BASELINE STUDY
ON HAZARDOUS WASTE MANAGEMENT
IN YEREVAN, WARSAW AND TIRANA

June 2021

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<th>Full Form</th>
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<tbody>
<tr>
<td>ADR</td>
<td>Agreement concerning the International Carriage of Dangerous Goods by Road</td>
</tr>
<tr>
<td>AKM</td>
<td>National Environmental Agency (Agjencia Kombëtare e Mjedisit)</td>
</tr>
<tr>
<td>AKUM</td>
<td>National Agency of Water Supply, Sewerage and Waste Infrastructure (Agjencia Kombëtare Ujësjellës Kanalizime dhe Mbetjeve te Ngurta)</td>
</tr>
<tr>
<td>ALL</td>
<td>Albanian lek</td>
</tr>
<tr>
<td>AMD</td>
<td>Armenian Dram</td>
</tr>
<tr>
<td>ARMSTAT</td>
<td>Statistical Committee of the Republic of Armenia</td>
</tr>
<tr>
<td>AVP</td>
<td>Vienna Waste Prevention Programme (Wiener Abfallvermeidungsprogrammem)</td>
</tr>
<tr>
<td>AWG</td>
<td>Austrian Waste Management Act (Abfallwirtschaftgesetz)</td>
</tr>
<tr>
<td>BAT</td>
<td>Best Available Techniques</td>
</tr>
<tr>
<td>BDO</td>
<td>(Polish) Waste Database (Baza Danych o Odadach)</td>
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<tr>
<td>BEiŚ</td>
<td>Strategy for Energy Security and Environment (Strategia Bezpieczeństwo Energetyczne i Środowisko)</td>
</tr>
<tr>
<td>BGBI</td>
<td>Austrian Federal Law Gazette (Bundesgesetzblatt)</td>
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<tr>
<td>CAC</td>
<td>Civic Amenity Center</td>
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<tr>
<td>CAS</td>
<td>Civic Amenity Site</td>
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<tr>
<td>CE</td>
<td>Circular Economy</td>
</tr>
<tr>
<td>CEPA</td>
<td>Comprehensive and Enhanced Partnership Agreement</td>
</tr>
<tr>
<td>CFC</td>
<td>Chlorofluorocarbons</td>
</tr>
<tr>
<td>CIS</td>
<td>Commonwealth of Independent States</td>
</tr>
<tr>
<td>CIWM</td>
<td>Committee on Integrated Waste Management</td>
</tr>
<tr>
<td>CLP</td>
<td>Classification Labelling Packaging</td>
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<tr>
<td>CNCO</td>
<td>Community non-commercial organization</td>
</tr>
<tr>
<td>CNG</td>
<td>Compressed natural gas</td>
</tr>
<tr>
<td>CWMD</td>
<td>Cleaning and Waste Management Directorate (Tirana)</td>
</tr>
<tr>
<td>DCM</td>
<td>Decision of the Council of Ministers</td>
</tr>
<tr>
<td>DEKRA</td>
<td>German Motor Vehicle Inspection Association (Deutscher Kraftfahrzeug-Überwachungs-Verein)</td>
</tr>
<tr>
<td>EBRD</td>
<td>European Bank for Reconstruction and Development</td>
</tr>
<tr>
<td>EC</td>
<td>European Commision</td>
</tr>
<tr>
<td>EEC</td>
<td>European Economic Community</td>
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<tr>
<td>EIA</td>
<td>Environmental impact assessment</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>ELV</td>
<td>End-of-life vehicles</td>
</tr>
<tr>
<td>ELW</td>
<td>European List of Waste</td>
</tr>
<tr>
<td>EMIC</td>
<td>Environmental Monitoring and Information Center (Armenia)</td>
</tr>
<tr>
<td>EPR</td>
<td>Extended producer responsibility</td>
</tr>
<tr>
<td>ESM</td>
<td>Environmentally Sound Management</td>
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<tr>
<td>EU</td>
<td>European Union</td>
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<tr>
<td>GCAP</td>
<td>Global Call to Action Against Poverty</td>
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<tr>
<td>GCF</td>
<td>Green Climate Fund</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross domestic product</td>
</tr>
<tr>
<td>HDPE</td>
<td>High density polyethylene</td>
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<tr>
<td>HHW</td>
<td>Household hazardous waste</td>
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<tr>
<td>HID</td>
<td>High intensity discharge</td>
</tr>
<tr>
<td>HLIB</td>
<td>Health and Labour Inspection body of the Republic of Armenia</td>
</tr>
<tr>
<td>HW</td>
<td>Hazardous waste</td>
</tr>
<tr>
<td>HWM</td>
<td>Hazardous waste management</td>
</tr>
<tr>
<td>HWRC</td>
<td>Household waste recycling center</td>
</tr>
<tr>
<td>IED</td>
<td>Industrial Emission Directive</td>
</tr>
<tr>
<td>IGO</td>
<td>Intergovernmental organizations</td>
</tr>
<tr>
<td>INSTAT</td>
<td>Institute of Statistics (Albania)</td>
</tr>
<tr>
<td>INTF</td>
<td>Integrated Network of Treatment Facilities</td>
</tr>
<tr>
<td>IPPC</td>
<td>International Plant Protection Convention</td>
</tr>
<tr>
<td>IPSIS</td>
<td>Integrated planning system information system</td>
</tr>
<tr>
<td>ISO</td>
<td>International Organization for Standardization</td>
</tr>
<tr>
<td>IWM</td>
<td>Integrated Waste Management</td>
</tr>
<tr>
<td>KE</td>
<td>Key-expert</td>
</tr>
<tr>
<td>LDPE</td>
<td>Low-density polyethylene</td>
</tr>
<tr>
<td>LGEP</td>
<td>Landscape gardening and environmental protection</td>
</tr>
<tr>
<td>LGU</td>
<td>Local Governance Unit</td>
</tr>
<tr>
<td>LLC</td>
<td>Limited Liability Company</td>
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<tr>
<td>LSGB</td>
<td>local self-governmental bodies</td>
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<tr>
<td>LSGU</td>
<td>Local Self-Government Units</td>
</tr>
<tr>
<td>MIE</td>
<td>Ministry of Infrastructure and Energy</td>
</tr>
<tr>
<td>MPO</td>
<td>Warsaw's municipal cleaning company (Miejskie Przedsiębiorstwo Oczyszczania)</td>
</tr>
</tbody>
</table>
MPSZOK  Mobile Civic Amenity Site
MSW  Municipal solid waste
MSWM  Municipal solid waste management
MWM  Municipal waste management
NEA  Nation Environment Agency
NGO  Non-government organization
NKE  Non-key expert
NLC  National Licensing Center
NWPP  National Waste Prevention Plans
OECD  Organisation for Economic Co-operation and Development
ÖNORM  Austrian Standards International
PCP  Polychlorinated biphenyls
PCT  Polychlorinated terphenyls
PET  Polyethylene terephthalate
PLN  Polish Zloty New
POP  Persistent organic pollutants
PRTR  Pollutant Release and Transfer Register
PSZOK  Selective Municipal Waste Collection Point
PUC  Public Utility Company
RA  Republic of Armenia
RDF  Refuse-derived fuel
REACH  Registration, Evaluation, Authorisation and Restriction of Chemicals
RFID  Radio-frequency identification
SEA  Strategic Environmental Assessment
SG  Strategic Goal
SN  Code number
SNG  Code number group
SZRM  Capital Board of City Development
UK  United Kingdom of Great Britain
UN  United Nations
UNECE  United Nations Economic Commission for Europe
UNEP  United Nations Environment Programme
UVP  Unique value proposition
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>VAT</td>
<td>Value-added tax</td>
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<tr>
<td>VCR</td>
<td>Video recorder</td>
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<tr>
<td>VDU</td>
<td>Visual display unit</td>
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<tr>
<td>VOC</td>
<td>Volatile organic compounds</td>
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<td>WEEE</td>
<td>Waste electrical and electronic equipment</td>
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<tr>
<td>WFD</td>
<td>Waste Framework Directive</td>
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<tr>
<td>WH</td>
<td>Waste Hierarchy</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
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<tr>
<td>WMC</td>
<td>Waste management concept</td>
</tr>
<tr>
<td>WÖLI</td>
<td>Vienna oil collection bucket</td>
</tr>
<tr>
<td>WUA</td>
<td>Vienna Environmental Ombudsman’s Office (Wiener Umweltanwaltschaft)</td>
</tr>
<tr>
<td>ZUSOK</td>
<td>Municipal Solid Waste Disposal Plant (Zakład Unieszkodliwiania Stałych Odpadów Komunalnych)</td>
</tr>
</tbody>
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I

CONTEXT ANALYSIS IN THREE PARTNER CITIES
HAZARDOUS WASTE DEFINITION AND APPLIED CLASSIFICATIONS

Basel Convention on the control of trans boundary movements of hazardous waste and their disposal, an international treaty, adopted in 1989 and into force from 1992, by UNEP, defines waste “as substances or objects, which are disposed of or are intended to be disposed of or are required to be disposed of by the provisions of national law”. The classification of waste as non-hazardous or hazardous waste is outlined in the EU Framework Directive on waste\(^1\), EU WFD - Article 3(2). Waste is classified by its origin (municipal or household waste and similar commercial, institutional and industrial waste, commercial and industrial) and characteristics (non-hazardous, inert and hazardous). Classification criteria relating to the properties that may render waste hazardous are noted in the revised Annex III to the WFD.

**Hazardous waste** is waste which by its origin, composition or concentration of hazardous substances can cause danger to the environment and human health and has at least one of the hazardous characteristics determined by regulations, including the packaging in which hazardous waste was or is packaged.

Classification criteria relating to the waste source and waste type are outlined in the European List of Waste (ELW)\(^2\), which is a summary list of non-hazardous and hazardous waste. List of waste includes twenty groups which represent different waste origin and composition. Every group consists of list of six-digit numbers (index number) for each individual type of waste and they indicate:

- the first two digits indicate the main activity/source from which the waste is generated, and type of waste,
- the third and fourth digits indicate the specific process/source in which the waste is generated,
- the fifth and sixth digits indicate the type of generated waste.

Hazardous waste is marked with an asterisk (*) which is placed after the index number. List of waste includes the following groups:

01 Waste resulting from exploration, mining, dressing and further treatment of minerals and quarry
02 Waste from agricultural, horticultural, hunting, fishing and aqua cultural primary production, food preparation and processing
03 Waste from wood processing and the production of paper, cardboard, pulp, panels and furniture
04 Waste from the leather, fur and textile industries
05 Waste from petroleum refining, natural gas purification and pyrolytic treatment of coal
06 Waste from inorganic chemical processes
07 Waste from organic chemical processes
08 Waste from the manufacture, formulation, supply and use (MFSU) of coatings (paints, varnishes and vitreous enamels), adhesives, sealants and printing inks


09 Waste from the photographic industry
10 Inorganic waste from thermal processes
11 Inorganic metal-containing waste from metal treatment and the coating of metals, and non-ferrous hydrometallurgy
12 Waste from shaping and surface treatment of metals and plastics
13 Oil waste (except edible oils, 05 and 12)
14 Waste from organic substances used as solvents (except 07 and 08)
15 Waste packaging; absorbents, wiping cloths, filter materials and protective clothing not otherwise specified
16 Waste not otherwise specified in the list
17 Construction and demolition waste (including road construction)
18 Waste from human or animal health care and/or related research (except kitchen and restaurant waste not arising from immediate health care)
19 Waste from waste treatment facilities, off-site waste water treatment plants and the water industry
20 Municipal waste and similar commercial, industrial and institutional waste including separately collected fractions

According to Basel Convention, hazardous waste is classified, when necessary, according to the concentration limit values of hazardous substances and into the list of hazardous waste categories according to origin and composition (Y list) and list of hazardous characteristics of waste (H list).

In Y list, hazardous waste is categorised by origin (“waste streams”) into 18 categories and by composition (“waste having as constituents”) into 27 categories as follows:

1. Waste streams
   
   Y1 Clinical waste from medical care in hospitals, medical centers and clinics,
   Y2 Waste from the production and preparation of pharmaceutical products,
   Y3 Waste pharmaceuticals, drugs and medicines,
   Y4 Waste from the production, formulation and use of biocides and phytopharmaceuticals,
   Y5 Waste from the manufacture, formulation and use of wood preserving chemicals,
   Y6 Waste from the production, formulation and use of organic solvents,
   Y7 Waste from heat treatment and tempering operations containing cyanides,
   Y8 Waste mineral oils unfit for their originally intended use,
   Y9 Waste oils/water, hydrocarbons/water mixtures, emulsions,
   Y10 Waste substances and articles containing or contaminated with polychlorinated biphenyls (PCBs) and/or polychlorinated terphenyls (PCTs) and/or polybromated biphenyls (PBBs),
   Y11 Waste tarry residues arising from refining, distillation and any pyrolytic treatment,
   Y12 Waste from production, formulation and use of inks, dyes, pigments, paints, lacquers, varnish,
   Y13 Waste from production, formulation and use of resins, latex, plasticizers, glues/adhesives,
   Y14 Waste chemical substances arising from research and development or teaching activities which are not identified and/or are new and whose effects on man and/or the environment are not known,
Y15 Waste of an explosive nature not subject to other legislation,
Y16 Waste from production, formulation and use of photographic chemicals and processing materials,
Y17 Waste resulting from surface treatment of metals and plastics,
Y18 Residues arising from industrial waste disposal operations.

2. **Waste having as constituents:**

Y19 Metal carbonyls,
Y20 Beryllium; Beryllium compounds,
Y21 Hexavalent chromium compounds,
Y22 Copper compounds,
Y23 Zinc compounds,
Y24 Arsenic; arsenic compounds,
Y25 Selenium; selenium compounds,
Y26 Cadmium; cadmium compounds,
Y27 Antimony; antimony compounds,
Y28 Tellurium; tellurium compounds,
Y29 Mercury; mercury compounds,
Y30 Thallium; thallium compounds,
Y31 Lead; lead compounds,
Y32 Inorganic fluorine compounds excluding calcium fluoride,
Y33 Inorganic cyanides,
Y34 Acidic solutions or acids in solid form,
Y35 Basic solutions or bases in solid form,
Y36 Asbestos (dust and fibers),
Y37 Organic phosphorus compounds,
Y38 Organic cyanides,
Y39 Phenols; phenol compounds including chlorophenols,
Y40 Ethers,
Y41 Halogenated organic solvents,
Y42 Organic solvents excluding halogenated solvents,
Y43 Any congener of polychlorinated dibenzo-furan,
Y44 Any congener of polychlorinated dibenzo-p-dioxin,
Y45 Organohalogen compounds other than substances referred to in this Annex (e.g. Y39, Y41, Y42, Y43, Y44).
H list shows hazardous characteristics which waste included in Y list may have.

<table>
<thead>
<tr>
<th>UN Class</th>
<th>Code</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>H1</td>
<td>Explosive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>An explosive substance or waste is a solid or liquid substance or waste (or mixture of substances or waste) which is in itself capable by chemical reaction of producing gas at such a temperature and pressure and at such speed as to cause damage to the surroundings.</td>
</tr>
<tr>
<td>3</td>
<td>H3</td>
<td>Flammable liquids</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The word &quot;flammable&quot; has the same meaning as &quot;inflammable.&quot; Flammable liquids are liquids, or mixtures of liquids, or liquids containing solids in solution or suspension (for example, paints, varnishes, lacquers, etc., but not including substances or waste otherwise classified on account of their dangerous characteristics) which give off a flammable vapour at temperatures of not more than 60.5°C, closed-cup test, or not more than 65.6°C, open-cup test.</td>
</tr>
<tr>
<td>4.1</td>
<td>H4.1</td>
<td>Flammable solids</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Solids, or waste solids, other than those classed as explosives, which under conditions encountered in transport are readily combustible, or may cause or contribute to fire through friction</td>
</tr>
<tr>
<td>4.2</td>
<td>H4.2</td>
<td>Substances or waste liable to spontaneous combustion</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Substances or waste which are liable to spontaneous heating under normal conditions encountered in transport, or to heating up on contact with air, and being then liable to catch fire.</td>
</tr>
<tr>
<td>4.3</td>
<td>H4.3</td>
<td>Substances or waste which, in contact with water emit flammable gases</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Substances or waste which, by interaction with water, are liable to become spontaneously flammable or to give off flammable gases in dangerous quantities.</td>
</tr>
<tr>
<td>5.1</td>
<td>H5.1</td>
<td>Oxidizing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Substances or waste which, while in themselves not necessarily combustible, may, generally by yielding oxygen cause, or contribute to, the combustion of other materials.</td>
</tr>
<tr>
<td>5.2</td>
<td>H5.2</td>
<td>Organic Peroxides</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Organic substances or waste which contain the bivalent-O-O-structure are thermally unstable substances that may undergo exothermic self-accelerating decomposition.</td>
</tr>
<tr>
<td>6.1</td>
<td>H6.1</td>
<td>Poisonous (Acute)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Substances or waste liable either to cause death or serious injury or to harm human health if swallowed or inhaled or by skin contact</td>
</tr>
<tr>
<td>6.2</td>
<td>H6.2</td>
<td>Infectious substances</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Substances or waste containing viable microorganisms or their toxins that are known or suspected to cause disease in animals or humans.</td>
</tr>
<tr>
<td>8</td>
<td>H8</td>
<td>Corrosives</td>
</tr>
</tbody>
</table>


Substances or waste which, by chemical action, will cause severe damage when in contact with living tissue, or, in the case of leakage, will materially damage, or even destroy, other goods or the means of transport; they may also cause other hazards.

<table>
<thead>
<tr>
<th>9</th>
<th>H10</th>
<th>Liberation of toxic gases in contact with air or water</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Substances or waste which, by interaction with air or water, are liable to give off toxic gases in dangerous quantities.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>9</th>
<th>H11</th>
<th>Toxic (Delayed or chronic)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Substances or waste which, if they are inhaled or ingested or if they penetrate the skin, may involve delayed or chronic effects, including carcinogenicity.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>9</th>
<th>H12</th>
<th>Ecotoxic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Substances or waste which if released present or may present immediate or delayed adverse impacts to the environment by means of bioaccumulation and/or toxic effects upon biotic systems</td>
</tr>
</tbody>
</table>

| 9 | H13 | Capable, by means, after disposal, of yielding another material, e.g., leachate, which possesses any of the characteristics listed above. |

### 1.1 Hazardous waste

Hazardous Waste (HW) is a subgroup of municipal solid waste and originates from households (household hazardous waste-HHW (Article 20 of WFD)) and from small commerce and industries and institutions, where such waste is similar in nature and composition to hazardous waste from households. HHW is any household waste that are generated from the disposal of substances including but not limited to the following listed waste sources and types: chemicals, domestic healthcare waste, construction and demolition waste, automotive maintenance waste, waste electrical and electronic equipment (WEEE), packaging waste, mercury-containing waste (other than WEEE).

An overview of the types of hazardous waste generated in the household, by their source and index number, as provided in the List of waste, are given below.

**Household chemicals and similar commercial, industrial and institutional chemicals**

#### 1) Cleaning and personal care products

Cleaning products (furniture polishes, oven cleaners, sanitary cleaners, metal cleaners, window cleaners, chlorine-based cleaners, ammonia-based cleaners, toilet cleaners and piping cleaners, etc.) and personal care products (cosmetics, deodorant, hair dye, nail polish, nail polish remover, etc.), where hazardous, are addressed under the following relevant List of Waste codes:

- 20 01 13* solvents, 
- 20 01 14* acids, 
- 20 01 15* alkalines, 
- 20 01 29* detergents containing hazardous substances, 
- 16 05 04* gases in pressure containers (including halons) containing hazardous substances.

Many daily-use cleaning products in households, commerce, industries, and institutions may become hazardous waste upon their disposal as they often contain solvents, acids, bases, abrasive materials, surfactants, brighteners, and other hazardous constituents. They can be flammable, irritant or corrosive, amongst other hazards. Those household products can irritate the eyes or throat, or cause headaches and other health problems, including cancer. Some products release volatile organic compounds (VOCs) and other harmful ingredients include ammonia and
bleach. VOCs and other chemicals released when using cleaning supplies contribute to chronic respiratory problems, allergic reactions and headaches.

2) **Paints, varnishes, ink and glues**

Paints are mixtures of solvents, pigments, minerals, resins, surfactants and other additives. The applicable code in the List of Waste is:

20 01 27*  paint, inks, adhesives and resins containing hazardous substances.

During their use and end-of-life, solvent-based paints emit volatile organic compounds to the air which are flammable and may damage the skin, eyes, respiratory tract, nervous system and internal organs.

3) **Households, parks and garden pesticides**

Pesticides are substances that are meant to control pests and include all of the following: herbicide, insecticides, nematicide, molluscicide, rodenticide, bactericide, insect repellent, antimicrobial, and fungicide. Some pesticides can be persistent and bio-accumulative and can be toxic if ingested, as well as irritating to eyes and skin. The applicable code in the List of Waste is

20 01 19*  pesticides.

4) **Photochemicals**

This category of hazardous waste has decreased in recent years thanks to digital photography but some households and photo shops still develop photographic film and produce prints using large amounts of hazardous chemicals. Liquid waste from the photographic process contains substances such as hydro-quinine, sodium sulphite, silver, mercuric chloride, cadmium, ferrocyanide, acids and formaldehyde. These are found in process bath waste, colour developer waste, bleach, fixer and fixer waste. The applicable code in the List of Waste is:

20 01 17*  photochemicals.

**Domestic healthcare waste**

1. **Unused Pharmaceutical products, medicine**

Households possess and use pharmaceuticals containing antibiotics, hormone-replacing drugs, cancer medicines, medicine for depression, etc. Cytotoxic and cytostatic medicines are medicines that are either: toxic, carcinogenic, mutagenic or toxic for reproduction. They include most hormonal preparations, some anti-viral drugs, amanyantineoplastic agents, immunosuppressants, some antibiotics. Any waste that is contaminated by cytotoxic and cytostatic medicines should be classed as cytotoxic and cytostatic waste: sharps (e.g. needles, syringes, scalpels, blades and sharp instruments), used glass bottles and vials, personal protective equipment (e.g. gloves, masks and gowns), syringe bodies and tubing.

