Database, October 2018". IMF.org. International Monetary Fund. Retrieved 2 May 2019.
[2] http://www.jet.sk/news/view/top-5-odvetvi-slovenskej-ekonomiky-z-hladiska-pridanej-hodnoty

Figure 1: Map of Slovak Republic[3]

1.2.1. The Bratislava Autonomous Region

The Bratislava Autonomous Region is situated in the (south) western part of the Slovak Republic, occupying a territory of 2052.6 km², the smallest region of the Slovak Republic. In 2016, the total population was 641 892 with a population density of 308.5 inhabitants per km².[4]

Districts

- Bratislava I
- Bratislava II
- Bratislava III
- Bratislava VI
- Bratislava V
- Malacky
- Pezinok
- Senec

[3] https://sk.wikipedia.org/wiki/Slovensko#/media/File:Un-slovakia.png
[4] http://www.region-bsk.sk/clanok/informacie-o-kraji.aspx?q=Y2hudW09Mg%3d%3d

As the most powerful economic region in the Slovak Republic, the Bratislava Region has a share of 26% of the Slovak GDP. By converting GDP per capita into purchasing power parity, the Bratislava Region exceeds the EU 25 average by 15.9%. All sectors based on traditional industrial production of goods are represented in the Bratislava Region's economy: it has recently developed into a European automotive centre, which contributes 30% to all Slovak exports. With the ongoing structural changes in the region's economy, the importance of the tertiary sector is growing especially in the area of trade and services, banking and insurance. The Bratislava region still has the lowest unemployment rate among all regions of the SR.

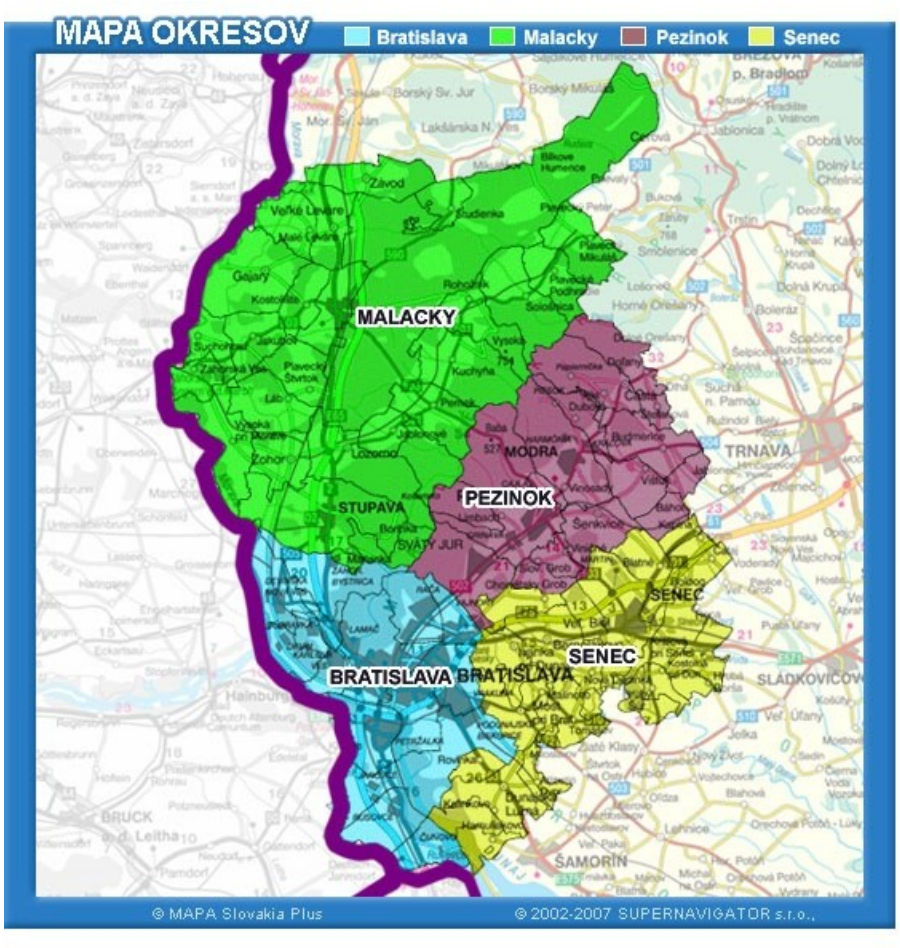

Figure 2: Map of Bratislava Autonomous Region5

1.2.2. The Trnava Autonomous Region

The Trnava autonomous region is located in the West of the Slovak Republic. To the West it borders with the Bratislava region, in the East with Trenčiansky and Nitrianskykraj, in the North with the Czech Republic (South Moravia) and Austria (Lower Austria) and in the South with Hungary (Rábsko-mošonsko-šopron County).

[5] http://www.region-bsk.sk/clanok/informacie-o-kraji-126328.aspx?q=Y2hudW09Mg%3d%3d

It has an area of 4 174 km², with 559,000 inhabitants. The Trnava Self-Governing Region consists of seven districts and with a total area of 4 148 km², it constitutes 8.5% of the total area of the Slovak Republic. The number of 550,000 inhabitants is the smallest of all Slovak regions, but one of the most productive regions in industry and agriculture. In the county, there are 251 villages, of which 17 have the status of cities: Dunajska Streda, Gabčíkovo, Šamorín, VeľkýMeder, Galanta, Sereď, Sládkovičovo, Hlohovec, Leopoldov, Piešťany, Vrbové, Senica, Šaštín-Stráže, Skalica, Holíč, Gbely and Trnava, which is also the federal capital. The region is part of the Vienna - Bratislava - Győr - Mošon - Šopron development region. On the territory of the region, the engineering and food industries prevailed in the past. At present its structure is varied. The energy needed for industry is supplied by the Nuclear Power Plant in Jaslovské Bohunice and the Hydro Power Plant in Gabčík, which are of national importance. Industry is dominated by the production of passenger cars. The Trnava self-governing region belongs among the most productive agricultural regions of Slovakia. The total area of agricultural land in 2015 was 288,396 ha, which represents 69.5% of the total area of the region. Of the total agricultural land area, almost 90% (89.7%) constitute of arable land (258 775 ha).[6]

Figure 3: Map of the Trnava Autonomous Region[7]

[6] https://sk.m.wikipedia.org/wiki/Trnavsk%C3%BD_kraj, RetrievedFeb. 2019
[7] https://www.trnava-vuc.sk/documents/10180/74794/Administrat%C3%ADvne+%C4%8Dlenenie+Trnavsk%C3%A9ho+samospr%C3%A1vneho+kraja/64426210-108a-45c8-b427-07fcd6ded3ea?t=1427358243860

2. Overview of the EU legal framework on waste

The EU policy on waste management is set out in the Community Strategy for Waste Management (last version: 1997) and is embodied in the Waste Framework Directive (2006/12/EC) and other supporting directives on numerous waste streams complementing this framework.

The most important directives for the PlasticFreeDanube project are concerning the management of macro-plastic waste that can become a source of river pollution (see brief summary, 2.1 to 2.5). Besides the main focus on plastic waste, regulations on other plastic-containing waste streams (e.g. construction waste, end-of-life vehicles, WEEE) will be briefly addressed.

2.1. The Circular Economy Package

In December 2014, the European Commission's first proposal on circular economy from July 2014 was withdrawn. In December 2015, the European Commission introduced a revised Circular Economy Package (CEP) including the Action Plan for a Circular Economy (COM (2015) 614) as well as legislative proposals amending EU directives on waste. The CEP promotes environmentally and economically sustainable growth by maintaining the value of products, materials and resources for as long as possible in the economy. It aims to reduce waste to a minimum as well as to promote reusing, repairing, refurbishing and recycling of existing materials and products. Moving towards a more circular economy shall deliver benefits, among which reduced pressures on the environment, enhanced security of supply of raw materials, increased competitiveness, innovation, growth and jobs.

The EU Action Plan contains planned measures covering the whole life cycle of products: from production and consumption to waste management and the market for secondary raw materials. The proposed actions will contribute to "closing the loop" of product lifecycle through greater recycling and re-use, and bring benefits for both the environment and the economy. Such actions include the Strategy on Plastics in the Circular Economy (2017), specific actions to reduce marine litter implementing the EU commitments to the 2030 UN Sustainable Development Goals (2015 onwards), development of quality standards for secondary raw materials (in particular for plastics, 2016 onwards), pre-demolition assessment guidelines for the construction sector (2017) and the voluntary industry-wide recycling protocol for construction and demolition waste (2016).

A provisional agreement on the Commission's four legislative proposals to revise six waste directives was reached between the co-legislators on 18 December 2017. The European Parliament endorsed the agreement at its Plenary Session in April 2018. The revised legislative framework on waste was approved by the Council on 22 May 2018 and came into force in July 2018 and form part of the 2018 Circular Economy Package:

1. Directive (EU) 2018/851 of 30 May 2018 amending Directive 2008/98/EC on waste.
2. Directive (EU) 2018/850 of 30 May 2018 amending Directive 1999/31/EC on the landfill of waste.

3. Directive (EU) 2018/849 of 30 May 2018 amending Directives 2000/53/EC on end-of-life vehicles, 2006/66/EC on batteries and accumulators and waste batteries and accumulators, and 2012/19/EU on waste electrical and electronic equipment.
4. Directive (EU) 2018/852 of 30 May 2018 amending Directive 94/62/EC on packaging and packaging waste.

The revised legislative proposals on waste set clear targets for reduction of waste and establish an ambitious and credible long-term path for waste management and recycling. Among key elements of the waste proposal are (European commission, 2018a):

- A common EU target for recycling of municipal waste:55% by 2025, 60% by 2030, and 65% by 2035
- A common EU target for recycling of packaging waste: 65% by 2025,70% by 2030;
- New recycling targets for different types of packaging waste, incl. targets for recycling of plastic: 50% by 2025, 55 % by 2030
- binding landfill target to reduce landfill to maximum of 10% of municipal waste by 2035;
- Obligatory separate collection of hazardous household waste by end 2022, bio-waste by end 2023 and textiles by end 2025;
- Mandatory extended producer responsibility (EPR) schemes for all packaging by 2024; minimum requirements for EPR schemes to improve their governance and cost efficiency
- Reinforcement of waste prevention objectives for food waste and marine litter to help achieve EU commitments to the UN Sustainable Development Goals.

The 2018 CEP further includes:

- A European Strategy for Plastics in a Circular Economy (see □);
- A Report on Critical Raw Materials and the circular economy
- A Communication on the Interface between Chemicals, Products and Waste;
- A Monitoring Framework on the Circular Economy at EU and national level
- A new Directive on Port Reception Facilities

2.1.1. EU Strategy for Plastics in the Circular Economy

As part of the transition to a circular economy, the EU Strategy for Plastics was released in January 2018. It aims to transform the way plastics and plastics products are currently designed, produced, used and recycled. By 2030, all plastics packaging placed on the EU market shall either be reusable or recyclable in a cost-effective manner and more than half of plastics waste generated recycled (European Commission, 2018b).

Under the new strategy, the European Union shall (European Commission, 2018c):

- Make recycling profitable for business: New rules on packaging will be developed to improve the recyclability of plastics used on the market and increase the demand for recycled plastic content. A pledging campaign which ended in September 2018 should boost the voluntary

uptake of recycled plastics (target: 10 Mt by 2025 in Europe), the results should be published in the 1st quarter of 2019 (European Commission, 2018d).

- Curb plastic waste: European legislation has already led to a significant reduction in plastic bag use in several Member States. The new plans will now turn to other single-use plastics and fishing gear, supporting national awareness campaigns and determining the scope of new EU-wide rules to be proposed in 2018 based on stakeholder consultation and evidence. The Commission will also take measures to restrict the use of microplastics in products, and fix labels for biodegradable and compostable plastics.
- Stop littering at sea: New rules on port reception facilities will tackle sea-based marine litter, with measures to ensure that waste generated on ships or gathered at sea is not left behind but returned to land and adequately managed there. Also included are measures to reduce the administrative burden on ports, ships and competent authorities
- Drive investment and innovation: The Commission will provide guidance for national authorities and European businesses on how to minimise plastic waste at source. Support for innovation will be scaled up, with an additional €100 million financing the development of smarter and more recyclable plastics materials, making recycling processes more efficient, and tracing and removing hazardous substances and contaminants from recycled plastics.
- Spur change across the world: As the European Union will also work with partners from around the world to come up with global solutions and develop international standards.

2.1.2. Directive (EU) 2019/.. on the reduction of the impact of certain plastic products on the environment ("Single-use Plastics Directive")

In May 2018, the European Commission proposed EU-wide rules to target the 10 single-use plastic products that are most often found on Europe's beaches and seas, as well as lost and abandoned fishing gear. Together these comprise 70% of all marine litter items. In March 2019 the European parliament agreed on (amended) ambitious measures proposed by the Commission to tackle marine litter, as well as abandoned fishing gear and oxo-degradable plastics. The Single-Use Plastics Directive voted on by the European Parliament tackles directly marine litter thanks to a set of ambitious measures:

- A **ban on selected single-use products made of plastic** for which alternatives exist on the market: cotton bud sticks, cutlery, plates, straws, stirrers, sticks for balloons, as well as cups, food and beverage containers made of expanded polystyrene and on all products made of oxo-degradable plastic.
- **Measures to reduce consumption** of food containers and beverage cups made of plastic and specific marking and labelling of certain products.
- **Extended Producer Responsibility schemes** covering the cost to clean-up litter, applied to products such as tobacco filters and fishing gear.
- A 90% separate **collection target for plastic bottles** by 2029 (77% by 2025) and the introduction of design requirements to connect caps to bottles, as well as target to

incorporate 25% of recycled plastic in PET bottles as from 2025 and 30% in all plastic bottles as from 2030.

Following this approval by the European Parliament, the Council of Ministers will finalise the formal adoption. This endorsement will be followed by the publication of the texts in the Official Journal of the Union. The Member States will then have two years to transpose the legislation into their national law (European Commission, 2019). Van Bael & Bellis (2019) stated that directives are "binding" and must be transposed into national law by Member States in order to become applicable which is planned to be in 2021. But certain details may be subject to change as the Directive has not yet received full legislative approval. Van Bael & Bellis (2019) summarized the Directive as following:

The scope of the Directive is limited to products which fall within the definition of "single-use plastic products" (SUPs). This definition covers products made either wholly or partly from plastic. Whether a product is classified as "single-use" depends on whether the product's design suggests that the product can be re-filled and/or is intended for use more than once.

The Directive covers the following single-use products:

- Beverage containers (including bottles) with a capacity of up to three litres;
- Cups for beverages, including their covers and lids;
- Food containers;
- Packets and wrappers intended for food;
- Plates, cutlery, straws and beverage stirrers;
- Plastic carrier bags;
- Certain sanitary products;
- Balloons;
- Tobacco products and filters.

In the Annex to the Directive, the products are sorted into different groups (A-G) depending on the measures they are subject to. Each measure also falls under a different Article. The type and scope of the different measures can thus be summarised as follows:

Part A – consumption reduction measures (Article 4): Applies to single-use food containers and cups for beverages. Member States must impose consumption reduction measures which achieve a measurable quantitative reduction in the consumption of these products. These measures must be "ambitious and sustained" but the type of measures is at the discretion of the Member States. The reduction is to be achieved by 2026 compared to 2022 levels.

Part B – prohibition of sales (Article 5): Applies to cutlery, plates, beverage stirrers, and straws. The prohibition takes effect two years after the Directive enters into force, i.e., by 2021.The prohibition also applies to cups, food and beverage containers made from expanded polystyrene. In addition, Article 5 bans sales of products made from oxo-degradable plastics.

Part C – product requirements (Article 6): Beverage containers with a capacity of up to three litres must be designed to ensure that caps remain attached to the container during and after use by 2024.Furthermore, polyethylene terephthalate (PET) bottles must contain at least 25% recycled plastic by 2025 and all single-use plastic bottles must contain at least 30% recycled plastic by 2030.

Part D – marking requirements (Article 7): Cups, sanitary products, and tobacco products must be clearly labelled with the amount of plastic they contain and waste disposal instructions by 2021.

Part E – Extended Producer Responsibility (EPR) (Article 8): Food containers, beverage containers with a capacity of up to three litres, cups, packets and wrappers, tobacco products, balloons, wet wipes, and plastic bags will be covered. EPR requires producers to take responsibility for the waste management of these products by 2024.

Part F – separate collection (Article 9): 77% of all bottles with a capacity of up to three litres sold in the same year must be collected by 2025, and 90% by 2029.

Part G – awareness raising (Article 10): EPR will also include costs of measures that Member States will have to take to inform the public of the availability of reusable alternatives, re-use systems, and waste management options, as well as information on the impact of littering.

2.1.3. The Waste Framework Directive (2008/98/EC) amended by Directive 2018/850

The Waste Framework Directive (WFD; Directive 2008/98/EC) sets the overarching legislative framework including basic concepts and definitions related to waste management in the EU, such as definitions of waste, recycling and recovery. It explains when waste ceases to be waste and becomes a secondary raw material (so called end-of-waste criteria), and how to distinguish between waste and by-products. The WFD lays down some basic waste management principles: it requires that waste be managed without endangering human health and harming the environment, and in particular without risk to water, air, soil, plants or animals, without causing a nuisance through noise or odors, and without adversely affecting the countryside or places of special interest. Waste legislation and policy of the EU Member States shall apply as a priority order the following waste management hierarchy (Figure 3): Waste management strategies must aim primarily to prevent the generation of waste and to reduce its harmfulness. Where this is not possible, waste materials should be reused, recycled or recovered, or used as a source of energy. As a final resort, waste should be disposed of safely (e.g. by incineration or in landfill sites, European Commission 2008).

Figure 3: Waste hierarchy according to Waste Framework Directive (source: European Commission, 2018)

The Directive introduces the “Polluter Pays Principle” and the “Extended Producer Responsibility”. It incorporates provisions on hazardous waste and waste oils, and includes two recycling and recovery targets to be achieved by 2020:

It also required Member States to set up separate collection of at least paper, metal, plastic and glass waste by 2015 where 'technically, environmentally and economically practicable'. Member States also need toadopt waste management plans and waste prevention programs (EC 2008, EP 2018).In 2018, Directive (EU) 2018/851 amended Directive 2008/98/EC on waste.

Targets before amendment were:

- 50% preparing for re-use and recycling of certain waste materials (paper, metals, plastic) from households and other origins similar to households, and
- 70% preparing for re-use, recycling and other recovery of construction and demolition waste

New recycling targets are:

- by 2025, the preparing for re-use and the recycling of municipal waste shall be increased to a minimum of 55 % by weight;
- by 2030, the preparing for re-use and the recycling of municipal waste shall be increased to a minimum of 60 % by weight;
- By 2035, the preparing for re-use and the recycling of municipal waste shall be increased to a minimum of 65 % by weight.’

Furthermore:

- Member States shall set up separate collection at least for paper, metal, plastic and glass, and, by 1 January 2025, for textiles.
- New rules for calculation of recycling targets exist.

Latham & Watkins LLP, 2018 summarized amendments as following: Directive (EU) 2018/851 requires Member States to improve their waste management systems into the management of sustainable material, to improve the efficiency of resource use, and to ensure that waste is valued as a resource. Among other areas of focus, the amendments address:

- Measures to prevent waste generation, *inter alia*, obliging Member States to facilitate innovative production, business, and consumption models that reduce the presence of hazardous substances in materials and products, encourage the increase of the lifespan of products, and promote re-use.
- The handling of municipal wastes.
- Incentives for the application of the waste hierarchy, such as landfill and incineration charges or pay-as-you-throw schemes.
- Measures to encourage the development, production, marketing and use of products suitable for multiple use that contain recycled materials, and that are, after having become waste, suitable for re-use and recycling.

- Measures to promote the re-use of products constituting the main sources of critical raw materials to prevent those materials from becoming waste.
- Minimum operating requirements for extended producer responsibility schemes.
- The promotion of sustainability in production and consumption in Member States, including communication and educational initiatives as well as measures to promote prevention and reduction of food waste.
- Member States' obligation to set up separate collection for paper, metal, plastic, and glass waste.

Extended Producer Responsibility (EPR)

Extended producer responsibility (EPR) can be defined as "an environmental policy approach in which a producer's responsibility for a product is extended to the post-consumer stage of a product's life cycle." EPR is typically understood to involve a shift in responsibility (administratively, financially or physically) from governments or municipalities to producers for collecting or taking back used goods, as well as sorting and treatment for their recycling (OECD, 2019).

The Waste Framework Directive sets principles regarding the implementation of EPR schemes in Member States. Three stream-specific directives (end-of-life vehicles, batteries and accumulators, waste electrical and electronic goods) introduce EPR as a policy approach. It is also used for packaging and other waste streams at varying levels in Member States. The Packaging Directive also indirectly invokes the EPR principle by requiring Member States (MS) to take necessary measures to ensure that systems are set up for the collection and recycling of packaging waste. Additional waste streams for which producer responsibility organisations have been most commonly identified within the European Union include tyres, waste oil, paper and cardboard, and construction and demolition waste. However, a much broader range of waste streams are subject to obligatory or voluntary producer responsibility systems in some MS, including: farm plastics, medicines and medical waste, plastic bags, photo-chemicals and chemicals, newspapers, refrigerants, pesticides and herbicides, lamps, light bulbs and fittings (European Commission, 2015).

The distributors of packaging, electrical appliances, automobiles and batteries have to set up and operate a collection and recycling system that enables the last user to give back these products free of charge. Although EPR is in theory an individual obligation, in practice producers often exert this responsibility collectively through 'producer responsibility organisations' (PROs), which collect license fees depended on the product (e.g. packaging, WEEE) and properties such as material, weight and recyclability.

Also PROs are facing competition on the European market, in most countries there is more than one operating PRO for WEEE, household and commercial packing. An example is the Packaging Recovery Organisation Europe (known as "the Green Dot"). Today, PROs in (mainly European) 29 countries are using the Green Dot as financing symbol to finance the organisation of the collection, sorting and recovery of used (mainly household) packaging (e.g. ARA in Austria, ENVI-PAK in Slovakia). On packaging, the Green Dot – a worldwide protected trademark –means that for such packaging a financial contribution has been paid to a qualified national packaging recovery organization set up in

accordance with the principles defined in European Packaging and Packaging Waste Directive 94/62 and the respective national law (PRO Europe, 2018).

A 2016 report by the Organisation for Economic Cooperation and Development (OECD) notes that while EPR schemes have helped to reduce landfilling and increase recycling, they have had limited effects on promoting eco-design (EP 2018).

2.1.4. Packaging and Packaging Waste Directive (94/62/EC) amended by Directive 2018/852

To harmonize already existing national measures concerning the management of packaging and packaging waste in several EU Member States and to prevent or reduce its impact on the environment Directive 94/62/EC was adopted. In 2004, the Directive was amended to provide criteria clarifying the definition of the term 'packaging' and increase the targets for recovery and recycling of packaging waste (e.g. 22.5% for plastics by 2008). In 2005, the Directive was revised again to grant new Member States transitional periods for attaining the recovery and recycling targets. In 2013 Annex I of the Directive containing the list of illustrative examples of items that are or are not to be considered as packaging was revised in order to provide more clarity by adding a number of examples to the list.

The Directive aims at limiting packaging volume and weight to the minimum amount necessary for the required safety, hygiene and acceptance for the packed product. Harmful and other dangerous substances (e.g., certain heavy metals) and materials as components of the packaging shall be minimised to prevent any adverse effects. The packaging shall be suitable for recovery in the form of recycling of materials, energy recovery, composting or re-use. Their final disposal should be considered as a last resort solution (van Putten 2011). This Directive requires Member States to take measures to prevent packaging waste and to develop packaging reuse systems. In addition to that, the functioning of the internal market shall be ensured by avoiding obstacles to trade and distortion and restriction of competition (EUROPEN).