Besides cytotoxic and cytostatic medicines, a variety of pharmaceuticals such as analgesics, antibiotics, hormone replacement drugs, oral chemotherapy drugs and antidepressants are commonly found in households and, according to some estimates, a significant proportion of them become waste. Directive 2004/27/EC amending Directive 2001/83/EC on the Community code relating to medicinal products for human use (Article 127b) requires that the Member States ensure that appropriate collection systems are in place for medicinal products that are unused or have expired. Additionally, Article 54j requires that “a reference to any appropriate collection system in place shall appear on the outer packaging of medicinal products or, where there is no outer packaging, on the
immediate packaging”. That is the reason that waste with code 20 01 32 is also included in the scope of hazardous waste management.

The relevant List of Waste codes are:
20 01 31* cytotoxic and cytostatic medicines,
20 01 32 medicines other than those mentioned in 20 01 31*.

Construction and demolition waste from households, small commerce and institutions

1) Asbestos waste
Asbestos is a hazardous mineral with a fibrous structure, which produces severe, potentially fatal, long-term health effects, including cancer, when inhaled. It was widely used in the past for insulation and other purposes, owing to its resistance to fire and heat. Asbestos is a carcinogenic substance classified as Group 1 by International Agency for Research on Cancer (IARC) and, according to Annex III to the Waste Framework Directive, waste that contains such a substance and exceeds a concentration limit of 0,1 % is classified as hazardous. A number of List of Waste entries apply to asbestos-containing waste that can be generated in households, either as the result of demolition or renovation works or as a result of discarding certain (old) equipment:
16 02 12* discarded equipment containing free asbestos,
16 02 15* hazardous components removed from discarded equipment,
17 06 01* insulation materials containing asbestos,
17 06 05* construction materials containing asbestos.

2) Treated wood
Wood waste is generated by household renovation and repair works involving structural and non-structural elements, for instance, window and door frames, separation walls and roof elements, wood from awnings, garden fences and other outdoor wooden structures. In order to prevent the wood from degrading it is impregnated with wood preservatives. Some widely used preservatives such as chromated copper arsenate [CCA], creosote and pentachlorophenol have been severely limited or banned, but disposal of the wood that was treated with them is still necessary. The corresponding List of Waste code for this household waste is:
20 01 37* wood containing hazardous substances,
17 02 04* glass, plastic and wood containing or contaminated with hazardous substances.

3) Coal tar and tarred products
Coal tar was commonly used as a binder in road construction, prior to being superseded by bitumen. Coal tar creosote was used as a wood preservative for many decades. Today the use of creosote to treat wood is highly restricted and regulated under Regulation (EC) No 1907/2006 (REACH), Annex XVII, entry 31.

Waste containing coal tar is classified as hazardous because it contains significant amounts of polycyclic aromatic hydrocarbons (PAHs), a group of carcinogenic compounds. Asphalt waste containing coal tar is considered to be hazardous waste when the level of coal tar is > 0,1 %. The term coal tar describes a number of complex substances, derived from coal, which are classified as carcinogens of category 1A in annex VI of the CLP Regulation and which, according to Annex III of the Waste Framework Directive, classify as waste as hazardous if the concentration equals or exceeds 0,1 %. Coal tar can also be found in products like coal tarred board or roofing felt which was used, e.g., as part of roofs at garden houses. Some of these may give rise to considerable amounts of hazardous waste when being repaired or replaced.
The applicable codes in the List of Waste are:

17 03 01*  bituminous mixtures containing coal tar,
17 03 03*  coal tar and tarred products.

**Automotive maintenance waste**

1) Oil filters and contaminated absorbing materials

Oil filters from cars can become part of household waste during car servicing at home and at small car maintenance workshops. These activities may also generate other oil-impregnated waste such as clothes and gloves. The applicable codes in the List of Waste are:

15 02 02*  absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by hazardous substances
16 01 07*  oil filters.

2) Automotive products, surface polish, anti-freeze fluids

Many of the substances and mixtures used in cars, or for cleaning and maintaining them, are hazardous to human health and the environment. For example, the primary ingredient in anti-freeze is ethylene glycol, a toxic substance. Anti-freeze, like other liquids in the car such as brake fluids or lubricating oil need to be changed periodically. Applicable List of Waste codes are:

16 01 13*  brake fluids,
16 01 14*  anti-freeze fluids containing hazardous substances,
20 01 26*  oil and fat other than those mentioned in 20 01 25,
16 01 03  end-of-life tires.

According to ELW, end-of-life tires are not hazardous waste but they are included in this study because inadequate treatment of this type of waste, widely used, like burning in open areas, causing hazard impact to the environment, soil, air, flora and fauna, etc.

**Waste electrical and electronic equipment**

According to Article 3(1) of Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE), ‘WEEE’ means electrical or electronic equipment which is waste within the meaning of Article 3(1) of Directive 2008/98/EC, including all components, sub-assemblies and consumables which are part of the product at the time of discarding. ‘WEEE from private households’ means WEEE which comes from private households and WEEE which comes from commercial, industrial, institutional and other sources which, because of its nature and quantity, is similar to that from private households. Waste from EEE likely to be used by both private households and users other than private households shall, in any event, be considered to be WEEE from private households; Waste electrical and electronic equipment are covered by the following entries in the List of Waste:

20 01 21*  fluorescent tubes and other mercury-containing waste,
20 01 23*  discarded equipment containing chlorofluorocarbons,
20 01 35* discarded electrical and electronic equipment other than those mentioned in 20 01 21* and 20 01 23* containing hazardous components³.

Discarded equipment containing chlorofluorocarbons usually includes a refrigerator, freezer and air-conditioners.

**Batteries and accumulators**

20 01 33* batteries and accumulators included in 16 06 01*, 16 06 02* or 16 06 03* and unsorted batteries and accumulators containing these batteries.

Batteries and accumulators (20 01 33*) refer to lead-acid batteries, nickel-cadmium batteries and mercury-containing batteries.

**Mercury-containing waste (other than WEEE)**

Mercury is highly toxic to humans and animals when inhaled or ingested and it is toxic to aquatic organisms. Household Mercury-containing waste includes thermostats, thermometers, sporting equipment, batteries, light bulbs (fluorescent bulbs, compact fluorescent light bulbs (CFLs), high-intensity discharge (HID) lamps, ultraviolet lamps, neon lights), electronics (LCD screens). Dental amalgam is also a source mercury in waste. In the ELW mercury-containing waste electrical and electronic equipment (WEEE) is included in a waste category together with fluorescent lamps, 20 01 21*, mercury-containing batteries are included in 20 01 03*. The ELW code in scope is:

06 04 04* - waste containing mercury (*e.g.* thermometers).

**Edible oil and fat**

According to ELW, edible oil and fat are not hazardous waste but they are included in this study because of improper treatment of this type of waste. Improper management of waste vegetable oil and animal fat includes pouring it down sewage system, onto the soil, and disposing of it together with packaging via the residual waste bin, causing hazard impact to the environment, soil, air, surface and groundwater, etc. The ELW code is

20 01 25 edible oil and fat.

**Packaging**

Packaging waste that contains hazardous substances and mixtures (such as those listed in the sections above) is considered as hazardous waste. The following categories in the List of Waste apply:

15 01 10* packaging containing residues of or contaminated by hazardous substances,
15 01 11* metallic packaging containing a hazardous solid porous matrix (for example asbestos), including empty pressure containers.

³ Hazardous components from electrical and electronic equipment may include accumulators and batteries mentioned in 16 06 and marked as hazardous; mercury switches, glass from cathode ray tubes and other activated glass, etc.
Hazardous waste treatment

Some waste streams can be reuse, mostly cleaning and personal care products, paints, varnishes, inks, glues and resins. Recycling is possible treatment for used antifreeze and motor oil. Edible oil and fat can be fully recycled, by refining process, into biofuel, biodiesel, or soap. Used tyres can be also fully recycled in addition to asphalt for roads, signalling and parts for new cars, level crossings, surface for sports fields and playgrounds, roof insulation coatings, sound barriers in construction, waterproof membranes, rubber pipes, carpets, shoes, etc. The usual treatment of photochemical waste is recycling with the silver extraction. Batteries and accumulators and WEEE can be recycled according to its material type, metal, glass, plastic, etc. Hazardous waste which cannot be reused, can be recovered, e.g. can be used as secondary fuel for cement industry. Hazardous waste which cannot be recycled, neither recovered, can be incinerated under controlled conditions and at sufficiently high temperatures (above 1600°C). Landfilling asbestos waste, after stabilisation in concrete blocks, is currently best available technique for this waste stream. Coal tar and tarred products are treated thermally or deposited in landfills, depending on state regulation.

Labels on packaging

Labels on hazardous products provide information about the hazardous characteristics of a product, and are useful in identifying the type of waste and the hazards that it may present. According to the Classification, Labelling and Packaging (CLP) Regulation (EC) No. 1272/2008, all hazardous chemicals (substances and mixtures) placed on the market must be classified, labelled and packaged according to CLP requirements. Information about the hazards of a substance must be provided via the label on the packaging, which must include a pictogram signal word, hazard and precautionary statements, and the provision of safety data sheets.

The CLP Regulation introduced the United Nations Globally Harmonized System (UN GHS) for CLP of chemicals in Europe. The EU CLP Regulations have been fully operational since 1 June 2015.

Figure 1 Pictograms on household cleaning products
<table>
<thead>
<tr>
<th>Class/Category</th>
<th>Pictogram</th>
<th>Signal Word</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explosive</td>
<td>![Explosive Pictogram]</td>
<td>Danger</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Warning</td>
</tr>
<tr>
<td>Oxidising</td>
<td>![Oxidising Pictogram]</td>
<td>Danger</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Warning</td>
</tr>
<tr>
<td>Flammable</td>
<td>![Flammable Pictogram]</td>
<td>Danger</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Warning</td>
</tr>
<tr>
<td>Acute toxicity</td>
<td>![Acute Toxicity Pictogram]</td>
<td>Danger</td>
</tr>
<tr>
<td>Serious health hazard</td>
<td>![Serious Health Hazard Pictogram]</td>
<td>Warning or Danger</td>
</tr>
<tr>
<td>Corrosive</td>
<td>![Corrosive Pictogram]</td>
<td>Danger</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Warning</td>
</tr>
<tr>
<td>Hazardous to the environment</td>
<td>![Environment Hazard Pictogram]</td>
<td>Warning</td>
</tr>
<tr>
<td>Health hazard/ Hazardous to the ozone layer</td>
<td>![Health Hazard Pictogram]</td>
<td>Warning</td>
</tr>
<tr>
<td>Gas under pressure</td>
<td>![Gas Under Pressure Pictogram]</td>
<td>Warning</td>
</tr>
</tbody>
</table>

*Table 1 Signal Word and Corresponding Pictogram (EU CLP Regulation (EC) No 1272/2008 on the CLP of substances and mixtures)*
2 OVERVIEW OF EU AND NATIONAL LEGISLATIONS, AND STRATEGIC DOCUMENTS OF ARMENIA, POLAND, ALBANIA

2.1 EU legislation

Framework legislation


The Directive lays down measures to protect the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste and by reducing overall impacts of resource use and improving the efficiency of such use. It sets the basic concepts related to waste management and establishes a legal framework for the treatment of waste within the EU. The Waste Framework Directive defines in Article 4 the “waste hierarchy” considering the following steps as a priority order: 1) prevention, 2) preparing for re-use, 3) recycling, 4) other recovery, e.g. energy recovery and 5) disposal. These comprise the key elements for establishing national waste prevention and management legislation and policies.

All steps of the hierarchy on the management of waste needs to be carried without endangering human health, without harming the environment and, in particular: (a) without risk to water, air, soil, plants or animals; (b) without causing a nuisance through noise or odours; and (c) without adversely affecting the countryside or places of special interest (Article 13).

In addition, the Waste Framework Directive stipulates provisions for waste management covering aspects such as responsibility for waste management (Article 15), the principles of self-sufficiency and proximity and more specifically for the management of hazardous waste (including control (Article 17), ban on mixing (Article 18), and labelling of hazardous waste (Article 19), as well as management of household hazardous waste - HHW (Article 20). Specific requirements for the management of waste oils and bio-waste are laid down in Articles 21 and 22 comprising e.g. separate collection and treatment under the high level of environmental protection.

Any establishment or undertaking intending to carry out waste treatment needs to obtain a permit from the competent authority according to Article 23 of the Waste Framework Directive. Establishments or undertakings which carry out waste treatment operations, establishments or undertakings which collect or transport waste on a professional basis, brokers and dealers, and establishments or undertakings which produce hazardous waste shall be subject to appropriate periodic inspections by the competent authorities (Article 34).


In Article 8 of the WFD the “extended producer responsibility” is defined whereby the Member States may take legislative or non-legislative measures to ensure that any natural or legal person who professionally develops, manufactures, processes, treats, sells or imports products (producer of the product) takes responsibility on the management of waste thereof. This may cover measures such as encouraging the design of products or making available information on recyclability of products considering the technical feasibility and economic viability as well

as the overall environmental, human health and social impacts. Article 8a (introduced by Directive (EU) 2018/851) defines the minimum criteria of EPR schemes to be established.

In accordance with the polluter-pays principle, the costs of waste management shall be borne by the original waste producer or by the current or previous waste holders (see Article 14).

In Article 28 of the Waste Framework Directive (2008/98/EC), the minimum requirements for national waste management plans are laid down. The plans shall cover the entire geographical territory of the Member State concerned and shall set out an analysis of the current waste management situation, therefore. They shall define measures to be taken to improve environmentally sound preparing for re-use, recycling, recovery and disposal of waste and an evaluation of how the plan will support the implementation of the objectives should be established.

**Minimum requirements to enhance recycling**


- Increase of the preparing for re-use and recycling target for municipal waste: 55% by 2025, 60% by 2030 and 65% by 2035;
- Strict recycling calculation rules based on input into recycling and as of 1 January 2027 Member States may only count municipal bio-waste entering aerobic or anaerobic treatment as recycled if it has been separately collected or separated at source;
- By 31 December 2023 bio-waste shall either be separated and recycled at source or collected separately + shall not be mixed with other types of waste; this includes also the obligation to encourage home composting and composting and digestion of bio-waste resulting in compost or digestate that meet relevant high-quality standards;
- Concrete measures to promote re-use and prevention (including prevention of food waste);
- Improvement of definitions, harmonisation of calculation methods for recycling rates and streamlining of reporting obligations;
- Introduction of minimum operating conditions for Extended Producer Responsibility;
- Economic incentives for producers to put greener products on the market and support recovery and recycling schemes;
- Setting up of systems promoting repair and re-use activities for textiles and furniture;
- Set up a separate collection for textiles.


The Waste Shipment Regulation (WSR) includes a ban on the export of hazardous waste to non-OECD countries ("Basel Ban") as well as a ban on the export of waste for disposal. It also stipulates a procedure of prior written notification and consent before cross borders shipments of all hazardous waste and some other types of waste, including certain non-hazardous waste that are destined to non-OECD countries.

The amendment of the Waste Shipment Regulation through Regulation (EU) No 660/2014 aims at better addressing the problem of illegal waste shipments by strengthening Member States' inspection systems. Member States were required to establish inspection plans by 1 January 2017 based on a risk assessment that would aim, inter alia, to identify the minimum number of inspections required. Moreover, the amendment of the Waste Shipment
Regulation aims to provide enhanced powers to the authorities involved in inspections, enabling them to decide based on the evidence whether a carried substance or object is waste and whether a shipment can be considered an illegal shipment of waste.

**European Agreement Concerning the International Carriage of Dangerous Goods (ADR)**

The European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR) is under the auspices of the United Nations Economic Commission for Europe. The Agreement was amended by the Protocol amending article 14(3) and entered into force on 19 April 1985.

Equivalent agreements have been realized concerning the International Maritime Dangerous Goods Code (of the International Maritime Organization), the Technical Instructions for the Safe Transport of Dangerous Goods by Air (of the International Civil Aviation Organization) and the Regulations concerning the International Carriage of Dangerous Goods by Rail (of the Intergovernmental Organisation for International Carriage by Rail).

If hazardous waste are dangerous goods in the sense of ADR has to be decided in every single case, depending of the quantity and concentration of toxic or corrosive substances in the transport unit and physical properties of the waste (e.g. flashpoint of inflammable liquids). Most of other hazardous properties (e.g. mutagenic) which may arise in hazardous waste streams are not covered by the ADR agreement.

Examples of cases where the ADR regulations may apply are:

- Asbestos based insulation material (EWL code 17 06 01*) – UN 2590 or UN 2212, class 9;
- PCB containing Construction & Demolition waste (EWL code 17 09 02*) – UN 3152, class 9;
- Waste containing mercury – UN 2809, class 8, UN 2825, class 6.1;
- Residues of paint and lacquer – UN 1263, class 3; UN 3066, class 8.

For these materials a proper packaging and labelling in accordance with the ADR agreement is mandatory. Packaging and labelling have to be done at the place of generation.


The objective of the Landfill Directive is to prevent or reduce the adverse effects of the landfill of waste on the environment. It defines the different categories of waste (municipal, hazardous, non-hazardous waste and inert waste) to be landfilled and distinguishes three different classes of landfills: Landfills for inert waste; Landfills for non-hazardous waste; Landfills for hazardous waste.

According to the Landfill Directive the following waste may not be accepted in a landfill:

- liquid waste;
- flammable waste;
- explosive or oxidizing waste;
- hospital and other clinical waste which is infectious;
- used tires, with certain exceptions;
- any other waste which does not meet the acceptance criteria laid down in Annex II.

Directive (EU) 2018/850 amending Directive 1999/31/EC on the landfill of waste was published in the Official Journal of the European Union L150/100 on June 14th 2018, as a part of the European Circular Economy Package. The main elements of the amendments of the Directive include:

- The Member States shall take measures so that waste that has been separately collected for preparing for re-use and recycling are not accepted in a landfill;
- The Member States shall endeavour to ensure that as of 2030, all waste suitable for recycling or another recovery, in particular in municipal waste, shall not be accepted in a landfill. The only exception concerns waste for which landfilling delivers the best environmental outcome.
- The Member States shall ensure that by 2035 the amount of municipal waste landfilled is reduced to 10% or less of the total amount of municipal waste generated.


The IED aims to achieve a high level of environmental protection through the integrated permitting of certain highly polluting new or existing industrial and agricultural installations.

The IED improves and clarifies the concept of BAT (Best Available Techniques). It also introduces minimum provisions on environmental inspections of installations, the review of permit granting conditions, and reporting of compliance with regulations. Reference Documents on Best Available Techniques (BAT) have been published for several industrial sectors and are reviewed after a specific time period. The related Implementation Decisions cover the BAT conclusions with requirements for limitations of emissions.

**Waste incineration and co-incineration plants**

With the adoption of the Directive 2010/75/EU on industrial emissions (IED), a recast of the Waste Incineration Directive (2000/76/EC) took place. The requirements to waste incineration and co-incineration are now given in Chapter IV (Articles 42-55) of the IED Directive. The technical requirements for installations using incineration or co-incineration are found in Annex VI.

The delivery and reception of waste, especially hazardous waste, is regulated in detail. Prior to accepting hazardous waste, the operator has to have available information about the waste and to carry out a comprehensive reception procedure. High standard measurement techniques are required to monitor emissions to ensure compliance with the emission limit values.

**Waste stream specific regulations**

On the special waste streams covered by this Strategy, numerous European Directives have been established in terms of harmonizing national measures concerning the management of these waste and enabling a high level of environmental protection and ensuring the functioning of the internal market.

The Directives on the specific waste streams set inter alia targets to be met by the Member States to guarantee sufficient re-use, recycling and recovery of waste. Certain targets were amended throughout the Circular Economy Package and finally approved by the European Parliament in 2018. Table 2 gives an overview of the main targets defined by European Directives.

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5 OJ L257, 10.10.1996.
Table 2 Targets defined in EU legislation for recovery of specific waste streams

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| Directive 94/62/EC on packaging and packaging waste (amended latest by Directive (EU) 2018/852) and Directive (EU) 2019/904) on the reduction of the impact of certain plastic products on the environment | Member States are requested to introduce systems for the return and/or collection/treatment of used packaging to attain the following targets:  
- No later than 31 December 2025 (2030) a minimum of 65% (70%) by weight of all packaging waste will be prepared for reuse and recycled;  
- No later than 31 December 2025 (2030) the following minimum targets by weight for preparing for reuse and recycling will be met regarding the following specific materials contained in packaging waste: (i) 50% (55%) of plastic; (ii) 25% (30%) of wood; (iii) 70% (80%) of ferrous metal; (iv) 50% (60%) of aluminium; (v) 70 (75%) of glass; (vi) 75% (85%) of paper and cardboard.  
- By 2025, of an amount of waste single-use plastic products (listed in Part F of the Annex to Directive (EU) 2019/904) equal to 77% of such single-use plastic products placed on the market in a given year by weight;  
- By 2029, of an amount of waste single-use plastic products (listed in Part F of the Annex to Directive (EU) 2019/904) equal to 90% of such single-use plastic products placed on the market in a given year by weight.  
- According to Article 3 of Directive (EU) 2019/904 ‘single-use plastic product’ means a product that is made wholly or partly from plastic and that is not conceived, designed or placed on the market to accomplish, within its life span, multiple trips or rotations by being returned to a producer for refill or re-used for the same purpose for which it was conceived;  
- from 2025, beverage (listed in Part F of the Annex to Directive (EU) 2019/904) which are manufactured from polyethylene terephthalate as the major component (‘PET bottles’) contain at least 25% recycled plastic, calculated as an average for all PET bottles placed on the market on the territory of that Member State; and  
- from 2030, beverage bottles (listed in Part F of the Annex to Directive (EU) 2019/904) contain at least 30% recycled plastic, calculated as an average for all such beverage bottles placed on the market on the territory of that Member State. |
| Directive 2000/53/EC on end-of-life vehicles (ELV) (amended latest by Directive 2017/2096/EC and Directive (EU) 2018/849) | Member States were to introduce systems for the return and/or collection/treatment of end-of-life vehicles (ELV) to attain the following targets:  
- No later than 1 January 2015, for all end-of-life vehicles, the reuse and recovery shall be increased to a minimum of 95% by |
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| **Directive 2012/19/EC on waste electrical and electronic equipment (WEEE) (recast, amended latest by Directive (EU) 2018/849)** | Member States were to introduce systems for the return and/or collection/treatment of waste electrical and electronic equipment (WEEE) to attain the following targets:  
- From 2016 onwards, taking account individual national economies: Collection target of 45% of the average weight of products placed on the market in a given country in the 3 preceding years;  
- From 2019, the collection target increases to 65% of the average weight of products placed on the market in a given country in the 3 preceding years.  
- From 15 August 2018 the recovery targets apply as follows:  
  ▪ for temperature exchange equipment and large equipment (any external dimension more than 50 cm): 85% shall be recovered, and 80% shall be prepared for re-use and recycled;  
  ▪ for screens, monitors, and equipment containing screens having a surface greater than 100 cm²: 80% shall be recovered, and 70% shall be prepared for re-use and recycled;  
  ▪ for small equipment and small IT and telecommunication equipment: 75% shall be recovered, and 55% shall be prepared for re-use and recycled;  
  ▪ for lamps: 80% shall be recycled. |
| **Directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators (amended latest by Directive 2013/56/EU and Directive (EU) 2018/849)** | Member States were to introduce systems for the return and/or collection/treatment of batteries and accumulators and waste batteries and accumulators to attain the following targets:  
- Minimum collection rates of 45% by 26 September 2016 (including batteries and accumulators incorporated into appliances).  
- Recycling processes shall achieve the following minimum recycling efficiencies:  
  ▪ recycling of 65% by average weight of lead-acid batteries and accumulators, including recycling of the lead content to the highest degree that is technically feasible while avoiding excessive costs;  
  ▪ recycling of 75% by average weight of nickel-cadmium batteries and accumulators, including recycling of the cadmium content to the highest degree that is technically feasible while avoiding excessive costs; and  
  ▪ recycling of 50% by average weight of other waste batteries and accumulators. |
Legislation | Main content
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Directive 2008/98/EC, amended by Directive (EU) 2018/851, concerning waste oils, including edible oil and fat | In particular, within the main aims reported in the introductory section of the Directive, the following indications stand out.
(I) A special effort must be pointed toward the enhancement in actions aimed to improve the sustainable transformation of waste-based raw materials, possibly under circular economy models.
(II) Specific actions must be considered to improve the recycling and re-use of waste.
(III) Waste oils must be collected in an exclusive way in order to facilitate their treatment and recycling.
(IV) Concerning the treatment of waste oils, their transformation into added-value products must be preferred with respect to other transformations (e.g., destruction).
In particular, to push Member States toward actions pointed to pursuit the abovementioned points, Article 21 of the Directive 2008/98/EC was amended by adding the following paragraph: “4. By 31 December 2022, the Commission shall examine data on waste oils provided by Member States in accordance with Article 37(4) with a view to considering the feasibility of adopting measures for the treatment of waste oils, including quantitative targets on the regeneration of waste oils and any further measures to promote the regeneration of waste oils. To that end, the Commission shall submit a report to the European Parliament and to the Council, accompanied, if appropriate, by a legislative proposal.”


For several waste streams covered by European legislation financing schemes are proposed to achieve high collection and recycling rates by applying the “producer responsibility” principle. Thereby, all producers as defined by the Directives should be registered in order to participate in financing the net costs of collecting, treating and recycling of collected waste (see also Article 8 of the WFD and specific obligations defined in the waste stream related regulation).

Specific requirements for the management of waste oils and bio-waste are laid down in Article 21 and 22 of the WFD comprising e.g. separate collection and treatment considering a high level of environmental protection. Construction and demolition waste is also tackled in the WFD by defining a recycling target on that waste stream (see Article 11 of the WFD). In addition, the WFD sets recycling targets for municipal waste and non-hazardous C&D waste except excavated soil (Article 11 of the WFD).

Complementary, the Directive 86/278/EEC on the protection of the environment, and in particular of the soil protection when sewage sludge is used in agriculture seeks to encourage the use of sewage sludge in agriculture and to regulate its use in such a way as to prevent harmful effects on soil, vegetation, animals and man.

For those waste from extractive industries the Directive 2006/21/EC introduces measures for safe management, treatment and storage of mineral resources and the working of quarries. It lays down the rules for the granting of permits to operators of extractive industry waste facilities. The operators must provide a financial guarantee to ensure that the Directive’s obligations are covered prior to operations beginning. They must also ensure that funding is available for site restoration when a facility closes down.

**Additional regulation addressing hazardous substances in waste streams**

In the following table, main EU regulation tackling hazardous substances are listed and related obligations defined therein are shortly described:

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| Directive 87/217/EEC on the prevention and reduction of environmental pollution by asbestos | The Member States must take inter alia the measures necessary to:  
- ensure that asbestos emissions into the air, asbestos discharges into the aquatic environment, and solid asbestos waste are, as far as reasonably practicable, reduced at source and prevented;  
- to ensure that in the course of the transport and deposition of waste containing asbestos fibres or dust, no such fibres or dust are released into the air and no liquids which may contain asbestos fibres are spilled;  
- to ensure that where waste containing asbestos fibres or dust is landfilled at sites licensed for the purpose, such waste is so treated, packaged or covered, with account being taken of local conditions, that the release of asbestos particles into the environment is prevented. |
- creates a framework to protect human health and the environment by prohibiting, phasing out as soon as possible or restricting the production, placing on the market and use of persistent organic pollutants (POPs);  
- lays down rules for dealing with stockpiles and waste containing POPs;  
- requires EU countries to set up inventories for unintentionally produced POPs, draw up national implementation plans, monitor POPs in close cooperation with the European Commission and engage in information exchanges with both other EU countries and non-EU countries. |
| Directive 96/59/EC on the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCBs/PCTs) | The Directive establishes minimum requirements on the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCBs/PCTs) and the decontamination or disposal of equipment containing them. Member States inter alia are required to take measures ensuring that:  
- used PCBs and PCTs and equipment containing them are disposed of as soon as possible;  
- inventories are compiled of equipment containing more than 5 litres of PCBs and PCTs, and summaries of these are sent to the European Commission within 3 years of the legislation’s adoption;  
- companies disposing of PCBs and PCTs are licensed and keep registers of the quantity, origin and nature of the used PCBs and PCTs they receive;  
- safety precautions are in place to prevent any risk of fire to PCBs and PCTs or equipment containing them; |
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| **Regulation (EU) 2017/852 on mercury** | The Regulation establishes rules for the use and storage of and trade in mercury, mercury compounds and mixtures of mercury, and the manufacture and use of and trade in mercury-added products, and the management of mercury waste, such as:  
- the export of mercury outside the EU shall be prohibited and the export of specific mercury compounds and mixtures of mercury shall be prohibited as from the dates set out in the regulation;  
- the import of mercury and of specific mixtures of mercury for purposes other than disposal as waste shall be prohibited. Such import for disposal as waste shall only be allowed where the exporting country has no access to available conversion capacity within its own territory;  
- the use of mercury and mercury compounds in specific manufacturing processes shall be prohibited or shall only be allowed subject to the conditions set out in the regulation;  
- mercury and mercury compounds, whether in pure form or in mixtures, resulting from the chlor-alkali industry, the cleaning of natural gas, non-ferrous mining and smelting operations or extraction from cinnabar ore within the Union shall be considered to be waste within the meaning of the WFD and be disposed of without endangering human health or harming the environment, in accordance with that Directive. |
| **Directive 2011/65/EU restricting the use of certain hazardous substances in electrical and electronic equipment (recast)** | The Directive strengthens existing rules on the use of hazardous substances in electrical and electronic equipment to protect human health and the environment, by also promoting the appropriate electrical and electronic equipment (EEE) end of life with a view to maximising their recovery. Specifically, the Directive:  
- define restrictions in the use of hazardous chemicals, such as lead, mercury and cadmium, to specific EEE;  
- list technical substance-specific applications that are exempted from the restrictions. Several exemptions have been added since the publication of the directive and many have expired and no longer apply; the exemption lists are continuously updated in line with technical progress;  
- places an obligation on manufacturers to ensure any EEE that they place on the market has been designed and produced in line with the requirements set out in the legislation;  
- defines that importers must check that equipment has been approved as meeting the required standards, while distributors must also ensure the rules are adhered to. |
2.2 Armenian national legislation and strategic documents

2.2.1 Legal framework

The Republic of Armenia is facing the challenge of growing amounts of industrial and household waste. The industry of the Armenia is characterized as multi-sectoral, the main part of which consists of the enterprises of metallurgical, chemical, mechanical engineering, radio-electronic, woodworking, construction materials, oil, food and processing industries.


Constitution of the Republic of Armenia of July 5, 1995, as amended in 2005, stipulates (Article 12) that the state shall promote the preservation, improvement and restoration of the environment, the reasonable utilization of natural resources, guided by the principle of sustainable development and taking into account the responsibility for future generations. Also, everyone must take care of the preservation of the environment.

The Republic of Armenia has signed around 30 environmental international treaties of which ten are related to waste:

- Convention on Long-Range Trans-boundary Air Pollution (1997),
- The Basel Convention on the Control of Trans-boundary Movements of Hazardous Waste and Their Disposal (1999),
- Helsinki Convention on the Trans-boundary Effects of Industrial Accidents (1997),
- Stockholm Convention on Persistent Organic Pollutants (2004),
- Minamata Convention on Mercury (2017),
- Agreement on the cooperation of CIS member states with respect to the use of electronic and electro-technical equipment waste (2018),
- Decision of the Eurasian Economic Commission on defining the rates of import duties of the Eurasian Economic Union’s common economic tariff for waste and scraps of precious metals (2015).

The Law of the RA on waste (ՀՕ159-Ն), adopted in 2004, entered into force in January 2005, and amended several times (22.06.15ՀՕ-105-Ն, 27.10.17ՀՕ-174-Ն, 23.03.18ՀՕ-225-Ն, 21.03.18ՀՕ-188-Ն, 22.05.18ՀՕ-329-Ն, 04.03.20ՀՕ-117-Ն), regulates the legal and economic basis of waste collection, transport, storage, treatment, recycling, disposal, reduction of volumes and other related relations, state policy in waste management, the procedures for the standardization, accounting, and profiling of waste, as well as the prevention of negative impact on human health and the environment.

The Law on Waste in Article 4 defines “waste” as both “industrial (production)” and “consumption” waste, and defines hazardous waste and solid household waste.
The Law applies to the ‘waste’ generated during production (including subsoil, mining waste) or consumption activities - residues of raw materials, substances, outputs, other products or goods formed during production or as commodities (products) that have lost their initial consumer properties (Article 4). This definition differs from the one provided in Article 3 of WFD, where ‘waste’ means any substance or object which the holder discards or intends or is required to discard. Similar confusion is also related to the terms as household solid waste, bulky waste, etc. It is recommended to revise the Law on waste, to harmonize the definition of different types of waste with the WFD.

Term solid household waste refers to types of waste that are generated during consumption by physical persons in residential areas, as well as products that have lost their consumer properties during use by individuals in residential areas to meet personal needs. Solid household waste is also the waste generated by legal entities and during the activity of individual entrepreneurs and in structure similar to the waste generated during consumption by individuals in residential areas (Article 4). This category of solid waste is quite compatible with the description of municipal solid waste on the EU waste list in many other national legislation in force in the EU. In the case of waste generated in non-household environments, the use of the term household can be confused especially with another definition of household waste mentioned in the RA Law on Garbage Collection and Sanitation (HO-237-N, 08.23.2011).

Hazardous waste are waste that, by their physical, chemical and biological characteristics pose or may pose danger to human health and the environment and require special methods and means for dealing with them (Article 4).

The main principles of state policy in the field of waste management are the protection of human health and the environment from the negative impact of waste; ensuring the rational use of raw materials and energy resources; the combination of the ecological, economic and social interests of the society regarding the use of waste. The law promotes less-waste, and resource-efficient technologies but does not focus on the promotion of end-of-waste and less-waste consumption, extended producer responsibility regarding the acceptance of returned products and of the waste that remains after those products have been used, etc., as required in Article 8 of WFD. There is no promotion of waste sorting, including household hazardous waste separate collection, as a precondition for the most efficient re-use, recycling and other material recovery operations, as required in WFD (Articles 10. 11, 18 and 20).

The Law on Waste is missing the notion and definition of Waste Hierarchy (WH). While containing and promoting all components of Waste Hierarchy the law yet does not explicitly set the priority order which is central to the WH approach. Specifically, the notions such as upcycling and downcycling, Bio-waste, Waste holder, Dealer, Broker, Separate collection, Circular economy, Re-use, preparing for re-use, as well as definitions on types of recyclables are not introduced in the Law. To meet the requirements of the Comprehensive and Enhanced Partnership Agreement (CEPA) on “Preparation of waste management plans in line with the five-step waste hierarchy and of waste prevention programmes” it will be necessary to include the notion of Waste Hierarchy in the law. Also, all missing definitions.

The law stipulates:

- Competencies of public administration and local self-government bodies in the field of waste management,
- State standardization, registration, passporting, statistical reporting, standardization in the field of waste

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management,

− Rights and responsibilities of entities in the field of waste management,

− Ensuring economic promotion of waste utilization and waste reduction measures.

The competencies of the Government of Armenia and local self-government bodies in the field of waste are defined by Articles 7, 8, 9, 10 and 11 of RA Law on Waste and further explained in Chapter 3 of this Study. There is no obligation for state governance to develop a national strategy on waste management, neither a national waste management plan, as required in Article 8 of WFD. Also, there are no obligations for local self-governance to develop regional and local waste management plans. The preparation of waste management plans in line with the five-step waste hierarchy and of waste prevention programmes is part of CEPA requirements.

According to Article 7 Government of the RA is responsible, among others, for the development of the state policy for the waste sector and ensuring its implementation, for ensuring economic incentives for the introduction of less wasteful technologies, collection of waste and recycling of waste, for providing a procedure for the licensing of treatment, neutralization, storage, transportation, and disposal of hazardous waste and development of a list of banned and hazardous waste.

State-authorized body (Article 8) is responsible, among others, for: taking part in the development of a state policy in the sector of waste management; development of targeted programmes in the sector of waste management; approving the limits of waste quantities to be disposed of by legal entities and sole proprietors; development of the list of hazardous and prohibited waste; approving the waste profiles (passports) developed by entities generating waste; establishment of a database on the volumes of waste generation; development of draft legislation regulating the waste management sector as well as the adoption of normative acts within the frames of its authority, etc.

According to Article 11, local self-government bodies are responsible for the control of garbage collection, for compilation of the sanitary cleaning schemes of the area, for organization of the participation of the population in the process of collection of non-hazardous waste with resource value, etc. Article 13 of the Law on Waste refers to state registration of waste, passport and submission of statistical report which shall be carried out in accordance with the procedure established by the Government of the Republic of Armenia. Hazardous waste generators compile and approve waste passports agreed with the authorized body in the field. Legal entities (including foreign and private entrepreneurs) that generate hazardous waste are obliged to carry out the initial inventory of waste generated, utilized, disinfected, transferred to or received from entities, as well as disposed, and to submit administrative statistical reports to the body authorized in the field in accordance with the procedure established by Government of RA Decision on establishing the state waste registration procedure 1739-

According to Article 19, legal entities and individual entrepreneurs have the right to participate in the development of local, regional and state waste management programmes. According to Article 20, legal entities, individual entrepreneurs and individuals are responsible to place the waste only in the places specially allocated for them provided by this law.

While Article 23 of the Law on Waste promotes incentives for organizations introducing technologies contributing to the reduction of waste generation, there is still no legal act issued to define the procedure of applying for receiving the benefits. The mentioned Article 23 involves some conceptual uncertainties when defining the entities eligible for the benefits. Thus, saying “organizations introducing technologies contributing to reduction of waste generation, which recover, collect, store, and build facilities…” the article involves confusion between waste reduction practice and different treatment practices. Additionally, Article 23 does not specify the types of benefits, e.g. tax benefit, import taxation, feed-in tariff, etc.\(^8\)

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The rights and obligations of entities in the field of waste are defined by Law on waste. One of the responsibilities of legal entities and individual entrepreneurs in the field of waste management is to inform of hazardous situations arising during the use of waste that endangers human health and the environment; take measures to eliminate their consequences.

The Law on Waste sets out the Cadaster of waste that includes the “Registry of the objects of generation, recycling and recovery of waste” and the “Registry of waste disposal sites”, which do not include the waste collection and transportation entities. Thus, waste operators in the country do not report data on collected and landfilled waste. This information based on rough volume estimations is reported by municipalities to the RA Statistical Committee. This cadaster and register of waste should include both hazardous and non-hazardous waste, however, de facto only the information on hazardous waste is included.\(^9\)

In the aim to enforce the Law on waste, more than 40 sub-legislative acts have been adopted by the state authorities. Herein below are listed the most important laws and bylaws that arise from or are linked to the Law on Waste:

- The Decision of the Prime Minister of the Republic of Armenia “On measures ensuring the implementation of the Law on waste”, 30.05.2005, 380-Ա.
- The Decree of the RA Minister of Nature Protection “On Confirmation of the list of waste classified by the level of hazard”, 25.12.2006, 430-Ն,
- The Decree of the RA Minister of Nature Protection “On Confirmation of the List of Consumption and Industrial waste (including Waste from Natural Resource Use) formed in the Territory of the Republic of Armenia”, 342-Ն from 26 October 2006,
- RA Law “On Environmental Fee Rates”, 27.12.2006 (ՀՕ-245-Ն), amended 06.10.11 HO-262-Ն,

\(^9\) Ibidem.
- RA Law “On Environmental Monitoring”, 28.05.2005 (ՀՕ-82-Ն), amended 28.11.11 ՀՕ-281-Ն,
- The Decree of the RA Minister of Nature Protection “On Confirmation of the Exemplary Form of Waste Passport”, 02.02.2007, 19-Ն, amended by order No. 243-Ն of 20.08.15, amended by order No. 190-Ն of 03.08.16,
- The Decree of the RA Minister of Health, “On approving the hygiene requirements N2.1.7.002-09, sanitary rules and norms for the sanitary maintenance of residential areas, collection, storage, transport, processing, treatment, recycling, liquidation, and burial of waste, as well as for the occupational safety of the staff dealing with consumption waste”, 25-Ն, 22.12.2009, amended by Decree 38-Ն of 11.11.16.
- The Decision of the Government of the Republic of Armenia “On establishing the procedure for maintaining the register of waste disposal places”, 13.7.2006, 1180-Ն,
RA Code “On Administrative Offenses”, 06.12.1985, HSSHGST 1985/23, amended 17.05.16 ՀՕ-89-Ն, 02.09.93 ՀՕ-79, 08.04.08 ՀՕ-7-Ն, 03.10.11 ՀՕ-259-Ն, 11.09.12 ՀՕ-182-Ն, 19.12.12 ՀՕ-247-Ն, 20.11.14 ՀՕ-182-Ն, 16.05.16 ՀՕ-82-Ն, 17.05.16 ՀՕ-89-Ն, 06.10.15 ՀՕ-115-Ն, 29.06.16 ՀՕ-135-Ն, 13.12.17 ՀՕ-324-Ն, 21.03.18 ՀՕ-173-Ն, 22.05.18 ՀՕ-331-Ն,

The Decree of the RA Minister of Nature Protection on approving the N1-Waste (annual) format of the administrative statistical report “on the generation, use and disposal of waste” as well as the order of filling out the said form, 22.08.2002, 112-Ն, amended by Order No. 299-Ն of 31.08.17,

- The Decree of the RA Minister of Health, “On approving the hygiene requirements for the use of hazardous chemical waste and the storage and transport of hazardous chemicals”, N2.1.7.002-09, sanitary rules and norms, 29.10.2009, 20-Ն,
- The Decision of the RA Government “On approval of Technical Regulations on Lubricants, Oils and Special Liquids”, 14.05.2015, N-546-Ն.

**The RA Law on Garbage Collection and Sanitary Cleaning, 23.06.2011, (ՀՕ-237-Ն),** amended 16.12.16 ՀՕ-235-Ն, 21.12.17 ՀՕ-289-Ն, 22.05.18 ՀՕ-330-Ն, 28.06.19 ՀՕ-119-Ն, 10.09.19 ՀՕ-165-Ն, regulates the relations related to garbage collection and sanitation in the Republic of Armenia, stipulates powers of the authorized body of the Government of the Republic of Armenia in the field of garbage collection, sanitary cleaning, defines the requirements of organization of the waste collection and sanitation process, waste collection fee, its rates, the scope of payers, their rights and obligations, rights and responsibilities of garbage collection, calculation and payment procedure, non-payment of liability or non-fulfillment of obligations, in order to properly implement the procedure for exercising the powers of local self-government bodies in the field of garbage collection and sanitation. The community council (head or other designated person or entity) is responsible to control the proper implementation of the waste collection by the operator. The Operator will pay 50,000 AMD penalty for each case of improper implementation of waste collection that lies only on the operator. This Law does not regulate the relations to hazardous waste.

**RA Law on Apartment Building Management, 07.05.2002 HO-334,** amended 04.11.2003 ՀՕ-25-Ն, 04.10.2005 ՀՕ-195-Ն, 15.12.2005 ՀՕ-239-Ն, 20.03.2007 ՀՕ-141-Ն, 01.03.2011 ՀՕ-62-Ն, 13.04.2011 ՀՕ-112-Ն, 23.06.2011 ՀՕ-241-Ն, 19.03.2012 ՀՕ-79-Ն, 24.01.2020 ՀՕ-9-Ն defines the mandatory requirement for the implementation of mandatory norms, including sanitary and communal services. Regulates the relations for management of the common shared property of apartment buildings and defines the procedure of common shared property management by apartment building owners, the forms of management, authorities of governing bodies of the building, the procedure of formation of governing bodies, activities and termination thereof, as well as their relationships with State and local government bodies and organizations.