In 2015, the Directive was amended with Directive 2015/720 as regards reducing the consumption of lightweight plastic carrier bags. Member States shall reduce the annual consumption of bags to a maximum of 90 per person by the end of 2019 and to a maximum of 40 per person by the end of 2025. The measures to achieve these targets are at the discretion of the Member States and can include for example binding fees for plastic bags as an alternative or in addition to other measures.

In 2018, with the Directive (EU) 2018/852amending Directive 94/62/EC on packaging and packaging waste, higher recycling targets for packaging waste were adopted and are:

- 65% by weight of all packaging waste by end 2025 and
- 70% by weight of all packaging waste by end 2030
- 50% by weight for plastic packaging waste by end 2025
- 55% by weight for plastic packaging waste by end 2030

Member States shall also be encouraged to increase the share of reusable packaging on the market and the reuse of packaging by introducing measures such as: the use of deposit-return schemes; the setting of qualitative or quantitative targets; the use of economic incentives; differentiated financial contributions for reusable packaging under EPR schemes for packaging and the setting up of minimum percentage of reusable packaging placed on the market every year for each packaging stream.

According to the Commission and stakeholders, EPR schemes are the main driver for reaching the targets set in the Packaging Directive, although in the absence of requirements, their effectiveness varied a great deal (EP 2018). For this reason, Directive (EU) 2018/851 (Article 8a) contains minimum requirements for EPR schemes. Furthermore, by the end of 2024, EPR schemes have to be established for all packaging.

The new Waste Framework Directive requires in article 8a 4(b) a modulation of the financial contributions paid by the producers ("eco-modulation of fees") as an incentive for producers to design products that contribute to waste prevention and facilitate recycling. "Where possible", this shall be defined "for individual products or groups of similar products, notably by taking into account their durability, reparability, re-usability and their recyclability and the presence of hazardous substances hereby taking a life-cycle approach and aligned with the requirements set by relevant Union law, and when available, based on harmonised criteria in order to ensure a smooth functioning of the internal market.". The harmonized guidelines still need to be consulted with the Member States. In France, Italy and Germany modulated fees for plastics are already implemented on a national level; criticism concerns imports and the inner-European flux of products (European Recycling Platform 2018).

2.1.5. Landfill Directive (1999/31/EG) amended by Directive 2018/850

According to the waste management hierarchy, landfilling is the least preferable option and should be limited to the necessary minimum. The objective of the Directive is to prevent or reduce as far as possible negative effects on the environment, in particular on surface water, groundwater, soil, air, and on human health from the landfilling of waste by introducing stringent technical requirements for waste and landfills.

The Landfill Directive bans landfilling of untreated waste and sets targets. Compared to 1995, the base year, the share of biodegradable municipal waste going to landfills may not be higher than 75% in 2006, 50% in 2009 and 35% in 2016, with derogations grated to 16 Member states.

In the Action Plan for the Circular Economy from the European Commission a smarter collection and sorting of plastics, is said to be of critical concern to divert plastics away from high landfill and incineration rates. Within the last decade, landfill bans in several Member States, including Germany, Denmark, Sweden and Austria, have led to a successful increase in the recovery of plastic waste within these countries.

As part of the Circular Economy Package the Directive (EU) 2018/850 amended the Directive 1999/31/EC on the landfill of waste. Its main features include:

- To reduce the share of municipal waste landfilled to 10% or less by 2035;

- A ban on landfilling of waste suitable for recycling by 2030;
- Requiring the Commission to consider, by end-2024, setting a quantitative per capita target on landfilling.

2.1.6. Directive on End-of-Life Vehicles (2000/53/EC) amended by Directive 2018/849

The Directive on End-of-Life Vehicles (ELVs) aims to ensure an appropriate management of ELVs in the EU, encouraging manufacturers and importers to limit the use of hazardous substances and to develop the integration of recycled materials.

Vehicle and equipment manufacturers must factor in the dismantling, reuse and recovery of the vehicles when designing and producing their products. They have to ensure that new vehicles are: reusable and/or recyclable to a minimum of 85 % by weight per vehicle; reusable and/or recoverable to a minimum of 95 % by weight per vehicle.

The Directive requires that the recycling of all plastics from ELVs should be continuously improved. It is stated that "The Commission is currently examining the environmental impacts of PVC and will, on the basis of this work, make proposals as appropriate as to the use of PVC including considerations for vehicles" (Directive 2000/53/EC).

Treatment operations in order to promote recycling should include (among others) removal of tyres and large plastic components (bumpers, dashboard, fluid containers, etc), if these materials are not segregated in the shredding process in such a way that they can be effectively recycled as materials.

In 2018, Directive (EU) 2018/849 amended Directives 2000/53/EC on end-of-life vehicles, 2006/66/EC on batteries and accumulators and waste batteries and accumulators, and 2012/19/EU on waste electrical and electronic equipment. The amendment Directive requires Member States to, as well as the original requirements, take the necessary measures to ensure that all end-of-life vehicles are stored (even temporarily) and treated in accordance with the waste hierarchy. It also requires Member States to electronically submit a report on reuse and recovery targets for each calendar year to the Commission (UK Legislation Update Service 2018).

2.1.7. Directive on Waste Electrical and Electronic Equipment (2012/19/EU) amended by Directive 2018/849

The WEEE Directive sets targets for rates for separate collection, recovery and recycling/preparing for reuse of waste electrical and electronic equipment. Minimum targets (depending on category) valid from 15 August 2018 are 75-85% recovery rate and 55-80% - preparation for re-use and recycling.

A list of substances that have to be removed from any separately collected WEEE includes such plastic-containing components: plastic containing brominated flame retardants and external electric cables.

2.2. Registration, Evaluation, Authorisation and Restriction of Chemicals, REACH (EC-1907/2006)

The REACH Regulation aims to improve the protection of human health and the environment through the better and earlier identification of the intrinsic properties of chemical substances. Manufacturers and importers as well as downstream users of (chemical) substances, are required to gather information on the properties of their chemical substances in the supply chain, which will allow their safe handling, and to register the information in a central database in the European Chemicals Agency (ECHA) in Helsinki. The Agency is the central point in the REACH system. REACH also aims to enhance innovation and competitiveness of the EU chemicals industry (European Commission, 2016).

Especially the recovery of plastics wastes can be affected due to their high amount of used additives, the inhomogeneous and often changing composition of treatable wastes, the special monomer registration under REACH and the complex structure of actors in the sector. The hazard profile of these substances must be determined (or in the case of recycling, also of the mixtures), and then appropriate classification and labelling carried out. In order to support the safe use of their recycled products, recyclers must collect information about the ingredients and provide the classification and labelling to their customers (Federal Environmental Agency of Germany, 2012).

2.3. Regulation (EG) on Persistent Organic Pollutants (Nr. 850/2004)

Persistent organic pollutants (POPs) are chemical substances that persist in the environment, bio accumulate through the food web, and pose a risk of causing adverse effects to human health and the environment. This group of priority pollutants consists of pesticides (such as Dichloro diphenyl trichloroethane, DDT), industrial chemicals (such as polychlorinated biphenyls, PCBs) and unintentional by-products of industrial processes (such as dioxins and furans).

It was amended in November 2015 concerning the total ban on short-chain chlorinated paraffins (used as plasticiser in plastic). Since March 2016, the restrictions on the flame retardant hexabromo cyclododecane (HBCD) are in force (they are contained, e.g. in Styrofoam insulation boards).

2.4. Agreements and Conventions concerning on marine litter worldwide

Several agreements and conventions in EU and worldwide are dealing with plastic marine debris, as for example:

- The EU Marine Framework Directive
- The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972' (London Convention)
- The Global Program of Action for the Protection of the Marine Environment from Landbased Activities,
- The Honolulu Strategy – A Global Framework for Prevention and Management of Marine Debris,

- The 'Global Partnership on Marine Litter'
- The G20 Action Plan on Marine Litter

The EU Marine Framework Directive and the G20 Action Plan are explained in more detail below.

2.4.1. G20 Action Plan on Marine Litter

The Action Plan on Marine Litter was adopted during the German G20 presidency in July 2017 and recognises the urgent need for action on marine litter. The G20 aim to support national and local initiatives to address the challenges posed by marine litter and recognise the importance of plastic (and other) waste pollution. Since waste from land-based sources represents the largest proportion of marine litter found in the world's oceans, measures aimed at reducing and managing land-based waste are prioritised. However, pollution from sea-based sources, including fishing and aquaculture industry as well as from the shipping sector should also be addressed. Commitment to actions to prevent and reduce marine litter from single-use plastics and microplastics are explicitly mentioned. Planned measures for promotion of waste prevention and resource efficiency include (G20 Germany, 2017):

- A significant reduction of the use of microbeads and single-use plastic bags; where appropriate they should become outphased;
- A significant reduction of the loss of plastic pellets during production and transport.

2.4.2. EU Marine Strategy Framework Directive

The Marine Strategy Framework Directive aims to achieve Good Environmental Status (GES) of the EU's marine waters by 2020 and to protect the resource base upon which marine-related economic and social activities depend. It is the first EU legislative instrument related to the protection of marine biodiversity, as it contains the explicit regulatory objective that "biodiversity is maintained by 2020", as the cornerstone for achieving GES.

The Directive enshrines in a legislative framework the ecosystem approach to the management of human activities having an impact on the marine environment, integrating the concepts of environmental protection and sustainable use.

In order to achieve its goal, the Directive establishes European marine regions and sub-regions on the basis of geographical and environmental criteria. The Directive lists four European marine regions – the Baltic Sea, the North-east Atlantic Ocean, the Mediterranean Sea and the Black Sea – located within the geographical boundaries of the existing Regional Sea Conventions. Cooperation between the Member States of one marine region and with neighbouring countries which share the same marine waters, is already taking place through these Regional Sea Conventions.

In order to achieve GES by 2020, each Member State is required to develop a strategy for its marine waters (or Marine Strategy). In addition, because the Directive follows an adaptive management approach, the Marine Strategies must be kept up-to-date and reviewed every 6 years (EC 2019b).

2.5. Summary of the most relevant EU regulations and targets

Table 1 provides an overview of the EU regulations relevant for the management of plastic waste, including the latest amendments of the Directives adopted by European Commission in May 2018.

Table 1: Summary of EU-regulations relevant for the management of plastic waste

Framework	Regulation task	Target
Waste Framework Directive, amendment 2018/851	Regulates the correct management of waste.	By 202555% of municipal waste must be recycled (60% by 2030 and 65% by 2035). Minimum requirements for EPR schemes. Eco-modulation of fees for EPR schemes (still in progress).
Packaging and Packaging Waste Directive (PPWD) , amendment (EU) 2018/852	Regulates all the plastic packaging and packaging waste placed on the market; covering each Member State territory.	Current recycling targets for plastic are: 50% by 2025; 55% by 2030. Mandatory EPR schemes for all packaging by 2024. Member States shall increase the share of reusable packaging on the market and the reuse of packaging.
Amendment to the PPWD: 2015/720 Regulation of the Consumption of Light-weight Plastic Carrier Bags	Regulates the consumption of light weight plastic carrier bags.	Reduction leading to an annual consumption level of light-weight plastic bags to 90 per person in 2019, and 40 per person by 2025.
Directive on Landfill of Waste, amendment (EU) 2018/850	To reduce negative impacts of the landfills to e.g. groundwater, surface waters and human health.	A binding landfill target to reduce landfill to a maximum of 10% of municipal waste by 2035; a ban on landfilling of waste suitable for recycling by 2030.
Directive (EU) 2019/.. on the reduction of the impact of certain plastic products on the environment (“Single-use Plastics Directive”)	To curb the use of a number of single-use plastic products in the EU, which aims to prevent and reduce marine litter of these products To prevent use of oxo-degradable plastic products	A ban on selected single-use products made of plastic for which alternatives exist on the market: cotton bud sticks, cutlery, plates, straws, stirrers, sticks for balloons, as well as cups, food and beverage containers made of expanded polystyrene and on all products made of oxo-degradable plastic. Measures to reduce consumption of food containers and beverage cups made of plastic and specific marking and labelling of certain products.