**RA Law on Environmental Impact Assessment and Expert Examination, 21.06.2014, (ՀՕ-110-Ն),** amended on 11.09.14 ՀՕ-144-Ն, 04.03.20 ՀՕ-124-Ն, regulates the public relations in the field of environmental impact assessment in the Republic of Armenia. The Law defines three categories of assessment and expert examination – A, B, and C. In the waste sector, the law regulates:
– Environmental Impact assessment and examination process, taking into account the composition of the waste, the degree of hazard, volume, use, recycling, transportation, disposal, storage, burial, storage, preservation;

– Activities subject to mandatory strategic assessment and expertise (category A):
  o Collection, storage, use, processing, treatment, disposal, liquidation, placement, and burial of hazardous waste;
  o Installation of landfills or municipal waste recycling facilities to service communities with 15,000 or more residents or to receive at least 10 tonnes of waste per day, and/or treatment of municipal waste.

RA Law on Environmental Monitoring 28.05.2005 (ՀՕ-82-Ն), amended 28.11.11 ՀՕ-281-Ն. Article 22(6) of the law defines the main directions of the environmental control, including hazardous substances and industrial and household waste management: a) enforcing the requirements on handling hazardous substances and industrial and household (excluding radioactive) waste, meaning their generation, collection, transportation, storing, treatment, recovery, disposal, and placing in the environment; b) enforcing the requirements on exporting hazardous substances and waste from the Republic of Armenia and their transboundary shipment through the Republic of Armenia.


– Organization of waste collection, cleaning and disposal as mandatory provision of communal services in the community, as one of the mandatory functions of local self-government bodies;

– The competences of the Local Self-Government bodies and other authorities in relation to the organization of waste collection and sanitary cleaning, as provided by the Law of the Republic of Armenia On Waste Collection and Sanitation, by the Head of the Community;

– Determining the fees for garbage collection and sanitation, to be paid to the community budget by the community council and approval of the amount of those fees by the decision of the community council.

The Law on Local Self-Government in the city of Yerevan 26.12.2008, (ՀՕ-5-Ն), amendment 23.06.11 HO-229-N, 23.06.11 HO-239-N, 08.12.11 HO-345-N, 08.02.12 HO-15-N, 19.03.12 HO-134-N, 06.12.12 HO-226-N, 26.02.15 HO-8 TO, 25.05.16 HO-64-N, 04.10.17 HO-137-N, 04.10.17 HO-137-N, 21.12.17 HO-17-N, 17.01.18 HO-56-N, 21.03.18 HO-179-N, 21.03.18 HO-200-N, 23.03.18 HO-256-N, 13.06.18 HO-350-N, 11.09.18 HO-379-N, 10.09.19 HO-147-N, 21.01.20 HO-25-N, 24.01.20 HO-84-N, 06.03.20 HO-102-N, 25.03.20 HO-192-N, 18.06.20 HO-336-N, 28.10.20 HO-469-N, 03.11.20 HO-485-N, 11.02.21 HO-78-N, stipulates that in the sphere of urban development and communal economy, the mayor exercises the following obligatory powers: organizes garbage collection, cleaning, improvement and landscaping of streets, squares, parks, other public places of general use; and carries out other authorities provided by the Law of the Republic of Armenia on Garbage Collection and Sanitary Cleaning. The Law grants Yerevan the status of an independent local government, including the organization of its own waste collection and disposal service. According to the decision of the community council, the garbage collection and sanitation works are financed from the community budget. Garbage collection fee is a mandatory fee charged to the community budget or extra-budget in the amount determined by the community council. It fluctuates in the range of 50-400 drams per month for each resident of a residential building or 5-25 drams per square meter.

− for the organization of garbage collection works for the garbage collectors by the community,
− Permission from the community to legal entities or individual entrepreneurs to collect and transport construction-large-scale garbage, as well as to those who pay garbage collection fees to transport construction-large-scale garbage on their own.

RA Law on Environmental Fee Rates 27.12.2006 (ՀՕ-245-Ն), amended 06.10.11 HO-262-N, sets the rates for payment for the disposal of production and consumption waste in the environment in the prescribed manner (Article 3). The payment rates for the installation (storage) of each ton of production and consumption waste in the environment in the prescribed manner are:

− for the disposal of waste in specially designated areas (except industrial sites): these fees refer to different hazardous class (from 1500 drams for fourth class to 48000 drams for first class); non-hazardous waste, except for non-hazardous waste generated by mining legal entities after land demolition and construction (600 drams); non-hazardous waste disposed of by mining legal entities (0 drams) and non-hazardous waste caused by demolition and construction (60 drams).
− for the placement (storage) of waste in industrial squares: the fee includes both hazardous and non-hazardous waste and depends on hazardous class and time of storage: up to one year, between one and three years and more than three years.

The Decision of the RA Government on the establishment of the management procedure of the register of the facilities for the generation, treatment and recycling of waste, 20.04.2006, 500-Ն, amended by Decisions No. 1045-Ն of 10.09.15, No. 69-Ն of 29.01.16, No. 1442-Ն of 10.10.2019. The main objective of the register is to collect, analyze, process and store data on the generation, treatment, and recycling of waste. The Register is maintained by the Ministry of Environment of the Republic of Armenia (the Authorized Body) in accordance with the procedure established by the legislation of the Republic of Armenia.

The Decision of the RA Government on Mandatory Norms of Shared Property Maintenance of Multi-apartment Buildings, 1161-Ն, 04.10.2007, amended 15.12.11 N 1771-Ն, defines the mandatory norms for the maintenance of common equity ownership in apartment buildings, including:

- Disposal of consumption (household) waste at least once every three days, and in case of temperatures of +50˚C and above – every day;
- Disinsection (extermination of insects) and deratization (extermination of rodents) in common areas, chutes and waste collecting rooms at least once every three months;
- Sanitary cleaning of common areas at least once every two days.

The Decree of the RA Minister of Health, on approving the hygiene requirements N2.1.7.002-09, sanitary rules and norms for the sanitary maintenance of residential areas, collection, storage, transport, processing, treatment, recycling, liquidation, and burial of waste, as well as for the occupational safety of the staff dealing with consumption waste, 25-Ն, 22.12.2009, amended by Decree 38-Ն of 11.11.16. In order to prevent the negative effects of waste on human health and the environment, the Decree defines the norms for the collection, storage, and disposal of waste in buildings with chutes, the types and sizes of containers for the temporary storage of waste and their placement in different areas. Moreover, the containers must have lids and only two-thirds of the container should be filled with waste. The Decree also defines the norms for the transport of consumption waste, as well as the disinfection norms for containers, garbage trucks and waste collection rooms.
RA Code on Administrative Offenses 06.12.1985, HSSHGST 1985/23, amended 17.05.16 ṢO-82-Ն, 02.09.93 ṢO-79, 08.04.08 ṢO-7-Ն, 03.10.11 ṢO-259-Ն, 11.09.12 ṢO-182-Ն, 19.12.12 ṢO-247-Ն, 20.11.14 ṢO-182-Ն, 16.05.16 HO-82-Ն, 17.05.16 ṢO-89-Ն, 06.10.15 ṢO-115-Ն, 29.06.16 ṢO-135-Ն, 13.12.17 ṢO-324-Ն, 21.03.18 ṢO-173-Ն, 22.05.18 ṢO-331-Ն, establishes appropriate sanctions for cases of violation of garbage collection and sanitation rules, dumping of waste in undefined places. The RA Code of Administrative Offenses was amended in May of 2018, and harsher punishments and liability were foreseen for dumping waste in areas and sites not designated for waste collection and sanitary cleaning. The penalties have been differentiated according to the amount and type of waste (article 43.1).

Code of the RA National Assembly, Tax Code of the Republic of Armenia, 4.10.2016, HO-165-Ն. The Code sets environmental tax rates for the placement of production waste (or) consumption waste in specially designated places, such as, landfills, complexes and (or) buildings.

2.2.1.1. Legal framework for hazardous waste

Waste in Armenia is classified according to the following decrees:

- The Decree of the RA Minister of Nature Protection on approval of the list of waste classified by the level of hazard, 25.12.2006, 430-Ն,
- The Decree of the RA Minister of Nature Protection on Confirmation of the List of Consumer and Industrial waste (including Waste from Natural Resource Use) formed in the Area of the Republic of Armenia, 342-Ն from 26 October 2006.

According to the Decree of the RA Minister of Nature Protection on Confirmation of the List of Waste Classified by the Level of Hazard, 25.12.2006 (N 430-Ն), waste in Armenia are classified according to their level of hazard: class 1, 2, 3, 4 and 5. The extremely hazardous waste belong to category 1, highly hazardous waste to category 2, moderately hazardous waste to category 3, slightly hazardous waste to category 4, while category 5 implies non-hazardous waste. Waste which is included in Class V is inert waste, such as for example construction and demolition waste, glass, soil or concrete slabs. The unsorted (mixed) municipal solid waste from residential households and household spaces of commerce and institutions is defined as having the 4th class of hazard, which should require any household waste transporting and landfilling operator to receive a license for their operation. However, neither the waste collection operators nor the dumpsite operators at the communities do not pass EIA or Expert Examination required by the Law on EIA and Expert Examination (ՀՕ-110-Ն), for the activities for which assessment of Category A is mandatory.

To report all household waste as hazardous waste does not comply with the EU and UNSD (United Nations Statistics Division) definition.

The document lists different types of waste that are classified as hazardous waste and provides name, description of the physical form and origin of the mentioned waste. The List of waste classified by hazardousness is compatible with the corresponding lists of the Basel Convention and those of the OECD. In addition, Armenia has adopted the list of banned waste for import and classifies waste according to 4 different levels of hazardous waste and as non-hazardous waste.

Armenia does not use the European Waste Classification for Statistics (EWC-Stat Commission Regulation (EU) on waste statistics No 849/2010) (despite this is stated in the UNSD-Q2016, table R7). It is also not clear if, and if yes, to what extent, Armenia uses the R & D codes of the EU Waste Framework Directive.

Decree on the List of waste classified by the level of hazard, 430-N is not harmonized with the EU Decision on establishing a list of waste, 2000/532/EC, amended by 2014/955/EU, the same as the Decree of the RA Minister of Nature Protection on Confirmation of the List of Consumption and Production Waste (including waste from Natural Resource Usage), formed in the Territory of the Republic of Armenia. 26.10.2006, 342-Ն. This list provides
the codes for municipal solid waste, construction waste, food waste and etc., but does not define those any further. However, this classification does not seem to be used in the regular publications (see section and in the online-database ArmStatBank. The publications include no tables that would show the breakdown of waste by waste type. The waste are listed with 13-digit code, the name, and the source. Both Decrees have to be harmonized with the EU List of Waste.

**RA Law on Licensing 30.05.2001** (HO 193-N), amended 08.12.05 ՀՕ-252-Ն, 16.12.05 HO-31-N, 17.09.09. HO-169-N, 08.12.10 HO-227-N, 26.05.11 HO-208-N, 19.03.12 ՀՕ-132-Ն, 22.06.12 HO-172-N, 29.04.13 HO-48-N, 20.11.14 HO-172-N, 17.12.14 HO-230-N, 13.11.15 ՀՕ-121-Ն, 15.12.15 ՀՕ-175-Ն, 27.10.17 HO-169-N, 02.03.18 ՀՕ-107-Ն, 25.06.19 ՀՕ-71-Ն, defines the types of activities subject to licensing and regulates the related relations. The Decision of the RA Government on Confirmation of the Licensing Procedure for Hazardous Waste Management Activities in RA (N 121-Ն from 30 January 2003) defines the conditions for licensing the activities (collection, transportation, storage, treatment, recycling, utilization, disposal and burial) of hazardous waste in the Republic of Armenia and regulates the related relations. A legal entity or individual entrepreneurs (licensee) has the right to engage in hazardous waste operations in the Republic of Armenia if it has received a hazardous waste operation license in the Republic of Armenia. The applicant submits an application to the licensing body and it shall state the name of the legal entity or name and surname of the individual entrepreneur, location, place of activity, type of activity subject to licensing which the applicant intends to carry out, state registration number of the applicant, list of documents attached to the application (which depend on the activity), as well as information on recycling of hazardous waste. Although the licensing process includes a complicated procedure, it should be noted that the license is issued with not expiry dates and there is no requirement to renew the license. The license can be suspended or terminated, however, in practice, there have been no cases of suspending or terminating of licenses in the past decade.

The Decision of the RA Government on establishing the waste passportization procedure, 19.01.2006, 47-N, amended by 10.09.15 decision 1038-N, 24.12.2015 decision 1522-N, 26.04.18, No. 494-N regulates the procedure related to the preparation and approval of a hazardous waste passport for each type of hazardous waste. The registration of hazardous waste is carried out in order to save resources and ensure the safe use of hazardous waste. The passport has to contain information on the type, quantity, degree of hazard of hazardous waste generated by the waste generator, its composition, main resource and raw material properties. Waste generators (legal entities and individual entrepreneurs) are obliged to prepare the waste passport.

The form of the waste passport is defined by The Decree of the RA Minister of Nature Protection on Confirmation of the Exemplary Form of Waste Passport, 02.02.2007, (19-Ն), amended by order No. 243-N of 20.08.15, amended by order No. 190-N of 03.08.16 and include the following information:

- Waste name and code (in accordance with The Decree of the RA Minister of Nature Protection on Confirmation of the List of Consumer and Industrial waste (including Waste from Natural Resource Use) formed in the Area of the Republic of Armenia, 342-Ն from 26 October 2006),
- Information on waste generator (name, location, contact details),
- Waste amount,
- List of hazardous properties in accordance with Annex III to the Basel Convention on the Trans boundary Movements of Hazardous Waste and their Disposal,
- Waste origin: raw material and technological process resulting with the waste and technological parameters which could have a significant impact on waste properties,
- Waste composition (components percentage based on an accredited laboratory results),
- Recommended method for waste neutralization or recycling,
- Waste fire hazard (data on combustibility / flammability or non-flammability),
- Corrosion properties of waste (data on the corrosive activity of waste or its absence),
- Waste reactivity,
− Necessary precautions when handling waste,
− Restrictions on waste transportation,
− Additional information (Data on emergency prevention and hazards associated with this hazardous waste necessary elimination measures),
− Waste manufacturer announcement and technological parameters which could have a significant impact on waste properties.

Moreover, the entity generating waste must declare the following: “I have concluded through research that the given waste contains only the above-mentioned toxic components in the given percentages, due to which I have classified this waste as a waste of Category __. I confirm that the information provided by me is accurate and true.”

Legal entities (including foreign-individual entrepreneurs) that generate and transport hazardous waste are obliged to submit administrative statistical reports to the state authorized body in accordance with the procedure established by law and other legal acts. The form of the administrative statistical report on waste is defined by The Decree of the RA Minister of Nature Protection on Approving the Form N 1 “On Waste Generation, Use and Disposal”- (annual) of the Administrative Statistical Report and Filling Instruction for the Form N 1 “On Waste Generation, Use and Disposal”- (annual) Administrative Statistical Report Directive, N 112-N, 22.08.2002, Order ed. 16.12.09 No. 451-N, amended by Order No. 299-N of 31.08.17.

The Decree of the RA Minister of Health, on approving the hygiene requirements for the use of hazardous chemical waste and the storage and transport of hazardous chemicals N2.1.7.002-09, sanitary rules and norms, 29.10.2009, 20-N. These Sanitary Rules define the hazardous chemical waste generated during the activities of organizations and individual entrepreneurs, except for medical and radioactive waste, such as usage, prevention of waste generation, collection, transport, temporary storage, processing, treatment, disposal, neutralization, burial). Hazardous chemicals are highly toxic substances, except pesticides (mineral pesticides), mineral fertilizers.

The Decision of the RA Government on approval of Technical Regulations on Lubricants, Oils and Special Liquids, 14.05.2015, N-546-N. The purpose of this Technical Regulation is to establish mandatory requirements for products obtained as a result of processing (utilization) of lubricants, oils, special liquids, protecting the life (or) health of flora and fauna, preventing misleading activities of consumers, as well as saving resources. The main risks during the production, circulation, use (exploitation), processing of these products, are: fire hazard of the products, negative impacts to the environment, and to the human body. The requirements of this Technical Regulation do not apply to the following products:

1) Exported from the territory of the Republic of Armenia;
2) Antifreeze and cooling liquids.
3) brake fluids.
4) vegetable oils and animal fats;
5) not referring to the definitions’ "oil", "lubricant", "special liquid" defined in point 3 of this regulation;
6) Oils used for the preparation of perfumes and cosmetics, medicinal products, pharmaceuticals.

The processed products are subject to delivery at the collection points of the processed product for preparation for further processing (use). The processed products prepared for self-processing (use) or produced for the purpose of processing (use) from the collection points, must be accompanied by a quality passport. During the circulation of processed products, the following are prohibited:

a. discharge into reservoirs, on land and in general sewer networks,
b. export with subsequent burial in landfills for household and industrial waste;
c. mixing with oil (gas), gasoline, kerosene, fuel (diesel, marine, boiler, fuel oil) for the purpose of obtaining fuel for energy systems, except for the cases permitted by the authorized bodies in the field of nature protection;
d. mixing with products containing halogen organic compounds;
e. use as antifouling agents and means for impregnation of construction materials.

Agreement on the cooperation of CIS member states with respect to the use of electronic and electro technical equipment waste (2018)

The Republic of Armenia has no legal acts regarding the management of WEEE, batteries, waste oils. This Agreement is signed between CIS member states on 01.06.2018. The main objectives of this Agreement are: member states to contribute to this Agreement by developing national legislation and other regulations systems, having as objective and based on the agreed principles of environmental load reduction, environment-damage & EE components reduction by reduction of hazardous substances and WE & EE recycling by secondary raw material extraction for increasing the share of resources; assist in the development and harmonization of standards for WEEE management. Also, to support this agreement by organizing economic, strategic and national events, coordinated by the countries party to this Agreement, which will focus on the usage of the set of standards in WE & EE industry and on the exchange of experience in the related field, exchange of related experts and professionals in the training and qualification on level of hazard.

Conclusion: According to the above provided information, it seems that mentioned norms and regulations for management of hazardous waste in Armenia are relatively well-developed. However, there is still no single ESM (Environmentally Sound Management) facility for treatment of hazardous waste (e.g. mercury containing lamps or thermometers, batteries, etc.) in the entire republic. Until today, there has been no decree or legal act requiring design and construction of an ESM facility that would receive waste with 1st class of hazard for treatment or at least storing.

2.2.2 Strategic documents and plans

Based on local legislation and the Law on waste management, Yerevan, neither Armenia, is obliged to draft National, Regional or Municipal waste management plans. Related to waste management, the following documents are enacted:

- 2019 RA Government Programme, N 65-A, 08.02.2019,
- 2017-2036 Municipal Solid Waste Management System Development Strategy, N 49, 08.12.2016,
- Cleaner Production Concept, N 49, 2011,
- Armenia Development Strategy for 2014-2025, RA Government Decree # 442-N, 27.03. 2014,
- Strategy for the introduction of Extended producer responsibility (EPR), N 14, 12.04.2018,
- Comprehensive and Enhanced Partnership Agreement – CEPA, signed on 24.11.2017,
- A Report on waste governance in Armenia (WGA Report), March 2020, Yerevan,
- Yerevan Green City Action Plan 2017,

2019 RA Government Programme, N 65-A, 08.02.2019

The programme stipulates the main directions for the country’s environmental management, particularly focusing on environmentally sound management of chemicals and waste (including mining waste). In aim to ensure convenient and ecologically safe living conditions for citizens and to reduce the negative (hazardous) impacts of the municipal solid waste on the environment and public health, the programme define an institutional framework to establish waste management system compliant to international standards, waste management cost recovery through improved waste handling fee collection and better contracting and legal framework in the sector,
implementation of waste disposal and recycling programmes in collaboration with international institutions.

Based on the programme, the RA Government also developed an action plan, N650-L, May 2019, supporting the main directions on solid waste governance set in the programme (public awareness, collection fee, e-system for permits and licenses, monitoring networks, environment information system, legislation on chemicals, development of waste management strategy, etc.). Unfortunately, the programme neither action plan do not mention of circular economy and do not explicitly promote the use of economic incentives to promote waste hierarchy implementation and environmentally sound waste management and sustainable resource management.


This strategy is based on the recommendations and analysis presented in “RA MSWM Strategic Development Plan, Roadmap and Long-Term Investment Plan” implemented by European experts in 2013 with the support of the Asian Development Bank. It is approved by the Protocol Decision No 49, dated 08.12.2016. The main goal of the strategy is to create an integrated system of solid municipal waste management (MSWM) throughout the Republic of Armenia that meets EU standards and which will provide technically, financially, and environmentally cost-effective services to the population and enterprises (henceforth - users).

The national MSWM system will include regional MSWM sub-systems that operate independently but meet the same criteria and principles. The integrated nature of the system will ensure compatibility of waste management technologies (collection, transport, storage, disposal, recycling, processing) and the management system that will function based on a sustainable financial, institutional, and legal framework.

Outcomes of strategy implementation:


2) MSWM system will comprise a limited number of regional sub-systems (operation of no more than 10 regional landfills and implementation of waste collection in communities of the sub-system in line with EU standards ) and will cover 100% of Armenia’s territory.

3) At least 95% of the waste generated in Republic of Armenia will be collected. In Yerevan, waste collection is already 100% of generated.

4) Users will sort up to 20% of the waste generated by them.

5) Along with the introduction of the new system, all existing landfills operating in the territory of the RA will be terminated (if their modernization is considered infeasible).

6) The economy of scale will ensure the lowest possible fee rate. The implementation of the strategy will not require a change in the maximum of the waste collection fees defined by the RA legislation.