		Extended Producer Responsibility schemes covering the cost to clean-up litter, applied to products such as tobacco filters and fishing gear. A 90% separate collection target for plastic bottles by 2029 (77% by 2025) and the introduction of design requirements to connect caps to bottles, as well as target to incorporate 25% of recycled plastic in PET bottles as from 2025 and 30% in all plastic bottles as from 2030.

3. National Laws

3.1. Austrian federal legal framework

EU Regulations and decisions are binding throughout the EU and must be incorporated into national law by EU countries. In Austria competences are shared between the Federal Government and Provinces. The Federal Constitutional Act sets forth that legislation on hazardous waste falls exclusively under the jurisdiction of the Federal Government. With regard to other, non-hazardous waste, the Federal Government's jurisdiction only applies if there is a need to issue uniform requirements (also termed "authority in case of need"). Whenever the Federal Government does not make use of its authority in case of need, Provincial legislators are in charge. The Federal Government's authority in case of need for non-hazardous waste has also been implemented wherever a uniform regime applicable across the entire nation was required. Therefore, the Waste Management Act of 2002 and regulations derived there from bring together essential regulatory areas related to hazardous and non-hazardous waste.

3.2. Waste Management Act (2002)

The Waste Management Act of 2002 (WM Act) establishes the basic framework for waste management law (last amendment: 2018). More detailed configuration and implementation is generally provided in ordinances issued by the Federal Minister of Federal Ministry of Agriculture, Forestry, Environment and Water Management (that has become the Federal Ministry of Sustainability and Tourism in January 2018).

The WM Act is based on the precautionary principle and principle of sustainability and is geared towards the following objectives: to protect humans and natural environment; to minimize air pollution and gases relevant to climate change; to conserve resources; to ensure that the recovered materials are not more hazardous than the primary raw materials; to deposit the waste from waste treatment in a manner that is safe for future generations (Sec. 1 Waste Management Act of 2002).

The WM Act is based on the waste hierarchy of the EU Waste Framework Directive: waste prevention; preparation for reuse; recycling; other recovery (e.g. energy recovery) and waste disposal, while applying this hierarchy, ecological and economic factors need to be taken into account. A deviation from this hierarchy is only justified whenever a holistic approach shows that another option would bring about a better result in terms of environmental protection.

The WM Act sets requirements with regard to the development of a Federal Waste Management Plan and a Waste Prevention Program every six years. The WM Act also regulates obligations for the collection, processing, storage, transportation as well as import, export and transit of waste.

The WM Act defines principles and obligations of Extended Producer Responsibility for the management of packaging waste according to EU Packaging and Packaging Waste Directive (PPWD), as well as obligations with regard to the management of industrial and commercial waste.

The Sec. 13h of the WM Act provides the following definition of household packaging waste:

1. Size criteria:
   - area ≤1.5 m²
   - in the case of hollow bodies, a nominal filling volume ≤5 liters
   - in the case of expanded polystyrene packaging (EPS) a mass ≤0.15 kg per sales unit
2. Origin: generated in private households or institutions with similar to household packaging waste composition: restaurants, hotels, administration buildings, hospitals, medical practices, educational institutions, consulting firms, theaters, sports facilities, parks and other micro-enterprises.

The Sec. 13g of the WM Act defines legal bodies responsible for the management of packaging waste — producers and importers of packaging waste and packed goods — and requires them to participate in the approved collection and recovery system for household packaging (except for returnable/deposit packaging).

The Sec.13h requires that producers and importers of one-way dishes take part in the licensed collection and recovery system for household packaging.

The Sec. 14 of the WM Act foresees a ban on the free supply of plastic carrier bags to final consumers, minimum charges for the supply of plastic carrier bags as well as recording and reporting requirements on the quantity of plastic carrier bags placed on the market.

The Sec. 29provides for that the operation of waste collection and recovery systems is subject to approval by the Federal Ministry of Sustainability and Tourism (approval period – 10 years). Among other requirements, collection and recovery systems have to spend 0.5% of their income fees for waste prevention projects. Sec. 29b of the WM Act includes following additional provisions (list not exhaustive) with regard to the operation of waste collection and recovery systems for household and commercial packaging (in the next paragraph referred to as «collection system»):

- A collection system has to ensure full area coverage in each political district at a feasible distance to the consumer (for household waste: since 01 January 2018 each municipality must have at least one separate collection possibility for each separate collected fraction);
- A collection system for household packaging has to conclude agreements with the municipalities for the compensation of costs of municipal operators for collection and recovery of packaging waste collected in the residual waste;
- Collection systems for household and commercial packaging have to submit electronically data about the amount of packaging brought on the market by system participants on a monthly basis;
- Each three years investigations on the amount of market-input of plastic waste and share of plastic waste in the residual waste have to be carried out in all federal states.

The Sec. 30a contains provisions about the Packaging Coordination Agency (Verpackungskoordinierungsstelle, VKS) that can overtake obligations with regard to coordination of financial compensation and information of end consumers, cooperation on cost-efficient organization of packaging collection, management of the electronic database of commercial packaging waste, conduction of waste analyses, legal control and oversight.

Obligations for enterprises with regard to management of industrial and commercial waste are summarized in the Section 5 of this report.

3.3. Austrian Waste Management Plan and Waste Prevention Program

Since 1992, the Federal Minister of Sustainability and Tourism is required to draft a Federal Waste Management Plan (FWMP) at least once every six years (last, 7th version: 2017) and to publish it on the Internet in order to implement the objectives and principles of the Austrian Waste Management Act 2002 (AWG 2002). The FWMP is considered as the "White Paper" of Austrian waste management, with its periodic amendments it describes the development in Austrian waste management. The Waste Management Plan (WMP) and Waste Prevention Program (WPP) also contain measures and initiatives to promote a circular economy.

The Federal Waste Management Plan includes (Sec. 8 of the Waste Management Act of 2002):

1. An inventory of the waste management situation and an assessment of future waste streams;
2. The regional distribution of facilities for recovery and the disposal of waste; assessment of the need for their construction and decommissioning;
3. Existing waste collection systems and assessment of the need for new collection systems;
4. Specific measures: to reduce the quantities, pollutants content and adverse effects of the waste; to encourage the preparation for the reuse, recycling and other recovery; for environmentally and economically sound recovery of waste; for disposal of unavoidable/unrecoverable waste.

Additionally, at least once every six years the Federal Waste Prevention Programme must be developed with the aim to decouple economic growth from environmental effects associated with waste

production. It can be a part of the FWMP. In 2011, for the first time, a Waste Prevention Programme was included as a crucial component of the Federal Waste Management Plan. The Waste Prevention Programme must include at least (Sec. 9a of the Waste Management Act of 2002):

1. Objectives of the waste prevention measures;
2. A description of existing waste prevention measures;
3. An assessment of the appropriateness of the measures;
4. Qualitative or quantitative benchmarks to monitor and assess the progress made with the Measures;
5. In the case of cross-border projects, an illustration of the cooperation with concerned Member States and the European Commission.

The last version of the Austrian Waste Management Plan and Waste Avoidance Programme was published in December 2017 for the years 2018-2023 (BMNT, 2017).
Depending on the collection region, the packaging variety of other recyclables from households and similar establishments is collected separately, e.g. hard plastics, toys, CDs etc., the number of the fractions differ from one federal state to another. Only the collection of plastic packaging is obligatory in all federal states, therefore most requirements and measures in the FWMP (Sec. 6.4.3 "Packaging") are related to packaging waste.

According to Art.14 of Directive 94/62/EC, packaging and packaging waste is included in the waste management plans, including the measures for waste prevention and reuse. Accordingly, the following measures are to be set out or targets to be fulfilled:

- Prevention measures
- Promotion of reuse
- Targets for the recycling of packaging waste
- Establishment of take-back, collection and recovery systems
- Introduction of identification systems
- Compliance with quality requirements for packaging
- Establishment of databases
- Report of data on packaging (manufactured packaging, imported or exported packaging, packaging consumption, reuse share, recycling share, etc.).

The measures and legal acts implemented to date in Austria to transpose the Directive are described in the following sections. Austria has achieved or exceeded all targets through these measures. Ordinances related to the Waste Management Act of 2002, relevant for the topic of this study:

- Packaging Ordinance 2014
- Packaging Differentiation Ordinance 2015
- Household Packaging Producer Responsibility Ordinance2015
- Ordinance on taking back and deposit payments for refillable plastic beverage containers 1990

Additionally, the Ordinances on End-of-life Vehicles 2002, Electrical and Electronic Equipment 2005 include the take-back duties and material recovery requirements already determined in the related EU Directives, the Recycled Construction Materials Ordinance 2016 (incl. ÖNORM B3151) requires separation of materials for recovery, including dismantling of plastic parts (installations, sealing, walls) during deconstruction of buildings. Short overview of Landfill Ordinance 2008 is also provided below.

Sec. 6.4.3 of WM Act describes also some measures and initiatives related to plastic waste: The Sustainability Agenda Beverage Packaging and the Initiative on reduction of plastic carrier bags. Sec. 6.4.10 addresses microplastics as an important topic and mentions participation in initiatives concerning the reduction of plastic and microplastic entries in the environment (e.g. initiative for a Europe-wide phasing out of use of microplastics in cosmetics, "Zero Pellets Loss" initiative of BMLFUW with the Association of Chemical Industry in Austria, action to reduce disposable shopping bags, etc.).Closing knowledge gaps, responsible product design and conscious consumer behavior, as well as proper handling of sewage sludge as a sink for microplastics are mentioned as crucial for the solving of the microplastics problem.

3.4. Packaging Ordinance (2014)

In Austria, the EU Packaging Directive (94/62/EC) is on the one hand implemented through the Waste Management Act 2002 (amendment on packaging in 2013), in which substantial obligations, the distinction between household and commercial packaging and the licensing requirements for collection and recycling systems are described. In 1992, the Austrian packaging Ordinance (BGBl. Nr. 646/1992) came into force and was first amended in 1995 after the implementation of the EU Packaging and Packaging Waste Directive Further amendments were made in 1996, 1997, 2000, 2002 and 2006. On 1 January 2015, the new Austrian Packaging Ordinance (VVO - Bible. II Nr. 184/2014) was implemented. It contains expanded definitions and specifications for obliged companies and collection-and-recovery systems (PROs).

According to the Packaging Ordinance 2014, all manufacturers, distributors and importers that place packaging or packaged goods on the Austrian market are required to take the packaging back free of charge and ensure its recycling or reuse. The Ordinance is applied also to producers and importers of one-way dishes.

For household packaging, it is required to join a packaging compliance scheme from 1 January 2015 (Article 8 Packaging Ordinance 2014). For commercial packaging, one can choose one of the two options listed below for meeting the obligations (ARA, 2018):

1. Obligations of businesses that do not join a packaging compliance scheme

- Collect packaging waste through an own scheme
- Organise the re-use or recovery of packaging waste in state-of-the-art facilities
- Fulfil minimum recycling rates for each packaging material

- Submit annual data reports to the Ministry of Environment, including a breakdown by packaging materials, the amount of packaging placed on the market, the amount collected, the coverage rate in percent, the amount transferred and the transferee

2. Obligations of businesses that register with a packaging compliance scheme (alias collection and recovery systems for packaging or Packaging Responsibility Organisation, PRO):

- Enter into a compliance agreement with a licensed operator that overtakes collection, transportation and recovery of packaging.
- Submit data reports on the amount of packaging placed on the market
- Pay the material-specific compliance fee

On the Austrian market, seven PROs are authorized for the collection household packaging and eight for commercial packaging (BMNT 2018a). Exemplarily, compliance fees to be paid to the PRO Altstoff Recycling Austria AG (ARA), which was a monopoly in Austria from 1993 to 2015 and has still the highest market shares, are given below (ARA, 2019):

	Rate (€/kg) excl. VAT, from 01.01.2019
Plastic, household	0.063
Foils, commercial	0.070
Moulded containers, commercial	0.070
EPS, commercial	0.190

PROs for household packaging have to conclude contracts with corresponding municipalities or private disposal companies, or use the option to conclude a co-use contract with another PRO.