7) The economy of scale will lead to an increase in the attractiveness of the system for the private sector along the whole waste value chain (from waste collection to waste landfilling or recycling)

8) The impact on public health and the environment will decrease significantly. The landscapes cleansed up from litter will increase the Armenia’s tourist attractiveness.

Waste collection is a under responsibility of local self-government bodies. It is necessary to coordinate those functions by state authorized bodies, as waste management is related to the powers of the RA Ministry of Nature Protection and the Ministry of Health. In particular, the RA Law on Waste defined the term licensed landfill, defining the authority of territorial authorities to eliminate (liquidate) unlicensed landfills, while the licensing process and
the requirements for it are not clear. As a result, there are no licensed landfills in Armenia to date. According to the RA Ministry of Territorial Administration and Development, there are more than 450 unlicensed landfills in Armenia. Landfills are not mapped, their boundaries are not clear, the volume and composition of landfills are not known. Most landfills are designated areas where there is no management, or very limited or insufficient quality.

More than half of the population of Armenia lives in Yerevan or in the immediate vicinity of Yerevan (up to 50 km). As a result, most of the solid waste generated in Armenia is also concentrated in Yerevan. The strategy outlines installation of transfer stations, bins and containers for waste collection, waste sorting, construction and operation of landfills in line with EU standards, etc. The main principles of the strategy are: reduction and neutralization of the negative (dangerous) impact of municipal solid waste on the environment and public health, regular implementation of waste collection, mandatory sanitary cleaning, creation of conditions for sorting, re-use or recycling of waste to be used and reduction of the volume of waste disposed in the landfills. However, there is too little focus on raising capacities for sorted collection and recycling in the country. The target set for 2036 requires waste producers to sort up to 20% of the waste generated, which is a very low number for a period of nearly 20 years, compared to, for instance, the average targets set by EU Commission for the member states. Additionally, the strategy does not address the issue of biological waste and hazardous waste.

In order to implement this strategy, it is necessary to make changes in a number of laws and by-laws. These legislative reforms are planned to be implemented within 11 months after the approval of the strategy by the Government of the Republic of Armenia. It is still not implemented until today.

**Cleaner Production Concept, N 49, 2011**, 10

RA Government Protocol Decision № 49 adopted in 2011 makes a reference to the Cleaner Production Concept as one of the governing legal frameworks of the RA 2014-2025 Strategic Programme of Prospective Development, which shall facilitate the following: Safe management of waste, Introduction of an ecologically clean production, Complex solution to the issue of environmental pollution.

Cleaner production implies more efficient use of raw materials and energy, exclusion of toxic and hazardous materials, as well as prevention of production waste generation and pollution at the source. The philosophy of cleaner production targets the reduction of negative impacts of production and services on the environment during their entire life-cycle starting from the acquisition of raw materials and ending with use and final elimination.

The concept foresees the following: 1. Principles for the organization of environmentally clean and low-waste technologies; 2. Requirements for zero-waste production procedures and technologies; 3. Requirements for raw materials and energy resources in the organization of a low-waste or zero-waste production; 4. Requirements for finished goods 5. Measures aiming to ensure clean production 6. Main benefits expected from the introduction of the principles of cleaner production by the industrial organization.

Cleaner Production Concept framework aims at reducing the negative impacts from production and services during their entire life-cycle – from material extraction to consumption and disposal – that would include:

1) Reduction of prime costs for material, water, and energy recovery,
2) Prevention of waste,
3) Avoidance or reduction of hazardous materials and processes,
4) Improvement of environmental indicators,
5) Improvement of productivity,
6) Reduction of waste management costs,
7) Reduction of negative impacts on the environment,

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8) Reduction of unit cost, that would increase the competitiveness in global market,
9) Improvement of working conditions,
10) Development of production based on waste generated by other industries and human activities.


One of the chapters refers to Environmental Protection where the main environmental problems and planned measures are presented, however, hazardous waste management is not recognized as a problem.

Strategy for the introduction of Extended producer responsibility (EPR), N 14, 12.04.2018,\(^\text{11}\)

On April 12, 2018, the RA Government adopted a Protocol Decision N 14, on Approving the Strategy and 2018-2021 Action Plan for the Introduction of the Extended Producer (Importer) Responsibility Systems [viii]. At its core, the EPR has a governing strategy, according to which the producer or the importer, in the initial stage of production (import) of the given item, foresees measures preventing (or neutralizing the negative impacts) the environmental impacts arising in the final stage of that product’s (good’s) use and bears administrative and financial liability for the elimination of said negative impacts. The objectives of the EPR system are:

1) Prevention of waste generation,
2) Reduction of quantities at source of generation,
3) Recycling as secondary raw materials,
4) Recycling as secondary energy resource,
5) Burial in landfills (as the least preferable method for waste management).

The main long-term goal for the introduction of the EPR system is the promotion of production that meets environmental requirements, which will help to prevent environmental pollution and reduce the use of natural resources in all production cycles as well as reduce costs of waste recycling.

The strategy is expected to be implemented in two main phases, and the overall system was planned to be introduced by the end of 2021 in the following order:

1. Development of the corresponding legal framework (2018-2021)
2. Introduction and development of the EPR system, including:
   a. Developing and introducing a packaging marking system,
   b. Developing and implementing public awareness campaigns on waste separating and sorted collection,
   c. Implementing financial studies to assess the expenses by companies and consumers, as well as other studies.

In Annex 2 of the Strategy number of measures are provided for implementation in short term period, 2018-2021, including development of a drafts on changes and amendments in the RA Law on waste, RA Tax Code, RA Law on Waste Collection and Sanitary Cleaning, Law on Local Self-Governments.

According to the RA Ministry of Environment, given that:

- Armenia currently lacks treatment, recycling, recovery, and disposal, as well as sorted collection and transportation capacities necessary to introduce the EPR systems;

\(^{11}\) A Report on waste governance in Armenia (WGA report), March 2020, Yerevan
• Armenia has an obligation to establish full cost recovery mechanism in accordance with the polluter pays principle and EPR principle according to the CEPA signed between EU and RA of Armenia on 24 November 2017;

the action plan measures have been deemed untimely and inexpedient (which is fortified by 08.01.2019 N 02/24.10/8 Prime Minister’s decree) and thus will be implemented within the action plan and timeframe required by the CEPA.

The assumption that Armenia currently lacks capacities for treatment, recycling, recovery, and disposal, as well as sorted collection and transportation necessary to introduce the EPR systems is not fully substantiated. There are more than forty companies involved in solid waste recovery and treatment in the country.

However, there remains a need for additional analysis of waste handling, recovery, and treatment capacities in the country. Therefore, EPR adoption would require assessing these capacities for the specific types of waste selected according to the draft list of non-consumable products, including packaging, subject to recovery (Action 3 in EPR action plan).

**Comprehensive and Enhanced Partnership Agreement – CEPA, signed on 24.11.2017**

The Comprehensive and Enhanced Partnership Agreement (CEPA), signed between EU and RA of Armenia on 24 November 2017, has entered into force on the 1st March 2021. Areas/domains covered by this CEPA agreement and relevant Directives are:


There are number of waste governance targets which have to be met according to the set timeline:

• By 2020 to have established a system for disseminating environmental information to the public
• By 2021 to have prepared national strategy reducing the amount of biodegradable municipal waste going to landfill
• By 2021 to have established control and monitoring procedures in the operation phase of landfills and of closure and after-care procedures for landfills to be disaffected
• By 2021 to have established application and permit system and of waste acceptance procedures (at landfills)
• By 2022 to have prepared waste management plans in line with the five-step waste hierarchy and of waste prevention programmes
• By 2023 to have established register of waste collection and transport establishments and undertakings
• By 2024 to have established full cost recovery mechanism in accordance with the polluter pays principle and extended producer responsibility principle
• By 2024 to have established conditioning plans for existing landfill sites
• By 2024 to have established a system ensuring the relevant waste is subject to treatment before landflling
• By 2025 to have established obligations for operators to take the necessary prevention and remediation measures including liability for costs
• By 2025 to have established strict liability for dangerous occupational activities.  

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Report on waste governance in Armenia, prepared by the AUA Acopian Center for the Environment and published in 2020, includes analysis of current waste management system (Legislation and regulations, Institutional framework, Infrastructure, Waste management practices in Armenia) as well as legislation, institutional, financial mechanism and technology and infrastructure gaps with recommended improvements. The sorted collection is recognized as critical for the separation and elimination of hazardous waste. The hazardous waste contained in urban waste is still put in various landfills in the country. Thus, one of the suggested priority directions for the further policy and strategy dialog process is the improvement of hazardous waste handling/disposal infrastructure.

Yerevan Green City Action Plan 2017

One of the chapters in the Yerevan Green City Action Plan (GCAP), prepared in 2017, is dedicated to waste management, presenting the key challenges, vision as well as Strategic objectives (2030), mid-term targets (2025) and short-term actions (2017-2020). It is pointed out the negative environmental impact of the industrial sector as a whole as it generates major amounts of waste (both hazardous and non-hazardous) within the territory of Yerevan. Obsolete industrial waste disposal, as well as the absence of hazardous waste sanitary landfill capacities for Yerevan, increase the risk of environmental contamination significantly.

Although the existing policy measures plan for EU-standards-compliant MSW collection and disposal, other waste management aspects, such as capacities for other waste, including hazardous waste, have not been part of long-term planning yet.

Nevertheless, the future capacities for hazardous waste disposal are not tackled through a solid waste management strategy for Yerevan. Considering that there is no hazardous waste EU standard like disposal site serving in Yerevan industrial sector until now, planning of construction of such facility(ies) should become one of the priorities for the waste management sector policy.

For 2030, a vision of the City of Yerevan, which:

a. Will be served by a modern integrated waste-management system employing international standards, directing Yerevan towards a materially efficient economy.

b. Will make Yerevan attractive for state-of-the-art waste management and technological companies as well as affiliated service sectors.

Strategic Objectives (2030) are the following:

- 100% of MSW as well as other waste generated will be handled in appropriate waste disposal or waste treatment facilities and managed both according to EU standards
- More than 99% of producers of MSW and other waste will pay an appropriate obligatory fee for its collection and disposal.
- The recycling rate for MSW will be more than 30%, for other waste it is more than 60%.
- The integrated sorting and recycling system will bring revenues back to the MSW management system (more than 20% of MSW management costs p.a.).
- A publicly available database of MSW and other waste generated, treated and disposed in accordance with the national waste coding system will be in place.
- Frequent information and awareness campaigns on developments and accomplishments of the waste management sector as well as the reduction in waste generation will be delivered to citizens.

One of the actions in the GCAP is to create a sound programme for incentivisation of material efficiency in the industrial sector. Namely, the objective is to increase material efficiency in the industrial and related service sector in Yerevan to reduce the amount of all waste generated, to reduce the amount of hazardous waste generated, to start-up research-development-innovation process, to preferably using secondary raw materials, to reduce material consumption, to save operational costs.
2.3  Polish national legislation and strategic documents

2.3.1  Legal framework

The municipal waste management system in Poland has changed significantly in previous years as a result of adaptation to EU requirements, such as the scope of implementing the Waste Framework Directive and the ambitious CE legislative package from 2015.

Waste management in Poland is being implemented based on the EU waste management hierarchy, according to which waste prevention and preparation for reuse are the primary goals to be achieved, after that it is recycling (as well as composting) and other recovery methods (e.g. incineration with energy recovery). The last option in the waste management hierarchy is disposal, by storage of waste that cannot be subjected to recovery.

The list of the most important laws and by-laws regulating waste management in Poland:


The 2001 Environmental Protection Law is considered the basic act legal regulations governing the general principles of the use and protection of environmental resources, which also apply to waste management. The act defines the rules of environmental protection and the conditions for using its resources, taking into account the requirements of sustainable development.

The legislator in Art. 5-8 enacted the principles of environmental law, which can also be referred to the protection of its resources from negative impacts waste. Those principles are:

- The protection of one or several natural elements should be implemented taking into account the protection of other elements.
- Whoever undertakes activities that may have a negative impact on the environment is obliged to prevent this influence.
- Whoever pollutes the environment bears the costs of removing the consequences of contamination.
- Whoever may cause pollution of the environment bears the costs of preventing this pollution.
- Policies, strategies, plans or programmes concerning, in particular, industry, energy, transport, telecommunications, water management, waste management, spatial planning, forestry, agriculture, fisheries, tourism and land use should take into account the principles of environmental protection and sustainable land use development.

Important by-laws which arise from this Law are: the Regulation on inventories containing information and data on the use of the environment and the amount of fees due (Journal of Laws of 2019, item 1396, as amended) and the Regulation of 11 December 2019 on lists containing information and data on the scope of use of the environment and the amount of fees due (Dz.U. 2019 item 2443).


Act of 14 December 2012 on waste came into force on 23 January 2013, and it is an implementation of the EC law—the Waste Framework Directive of 2008, which provides measures to protect the environment and the lives and health of people, preventing and reducing negative impacts on the environment and human health resulting from the generation and management of waste, and limiting the overall effects of resource use and improving the efficiency of such use.

Hazardous waste is defined in Polish Law as waste that displays one or more of its hazardous properties: explosive, oxidizing, highly flammable, flammable, irritant, harmful, toxic, carcinogen, corrosive, infectious, toxic for reproduction, mutagenic, sensitizing, ecotoxic, waste which releases toxic or very toxic gases in contact with water,
air or an acid and waste which, after the end of the disposal process, can by any means yield another substance. To identify the hazardous character of waste, the Law on waste refers directly to the EU regulations (EU 2014/1357 and EU 2017/997).

Based on Article 4 of the Act on waste, the Regulation of 2 January 2020 on the catalogue of waste (DZ.U. 2020 poz 10) was adopted. Waste catalogue in Polish acts is compliant with the European List of Waste (ELW). The List of Waste identifies types of hazardous waste.

In Section II of Act on waste, general principles of waste management are defined. Waste management should be conducted in a manner ensuring protection of human life and health and the environment. Waste hierarchy that applies to hazardous and non-hazardous waste includes: prevention of waste generation, preparation for reuse, recycling, other recovery processes including energy recovery and disposal as the least preferred option.

The principle of proximity prescribes that waste shall be treated at the place of its generation or transported to the facilities located as close as possible to the place of its generation taking into account waste hierarchy and best available technics.

The costs of waste management shall be borne by the original waste producer or by the present waste producer or the previous holder of the waste – polluter pays principle.

Chapter 4 of Section II of the Act on waste regulates hazardous waste handling. Mixture of different hazardous waste, hazardous waste with non-hazardous waste, as well as dilution of hazardous substances, is forbidden. As an exception it is allowed to make any of those mixtures in course of treatment process to improve safety and effectives of disposal/recovery process but only if this does not increase the threat to human health and environment.

Transport of hazardous waste shall be carried out in accordance with provisions related to transport of hazardous substances (ADR for road transport, RID for railway transport or IMDG for sea transport) and each carrier must be authorised to transport. Waste carriers must be authorised by sub-regional authority. Since January 2018, all waste carriers have to be registered in nationwide waste database and have a specific registration number.

Waste can be stored only at places to which the holder of waste has a title (ownership, rent, lease etc.). Storage of waste is allowed only as a consequence or intermediate stage of generation, collection or treatment process and can be stored not longer than 3 years if this is justified by organization of technical requirements of treatment processes (not longer than 1 year in case of hazardous waste, combustible waste, unsorted (mixed) municipal waste and waste originating from the processing of municipal waste).

Activities in the field of collection of waste and waste treatment require permits. Permits are issued by: - the head of regional self-government (marshal) in case of IPPC permits and the head of county (starosta) in other cases. IPPC permit is valid for unlimited time while the permit for collection and treatment of waste is valid for maximum 10 years.

The voivodship marshal keeps a register of entities introducing products (packaged products, tires, lubricating oils, vehicles, batteries or accumulators) and waste management (recovering or recycling waste).

Responsibility for waste management is assumed by the waste generator. Waste generator may pass the duty to other entity authorized for collection or treatment of waste. In such a case responsibility for waste management passes with the waste to the next holder. There are exceptions from that principle are: - waste carriers do not assume responsibility for waste management, waste generator is responsible for waste until waste carrier hands over the waste to the next holder, - generator of infectious medical waste remains responsible for the waste until it is incinerated, - dealers and brokers do not assume responsibility if they do not take possession of waste.

Specific waste streams defined by this Law are: PCB waste, waste oils, household sewage sludge, medical waste, waste from accidents and metal waste. Waste oils shall be collected separately, as far as it is technically feasible.
Waste oils should be processed in accordance with the hierarchy of waste management methods – regeneration, other recovery process and neutralization.

The implementation of the Act on waste in 2013 presented a fundamental change by imposing on municipalities an obligation to develop local systems for the collection of municipal waste from owners of inhabited real estate properties, with the possibility of extending this system to other real properties where municipal waste is generated in exchange for a fee paid by property owners. So at present, municipal waste management is a part of actions performed by the municipalities, and entrepreneurs are obliged to participate in tenders for the collection and management of municipal waste. The obligations of municipalities in terms of collection and management of municipal waste consist of:

- Covering inhabited real properties and, optionally, other real properties with the municipal system,
- Adopting appropriate acts of local law,
- Managing resources from the fees charged to property owners,
- Introducing selective collection of waste,
- Ensuring the functioning of the municipal waste selective collection centre (MWSCC),
- Achieving levels of recycling, preparing for reuse and recovery of certain fractions of municipal waste, and reducing the weight of biodegradable municipal waste to be landfilled,
- Ensuring the functioning of the regional installation for municipal waste treatment (RIMWT),
- Carrying out information and education measures in the field of proper handling of municipal waste,
- Supervising municipal waste management, inter alia, by controlling a stream of municipal waste generated in the municipality and operators collecting municipal waste,
- Carrying out an annual analysis of the state of municipal waste management in order to verify the technical and organizational possibilities of the municipality as regards municipal waste management.

To improve the waste collection and management system in Poland and to comply with EU regulations and harmonize the municipal waste segregation system throughout the country, in 2019, new rules on waste segregation were introduced in Poland. The changes not only involved more waste fractions (now five in comparison to previously three) for more thorough segregation but also a completely new bio-waste fraction, which includes kitchen waste but without animal-origin waste, fat or bones.

The system was introduced step by step, and a substantial part of the previously used containers was re-labelled. In the new system the waste previously held in the red container or the bag for “segregated dry waste” will be divided into two fractions:

**The five-container waste collection system:**

- paper – the blue label (clean paper and cardboard packaging, newspapers, magazines and leaflets, cardboard, notebooks, office paper),
- metals and plastics – the yellow label (empty packaging, squashed plastic bottles, bottle caps and jar lids, plastic packaging, bags, foil bags, juice and milk cartons (tetra pak), crushed beverage and food cans),
- glass – the green label (empty glass packaging, glass bottles, jars, glass cosmetics packaging, empty glass drug packaging),
- bio – the brown label (vegetable and fruit refuse, egg shells, coffee grounds and tea dregs, withered flowers and plants, food leftover excluding meat, bones and animal fat),
- mixed – the black label (meat and bone residues, wet or dirty paper, used hygienic materials, including disposable nappies, gravel from litter trays for animals, pottery, broken glass and mirrors, textiles); the mixed waste container may only be used for the waste which cannot be placed in any of the mentioned containers for segregated waste or brought to a Selective Municipal Waste Collection Point (PSZOK) and is not hazardous waste.
The Act of December 14, 2012 on waste has already been amended many times. The amendments were related to the changes introduced to other acts in the field of geological and mining law, maintenance of cleanliness and order, prevention of sea pollution, rules of the functioning of local government municipalities, access to information on the state and protection of the environment and acts regulating the handling of specific types of waste, i.e. packaging waste, waste electrical and electronic equipment, waste batteries and accumulators or end-of-life vehicles, which also resulted from the need to implement EU regulations in this area. These changes concerned, inter alia, regulations in the field of packaging waste management, landfills, treatment of sewage sludge, classification and transport of hazardous waste, and in the broadest scope - permits for collection and processing of waste, records and reporting introduced by the Act of November 24, 2017.

Acts implementing the Law on waste:

2.1. Regulation on detailed requirements for the storage of waste - Dz.U.2020 poz.1742
2.2. Regulation of 10 June 2020 on the functioning of the Database on products, packaging and waste management - DZ.U. 2020 poz. 1071
2.3. Regulation of 2 January 2020 on the catalogue of waste - DZU. 2020 poz. 10
2.4. Ordinance of 7 October 2016 on the detailed requirements for the transport of waste - OJ. 2016 item 1742
2.5. Ordinance of 10 November 2015 on the list of types of waste that natural persons or organisational units that are not entrepreneurs may recover for their own use, and permissible methods of their recovery - OJ. 2016 item 93
2.6. Ordinance of 11 May 2015 on the recovery of waste outside installations and facilities - OJ. 2015, item 796
2.7. Ordinance of 24 December 2019 on the conditions for recognising waste as having infectious properties and the manner of determining these properties OJ. 2020 item 3
2.8. Regulation of 23 December 2019 on types of waste and quantities of waste for which there is no obligation to keep records of waste - Dz.U. 2019 item 2531
2.9. Ordinance of 29 August 2019 on the video control system of the place of storage or dumping of waste - OJ. 2019 pos. 1755
2.10. Ordinance of 7 February 2019 on the rates of security of claims - Dz.U. 2019 item 256
2.11. Ordinance of 5 October 2017 on the detailed handling of medical waste - OJ. 2017 item 1975
2.12. Regulation of 21 October 2016 on requirements and methods of disposal of medical and veterinary waste - Dz. U. 2016 item 1819
2.13. Ordinance of 24 July 2015 on types of medical waste and veterinary waste whose recovery is permissible - Dz .U. 2015 item 1116

3. Act on maintenance of cleanliness and order in municipalities. Date of original text: 13 September 1996. (05 July 2018)

Municipalities are responsible for maintaining cleanliness and order and creation of conditions necessary for their maintenance, in particular:

1) to provide construction, maintenance and operation on their own or shared with others municipalities: - installations for the treatment of municipal waste;
2) to cover all property owners in the commune in the system municipal waste management;
3) to supervise the management of municipal waste, including the implementation of tasks entrusted to entities collecting municipal waste from owners real estate;
4) to provide selective collection of municipal waste, including at least: paper, metals, plastics, glass, packaging waste multi-material and bio-waste;
5) to create separate municipal waste collection points in a manner allowing easy access for all residents of the commune that ensure acceptance of at least municipal waste: listed in point 5, hazardous waste, expired drugs and chemicals and sharp objects (needles, syringes), used batteries and accumulators, waste electrical and electronic equipment, furniture and other waste large-size, used tires, construction and demolition waste, textile waste and clothes;
6) to perform information and educational activities in the correct municipal waste management, in particular in the field of separate collection of municipal waste;
7) to inform citizen via Municipal’s website about: entities collecting municipal waste from property owners, places managed by entities where municipal waste from property owners is received, separate municipal waste collection points.