The collected packaging waste is divided between individual collection and recycling systems based on their assigned market shares. To calculate the market shares, the collection and recycling systems report their handled packaging materials monthly. The market shares are publicly available on the Internet.

In order to carry out certain joint tasks of all PROs, the Packaging Coordination Agency (VKS) was established. Their tasks are in particular:

- coordination of information for final consumers,
- carrying out of the necessary analyses concerning the collection,
- coordinated control of system participants of all collection and recovery systems,
- keeping of a register of collection points of commercial packaging.

The Packaging Coordination Agency was also assigned the management of waste prevention projects. The financing is provided by the PROs, which account for 0.5% of their fee income.

The Packaging Ordinance establishes the following separate collection and recycling targets for plastic packaging waste, based on the weight of materials collected in a calendar year, and inputs to recycling facilities:

- Household plastic packaging: separate collection 60%, input to recycling 50%;
- Commercial plastic packaging: separate collection 85%; input to recycling 75%;
- Overall target for all plastic packaging in Austria: 22.5%input to recycling.

Stakeholder dialogue on the future of the packaging collection in Austria

In the period from December 2013 to November 2015, a dialogue took place at federal level on the initiative of the BMLFUW ministry about a satisfying future organisation of packaging collection. Among the topics discussed were: container size and type, density of collection points, kerbside vs. drop-off-systems, collection of moulded containers only vs. collection for all plastics packaging, necessary adoptions for the market opening of household packaging 2015 etc. Participants included representatives of the federal states, municipalities, social partners and the economy, as well as collection and recycling systems for packaging, the Packaging Coordination Agency, NGOs and ministries. From the point of view of the stakeholders of Austrian waste management, the overall goal of the separate collection of packaging is the collection of as much material as possible for high-quality recycling. For an optimization of packaging waste collection, further stakeholder dialogues were proposed for the future, especially with regard to higher EU-wide collection and recycling targets.

3.5. Packaging Differentiation Ordinance (2015)

The Packaging Differentiation Ordinance was last amended in 2016 (BGBl. II Nr. 29/2016) and sets rules and set of criteria for a clear differentiation of household packaging and commercial packaging in order to avoid distortions of competition between operators for the collection and recycling of packaging. Differentiation is done based on 47product groups (e.g. beverages or dairy products) and on the size of packaging (for household packaging: area ≤1.5 m² or ≤5 litres, for EPS: mass ≤0.15 kg per sales unit; WM Act 2002, §13h). The shares of different packaging materials in each product group are already predefined as household packaging or commercial packaging.

3.6. Household Packaging Compensation Ordinance (2015)

Within the framework of Extended Producer Responsibility, the Household Packaging Compensation Ordinance (BGBl. II Nr. 275/2015) establishes a model for calculating compensations to be paid by PROs (by market share) to municipalities for the collection and treatment of household packaging in residual municipal waste. The determination of the quantities of packaging in residual municipal waste is conducted through waste composition analyses in all federal states. PROs have to conclude agreements with municipalities about the financial compensation for the collection and treatment of packaging in the residual waste. The Ordinance also contains a definition on the total coverage mass and quota.

3.7. Landfill Ordinance (1996)

In Austria, landfill restrictions were established in 1996 with the Landfill Ordinance, and entered into force in 1997. The year 2004 was set as the deadline for total compliance with the Landfill Ordinance, thus providing a transition time of seven years for the establishment of new infrastructure. In 2016, the latest amendment to the Landfill Ordinance (BGBl. II Nr. 291/2016) was implemented.

The Landfill Ordinance introduces a system of limit values that define the conditions for wastes (municipal waste, commercial and industrial waste, construction and demolition waste) to be allowed to landfill. However, one focus lies on wastes which contain organic matter: municipal waste and similar waste from commerce and industry, but also plastics, tires, sewage sludge, wood, biodegradable waste. Indeed, wastes must present a TOC value (total organic carbon) of 5 % or less by weight in order to be allowed to landfill in order to reduce the production of methane and acid leachate during organic decomposition. This landfill restriction became subsequently referred to as the TOC ban: it requires organic wastes to be treated prior to landfill, either via thermal treatment or mechanical-biological treatment (MBT). The output from MBT may only be allowed to landfill if its calorific value is 6,600 kJ/kg or less. In practice this means that the higher calorific portion of the waste (especially plastic) that enters a MBT plant must be mechanically separated and sent to thermal treatment for energy recovery. In addition to the limit values, introduced landfill taxes are making landfilling a more expensive option than incineration.

In 2015, 71% of plastics wastes in Austria were incinerated, 28% recycled and 1% landfilled (UBA 2017).

3.8. Sustainability Agenda for Beverage Packaging

Ambitious reuse targets for beverage packaging were set in Waste Management Act (AWG) 1990 but reduced later on and entirely removed from the Austrian legal framework in 2000. In 2000, the Austrian Chamber of Economy (WKO) introduced a "Voluntary commitment for refill and environmentally friendly treatment of beverage packaging". In 2011, the voluntarily Sustainability Agenda for the period 2008 – 2017 was signed based on the recommendations of the social partners on reusable beverage packaging with the following priorities (BMNT, 2017): Stabilization of the quota of reusable beverage packaging at 22.1% (base 2010) through its popularisation (placement in the shop, promotional prices, weight decrease, reusable 0.33 l beer bottles etc.), promotion of the recycling of beverage packaging through bottle-to-bottle recycling of PET containers and increase in recycling of beverage cans, anti-littering measures (e.g. toss-it-in-the-bin by ARA 2012). In 2018, the latest Sustainability Agenda of the Austrian Economy for Beverage Packaging until 2030 was introduced with the aim of improved holistic life cycle assessments and a new focus on communication measures for food waste prevention (WKO 2018).

But, since reusable beverage packaging is ruled by voluntary self-commitments in Austria, the share of multi-use bottles has decreased from 60 to 20% (Ökologie Institut, 2019, Profil, 2019)(Figure 4). Multi-use exists mainly in gastronomy. In food retail, trade consumers have only little possibility to

choose between multi and single-use bottles. The Sustainability Agenda leaks on binding measures to raise share of multi-use beverage bottles.

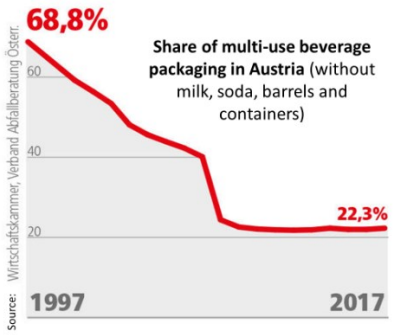

Figure 4: Multi-use-beverage packaging (%) in Austria 1997-2017 (modified, source: Profil, 2019)

The decline of reusable beverage packaging compared to one-way packaging was continuing because of a higher convenience factor in production, transport, collection and consumption (light weight, resistance to breakage, dense collection system), a higher level of out-of-home consumption (trends like "coffee-to-go"), advertising and trade prices.

Especially one-use beverage packaging is often improperly disposed via littering (Hochreiter 2010).

3.9. Implementation of Directive (EU) 2015/720 on plastic carrier bags

In Austria, between 5,000 and 7,000 tonnes of plastic bags per year are produced as waste, approx. 0.01% of the total waste volume. Due to the high environmental awareness of the population and the nationwide, densely expanded collection system almost all plastic carrier bags are collected and incinerated or recycled. Nevertheless, further potential measures can be exploited to increase resource efficiency and sustainability. The use of shopping bags, carrying baskets, cloth bags or other reusable carrying aids has top priority in terms of waste prevention (BMNT 2017).

The Directive (EU) 2015/720 sets also a political goal for Austria is reduce the existing number of plastic carrier bags by 50% until 2019. In addition, the use of all disposable carrier bags should be reduced. A voluntary agreement with certain Austrian trading companies from all areas and also with NGOs was signed. In particular, the mandatory fee for disposable plastic bags was established and all other materials - paper and bioplastic (before there was a voluntary charge, used mainly by food retailers). There is still an exception for plastic bags for loose fruit and vegetables, which are not allowed to be placed at the cash desk any more. The participating companies need to include the number of disposable carrier bags in their annual report in order to provide data for the annual report of the BMNT to the EU (BMNT 2017).

In December 2018, the Austrian government announced a planned set of measures for January 2020, including:

- a ban on non-biodegradable light-weight plastic carrier bags;

- a rapid implementation of Directive (EU) 2015/720;
- a ban on microplastics in cosmetics and detergents(if no EU-wide solution is found beforehand);
- 20-25% of the amount of (mainly one-way) plastic packaging from 2016, corresponding to approx. 60.000 tons of plastics, need to be reduced by 2025 combined with awareness-raising measures (BMNT 2018b).

3.10. Legal Framework in the Austrian Federal Provinces

The Austrian Federal Provinces have jurisdiction over municipal waste collection, the associated levying of waste collection fees and the planning of plants, particularly of plants for the disposal of this waste. All nine Federal Provinces have their own pertinent waste laws, some of which have given rise to associated ordinances. They essentially govern municipal waste, insofar as this waste is not covered by legal statutes of the Federation, and thus primarily residual and bulky waste. To a lesser extent, they also cover recyclables and biogenic waste. With respect to commercial and industrial waste, the focus is on waste similar to household waste and partly on recyclables.

As a consequence of the division of competencies between the Federal Republic and the nine Federal Provinces, the latter formulated their own Waste Management Laws dealing with non-hazardous waste management at the provincial level. There exist nine Federal Waste Management Acts. Relevant for this study are the Federal Waste Management Acts of Vienna and Lower Austria, which are described in detail below.

3.10.1. City of Vienna

Waste Management Act of Vienna (1994)

The Waste Management Act for Vienna (last version 22.03.2018) stipulates the compulsory collection of residual waste and recyclables for the entire municipal territory. The Act also defines the calculation basis for waste collection and disposal fees, the prerequisites for the construction of waste treatment and utilisation facilities as well as the preconditions for the formulation of Waste Management Plans and Waste Avoidance Programmes for Vienna. The development of waste management concepts for construction sites and events is likewise organised, with an emphasis on waste avoidance (City of Vienna, MA 48).

Waste Management Plan, Waste Avoidance Programme (2013-2018)

Whenever needed and at least every six years, the Municipal Department 48 (MA 48) develops a Waste Management Plan and a Waste Avoidance Programme on behalf of the Provincial Government of Vienna. This concept also determines planning horizons, which must not contradict those of the Federal Waste Management Plan (City of Vienna, MA 48) .The last version of the Waste Management Plan and Waste Avoidance Programme, was developed for the years 2013-2018 (City of Vienna, 2012).

With regard to the management of plastic waste, the Waste Management Plan contains following measures:

- Section 8.4 “Capacity management for sorting of mixed lightweight packaging (LWP)” that describes the available capacity for LWP sorting in Vienna (14 000 t/a) that is much higher than the forecasted amount of LWP generation in 2018 (7200 t/a of hollow bottles that are collected separately).
- Section 10.1.2“Measures on collection of recyclables” describes planned measures for separate collection of recyclables and includes following measures for an optimisation of plastic waste collection: to install more plastic waste bins next to multi-storey apartment buildings; introduction of bag collection of plastic waste (hollow plastic bottles/containers) in the single-family houses; increase of separate collection of plastic waste by commercial companies (bags for foils and bins for hollow plastic bottles/containers) .
- Section 10.1.3“Measures on waste collection centres (civic amenity sites)” contains requirement to increase awareness about plastic foils collection at waste collection centres.
- Section 10.7 “Public relations” addresses the need to improve information campaigns about the separate collection of plastics.

The section “Package of measures “Green events” of the Waste Avoidance Program “addresses the need for extension and optimisation of existing campaigns aimed at reducing one-way dishes: the City of Vienna offers a free-of-charge-rent of refillable dishes (cups, plates, cutlery) for small and large events, including a Vienna Dishes-Mobil (more details in Deliverable 3.1.3 “Waste management in Austria, Vienna and Lower Austria”).