Acts implementing the Act:

3.2. Ordinance of 15 December 2017 on levels of reduction of landfill of biodegradable municipal waste mass - OJ. 2017 item 2412
3.3. Ordinance of 11 January 2013 on the detailed requirements for the collection of municipal waste from property owners - Dz. U. 2013, item 122
3.4. Regulation on the determination of the templates of reports on collected municipal waste, collected liquid waste and the implementation of tasks in the field of municipal waste management. Date of text: 26 July 2018

4. Act on the provision of information about the environment and its protection, public participation in environmental protection and environmental impact assessments. Date of original text: 03 October 2008 (last amendment 03 October 2018)

Acts implementing the Act:

4.1. Regulation of 29 July 2020 on the template of the report - OJ. 2020 item 1457
4.2. Regulation of 27 August 2019 on the rate of the recycling fee - OJ. 2019 item 1639
4.3. Ordinance of 3 December 2018 on the minimum annual levels of recovery and recycling for multi-material packaging and for packaging of hazardous substances, below which levels may not be specified in the agreement concluded with the marshal of the voivodship - Dz.U. 2018 item 2310
4.4. Ordinance of 3 December 2018 on the annual recycling levels of packaging waste from households - OJ. 2018 item 2306
4.5. Regulation of 11 September 2018 on templates of DPO and DPR documents - OJ. 2018 item 1809
4.6. Regulation of 21 December 2015 on the annual external audit of entrepreneurs issuing DPO, DPR, EDPO or EDPR documents - Dz.U. 2015 item 2264.

5. Act on the obligations of entrepreneurs with respect to the management of certain waste and on product fee. Date of original text: 11 May 2001

Acts implementing the Act:

5.1. Regulation of 16 February 2015 on documents confirming recovery and recycling separately - OJ. 2015, item 278
5.2. Regulation of 27 October 2014 on annual levels of recovery and recycling of waste generated from

Acts implementing the Act:

2.3.1.1 Legal framework for hazardous waste

7. Law on waste electrical and electronic equipment. Date of original text: 11 September 2015 (29 June 2018)

Acts implementing the Act:
7.1. Regulation of 7 November 2020 on the method and detailed manner of calculating the minimum annual collection rate of waste electrical and electronic equipment - OJ. 2020, item 2035
7.3. Regulation of 25 April 2019 on the template of the certificate confirming recycling and the template of the certificate confirming other than recycling recovery processes and the manner of their transmission - OJ. 2019 item 797
7.4. Regulation of 10 July 2018 amending the Regulation on the scope and model of the annual report on the functioning of the waste equipment management system - Journal of Laws. 2018 item 1361
7.5. Regulation of 14 June 2018 on detailed rates of product fee for groups of equipment - OJ. 2018 item 1194
7.6. Regulation of 21 July 2017 on minimum annual collection rates of waste electrical and electronic equipment - OJ. 2017, item 1499

Law on waste electrical and electronic equipment - Date of original text: 11 September 2015 (29 June 2018)- Uniform text of the Act (16 September 2020 ) - OJ. 2020 pos. 1893

The Act specifies measures to protect the environment and human health by preventing adverse effects for the generation of waste electrical and electronic equipment, and by managing it or by reducing these effects and the overall impacts of resource use and improving their efficiency use.

This Act implements, with regard to its regulation, Directive 2012/19/EU of the European Parliament and of the Council dated July 4, 2012 on waste electronic and electrical equipment (WEEE) (Official Journal of the EU L 197 dated July 24, 2012, page 38, as amended);

According to the Article 2, the Act applies to electronic and electrical equipment and waste equipment. The extensive list of the provisions of the Act does not apply to the types of equipment is given in the Article 2, Item 2.

Targets for collection, re-use, recycling and recovery of WEEE are defined by Directive 2012/19/EC on WEEE, amended by Directive (EU) 2018/849.

According to the Article 7, Item 1, public administration authorities, with regard to their capacity, support the cooperation between the economic operator that places the equipment on the market and entities conducting activities regarding recycling and recovery processes other than recycling as well as undertake actions to promote
the designing and production of equipment to facilitate its reuse, disassembly as well as recovery of waste equipment, its components and materials

In the Chapter 5 on collecting and transporting waste equipment the Law stipulates in Article 34 that it is forbidden to place waste equipment along with other waste, and according to the Article 35, it is forbidden to collect incomplete waste equipment as well as parts coming from waste equipment for an entity that is not: a distributor conducting a retail trade unit with the total area of sales, a treatment plant operator, an entity collecting municipal waste from real estate owners or an entity conducting a centre for selective collection of municipal waste.

Economic operators operating service points are obliged to accept waste electrical and electronic equipment free of charge when the repair of equipment delivered to the service point is impossible for technical reasons or when the equipment’s owner deems it unprofitable to repair the equipment.

According to the Article 41, the distributor as well as the economic operator operating a service point may refuse to accept waste equipment that creates a hazard to the health or life of persons accepting the waste equipment due to its contamination, in that case the owner of waste equipment transfers it to a waste equipment collector or a treatment plant operator.

Treatment of waste equipment is regulated within Chapter 6 of the Law and Article 46 which stipulates that disassembling of waste equipment as well as the preparation of waste equipment or waste left after the disassembly of waste equipment for reuse is conducted only in a treatment plant, also disassembly of waste equipment, recycling and recovery processes other than recycling, except for the preparation for reuse, include at least the removal of liquids and that recovery processes are conducted with the use of the best available techniques.

It is forbidden to dispose of waste equipment, before subjecting it to treatment, described above. Technical requirements for waste treatment are:

Locations where WEEE is stored, before treatment, must have:
1) impermeable bases on an appropriate area along with devices to liquidate leakages and, if necessary, clarifiers and oil separators;
2) roofs preventing the impact of weather factors on relevant areas;
3) a protection preventing the access of third parties.

The treatment plant must have:
1) legalized weighing device to determine the mass of accepted waste equipment as well as the mass of waste from waste equipment,
2) a warehouse for waste from waste equipment prepared for reuse;
3) containers for storing batteries and accumulators, condensers containing PCB as well as other hazardous waste, including radioactive waste;
4) impermeable bases on an appropriate area along with devices to liquidate leakages and, if necessary, clarifiers and oil separators;
5) water treatment devices that are compliant with regulations related to the protection of health and the environment, in particular water regulations;
6) systems enabling the treatment of waste equipment generated from particular groups of equipment processed in a given treatment plant;
7) systems enabling the elimination of substances depleting the ozone layer or fluorinated greenhouse gases with the global warming potential (GWP) above 15, including gases found in foams and cooling circuits.
through their proper recovery and proper cleaning or destruction – in the case of processing cooling devices.

Product fee
Regarding the obligation to achieve the minimum annual level of waste equipment collection, the level of recovery as well as the level of preparation for reuse and recycling of waste equipment, economic operator that places the equipment on the market that did not meet the obligation to achieve the minimum annual level of waste equipment collection, the level of recovery or the level of preparation for reuse and recycling of waste equipment is obliged to pay the product fee, calculated separately for each group of equipment, according to the Article 72.

Obligations of public administration authorities are defined by the Law in Articles 86-90, and are as follows:
The voivodship environmental protection inspector control the treatment plant at least once a year. The voivodship. The environmental protection inspector prepares and transfers collective information on the results of controls conducted in the previous calendar year to the Main Inspector of Environmental Protection until February 15 for the previous calendar year. The Main Inspector for Environmental Protection prepares and transfers an annual report on the functioning of the waste equipment management policy in the previous calendar year to the minister competent for environment until July 30 each year. The minister competent for the environment prepares and transfers to the European Commission a report from the performance of the regulations of the Act containing, in particular, information on:
1) the mass of equipment placed on the market along with the name of the group of equipment;
2) the mass of collected waste equipment;
3) the mass of waste equipment prepared for reuse and subjected to recycling as well as recovery processes other than recycling;
4) the mass of waste from waste equipment exported from the territory of the state.
The report is transferred to the European Commission every 3 years, within 9 months, counting from the end of the three-year period to which it relates.

8. Law on batteries and accumulators. Date of issue of the text: 24 April 2009. Consolidated text of 16 September 2020

Acts implementing the Act:
8.2. Ordinance of 3 December 2009 on the rate of product fee - Dz. U. 2009 No. 215 item 1672
8.3. Regulation of 18 July 2017 on specific requirements for the treatment process of waste lead-acid automotive batteries, waste lead-acid automotive batteries, waste lead-acid industrial batteries or waste lead-acid industrial batteries and installations recycling lead and its compounds or recycling plastics – Journal of Laws 2017 item 1474
8.4. Regulation of 25 April 2019 on the template of the document confirming the collection of the deposit fee and the document confirming the return of the deposit fee - Journal of Laws 2019 item 811
8.5. Regulation of 25 April 2019 on the model of certificate of collected waste portable batteries or waste portable accumulators and records of certificates of collected waste portable batteries or waste portable accumulators - OJ. 2019, item 812
8.6. Ordinance of 25 April 2019 on the model certificate of processed waste batteries or waste accumulators and records of certificates of processed waste batteries or waste accumulators - Dz. U. 2019, Item 813
Poland as an EU Member Country, complies with the sustainable management of the entire lifecycle of these products which is governed by Directive (2006/66/CE) “On waste from batteries and accumulators”, amended by Directive 2013/56/EU and Directive (EU) 2018/849, where the products containing hazardous substances, such as mercury or cadmium, are strictly prohibited to be introduced to the market, and the procedure of separated collection, recycling and their final treatment should be applied according to the sustainable development standards. This waste category is strictly prohibited to be deposited in landfills, or in incinerators.

The main purpose of the Act is reducing the negative impact of batteries and accumulators as well as waste batteries and used batteries to the environment by reducing the amount of substances dangerous in batteries and accumulators and proper collection and recycling of their waste, including by promoting high the level of collection of used portable batteries and spent portable accumulators, and also the Act specifies requirements for batteries and accumulators placed on the market, rules for placing batteries and accumulators on the market, rules for the collection, processing, recycling and disposal of used batteries.

The provisions of the Act apply to all types of batteries and accumulators produced and introduced for marketing, and waste batteries and waste accumulators. Batteries and accumulators placed on the market, including batteries and batteries installed in equipment must not contain more than 0.0005% by weight of mercury and portable batteries and accumulators placed on the market, incl. when fitted to equipment, they must not contain more than 0.002% by weight of cadmium. Batteries and accumulators placed on the market, including sets and button cells, should have proper markings with the symbol of separate collection.

The placing on the market and distribution of batteries is prohibited for batteries that do not meet the above listed requirements.

Regarding the disposal of used batteries and spent accumulators the Act prohibits to put waste batteries and waste accumulators together with other waste in the same container. Waste car batteries and used car batteries and waste industrial batteries should be separately collected by type in order to facilitate their processing with technologies and installations for the processing and recycling of individual types of waste batteries or waste accumulators.

Collecting waste batteries or waste accumulators:
- an entity operating a waste collection point, holding a permit for conducting activities in the field of collecting waste in the form of used waste batteries or spent accumulators,
- a municipal organizational unit operating in the field of collecting municipal waste,
- an entrepreneur entered in the register of regulated activities in the scope of collecting municipal waste from property owners.

Storage of used and used waste batteries or spent batteries in batteries treatment plants, should be equipped with hardened surfaces, impermeable base, resistant to weather conditions or in suitable, non-conductive, resistant containers substances contained in batteries or accumulators and the effects of atmospheric conditions. Waste batteries and spent accumulators intended for processing and recycling can be stored for no more than a year in total for all subsequent holders of this waste.

The entrepreneur placing batteries or accumulators on the market shall be obliged to organize and finance the collection, processing and recycling and disposal of waste batteries and accumulators as well as proper management of waste batteries and used batteries.

According to the Article 33, the person who places portable batteries or accumulators on the market is obliged to achieve collection levels in the amount specified in the regulations provided in the Paragraph 2 of the Article 33 which are:
1) the need to achieve the collection level by 26 September 2012 in the amount of at least 25% and by 26 September 2016 and thereafter years - in the amount of at least 45%;
2) the need to gradually establish a national system of collecting waste batteries portable and spent portable batteries and increasing its efficiency;
3) activities for the competitiveness of the Polish economy and necessity fulfilment of international obligations

According to the Eurostat data, Poland significantly increased its collection rates for portable batteries and accumulators, from 23% (of sales) in 2011 to 81 % in 2018, and was second only to Croatia for that year.

Settlement of the fulfilment of the obligation to provide the required the collection rate referred to in Article 33, occurs at the end of the year calendar. If the entrepreneur introducing portable batteries or portable accumulators did not fulfil the obligation referred to in art. 33, he/she is obliged to pay the product fee.

The end user is obliged to hand over the used batteries portable and spent portable batteries, including portable batteries and portable batteries that can no longer provide an energy source, to collecting waste batteries or spent accumulators or to the place of collection.

The collector of waste batteries or spent accumulators is obliged to handing over the waste batteries or spent accumulators to the operator of the plant treatment of waste batteries or spent accumulators.

Waste battery treatment facilities must be registered and licensed and are responsible for reaching the recycling efficiency targets. A waste or spent batteries treatment plant operator is obliged to process and recycle waste batteries or used batteries and the waste generated from them in a manner that is safe for environment and human health and it is forbidden to process waste batteries and waste accumulators outside a waste batteries or accumulators treatment facility.

The voivodship marshal keeps a separate bank account in order to collect and transfer proceeds from the product fee, additional product fee, fees for public educational campaigns and unclaimed campaigns deposit fee.


End of life vehicles (ELV) is a significant waste stream including large volume of materials that can be recycled. In European Union the system of collecting and treatment of ELV is described in Directive WE 2000/53/EC. In matters relating to the handling of recalled vehicles the provisions shall apply to operation in the scope not regulated in the Act on waste.

The provisions of the Act shall apply to: vehicles manufactured on the territory of the country, vehicles imported in the territory of the country, waste generated by vehicles and do not apply on historic vehicles.

An entrepreneur who is a vehicle manufacturer is obliged to:
1) limiting the use of hazardous substances in vehicles in order to prevent emissions of these substances into the environment and facilitate recycling end-of-life vehicles;
2) taking into account the requirements of disassembly and re-use of items vehicle equipment and parts; and recovery and recycling of end-of-life vehicles out of service;
3) use of recycled materials in the production of vehicles.

Materials, items of equipment and parts of vehicles may not contain lead, mercury, cadmium and hexavalent chromium, except when these substances are necessary to obtain the required technical characteristics of materials, equipment and vehicle parts. These provisions, provided in Articles 6-9 of the Act apply to new vehicles.

The person placing the vehicle on the market is obliged to provide a vehicles collection network covering the territory of the country in such a way that in each voivodeship there are at least three disassembly stations or vehicle
collection points, including at least one dismantling station, located in various localities, providing the vehicle owner with the option of returning the vehicle end-of-life vehicle.

The owner of the end-of-life vehicle should turn it over exclusively to the entrepreneur running the disassembly station or the entrepreneur vehicle collection point.

The entrepreneur operating the disassembly station should provide environmentally and for human health safe way for processing of withdrawn vehicles from exploitation and the waste generated from them.

According to the Article 28, an entrepreneur operating the disassembly station is obliged achieve the level of recovery and recycling of vehicle waste decommissioned in the amount of respectively 95% and 85% annually of the vehicle mass received at its dismantling station. The entrepreneur running a disassembly station, which in a year calendar has not fulfilled the obligation referred to in Article 28, is obliged to calculate and pay the fee for non-achievement. Fee for failure to achieve the required level of recovery and recycling end-of-life vehicle waste shall be calculated as the product of the fee rate and the missing mass of waste necessary to achieve the required level of recovery or recycling of vehicle waste decommissioned.

Regarding the duties of the public administration bodies, the regional director of environmental protection is authorized for issuing a permit for waste collection to the entrepreneur running the collection point vehicles. The details regarding permitting conditions are provided by the Article 39.

According to the EU Environmental Implementation Review 2019 Country Report – POLAND, around one third of all illegally dismantled vehicles in the EU ‘disappear’ in Poland. One of the reasons stated for this large-scale illegal dismantling is that Poland at that time has no penalties for the lack of vehicle registration and that Poland has the oldest fleet of passenger cars in the EU and imports of used cars are increasing which indicates that this policy area calls for attention and stronger enforcement as regards ELV treatment.

10. Act on the management of packaging and packaging waste. Date of original text: 13 June 2013

Packaging presents “products” that are placed on the market, made of any materials, intended for the storage, protection, transport, delivery or presentation of any product, from raw materials to already processed goods.


The Act specifies:
  1) requirements to be met by packaging placed on the market,
  2) principles of the packaging recovery organization,
  3) rules for dealing with packaging and packaging waste,
  4) the rules for determining and collecting the product fee and the recycling fee - to reduce the amount and harmfulness of materials and substances to the environment contained in packaging and packaging waste, as well as the amount and harmfulness for the environment of packaging and packaging waste in the process stage production, marketing, distribution and processing,

The Act also specifies the obligations of users of hazardous substances which are plant protection products.

According to the Article 18, The person who introduces dangerous substances in packages is obliged to organize a collection system and ensure recovery, including recycling, packaging waste from hazardous substances, except that the introductory part it is obliged to organize dangerous substances which are plant protection products a collection
system and provide recovery, including recycling, of packaging waste from hazardous substances which are plant protection products.

Targets for level of recovery and recycling of packaging waste for different fractions is given in Annex 1 of the Act, the total level for all packaging being 56% for recycling and 61 % for recovery. In 2018, Poland achieved 58% of packaging waste recycling.

The minister responsible for climate matters in agreement with the minister responsible for public finance and the minister competent for economy it will determine, by way of an ordinance, detailed product fee rates for individual types of packaging, being guided by the negative impact on the environment of packaging waste resulting from these packaging, at their costs development and taking into account that the product fee should constitute an incentive to recover and recycle packaging waste. The product fee is calculated at the end of the calendar year. The product fee is paid to a separate bank account kept by the voivodship marshal by March 15 of the year following the year calendar to which the fee applies.

11. Act to prohibit the use of products containing asbestos. Date of original text: 19 June 1997 Consolidated text of the Act of 16 September 2020

11.1. Regulation of the Minister of Economy and Labour of October 14, 2005 on the principles of occupational health and safety for the protection and removal of asbestos-containing products and the training programme for the safe use of such products, Journal of Laws 2005 No. 216 item 1824


11.3. Ordinance of the Minister of Economy of 5 August 2010 amending the ordinance on the methods and conditions for safe use and removal of asbestos-containing products, Journal of Laws 2010 no. 162 item. 1089.

Since 1997, it has been prohibited in Poland to manufacture products containing asbestos, to market asbestos and products that contain it, and to import asbestos and products that contain it.

The ministry competent for the economy, in agreement with the ministry competent for internal affairs, the minister competent for affairs inland navigation, the minister competent for transport and the minister competent for climate matters enact legal acts which regulate the methods and conditions safe use and disposal of asbestos-containing products. These regulations include: obligations of the contractor for works related to safe use and removal of asbestos-containing products; the methods and conditions for safe use and disposal of the products containing asbestos, taking into account protection against penetration asbestos to the environment; conditions of preparation for transport and transport of products and waste containing asbestos to the place of their storage, taking into account protection against the penetration of asbestos into the environment; requirements to be met by the labelling of products and waste containing asbestos.

The ministry competent for labour, in agreement with the minister competent for health matters, determine define principles of occupational health and safety in securing and removing asbestos-containing products, training programme in the field of safe use of products containing asbestos - having regard to measures to eliminate or reduce dust emissions asbestos and protection of workers against their effects, and methods of packing and marking of asbestos-containing materials. Local legal acts - Warsaw.

Municipal waste management is one of the municipal’s own tasks, and its obligations in this regard are regulated by the Act of September 13, 1996 on the maintenance of cleanliness and order in communes, amended many times. The result of frequent changes in the act is the constantly expanding the catalogue of tasks of local authorities related mainly to waste management. The most important amendment to the aforementioned act took place in 2011, and
the regulations introduced at that time were commonly called the "waste revolution", because the act shifted the burden of responsibility for what happens with municipal waste from companies collecting it from residents to municipalities, and also completely changed the system of fees for waste management and permits to conduct business in this area. The new system became fully operational on 1 July 2013. Since then, the act has been amended many times. However, the assumptions of the system remained unchanged.

The Act on Maintaining Cleanliness and Order in Municipalities entrusted municipalities with the creation of a municipal waste management system in their area. On this basis, the Municipal Councils pass (create) Resolutions that are the local legal system.

Legal act in force in Warsaw:

1. Resolution No. LXI / 1631/2018 of the Council of the Capital City of Warsaw of February 8, 2018 on the Regulations for maintaining cleanliness and order in the Capital City Warsaw,

2. Resolution No. LXI / 1632/2018 of the Council of the Capital City of Warsaw of February 8, 2018 on the specification of the detailed method and scope of the provision of municipal waste collection services from property owners in the Capital City of Warsaw,

3. Resolution No. XL / 1255/2020 of the Council of the Capital City of Warsaw of November 26, 2020 on amending the resolution amending the resolution on determining the method of calculating the fee for municipal waste management in the case of real estate which is partly real estate inhabited by residents, and part of the property where the residents do not live, but municipal waste is generated - the change is effective from April 1, 2021.