3.10.2. Province Lower Austria

Waste Management Act of Lower Austria (1992)

The Waste Management Act of Lower Austria was developed in 1992 (last version 27.04.2017) as a piece of basic legislation in the field of waste management in the Province of Lower Austria. It defines main aims and principles of the waste management system and regulates the organization of avoidance, transport and collection of municipal waste and the procedure for lying down and prescribing waste management fees. The Act requires the development of a Waste Management Plan every 5 years.

Waste Management Plan of Lower Austria (2016-2020)

The plan formulates future goals and measures of Lower Austrian Waste management, starting with waste prevention over the preparation for reuse, the proper separation of waste in the households to the application of complex disposal technologies. For this 5-year period, the Waste Management Plan formulates concrete objectives and measures of Lower Austrian waste management for the individual waste fractions and inter-municipal cooperation.

Recyclable materials (approx. 30% by weight) are one of the focal points of the planning period 2016-2020.In order to further optimize the municipal waste management; the preparation of a future concept for recycling centres is planned. The aim is to continually change the material collection centres

into recycling centres. For plastic waste, an optimisation and increase of efficiency of their separate collection is aimed. In Lower Austria, plastic packaging is collected in six various systems, however, the mass fraction of plastic packaging and bonded materials in the residual waste remains quite high (>50% of the generated LWP). Specific objective for the plastic waste: collecting material for high-quality recycling and reducing the various collection systems for plastic packaging. Planned measures to achieve the objective:

- Outlining plastic flows (quantities and qualities) in Lower Austria: examine the material composition of plastic waste in order to enable an ideal plastic waste treatment
- Pilot project on material collection centres: collection of non-packaging plastics with similar material properties
- Finding arguments supporting the reduction of collection systems for plastic packaging within the scope of the regional stakeholder dialogue.

The plastic fraction is also mentioned with regard to its content in bulky waste in order to improve the collection and reuse of plastics found in bulky waste sorting analysis and the quantification of the overall amount of plastics, wood and metals. Their reuse potential needs to be examined.

3.11. Slovak federal legal framework

Waste management was introduced to Slovakia in 1991, when the first waste law was approved.

Slovakia joined the European Union in 2004; therefore, EU legislation had to be implemented into Slovak legislation on waste management: In the period 2001 to 2006, the Act 223/2001Coll. on Waste has been harmonised with all EU Waste Directives, including the Directive 2000/53/EC on end-of life vehicles, the Directives on waste electrical and electronic equipment (WEEE), the Directive on PCB/PCT, and the Directive on hazardous waste, the Landfill Directive. Among other things, market oriented economic instruments were implemented in the environmental legislation, including the fund for landfills closure, a new local fee by means of which municipalities better organise waste management and the Recycling Fund to support the collection and recycling of packaging and certain other end-of-life products. This act was amended 32 times by 2010.[8]

In 2015, the new Waste Management Act 79/2015, incorporating the requirements of the EU Packaging and Packaging Waste Directive 2015, came into force.

3.11.1. Waste Management Act 79/2015

The Waste Management Act 79/2015 and amendments to certain acts is in force since January 1 2016 (latest amendment: Act no 313/2016).

The Waste Management Act 79/2015 governs:

a) programming documents for the waste management system,

b) waste prevention measures,

[8]Waste Management in the Slovak Republic, Supreme Audit Office of the Slovak Republic 2010

c) rights and obligations of legal and natural persons related to waste prevention and waste management,

d) extended producer responsibility,

e) management of specified products and waste streams,

f) management of municipal waste,

g) transboundary movement of waste,

h) waste management information system,

i) scope of competence of administrative authorities and municipalities in matters of the state waste management administration

j) liability for breaches of obligations in the area of waste management, and

k) the operation and process of winding up and terminating the Recycling Fund.

This Act also includes a law on packaging no. (č. 119/2010 Z.z., amending Act no. 223/2001).

In addition to classical conceptual definitions, sanctions, or control mechanisms, the following four key areas are addressed for companies or communities:

1) § 14 deals with the obligations of the waste holder, the producer of the waste or person who is in possession of waste (including municipalities).
2) § 27 addresses the extended producer responsibility for packaging, non-wovens, tires, batteries and accumulators, electrical and electronic equipment and vehicles.
3) § 80 determines how municipal waste management has to be handled by the municipality:
4) Reporting obligations in waste management include agreements, registrations, representations and authorizations.

Extended Producer Responsibility (EPR, in SK: OZV)

This means that the manufacturer (the one who registers the reserved product for the first time on the Slovak market) is obligated to take care of the product (packaging, non-wovens, tires, batteries and accumulators, electrical and electronic equipment and vehicles) during its whole life span —from production to consumption to end of life. As stated in the waste management hierarchy, the goal is to prevent the occurrence of waste, support re-use and, finally, waste management itself. EPR also takes responsibility for consumer information such as learning materials in schools or information campaigns across the whole of Slovakia, as well ensuring the financial coverage of these activities.

Producers of specified products shall report to the *coordination centre for the specified waste stream (e.g. packaging or WEEE)*:

a) information about the quantity of their production, cross-border transport from another Member State to the Slovak Republic, import, cross-border transport to another Member State from the Slovak Republic, or export of a specified product,

b) the type and quantity of waste from specified products, and

c) the type and quantity of waste from a specified product for which they, being the holders thereof, have ensured collection and recovery in the first waste recovery installation by means of operations R1 through R11 according to Annex 1.

The Recycling Fund (359/2005) was dissolved at the end of 2016 and replaced by EPR: Producers to pay for all costs concerning the collection, sorting and recycling and either a) contract with an authorized Producer Responsibility Organization (PRO) or b) become an authorized individual complier.

With 11 PROs managing packaging and packaging waste till 2017, 11 PROs managing waste electrical and electronic equipment, and 7 PROs for batteries and accumulators the PROs are subject to competition for every waste stream. According to the waste act, these PROs must be non-profit. For packaging, the Green Dot System ENVI-Pak, founded in 2003, and Natur-Pack have the highest market shares with approx. 50% and 25% respectively.[9]

Act No. 79/2015 has legally defined the conditions for a clearing house (e.g. *coordination centre for packaging waste*) per EPR waste stream (Interreg MOVECO 2017).

The objectives of waste management in the field of packaging according to Annex 3, Part III of the Waste Act are:

a) a total level of recovery of at least 60% of the volume of packaging waste, a total level of recovery of at least 55% or more amounting to 80% of the total volume of packaging waste,

b) the rate of recovery for individual packaging materials (waste streams) of at least:
- 60% of the total volume of glass packaging waste,
- 68% of the total volume of paper packaging waste, (including cardboard and board),
- 55% of the total volume of metal packaging waste,
- 48% of the total volume of plastic packaging waste,
- 35% of the total volume of wood packaging waste.

c) a level of recycling for individual packaging materials (waste streams) of at least:
- 60% of the total volume of glass packaging waste,
- 60% of the total volume of paper packaging waste, (including cardboard and board),
- 55% of the total volume of metal packaging waste,
- 45% of the total volume of plastic packaging waste,
- 25% of the total volume of wood packaging waste.

EPR is also applying for non-packaging waste such as window glass: In accordance with the obligations referred to in § 27(4), producers of non-packaging products shall ensure the collection, transport, recovery, recycling and disposal of waste from non-packaging products that they have placed on the market and are part of separately collected components of municipal waste, to the full extent, at least to the level of their collection share. Therefore, they are also obliged to contract with a PRO.

For the "PlasticFreeDanube" project, which focuses mainly on plastics, the following parts of the Waste Management Act 79/2015 are the most important:

[9] https://www.wikiwasteschemes.com/slovak-republic. Retrieved in May 2019

- Fourth section: Packaging and packaging waste § 52- § 59
- Sixth Section: Municipal Waste §80- §83

Other legal framework that supplement the Act 79/2015:

- Act no. 329/2018 Z. z. on the Fee for the Deposit of Waste and on the Amendment to the Act No. 587/2004 Coll. on the Environment Fund (update effective from 1.1.2019)
- Decree No. 365/2015 Coll. on the Waste Catalog (update effective from 1.1.2018)
- Decree No. 366/2015 Coll. on registration duty and reporting obligation (attachments include templates) (update effective from 1.1.2019)
- Decree No. Act No. 367/2015 Coll., Amending Decree No. 228/2014 on requirements for fuel quality and science
- Notification 368/2015 Coll. on Issuing of Decree on uniform methods of analytical control of waste
- Decree No. 371/2015 Coll., which implements certain provisions of the Act on Waste (obligations of producers and holders of waste, standards for sorted collection in municipalities, methods and conditions for disposal of biodegradable waste, approvals) (update effective from 1.1.2019)
- Decree No. 373/2015 Coll. on Extended Producer Responsibility and the management of dedicated waste streams(update valid from 1.1.2019)
- Decree No. 382/2018 Z. z. on waste dumping and storage of waste mercury(update effective from 1.1.2019)
- Regulation of the government of the Slovak Republic 330/2018 Coll., which stipulates the amount of the fees for the deposit of waste (update effective from 1.1.2019)

3.11.2. Packaging and Packaging Waste (Subp. 4,§ 52 -59 of Act 79/2015)

This section deals with the requirements for the composition, properties and labeling of packaging and the rights and obligations to the management of packaging with the aim of

(a) preventing the occurrence and the harmfulness of packaging waste and reducing its quantity and danger for the environment,

(b) preventing barriers to trade, distortion and restraint of competition.

It also deals with the requirements and obligations for packaging manufacturers, distributors, and waste management. Packaging must be designed, manufactured, marketed or distributed so as to meet essential requirements for their composition and properties and to allow its reuse or recovery, including energy recovery, recycling and organic recycling whereas fulfilling the requirements lay down by harmonized standards. Heavy metal concentrations in packaging are strictly regulated.

Comment: The legislative proposal on a deposit scheme for Slovakia still needs to be approved by the Parliament and should become effective on 1 January 2020 when signed by the President. Under the new legislation, the introduction of reverse vending machines will not be mandatory for all stores or operations. It will only be mandatory for those that are larger than 300 square meters. However, it is assumed that many smaller stores will take over the system over time. The law envisages a deposit of 12 cents per plastic bottle

and 10 cents per can. In addition to that, returnable packaging would have to be clearly marked. Although the law should come into force in 2020, it has given the manufacturers and distributors of beverages two years to provide technical support and to deploy the entire deposit system.

3.11.3. Waste management and waste prevention program of the Slovak Republic

Waste legislation in Slovakia has been brought in line with EU regulations. Since 1993, the strategic direction of waste management has been defined through the concept document *Waste Management Programme of the Slovak Republic* (hereinafter WMP SR, in SK: POH SR), adopted by the government. The WMP SR is evaluated regularly (as a rule, every five years) and new targets have been set out for the next period (EEA 2014). Since 1993, there have been 6 WMP SR, and the *Waste Management Programme of the Slovak Republic 2016-2020* is the latest one.

The structure of WMP SR for the years 2016 to 2020 corresponds to the requirements of Article 29 of the Waste Framework Directive. The program does not contain waste prevention measures under Article 29 of the Waste Framework Directive, as these were adopted in a separate document titled "*Waste Prevention Program of the Slovak Republic for the years 2014-2018*", which was approved by the Government of the Slovak Republic by Resolution no. 729/2013 of 18 December 2013.

The WMP SR reflects the national waste management policy, covers the whole territory of the Slovak Republic and its purpose is to ensure the implementation of the measures resulting from the European Union waste management directives. The Slovak Ministry of Health is subject to the assessment of the impact of the strategic documents pursuant to § 4 par. 1 of Act no. 24/2006 Coll. on environmental impact assessment.

A Binding part of WMP SR consists of the shipment of specified types and quantities of waste (waste streams) and targets aimed at reducing the amount of packaging waste, the amount of polychlorinated biphenyls and contaminated equipment and measures to reduce the amount of biodegradable municipal waste going to landfills.

The WMP SR determines the priorities of waste management in Slovakia and sets several objectives. One of these is the diversion from landfilling and the direction of waste sorting and recycling; the recycling of paper and cardboard, glass, plastics and metals in household waste shall be increased to at least 50% by 2020. Sorting plays a crucial part in this field.