4. Resolution No. XL / 1254/2020 of the Council of the Capital City of Warsaw of November 26, 2020 on amending the resolution amending the resolution on the choice of the method of determining the fee for municipal waste management, determining the rate of such fee, and determining the rate of fee for the container and bag by specified capacity, - the change is effective from April 1, 2021.

5. Resolution No. XXXII / 976/2020 of the Council of the Capital City of of Warsaw of July 2, 2020 amending the resolution on the collection of municipal waste from property owners where residents do not live, and municipal waste is generated. The provisions are valid from August 1, 2020.

6. Resolution No. XXXI / 911/2020 of the Council of the Capital City of Warsaw of June 18, 2020 on determining the upper rates of fees for municipal waste collection services from property owners and emptying septic tanks and transporting liquid waste. The provisions are valid from August 1, 2020.

2.3.2 Strategic framework

NATIONAL STRATEGIC DOCUMENTS

Strategy for Energy Security and Environment - a perspective until 2020 (BEiŚ)

The main task of the BEiŚ Strategy is to integrate the environmental policy with the energy policy wherever these aspects intertwine in a perceptible way, as well as the outlining of the directions in which it should develop the energy industry and identification of priorities in environmental protection.

In the field of waste management, a target has been set to improve the condition of the environment.

This is possible thanks to the following tasks:

- ensuring access to clean water for society and the economy, rational waste management, including their use for energy purposes,
- supporting new and promoting Polish energy and environmental technologies,
- promoting ecological behaviour and creating conditions for the creation of green jobs.

In the field of waste management, including their use for energy purposes, the BEiŚ Strategy introduces activities aimed at ensuring the functioning of the separate collection/collection system municipalities through the intensification of environmental education, aimed at, inter alia, reducing waste generation at the source, both producers and consumers, shaping the right consumption patterns, building infrastructure for selective collection of municipal waste and full implementation of the new economy system municipal waste, in accordance with the Act on maintaining cleanliness and order in municipalities.

**National Waste Management Plan 2022 - NWPP 2022**

The Member States are obliged to develop National Waste Prevention Plans (NWPP). In Poland, NWPP currently in force was adopted in 2016, with the perspective of being implemented up to 2022. This document was developed according to the requirements provided in the Act of 14 December 2012 on waste [44]. The first mentioned waste stream indicated in the framework of the NWMP 2022 is municipal waste (including food waste and other biodegradable waste). Moreover, each voivodship (the highest-level administrative subdivision of Poland; currently, there are 16 voivodships) prepared its regional waste management plan, in which municipal waste is a key issue.

The waste hierarchy introduced in the Directive 2008/98/EC was the starting point for developing the objectives and lines of action in waste management provided in the NWMP 2022.

Within the framework of the NWMP 2022, waste has been divided into municipal waste, including food waste and other biodegradable waste, waste products (waste oils, waste batteries and waste accumulators, WEEE, end-of-life vehicles, end-of-life tyres, packaging and packaging waste), hazardous waste (medical and veterinary waste, PCB-containing waste, asbestos-containing waste, waste repositories), other waste (waste from construction, renovation and dismantling of buildings and road infrastructure, municipal sewage sludge, biodegradable waste other than municipal waste) etc.

The objectives and tasks presented in *The National Waste Management Plan 2022* relate to the years 2016-2022 and prospectively to the period to 2030. The NWMP 2022 established objectives and for that purpose the lines of action have been determined, regarding, environmental education, developing selective waste collection. The objectives identified in the NWMP 2022 are:

- waste prevention;
- reducing the amount of biodegradable municipal waste sent to landfills, so that in 2020 no more than 35% of the weight of this waste were landfilled in relation to the weight of waste generated in 1995;
- seeking to reduce the amount of landfilled waste;
- achieving the required level of recycling and preparing for reuse for paper, metals, plastics and glass from a stream of municipal waste;
- ensuring the achievement of the adequate level of collecting waste equipment, waste batteries and waste accumulators;
- achieving the appropriate level of recovery and recycling of waste products, including packaging waste, end-of-life tyres, waste oils;
- completing the liquidation of waste repositories, containing expired PPP and other hazardous waste;
- increasing the share of waste subject to recovery operations.

Objectives and lines of action are adopted in the NWMP 2022 for all relevant waste streams, some of them are presented in terms of relevance for the Study as follows:

**Waste oils** - In management of waste oils:

- prevention of generation of waste oils;
- aiming at increasing the amount of collected waste oils;
- maintaining the level of recovery of at least 50% and of recycling understood as regeneration of at least 35%;
- in case of lubricants: increasing the level of recycling to at least 35% and of recovery to at least 50% in 2020.

End-of-life tyres - In management of end-of-life tyres:
- maintaining the current level of recovery of at least 75%, and of recycling of at least 15%;
- increasing public awareness, including entrepreneurs, about the proper, i.e. sustainable, use of vehicles, in particular tyres, and lawful methods to handle end-of-life tyres.

Waste batteries and waste accumulators:
- increasing public awareness, including entrepreneurs, about the proper handling of waste batteries and waste accumulators;
- achieving in 2016 and in the next years the level of selective collection of waste portable batteries and waste portable accumulators of at least 45% of the weight of portable batteries and accumulators placed on the market;
- maintaining the level of recycling: waste acid lead batteries and waste acid lead accumulators of at least 65%, waste nickel cadmium batteries and waste nickel cadmium accumulators of at least 75%, other waste batteries and waste accumulators of at least 50% of the weight of waste batteries or waste accumulators.

Waste electrical and electronic equipment:
- increasing public awareness, including entrepreneurs, about the proper handling of WEEE;
- reducing WEEE generation;
- ensuring the achievement of the adequate level of WEEE collection: (levels of collections are provided for time periods in terms of the annual average weight of equipment placed on the market);
- ensuring the achievement of the adequate levels of recovery and recycling of waste equipment (levels of recovery and preparing for re-use and recycling are provided for time periods in terms of the weight of waste equipment);

Packaging and packaging waste:
- ensuring the proper quality of packaging waste collected selectively in households;
- maintaining the levels of recovery and recycling at least at the level specified in annex No 1 to the Act of 13 June 2013 on packaging and packaging waste management;
- achieving and maintaining minimum levels of recovery and recycling in the individual years for multi-material packaging;
- achieving and maintaining minimum levels of recovery and recycling in the individual years for hazardous product packaging, including PPP;
- eliminating the use of unfair practices as regards issuing documents confirming treatment of packaging waste;
- increasing awareness of users and sellers of products containing hazardous substances, including PPP, about the proper handling of packaging for these products.

Asbestos-containing waste - In management of asbestos-containing waste, the objective consisting in achieving the objectives set out in the Programme of Cleaning the Country from Asbestos for 2009-2032 adopted on 15 March 2010 by the Council of Ministers.

According to the provisions of the Act of 14 December 2012 on waste, the National Waste Management Plan 2022 also identifies the waste prevention measures, the annex to the Plan contains a list of the existing waste prevention measures, along with an evaluation of their usefulness.
Asbestos Removal Programme for the years 2009-2032 (POKzA)

The Asbestos Removal Programme implements the conclusions contained in the Report on the Programme implementation in the years 2003-2007 removal of asbestos and asbestos-containing products used on the territory of Poland through the introduction priority legislative tasks, launching financial support for activities carried out by units local government and the improvement of the Programme implementation monitoring system.

The document sets the following targets for asbestos:

- removal and disposal of asbestos-containing products,
- minimization of negative health effects caused by the presence of asbestos in the territory of the country,
- elimination of the harmful effects of asbestos on the environment.

The above-listed goals should be achieved through the following activities:

- legislative tasks,
- educational and information activities including: activities aimed at children and youth, training government and local government administration employees, developing information materials and educational, evaluation and promotion of technologies for the destruction of asbestos fibers in asbestos waste, organization and participation in national and international trainings, seminars, conferences and congresses
- tasks related to the removal of asbestos-containing products, including: removal of products containing asbestos from building structures, cleaning of real estate areas, cleaning of utility facilities public places, areas of former plants producing asbestos-containing products, construction asbestos waste landfills and construction of installations and devices for the destruction of asbestos fibres in asbestos waste, supporting tasks, including financial support for the development of programmes removal of asbestos-containing products and cleaning of asbestos from areas at all levels
- monitoring of the programme implementation in the form of the Electronic System of Spatial Information Monitoring the process of removing asbestos-containing products
- exposure assessment and health protection activities, including the activities of the Research Reference Centre and Health Risk Assessments related to asbestos.

The programme creates, among others the following possibilities:

- storage of asbestos waste in underground landfills,
- implementation of new technologies enabling the destruction of asbestos fibres,
- leaving in the ground - in cases permitted by law - withdrawn asbestos products out of use.

National Strategy for Environmental Education [date/ref]

In the Environmental Education Strategy, the main goals of environmental education have been identified and indicated the possibility of their implementation.

The basic goals, defined in the National Strategy for Environmental Education, are:

- disseminating the idea of eco-development in all spheres of life, including work and leisure human, i.e. permanent environmental education for all inhabitants of the Republic of Poland,
- implementation of environmental education as an interdisciplinary education at all levels of formal education and informal.
MAZOWIECKIE VOIVODSHIP STRATEGIC DOCUMENTS

Development Strategy for the Mazowieckie Voivodeship until 2030

On October 28, 2013, the Sejmik of the Province adopted the Development Strategy for the Mazowieckie Province to 2030, which is an update of the Strategy of 2006. The document contains objectives and directions of activities taking into account changes in external and internal conditions for the development of the region, as well as the determinants of EU and national policy regional. The strategy constitutes the activities undertaken by the voivodeship authorities, and its scope significantly determines the development processes of the region. It is an important document in the production of programming documents and planning at the voivodeship level, as well as the regional operational programme, sector strategies, programmes, plans and activities.

The developed Strategy defines the main goal, which is territorial cohesion, understood as reducing disproportions development in the Mazowieckie Voivodeship and the growing importance of the Warsaw Metropolitan Area in Europe, as a consequence, it will contribute to the improvement of the quality of life of the inhabitants. One of the strategic goals is to ensure the economy of diversified energy supply with sustainable management of environmental resources, which will be implemented through actions, inter alia, towards the recovery and disposal of waste. At the same time, solutions should be implemented to minimize the amount of generated waste. The quantity should be limited to generated waste, and those that are generated, subject to selective collection, recovery, and energy use and disposal. On the other hand, actions are also needed to raise environmental awareness for residents, incl. through cooperation with non-governmental organizations.

Spatial Development Plan for the Mazowieckie Voivodeship 2004

The Spatial Development Plan for the Mazowieckie Voivodeship was adopted by a resolution of the Voivodeship Assembly Mazowiecki No. 65/2004 on June 7, 2004. It is the basic document defining in the system spatial objectives and directions of the region’s development.

The main mission of the Plan is to create conditions conducive to achieving territorial and lasting cohesion and sustainable development of the Mazowieckie Voivodeship, improving the living conditions of its inhabitants and permanently increasing the efficiency of economic processes and the competitiveness of the region.

Waste Management Plan for the Masovian Voivodship 2024


In Waste Management Plan in the Mazowieckie Voivodship 2024, 3 regions of municipal waste management were designated in the voivodship, and 7 communitiees were included in the regions in the Łódzkie and Podlaskie voivodships.

An integral part of the Waste Management Plan are: an investment plan, a waste prevention programme, a programme for the removal of asbestos-containing products and the PGO WM 2024 environmental impact forecast.

The Waste Management Plan for the Masovian Voivodship 2024 identifies regional municipal waste processing installations:

- for the composting of green waste and other municipal bio-waste or mechanical-biological treatment of mixed municipal waste,
- for the storage of sorting residues and mechanical-biological waste treatment,
- for thermal waste treatment.
Waste management plan for the Masovian Voivodship 2024:
- defines the goals and directions of activities in waste management in accordance with overarching documents - national and EU introducing the principles of circular economy,
- sets the general framework for waste prevention in the voivodship,
- indicates the directions and methods of dealing with waste, including hazardous waste,
- determines the investment needs, including the area of hazardous waste management.

The Plan adopted the targets for all relevant waste streams, of which for packaging waste and hazardous waste are provided below:

Waste oils:
- to prevent generation of waste oils;
- striving to increase the mass of collected waste oils; including special emphasis should be placed on the efficiency of collecting and processing the resulting oils waste;
- maintaining the level of recovery at the level of at least 50%, and recycling understood as a regeneration of at least 35%;
- in the case of lubricants: increase in the recycling rate to value at least 35% and recovery to at least 50% in 2020.

Waste batteries and accumulators:
- increasing the awareness of the public and entrepreneurs about the correct handling of waste batteries and spent accumulators;
- achieving in 2016 and in the following years the level of waste batteries collection portable and spent portable batteries in the amount of at least 45% by weight introduced portable batteries and accumulators;
- maintaining the level of recycling efficiency: waste lead-acid batteries and spent lead-acid batteries in the amount of at least 65%, spent nickel-cadmium batteries and spent nickel-cadmium batteries in the amount of at least 75%, other waste batteries and spent accumulators in the amount of at least 50% mass of waste batteries or spent accumulators.

Waste electrical and electronic equipment:
- increasing the awareness of society and entrepreneurs about correct the method of handling WEEE;
- reducing the generation of waste in the form of WEEE;
- ensuring that the appropriate level of WEEE collection is achieved (levels of collections are provided for time periods in terms of the annual average weight of equipment placed on the market);
- ensuring the achievement of appropriate levels of recovery and recycling of waste equipment from 1 January 2018 (levels of recovery and preparing for recovery and recycling are provided in terms of the type of waste equipment and their weight).

End-of-life vehicles:
- achieving minimum annual levels of recovery and recycling based on weight vehicles accepted at the disassembly station per year at least at the level of 95% and 85% respectively;
- limiting irregular practices in the field of vehicle collection and dismantling end-of-life vehicles (increase in the number of end-of-life vehicles sent to legal disassembly stations);
- limiting the number of vehicles brought from abroad directly to the station illegal disassembly.

Waste tyres:
- maintaining the current level of recovery of at least 75%, a recycling of at least 15%;
increasing awareness of the public, including entrepreneurs, about the proper, that is, the sustainable use of vehicles, in particular tyres and allowed the legal provisions on how to handle used tyres;

- increasing the awareness of entrepreneurs running vulcanization plants, and tyre replacement in terms of the waste tires they produce in connection with the conducted activity.

Packaging and packaging waste:

- ensuring the appropriate quality of packaging waste collected selectively in households;
- maintaining the levels of recovery and recycling at least as specified in Annex 1 to the Act of 13 June 2013 on the management of packaging and packaging waste;
- achieving and maintaining at least the levels of recovery and recycling in individual years for multi-material packaging in accordance with the Regulation of the Minister of the Environment of April 16, 2014, on minimum annual recovery and recycling rates for packaging multi-material and for packaging of hazardous substances, in individual years, below which no levels can be set in an agreement concluded with the voivodship marshal (Journal of Laws of 2014, item 618);
- eliminating the use of irregular practices in issuing documents confirming the processing of packaging waste;
- Increasing the awareness of users and sellers of products containing hazardous substances, including PPC, regarding proper conduct with packaging for these products.

Waste containing asbestos:

In the management of asbestos-containing waste, the primary target is disposal of all asbestos-containing products by 2032 at the latest (it results from the adopted by the Council of Ministers on March 15, 2010 of the Asbestos Removal Programme from the Country for the years 2009–2032 and the Programme for the removal of asbestos-containing products from the site Mazowieckie voivodeship constituting Appendix 3 to the Waste Management Plan for the Masovian Voivodship 2024).

The Plan also provides lines of action in the field of waste prevention and shaping the waste management system, and most notably in the field of waste collection and transport to ensure the possibility of separate collection via civic amenity sites (PSZOK) and as appropriate opportunities in a way that is convenient for residents, at least the following factions waste: waste batteries and spent accumulators, WEEE, expired drugs and chemicals, furniture and other bulky waste, waste tires, green waste etc. In addition to ensuring selective collection of municipal waste "at source" and accepting waste at the CAS (PSZOK), it is recommended to ensure the collection of waste through sockets for separately collected packaging waste and mobile collection points.

The Plan provides also a gradual introduction circular economy principles that preserve value of products for as long as possible, use resources efficiently and reduce waste. The Plan includes long-term goals in terms of reducing waste landfilling and intensifying preparations for the reuse and recycling of priority waste streams such as municipal waste, packaging waste and industrial waste. Support for implementation assumptions in the field of municipal waste management is the Investment Plan that is the guarantor of financing of projects. Each municipality from the Mazowieckie voivodeship will be able to apply for co-financing of the construction of a separate waste collection point communal facilities equipped with the necessary infrastructure and a repair point, point for acceptance of non-waste used items. In the Investment Plan all notified expansion projects were also taken into account and most notably the modernization of the existing CAS (PSZOK).

The Environmental Protection Programme of the Mazowieckie Voivodeship for 2011–2014, taking into account the perspective to 2018

By Resolution No. 104/12 on April 13, 2012, the Sejmik of the Mazowieckie Voivodeship adopted the "Protection programme of the environment of the Mazowieckie Voivodeship for 2011-2014, taking into account the perspective until 2018". It has been prepared in accordance with the current legal regulations in the field of environmental
protection on the basis of provisions of the Environmental Protection Law. The overriding goal of the Programme is to define an environmental policy for Mazowieckie Voivodeship, as well as the implementation of the State Environmental Policy. The programme is consistent with the indications "Development Strategy of the Mazowieckie Voivodeship until 2020", that is, with an overarching document specifying both objectives and directions of activities in the field of the ecological policy of the voivodeship.

The main objectives of the Programme are:

- reduction of environmental pollution,
- sustainable use of materials,
- development of pro-ecological forms of activity in the economy,
- creating a system of protected areas,
- improvement of ecological safety,
- increasing the level of ecological knowledge.

Waste management has been adopted as the priority in the field of ecological policy for the Mazowieckie Voivodeship and the protection of natural resources, mainly biodiversity.

In January 2020, the new system of waste registration, the Waste Database (Polish—Baza Danych o Odadach—BDO) was introduced in Poland, which is a register of entities introducing products, packaged products, and waste management. The register is kept in electronic form. According to the authors of legislative changes, it serves to help control waste management, prevent illegal waste disposal, enable electronic fulfilment of registration, and reporting obligations. It should be emphasized that the Waste Database is an obligatory tool of waste evidence for companies that generate non-municipal waste.

Warsaw 2030 Strategy (#Warszawa2030 STRATEGIA)

The Warsaw’s Development Strategy, similarly to the strategies of other communes in Poland, is not a document required by law. However, a great majority of local governments prepared these documents, in order to facilitate a better realization of the development potential of the city as well to neutralize its weaknesses, among others:

- a strategy defines municipality’s objectives and the ways of achieving them, meaning that the local government authorities, city officials, as well as social and business organizations cooperating with the City are made aware what their primary focus should be. It is also a starting point for the preparation of various programmes and/or plans that state what kind of activities, tasks and projects will be implemented;
- a strategy ensures that funds and other resources of the city are used primarily for implementing the most important solutions, which increases the effectiveness of the undertaken activities;
- as early as at the stage of the strategy formulation, it facilitates cooperation with external entities which influences the shape of the city. In consequence, it is easier to meet the strategy’s requirements and ensure the stability of city policies.

The Warsaw’s Development Strategy presents a vision of the city’s development planned for realization in the upcoming years. It is a very important document in helping the local authorities to make crucial decisions. The previous strategies were adopted by the Warsaw City Council in 1998, and 2005. The difference that this strategy update provides is a large scale inclusion of the residents and other stakeholders. At each stage, the opinions of residents and other stakeholders is taken as a starting point for further work, which is significantly different to the past practice when residents and stakeholders were only able to give their opinion on the already introduced solutions. This provides everyone with an opportunity to take part in the decision making process concerning the directions of Warsaw’s future development.

The two-year process of developing the strategy involved residents, entrepreneurs, NGOs, business support institutions, representatives of the City's authorities from various political fractions, the City Office specialists, experts and other entities interested in Warsaw’s development. This process was conducted in the following stages:
- determining a vision of Warsaw in 2030, i.e. the condition of the City post-Strategy implementation;
- identifying, through diagnostic analyses, the challenges faced by the City and the potential that facilitates the vision;
- setting strategic and operational objectives, the implementation of which would result in achieving the envisioned condition, i.e. defining the expected outcomes;
- defining the strategy implementation, monitoring, and evaluation methods which ensure both fast and efficient realization of the City’s development policy;
- drafting the Strategy document based on previously developed elements;
- submitting the draft version of the Strategy for social consultations and ex ante evaluation by external experts, and introducing the necessary changes;
- making formal arrangements regarding the draft of the Warsaw City Council’s resolution on the adoption of the strategy, and introducing the necessary changes to that document.

The vision of Warsaw is presented in 2030 from three different perspectives - Active residents, Friendly space and Open Metropolis.