At the same time, the WMP SR considers the open negotiations of the European Commission on the circular economy and outline plans of the Waste Management Strategy for 2025 and 2030 within the framework of the forthcoming "Waste bundle", which fundamentally modifies the way waste is handled in favour of its recycling and the sustainable use of recyclable waste in order to ensure the rational use of natural resources.

According to the new EU targets in the EU Waste Framework Directive, the Slovak Republic aims to reach a recycling of 55% for plastic waste, 80% for glass, 70% for paper and paperboard to and 90% for metals by 2020. In order to reduce the disposal of biodegradable waste, the Ministry of

Environment wants to support domestic and community composting projects as well as biogas plant projects.[10]

3.12. Legal framework in the Slovak Federal Provinces

In Slovakia, the waste management legislation at the regional level is specified in the National Waste Act 79/2015. More specifications on waste management on the territory of a given municipality are given in the regional *General Binding regulations* (in SK: všeobecne záväzné nariadenia, *VZN*).

The VZN must comply with the Waste Act 79/2015and its amendments, and must also reflect the waste management program (WMP SR), the region and the municipalities for a defined period.

The WMP SR for the years 2016 to 2020 is the fifth national program setting out basic requirements, objectives and measures in the area of waste management. It is based on the evaluation of the previous WMP SR for the years 2011 to 2015 and the analysis of the current state and needs of waste management in the Slovak Republic. The WMP SR is drawn up during the period of the approved Partnership Agreement 2014-2020, using European Structural and Investment Funds in the volume of 15.3 billion EUR for 10 years. The Partnership Agreement defines the strategy and priorities for effective and efficient investments. At the same time, the program will take into account the approved Environmental Quality Operational Program for the 2014-2020 programming period, which will significantly contribute to the direction of investments in waste management infrastructure by the 2020 deadline.

The binding part of the WMP SR is a document for the decision-making activity of the state administration bodies in waste management. District offices in the Region's headquarters are required to draw up programs for regions based on the objectives and measures set out in this document. The program of the region will be drawn up for the territory which is in the competence of the relevant district office at the headquarters of the region. The WMP SR also includes intentions to build facilities for the valorisation and disposal of waste of supra-regional significance.

3.12.1. The Bratislava autonomous region and Trnava autonomous region

Analyses of waste generation and management have been conducted in the Slovak Republic since 1995, based on the regional information system (RISO). Waste producers need to give annual "Reports on waste generation and disposal" to the relevant District Office who has access to the RISO and finally submits the reported data to the RISO information system.

[10] http://www.minzp.sk/sekcie/temy-oblasti/odpady-obaly/poh/poh-sr-2016-2020/

4. Waste management in enterprises

4.1. Waste management in Austrian enterprises

4.1.1. General provisions

The management of waste from companies is the responsibility of the company owner .Every company must keep records of the waste generated. If hazardous waste is generated during operation, the law prescribes further obligations. Simplifications are foreseen for businesses that produce waste in quantities as an average private household. A company with >100 employees has to develop a Waste Management Concept and also needs to appoint a technically qualified Waste Management Officer and a deputy (Austrian Chamber of Commerce, 2018).

Industrial and commercial waste is mostly handled by private companies. In the study "New knowledge basis for handling of industrial and commercial waste in Lower Austria" it was estimated that out of 940,000 t of generated waste around 120,000 t are residual waste, which are collected to ¼ by a municipality and ¾ by private waste management companies (Stoyanova, 2010). It is to be assumed that most of the other operational waste will also be collected and treated by the private the waste management industry.

4.1.2. Recording requirements

As the owner of waste (waste producer), every company is required to keep records on its accumulated waste. With regard to non-hazardous waste, problematic substances (hazardous household waste) and waste oil (> 200 litres in a calendar year), the following must be documented: type, quantity, origin, whereabouts and reference period (Sec. 17 of the Waste Management Act, 2002). Other reporting duties arise from the Packaging Ordinance, Ordinance Regulating the Handling of Waste Electrical Equipment, Battery Ordinance, Ordinance on Old Vehicles and others. The type of recording can be freely chosen depending on the type of waste, e.g. as collection of copies of invoices, delivery slips, documents or in the form of electronic data. The records must be retained separately from other business documents for at least seven years and presented to the authorities upon request.

4.1.3. Disposal obligations

The Waste Management Act 2002 provides that waste must be transferred to an authorised collector or processor for disposal at least once within 12 months. Waste designated for recovery must be transferred to an authorised collector or processor for disposal only within 36 months (Sec. 15 of the Waste Management Act, 2002). PCB-containing materials (used e.g. as plasticisers in plastic) must be handed over immediately after their generation for treatment in waste incineration plants (Sec. 16 of the Waste Management Act, 2002).

Section 15 paragraphs 5a and 5b of the Waste Management Act 2002 requires a heightened obligation for waste producers to exercise due diligence for a waste transfer that is in compliance with the law. The administrative penalty for the incorrect transfer of waste is a fine of up to €41,200 (Austrian Chamber of Commerce, 2018).

4.1.4. Waste Management Concept

The Waste Management Concept (WMC) must be updated pursuant to the Waste Management Act 2002 and/or the Austrian Trade Regulation Act of 1996, if a company site employs >20 persons (operator obligation).A WMC provides information about the type, quantity, origin and location of all the waste accumulated through the operation of the business. It also defines measures to prevention and disposal of waste, as well as the planned development of the enterprise and its waste quantities. The program has to be renewed after each significant waste-relevant change in the facility and at least every 7 years (Sec. 10 of the Waste Management Act, 2002). The term „business operation" within the meaning of this provision should be interpreted broadly and includes not only industrial operations but also office buildings and schools (WKO 2016 and 2018).

4.1.5. Waste Management Officer

In enterprises with more than 100 employees, a technically qualified waste representative and deputy waste representative must be appointed. This is usually a qualified employee with an environmental education. The waste management officer is responsible for the waste management in the company and the contact with the authorities. The waste management officer is tasked with monitoring the company's compliance with waste management regulations, the organization of the implementation of waste management regulations, providing information and advice to the company owner on all issues concerning business relevant waste management, including waste management issues in procurement, estimation of the costs of waste treatment and potential income from recyclables (Sec. 11 of the Waste Management Act of 2002).

4.2. Waste management in Slovak enterprises

4.2.1. An entrepreneur as a manufacturer of a reserved product

A manufacturer of a reserved product is a manufacturer of electrical equipment, a battery and accumulator manufacturer, a packaging manufacturer, a vehicle manufacturer, a tire manufacturer, and a non-consumer manufacturer of the product.

In simple terms, there is almost every entrepreneur for the reserved product manufacturer covered by the extended liability and related obligations. Only non-packaging manufacturer is any person who, in the course of his business, irrespective of the selling technique used, including the sale under a distance contract, places on the market a non-wrapped product, including an ordinary advertising flyer, business card, catalogue or any other promotional material that is intended for customers.

Therefore, in order to be defined as a manufacturer of non-woven products, it is sufficient that you put on the market something that is not wrapped, it is made of plastic, paper, glass or cardboard, and the waste can end up in communal waste. Such conditions are met by an ordinary advertising flyer, which is imprinted on potential customers printed in the mailbox, and they will then be thrown into the basket.

In addition, if you thought you were getting rid of the title of the manufacturer of non-woven products by giving yourself leaflets, for example, printing through the printer, that's not the case. The

manufacturer of these products is not considered to be the printer that pushes them, but the manufacturer is the entrepreneur who puts them on the market.

Likewise, any businessman who delivers goods packaged in packages (even if only micro-bag bags) to his customers can consider himself a packaging manufacturer within the meaning of the Waste Act. According to the Waste Act, therefore, the producer of packaging is not the one who actually manufactures packaging (for example, micro-bag bags or cardboard boxes), but the businessman who packs the goods for his customers.

4.2.2. Obligations for the producer

In addition to specific obligations for each particular type of product manufacturer, such as manufacturers of packaging or non-wovens, the following generic obligations also apply also to them:

a) the manufacturer must register in the Producers Register of the product type, maintained and updated by the Ministry of the Environment. In this context, he must also notify any changes to the registered data,
b) if he has no registered office or place of business in the Slovak Republic, he must appoint an authorized representative in accordance with the law to fulfil the obligations imposed by the waste law,
c) he must report the material composition of the product, its structure and its designation in accordance with the law, if that obligation results from it,
d) comply with the obligation to inform the public and the processor of the waste stream in accordance with the law,
e) he shall ensure the fulfilment of the objectives set out in Annex. 3 of the Act,
f) he shall ensure the disposal of dedicated waste streams to the extent and in the manner prescribed by law,
g) he shall ensure the recovery and recycling of the dedicated waste stream at least at the level of the binding targets and the recovery and recycling limits for the dedicated waste stream set out in Annex II. 3 of the Act,
h) he shall keep and maintain records and report them to the Ministry,
i) he must comply with the obligation to provide information to the end users of the specific product in accordance with the law,
j) he must calculate the collection and market share in accordance with the law, on the basis of data published by the Ministry at its headquarters by 15 July at the latest,
k) he must ensure that all separately collected components of municipal waste belonging to a dedicated waste stream are taken from the responsible municipality.

4.2.3. Organization of Extended Producer Responsibility

If a producer wants to least hand over a part of the obligations mentioned above, he may enter a contract with a Producer Responsibility Organization (PRO) for the particular product type (e.g. packaging or WEEE) and pay fees to the PRO for the fulfilment of legal obligations on collection, sorting and treatment:

(a) Waste Act and E-Commerce Obligations to offset the actual costs of the dedicated waste stream (after deducting the revenues from the recycling)arising from the collection, transport, preparation for reuse, recovery, recycling, treatment and disposal of separately collected waste belonging to the particular product waste stream,
(b) provide transparent, true and complete data and information,
(c) without delay, notify any change in identification data, legal status, subject matter or type, composition, quantity and characteristics of the product, insofar as it may affect the proper performance of the obligations,
(d) submit on request the documents proving the correctness of the provided data on the quantity of a particular product placed on the Slovak market within 30 days from the day of delivery of the written request.

Attention is also drawn to the fact that, under the Waste Act, without a PRO's breach of law, an entrepreneur is entitled to terminate a contractual relationship only on 31 December of the calendar year. However, in case of breach of obligations, a contract with a PRO may be terminated within 30 calendar days.

4.2.4. Other obligations stemming from the Waste Act

According to the Waste Management Act 79/2015, the waste holder can be considered to be one of the traders who, in the course of his business, has waste in his possession for a certain time period (stored a basket, for example). Additional obligations are linked to that, such as keeping records of waste types and quantities and handling them.

In addition to the above obligations, the Waste Act contains an additional number of obligations pertaining to individual entrepreneurs depending on their activities. If, for example, you are considered to be a manufacturer of electrical equipment or batteries, it is advisable to contact an expert in this area who can give you advice on your duties. In case of non-compliance with the statutory obligations, there are heavy fines for entrepreneurs.

5. Institutional Framework

5.1. Austrian Institutional Framework

A List with the most important stakeholders in the Austrian waste management is provided in Table 2:

Table 2: Most important stakeholders in the Austrian waste management

Principal Stakeholders and their Roles in Waste Management	**Stakeholders' Roles**	**Relevant Stakeholders in Austria, especially in the Province Lower Austria and the City of Vienna**
Central government	Implementation and maintenance of compliance with EU policies and legislation on waste. Development and implementation of a national waste management strategy.	Federal Ministry of Sustainability and Tourism
Environmental agencies working on behalf of the central government	Provision of planning, regulation and technical assistance.	Environment Agency Austria
Regional and local government	Provision of planning, regulation, and monitoring.	- State Parliament of Lower Austria, Lower Austrian Provincial Government - State Parliament of Vienna
Municipalities	Collection, treatment, recovery and disposal, as well as some planning and regulating.	- Municipalities united in the framework of Lower Austrian Environmental Associations (95% of population) and single municipalities; - City of Vienna Administration, Municipal Departments MA 48 and MA 22
Waste management companies	Collection, treatment, recovery and disposal services.	Overview is provided in report D 3.1.3 "Waste management system in Austria"
Industrial/commercial waste producers	Prevention, minimisation and recycling of waste. Duty to ensure proper handling, recovery and disposal of waste. Monitoring and reporting on waste production, recovery and disposal.	Overview is provided in the Deliverable 3.3.1: "Report on plastic pollution"

NGOs, associations	Representing the public interest. Lobbying on planning and environmental issues.	List of relevant networks, NGOs will be provided further in this section
Research institutions	Technical research, inter alia, to develop new waste management technologies, or conduct environmental analysis.	
Public	Separation at source, recycling and prevention of household waste. Payment of fees for waste collection, recovery and disposal services. An interested and affected party within the proximity of waste management facilities.	

5.1.1. Austrian legislators and public administration

Legislative institutions ensure the development of an efficient legal framework in the field of waste management.

Public administration ensures that legal norms in waste management are fulfilled by the creation of waste management plans that include concrete specifications for reducing the quantities and pollutant content of waste, an environmentally friendly and economically useful utilization of waste, to promote the prevention and recovery of waste, in particular in terms of resource conservation and the planned measures to achieve these targets.

5.1.2. Austrian national government bodies

Federal Ministry of Sustainability and Tourism

The Federal Ministry of Sustainability and Tourism is, amongst other duties, responsible for the protection of the environment. It is subdivided in 7 sections whereas Section V is responsible for waste management, chemical policy and environmental technology. The Ministry is in charge of waste management legislation on the federal level.

Environment Agency Austria

Environment Agency Austria – EAA (UBA, Umweltbundesamt) is an expert institution owned by the Federal Government, established in 1985.EAA works on behalf of the government providing expert knowledge and technical assistance in developing plans, strategies and solutions for decision-makers in politics, administration and the economy. It also provides laboratory diagnostics. It provides, among others services, on analysis of microplastics, published a study on Micro-Plastics in the Danube (2015) and participated in the Joint Danube Survey (2015)–research expedition analyzing the water quality of the river Danube.

The *Packaging Coordination Agency (Verpackungskoordinierungsstelle, VKS)* is owned by the EAA. It coordinates the interest of the different parties in the field of EPR and ensures a fair competition between the different producer responsibility organisations (PROs). All PROs have to finance the VKS depending on their market share, covering all costs of its operation. Activities of the VKS in the household

packaging sector include e.g. the coordination of consumer awareness raising campaigns for packaging collection and the calculation of packaging material in residual waste, which has to be compensated by payments from PROs to municipalities. In the commercial sector it provides the so called „Anfallstellenregister"(electronic database on types and amounts of packaging waste generated by commercial users as input data for disposal companies). For both sectors it organises and coordinates analysis of packaging waste (e.g. the sorting analysis of household packaging waste).

5.1.3. Regional government bodies: province Lower Austria

State Parliament of Lower Austria

The State Parliament of Lower Austria issues waste management laws of Lower Austria (Waste Management Act of Lower Austria, 1992).

Lower Austrian Provincial Government

The Lower Austrian government (Amt der NÖ Landesregierung) is in charge of developing waste management plans (Waste Management Plan of Lower Austria, 2016-2020).

Lower Austrian Environmental Associations (NÖ Umweltverbände)

Out of 573 Lower Austrian municipalities, 559 (95 % of the population) have voluntarily joined 22 regional environmental organizations. In 1993, they founded the Lower Austrian Waste Management Association ("Die NÖ Umweltverbände"), which is in charge implementing waste management in Lower Austrian municipalities (Gemeinden). It is also responsible for the education, awareness campaigns and the implementation of various projects.

5.1.4. Regional government bodies: City of Vienna

State Parliament of Vienna

The State Parliament of Vienna issues waste management laws (e.g. Viennese Waste Management Act).

City of Vienna administration: Municipal Departments MA 48 and MA 22

There are two municipal departments responsible for waste management in Vienna, namely the Municipal Department for Waste Management, Street Cleaning and Vehicle Fleet (MA 48), and the Municipal Department for Environmental Protection (MA 22).While MA 48 is responsible for the communal collection and treatment of waste from private households and companies, the MA 22 has the task of monitoring the implementation of waste regulations. At a strategic level, they e.g. work together on the realisation of the Strategic Environmental Assessment (SEA) of the Viennese Waste Management Plan or the initiation of waste prevention projects.

5.1.5. Other Austrian stakeholders (networks, associations)

Association of Austrian Plastics Processors (VÖK)

The Association of Austrian Plastics Processors (Vereinigung Österreichischer Kunststoffverarbeiter, VÖK) was founded in 1958. Its main functions are information and networking events and financial support for young specialists through scholarship funds. VÖK also provides homepage (http://www.kunststoff.or.at) listing raw material suppliers, processing companies and research & development institutions in the field of plastics.

Plastics Cluster

The Plastics Cluster is a cross-industry network for the plastics sector. It initiates, promotes and coordinates successful cooperation between companies. With nearly 400 companies, the Plastics Cluster is the largest cluster initiative in Austria. Every link in the value creation chain is represented - from raw materials and recycled materials to plastics processing, plastics mechanical engineering, mould and tool making, plastics technology providers and R&D facilities and educational institutions. As a hub connecting member companies, research institutes and decision-makers, it is committed to creating better conditions in the plastics industry in Austria.

The Plastics-Cluster is an initiative of the countries Upper Austria, Lower Austria and Salzburg. The legal bodies of the Plastics Cluster are Business Upper Austria - The Business Agency of Upper Austria and Ecoplus. The Business Agency of Lower Austria. Plastics Online cluster database provides data on companies - cluster members representing the whole value chain - from raw materials and recycled materials to plastics processing, plastics mechanical engineering, mould and tool making, plastics technology providers and R&D facilities and educational institutions (Kunststoffcluster, 2018).

Austrian Water and Waste Management Association (ÖWAV)

Since 1909, the Austrian Water and Waste Management Association (ÖWAV) represents the entire spectrum of water and waste management in Austria. The ÖWAV provides its over 2.000 members a sector network and a neutral and independent platform for all specialized experts and involved professional groups as well as up-to-date information and a balance of interests in the national water, wastewater and waste management. Members of the ÖWAV are public administrations, municipal services, private sectors and universities. The principle tasks of the association include the elaboration of ÖWAV-regulations provided by working groups within the association's professional departments, the development and organization of education and training offerings related to practical needs as well as information and communication (ÖWAV, 2018).

5.2. Slovak Institutional Framework

5.2.1. Slovak National government bodies

Ministry of the Environment of the Slovak Republic

The Ministry of the Environment of the Slovak Republic is the central authority of state administration for the creation and protection of the environment including administration on waste management. The competence of the Ministry of the Environment of the Slovak Republic is stipulated in § 105 of the Act of the National Council of the Slovak Republic no. 79/2015 Z. z. on Waste and on Amendments to Certain Acts.

Slovak Environmental Inspectorate

The Slovak Environmental Inspectorate is the state supervisory authority in waste management. Inspection competencies are listed in Section 106 of the Waste Act.

District office in the regional capital

On 1 October 2013, according to the law of the National Council of the Slovak Republic no. 180/2013 Z. z. on the organization of the local state administration, the competence of the former district environmental authorities at the headquarters of the region has been transferred to the management of the newly established district offices at the headquarters of the regions. Their competencies are set out in Section 107 of the Waste Act.

District Office

On 1 October 2013, according to the law of the National Council of the Slovak Republic no. 180/2013 Z. z. on the organization of the local state administration and on the amendment of some laws, the competence of former district environmental authorities has been transferred to the management of newly established district authorities as *environmental care departments.* The competencies of district authorities are set out in Section 108 of the Waste Act.

The state administration for waste management further involves:

- Municipalities (Section 109 of the Waste Act),
- Slovak Trade Inspection (Section 110 of the Waste Act)
- State administration bodies in the field of taxes, fees and customs (Section 111 of the Waste Act).

Slovak EnvironmentalInspectorate

The Slovak Environmental Inspectorate (SIŽP) was established in September 1991, for the fields of water and air. The intensive development of environmental legislation aimed at protecting the environment has also extended the scope of environmental state supervision in the coming years, and currently, SIZP operates in four other areas, including waste management. New technologies are coming up very quickly and putting them into practice is accompanied by the regulation of completely new areas in the context of the requirements of sustainable development. This is a very challenging job for SIŽP, and it continues to be a challenge, because even though job agencies also offer professionals who control completely new and special technologies, they are not experts who control these technologies at a level that they can control or permit those. Professional qualifications of specialists have

to be ensured by SIŽP itself. It is a prerequisite for fulfilling its function – to ensure effective professional environmental supervision. As part of the SR environment, Slovakia is the decisive body in enforcing environmental legislation into practice.

Slovak EnvironmentalAgency

The Slovak Environmental Agency (in SK: SAŽP) is a professional organization of the Ministry of Environment of the Slovak Republic with a national competence in the field of environmental care and landscape development in accordance with the principles of sustainable development.

The SAŽP was established by the Minister of Environment of the Slovak Republic on 17 May 1993 as a budgetary organization of the Ministry of Environment of the Slovak Republic. Its activity started on 1 July 1993, since 1 January 2001 itis a contributory organization. In 2005, SAŽP were awarded certificates of quality management system and environmental management system according to ISO 9001 and 14001 standards. The Slovak Environmental Agency (SAŽP) is a legal person authorized by the Ministry of the Environment of the Slovak Republic to act as a competen tauthority of the SR for EMAS.

State Nature Conservation of the Slovak Republic

The State Nature Conservation of the Slovak Republic is a special professional organization of the Ministry of the Environment of the Slovak Republic with a national competence, focused mainly on securing tasks in the field of nature and landscape protection, including cave administration pursuant to the provisions of Act no. 543/2002 Z.z. on Nature and Landscape Protection, as amended, and on the protection of species of wild fauna and flora by regulating trade with them pursuant to the provisions of Act no. 15/2005 Z.z. on the protection of species of wild fauna and flora by regulating trade therein and on the amendment of certain laws as amended. In particular, it cooperates with other professional institutions concerned with the care of the environment and nature and landscape conservation, speleology and related disciplines, with local government and local authorities, with domestic and foreign scientific institutions and universities, partner organizations abroad and other organizations with an environmental and speleological focus. It also evaluates waste management and prevention programmes in Slovakia.

Environmental Fund

The Environmental Fund is a separate legal entity based in Bratislava. It was established by Act No. 587/2004 Coll. on the Environment Fund and on the amendment of some laws with effect from 1.1.2005. The Environmental Fund management is carried out by the Ministry of the Environment of the Slovak Republic. The status of the Fund and its basic mission are defined by the Fund Act and Decree of the Ministry of the Environment of the Slovak Republic no. 157/2005 Coll. of 31 March 2005. The details of the organization and activities of the Fund are regulated by the Statute of the Environmental Fund, issued by the Minister of the Environment of the Slovak Republic - by decision of the Minister of 23.11.2015 no. 34/2015 - 1.6. The Statutory Body of the Environmental Fund is the Director of the Fund, appointed and recalled by the Minister. The competencies and scope of activities of the

individual organizational units of the Fund derive from the Statute and the organizational order of the Fund.

5.2.2. Other Slovak stakeholders (networks, associations)

Slovak water management company (SWMC, in SK: Slovenský vodohospodársky podnik, š. p.)

The Slovak water management company manages water courses and river basins (including the River Danube) in Slovakia.

The SWMC is classified as strategically important state-owned enterprise with a modified management method because it also has assets that, according to the Constitution of the Slovak Republic, it is the exclusive property of the State. It provides care for water courses and tangible fixed assets built on them and takes care for the quantity and quality of surface and groundwater.

Slovak waterconstructions/ Slovenská vodohospodárska výstavba

For over sixty years, more than 350 water, hydro-power and engineering buildings have been connected to this state-owned Water Management Company throughout Slovakia.

The name of the company, however, is connected mainly with one of the largest water projects in Europe - the Gabčíkovo Water Works, ensuring their efficient and safe operation as well as the production and sale of electricity. The Gabčíkovo Hydropower Plant is one main sampling station of the PlasticFreeDanube Project.

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