The following Strategic objectives were defined: Responsible community, Convenient locality, Functional space and Creative environment. For each strategic objective Operational objectives are also defined. Within operational objective 3.2. We live in a clean, natural environment the field of waste management is recognized and it is stated that it will be made more efficient, in line with the concept of circular economy.
2.4 Albanian national legislation and strategic documents

2.4.1 Legal framework

Since June 2014, the Republic of Albania is an EU candidate country. Albania is striving to carry out effective reforms on environment protection and integrated waste management in line with EU recommendations due to an inconsistency between institutions and the reality of environment and waste management in the country. Waste is one of the most important, technically and financially challenging subchapter of Chapter 27 “Environment and Climate Change”. The last 4 subsequent EC Progress Reports have pointed out that a modest progress has been made by the country with regard to the integrated waste management. The following laws and bylaws are the most important acts that influence integrated waste management in the country:

- Law No. 10463, dated 22 September 2011 “On Integrated Waste Management”, as amended by the Law No 32/2013, the Law No. 156/2013 (and by the Law No. 92/2016, still pending approval);
- Law No 8216/1997 “On the control of trans-boundary movements of hazardous waste and their disposal”;
- Law No. 139/2015 “On Local Self-Government”, as amended by the Law no. 38/2019;
- Law No. 119/2014 “On the Territorial-Administrative Division of the Local Government Units in Albania;
- Law No. 78/2017 “On Finances of Local Self-Government”, as amended;
- Law No. 125/2013 “On Concessions and Private Public Partnership”;
- Law No. 10440/2011 “On environmental impact assessment”;
- Law No. 10448 14 July 2011 “On Environmental Permitting”;
- Law No. 7/2017 “On the promotion of use of renewable energy resources”;
- Law No. 9643 dated 20 November 2006 “On Public Procurement”;
- DCM No. 177, dated 06 March 2012 “On packaging and its waste”;
- DCM No. 178, dated 06 March 2012 “On waste incineration”;
- DCM No. 452, dated 11 July 2012 “On waste landfills”;

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• DCM No. 705, dated 10 October 2012 “On end-of-life vehicles’ waste management”;
• DCM No. 765, dated 07 November 2012 “On the adoption of rules of separate collection and treatment of used oils”;
• Order No. 893/2013 “On approving the model register for operators that generate, collect, and recycle used oils”;
• DCM No. 866, dated 4 December 2012 “On batteries, accumulators and their waste”;
• DCM No. 957, dated 19 December 2012 “On waste from electric and electronic devices”;
• DCM No. 117, dated 13 February 2013 “On criteria to define when some types of scrap metal cease to be waste”;  
• DCM No. 798, dated 29 September 2010 “On the adoption of the regulation ‘on the administration of hospital waste’;  
• DCM No. 229, dated 23 April 2014 “On the adoption of rules regarding transferring non-hazardous waste and information to be included in the transfer document”;  
• DCM No. 371 dated 11 June 2014 “On the adoption of rules regarding delivery of hazardous waste and their delivery document”;  
• DCM No. 418, dated 25 June 2014 “On separate collection of waste at source”;  
• DCM No. 608, dated 17 September 2014 “On setting measures necessary for collection and treatment of biowaste and criteria and deadlines for their reduction”;  
• DCM No. 641, dated 01 October 2014 “On the adoption of rules regarding non-hazardous waste and inert waste export and transit”;  
• DCM No. 127, dated 11 February 2015 “On requirements to use sewage sludge in agriculture”;  
• DCM No. 387, dated 06.05.2015 “On rules regarding the controlled disposal of PCBs/PCT/s, decontamination or disposal of equipment containing PCB/PCT and/or disposal of used PCB/ PCT waste”;  
• DCM No. 575, dated 24 June 2015 “On the adoption of requirements regarding inert waste management’;  
• DCM No. 687, dated 29 July 2015 “On the adoption of rules for keeping, updating and publishing waste statistics”;
• DCM No. 652, dated 14 September 2016 “On rules and criteria regarding management of waste from used tyres’;
• DCM No. 232, dated 26 April 2018 “On some amendments and additions to DCM No. 177, dated 06 March 2012 “On packaging and its waste”;  
• DCM No. 319, dated 31 May 2018 “On the adoption of measures for integrated waste management costs”;  
• DCM No. 504, dated 13 September 2017 “On Defining the Scope of State Responsibility of the Ministry of Infrastructure and Energy”;
• DCM No. 431, dated 11 July 2018 “On the Organization and Functioning of the National Agency for Water,
Wastewater and Waste Infrastructure”;

- DCM No. 509, dated 13 September 2017 “On the define of the Role and Responsibilities of the Ministry of Tourism and Environment;
- DCM No. 1104, dated 28 December 2015, “On the approval of the requirements for preventing the discharge of waste generated by ships and surpluses from cargoes at sea”;
- Regulation No. 1/2007 “On Treatment of Construction and Demolition Waste from Creation and Transportation to Disposal”;
- Guideline No. 6/2007 “On Approval of Rules, Content and Deadlines for Drafting of Plans for Solid Waste Administration”;
- DCM No. 428 dated 8 June 2016 “On establishing the state database for the digital map of the urban waste sites”;
- Order No. 1957, dated 6 November 2014 “On approving the model of authorization for the export of solid waste and the model of authorization for the transit of non-dangerous solid waste;
- DCM No. 94, dated 14 February 2018 amending and supplementing DCM N. 641 dated 1.10.2014 on the rules of procedure for the export of solid waste and transit of non-dangerous solid waste;
- DCM No. 290, dated 11 March 2020 “On the creation of the state database of the integrated planning system information system (IPSIS) to ensure compliance with the IPSIS System”.

The table below shows the alignment of a few of the laws in the waste management sector with the EU directives. It is a positive sign that the legislation on waste management is developing towards full compliance with EU waste management policy. However, legal changes do not ensure compliance in terms of practice and more demanding legislation results in a more difficult process of implementation. A clear transition strategy from current practice to the standards required by law is lacking.

<table>
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<tr>
<th>EU acquis</th>
<th>Albania</th>
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DCM No. 765/2012 “On the adoption of rules of separate collection and treatment of used oils”

DCM No. 705/2012 “On end-of-life vehicles’ waste management”

Further Obligations Deriving from International Treaties and Conventions

Albania is a member of several international treaties and conventions relevant to environmental protection and waste management; such as Aarhus Convention (rectified on 26 October 2000), Basel Convention (rectified with the Law No 8216/1997 “On the control of trans-boundary movements of hazardous waste and their disposal”), Minamata Convention on Mercury ratified on 26 May 2020; Stockholm Convention ratified on 4 October 2004 and the Paris Agreement of United Nations Framework Convention on Climate Change (rectified on 22 April 2016). These Conventions have been fully ratified by the Republic of Albania and legally and technically adapted to the countries context. The main pillars of the conventions are access to environmental information and decision-making, environmental justice, control of transboundary movements of hazardous waste and reducing greenhouse gas emission. Regarding waste classification, the Albanian Catalogue for Classification of Waste has been approved with DCM No. 99, dated 18.2.2005 and as amended with the DCM No. 579, dated 3.9.2014, according to the European Catalogue of Waste and the Basel Convention, with the purpose to reduce the number and type of waste that enters the Albanian border. Albanian Catalogue is however limited as compared to the Basel catalogue. Limitations have been introduce to somehow reduce the number and type of waste that could enter the Albanian marked or even for the purpose of trans-boundary movement of waste.

Law No. 10431, dated 9.6.2011 “On environmental protection”

This law provides the legal basis and framework for implementation of a large number of EU environmental directives that are relevant to the protection of the environment from human activities, including energy production.

It aims at the protection of the environment at a high level, its preservation and improvement, prevention and reduction of risks to human life and health, ensuring and improving quality of life, for the benefit of present and future generations, as well as providing conditions for development stable of the country. Protecting the environment from pollution and damage is a national priority and is mandatory for every resident of the Republic of Albania, for all state bodies, as well as for natural persons and legal entities, domestic and foreign, exercising their activity in the territory of the Republic of Albania.


The main principles of environmental protection are covered like the principle of prevention and taking precautionary measures, the principle of integrated approach, the "polluter pays" principle, the principle of the right to information and public participation, etc.

Integrated waste management aims to prevent or reduce waste and their harmful impacts on the environment, as well as the efficient use of natural resources, with aimed at protecting the environment, resources, human health, and improving the quality of life. Waste management measures are determined by a special law as provided herin below.
Law No. 10463/2011 “On Integrated Waste Management” as amended by the Law No. 32/2013, the Law No. 156/2013, (and by the Law No. 92/2016 which pending approval)


This Law aims to ensure the protection of environment and human health against pollution and damage resulting from solid waste. To this end, it sets out rules governing the environmental treatment of solid waste at every stage: creation, collection, separation, transportation, recycling, processing and disposal. The Law further aims at waste reduction and the reduction of the hazardous and dangerous impact of waste. The most important components set out in the Law No. 10463/2011 are the following:

- **Waste management hierarchy**

Law no. 10463 defines the priority hierarchy of waste management: prevention, reuse, recycling, recovery and final treatment. The law assumes that in Albania already exist a sound and efficient collection system, therefore implementation of hierarchy is suggested for implementation. However, the waste collection system is not effective, neither it covers most of the country, therefore waste collection is the most important priority along with implementation of the hierarchy.

- **Type of waste**

Waste is divided into hazardous and non-hazardous waste.

- **Integrated waste management planning**

National Plan for Integrated Waste Management stands at the top of the planning hierarchy of the sector. As stated in the article 11 of this law, the National Plan are developed through the ministries at the central level, therefore leaving municipalities and the regional council almost outside of discussion process.

With its concept of “expanded responsibilities”, the Law attaches the responsibility for the integrated waste management on the producer of waste, to a licensed natural or legal person (Article 16). This formulation does not provide a clear role for the municipalities, even though their role is stipulated exclusively in Law No. 139/2015, but not necessarily in the Law “On Integrated Waste Management”. Despite the fact that the municipality is not necessarily the waste producer, according to item 12 of article 21 of the Law No. 10463/2011, the mayor is personally and fully duty-bound for the management (plans, actions, execution) and administration (decision, objectives, targets).

- **Separate collection of municipal solid waste at source**

As defined in Article 18, item 3, of the Law No. 10463/2011 local government units (municipalities) are responsible for setting in place a full and effective separate collection of waste at source by December 31, 2018, on at least four streams/packaging waste - paper/cardboard, metals, plastics and glass. Collection, disposal and treatment of other waste are regulated by regulations other than those designated to municipalities.

- **Reuse and recycling of waste**

Implementation of article 18 has triggered the design and approval of several bylaws, which have set up intermediary deadlines and recovery and recycling targets based on the overall objectives as set forth in the Strategy and the National Plan. On the one side, most of the deadlines and intermediate targets have not been met, on the other
side, none of the decision or any other law ensure financial aid to support the establishment of the Integrated Network of Treatment Facilities without which achievement of these deadlines and targets is not possible.

- **Waste treatment**

Recovery and disposal of municipal waste, regulated in article 22 of the Law No. 10463, is carried out through the Integrated Network of Treatment Facilities (INTF), which is created based on “Best Available Techniques (BAT)”; however, the Law fails to detail the meaning of INTF and BAT. The laws define that in all cases, the initiative, allocation of funding and permitting for construction and operation of landfills and incinerators is a competence of the ministry responsible for the environment and the ministry responsible for public works, thereby excluding any direct responsibility either of regional councils or municipalities. The Law dedicates two chapters (Chapter VII and VIII) to waste treatment through landfills and incineration. The law does not provide any responsibilities for the municipalities regarding waste treatment, which means that these responsibilities are left only with the natural or legal persons licensed according to Law No. 10448/2011 “On environmental permits”.

- **Extended Producer Responsibility**

Extended producer responsibility ensures that ‘producers’ which are manufacturers or importers that place a selection of products on the Albanian market, are responsible for financing and organising the end-of-life management of their products that originate from private households. The financing of the management of end-of-life products that originate from industry, may be organised differently, subject to an agreement between the “producers” of packaged products and their industrial clients. Priority is given to establishing separate collection, at source, of products and materials that pose higher risk to the environment and/or for which there is a processing market for purposes of recycling or energy recovery. Whereas the municipalities must continue to finance the provision of services for the collection, pre-treatment and disposal of biowaste and residual waste, producers need to cover the costs of introducing separate collection and management systems for packaging waste and other specific waste streams, including household hazardous waste, that are subjected to extended producer responsibility (EPR). The purpose of separate collection, for example through take-back systems in cooperation with distributors, is to maximise reuse, repair, refurbishment and recycling, in line with the waste hierarchy, complying with specified collection and recovery targets. Waste that can be recycled is regarded as a secondary raw material, and part of the fraction can be used to recover energy. The purpose of local facilities for sorting and processing the recovered materials is to provide locally sourced secondary raw materials for production factories.

- **Licensing**

Licensing of legal and physical persons that carry out operational activities on the waste treatment of any category is a competence of the ministry responsible for the environment, delegated to the subordinated Nation Environment Agency (NEA), in accordance with the law on environmental permits and the law that regulates the activity of the National Business Centre.

- **Data keeping and reporting**

Based on article 55 of the Law No. 10463, the responsibility for collecting, keeping and reporting data on waste is vested to municipalities and, at the same time, municipalities and regional councils report annually to the responsible ministry on the performance of the implementation of respective waste management plans. At the national level, statistics are collected, maintained and reported from NEA. The role and the responsibilities of municipalities on waste data recording are specified in DCM No. 687/2015 “On implementation of the rules for keeping, updating and publishing waste statistics”, which became effective from 1st January 2019. Data recording and reporting is done simultaneously by Ministry of European Integration (MEI) and Institute of Statistics (INSTAT). The method of data collection, processing and reporting from INSTAT is carried out based on EUROSTAT’s applied methodology. These data are increasingly becoming a reference point for presenting the state of environment and especially that of waste management. Data recording and reporting is perceived as one of the major problems across
the spectrum of waste operations. One of the main reasons is the fact that the data are merely estimates and they are in no case a product of measurements or weights, so their accuracy is doubtful.

- **Sanctions and penalties**

   Article 62 of the Law No. 10463 sets out a long list of sanctions to any legal breach or illegal act concerning integrated waste management. In particular, item 11 of this article specifies that the mayor is directly responsible and is fined a specified amount unless all necessary conditions and standards to ensure integrated waste management have become effective.

- **Cost Calculation and fee setting**

   Municipalities are responsible for cost calculate and for tariff setting for the delivery of waste management services. These institutions exercise this authority based on the right provided for by Law No. 139/2015 “On Local-Self-Government”, as well as by Law No. 78/2017 “On Finances of Local Self-Government”. Unified methodology for local government to calculate service costs was not established in the time when this Law has been adopted. It is established by DCM No. 319 of 31.05.2018 “On the adoption of measures for integrated waste management costs”. Municipalities set and collect waste tariffs to ensure that the waste service costs are covered and investments can be made to improve service provision over time. Tariffs should cover as a minimum O&M costs for waste collection, transfer, pre-treatment and sanitary landfill, including asset depreciation and financing costs, within affordability constraints. In order to cover service costs, municipalities established different tariff categories, considering the customer profile and/or the level of service provided in different service areas.

- **Waste ownership**

   Law No 10463/2011 does not determine the ownership on municipal solid waste. Article 2 of this law specifies that “all waste”, according to definitions as in this law, once disposed of, are property of the state.

Chapter V (articles 23-27) of this Law refers to integrated **hazardous waste management, including used oils**. Collection, transport, storage and treatment of hazardous waste are performed only in conditions that ensure the protection of the environment and human health, in accordance with the Law. These conditions include measures that ensure the traceability of waste from generation to final destination, as well as the control of hazardous waste. These provisions do not apply to mixed waste generated by the household sector itself.

Hazardous waste, when is delivered from one natural or legal person to another, is accompanied by a submission document, which includes the following information: data on submitter, carrier and recipient; waste description (waste code and quantities), details on chemical and biological of hazardous waste and their concentration.

Integrated management of specific waste streams as biowaste, packaging and their waste, batteries and accumulators, end-of-life vehicles, WEEE, C&D waste, hospital waste, waste from used tyres, etc., is defined by articles 28-41 of Chapter VI. Waste landfills classification (including landfills for hazardous waste), construction and operation, waste acceptance at landfills, are defined in articles 43-46 of Chapter VII. Chapter VIII refers to waste incineration (article 47). Council of Ministers approve the rules for integrated management of hazardous waste including used oils, specific waste streams, waste landfills and waste incinerators.

From this Law derives bylaws which regulate used oils, batteries and accumulators, end-of-life vehicle, WEEE, hospital waste, waste tires, etc.

The Law No. 156/2013 amends articles 22, 48 and 62, and repeals article 49 of Law No 10463 of 2011. According to the new amendments, the import of hazardous and non-hazardous waste in Albania is prohibited under all circumstances, which is not in line with international legislation. Fines of All 1,500,000 to 2,000,000 are issued in cases of infringements.
The Law No. 32/2013 amending and supplementing Law No. 10463/2011 amends and supplements articles 56, 62, and 63 of the Law No 10463 of 2011, in relation to the tasks and authorities of the Inspectorate responsible for the environment protection with regard to the inspection of installations, issuance of fines, and measures taken in case of infringements.

The Law No. 92/2016 amended Article 48/1, paragraph 1 of Law No 10463/2011, providing the right to import non-hazardous solid waste, included in the Green List (established by DCM No 825/2008, and abolished by the Law No. 156/2013), for purposes of usage as raw materials, in the recycling industry and other industries, not excluding waste incineration activities. At the same time, the government issued several permits for incineration activities. The enactment of this act was followed by considerable reaction of the public, based on which the President, did not approve the Degree for its entering into force. The argument of the government to the public opinion, for such a shift, was that these new legal changes did not permit entrance of waste but of primary products necessary for the recycling industry. Secondly it was explained that the country was now ready to administer and control the import process through its administrative procedures and facilities. This Law still pending approval. This action first required the approval of the Green list, containing the list of waste permitted to be imported, abolished in 2013 together with DCM No 825/2008.


This Law on Environmental Permitting establishes rules for permitting the operation of certain groups of polluting activities, measures designed to prevent or, where that is not practicable, to reduce emissions from such activities, including measures concerning energy source. The Law aims at preventing, reducing and controlling the pollution caused by several activities in order to reach a high level of protection for the environment, human health and life quality. The Law includes the following Chapters: General Provisions, A type Environment Permits, B Type Environment Permits, C type Environment Permits, General Provisions for Environment Permits, and Transitory and Final Provisions. There are also provisions on A, B, and C environmental permits.

Law No. 44/2013 amends article 29 of law No. 10448 of 2011 concerning the complimentary penalties issued in cases of infringements. Such penalties, in addition to the monetary ones, are decided upon by the responsible State Inspectorate based on the proposal of the National Environmental Agency or the inspectors of the pertinent State Inspectorate.


The Law regulates management of cleaning, waste collection and treatment and defines ownership of state over the waste after their disposal. Contrary to this fact, private service operators have full rights on waste management service delivery in Albania. In the majority of the cases, MSW management in Albania is realized through management contracts with private operators, pursuant to Law No. 8094/1996, which are selected, based on a competitive bases, in compliance with the procedures of the Law No 9643 dated 20.11.2006 “On Public Procurement”. Law No. 8094/1996 “On Public Waste Disposal” provides the legal basis for the municipalities to outsource this service to third parties by virtue of management contracts, which may last up to 5 years.

According to the Law No 8094/1996 “On Public Waste Disposal” waste in public containers is public property. . Apart from this fact, this Law runs contrary to many provisions of Law No. 10463/2011 and, for this reason, it should be abrogated in order for the sector to be fully administered in the framework of the Law No 10463/2011 “On integrated waste management “ and for the municipalities to take full advantage from the implementation of Article 33 of Law No. 139/2015 “On Local Self-Governance”.

Law No 139/2015 “On Local Self-Government” as amended by the Law No. 38/2019
Described in earlier part of the report.

Law No. 115/2014 “On the Territorial-Administrative Division of the Local Government Units in Albania”
The integrated waste management sector is particularly affected by Law No. 139/2015 “On Local Self-Governance”, as amended, as well as Law No. 119/2014 “On the Territorial-Administrative Division of the Local Government Units in Albania”.

Law No 139/2015 conveys the full authority of establishing an integrated waste management to the local governments. Meanwhile, Law No. 119/2014 reduced the number of the Local Governance Units (LGUs) from 373 units to only 61 municipalities. Law No. 139/2015 has re-emphasized the full authority of local government on integrated waste management issues, stipulating, inter alia, that:

- Collection, transportation, storage and treatment of municipal solid waste are a Municipal function (Article 23, paragraph 10);
- Municipalities may use every instrument allowing them to ensure sustainable management, which combines quality, quantity and the cost affordable by them (Article 32, paragraph 1);
- Tariff setting to cover service costs (Article 9, paragraph C/b);
- Establishment of a standard of the same or higher level than the national level (Article 22, paragraphs 2 and 3), while the Government shall subsidize them when the national standard is not financially affordable by the municipalities.

Cooperation among municipalities to create joint solution for the waste management of their region is stipulated in Chapter V of the Law No. 139/2015.

Law No. 107/2014 “On Territorial Development Planning” 13
The Law (Article 3 and 11) specifies that the facilities for the treatment of municipal solid waste are classified as public infrastructure facilities.

The law (article 5) defines three main levels of planning:

1. National level:
   a. Council of Ministers,
   b. Territory Planning Council,
   c. Line ministry responsible for territorial planning and development.

2. Region council (Qark) level:
   a. Region Council (Qark).

3. Municipal (local) level:
   a. Municipal Council;
   b. Mayor.

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Among other things, the Law (Article 10) has given the Council of Ministers and the National Territorial Council the authority to draft and adopt the national development plan instruments, as well as the zone and sector-based development plans.

The sector-based plans at the regional level (Article 19) include planning regarding the determination of the place and the programmes for the development of the “public infrastructure”, inter alia even for the waste treatment plants in general and for the integrated waste management treatment in particular. At the same time (Article 20), this responsibility has been given to the municipalities too. However, the ministries may undertake the initiative to propose and develop plans on sectors when they are judged as having a national or strategic interest.

At municipal level responsibilities are divided among the Municipal Council and the Mayor, where the Mayor has the authority to take the initiative for the development of the local general plan. Basically, municipalities and ministries of line take the initiative to develop plans at their respective levels; however, eventually these plans are approved only by the Municipal Council and National Territorial Council, respectively.

According to this Law, it seems that the adoption of a plan for the development and construction of a waste treatment plant may be considered of national and strategic interest, as it may be considered as a facility of regional, cross-municipal interest, or of interest for a single municipality, as well.

**Law No. 7/2017 “On the promotion of use of renewable energy resources”**

The Law No. 7/2017 “On the promotion of use of renewable energy resources”, was passed by Parliament in 2017. This law, among other things, aims at reducing the import of fossil combustible matters, emission of greenhouse gasses and environment protection. The law supports production of energy from biomass, defined as the biodegradable part of biological remains and waste including, municipal waste. The law encourages the construction and operation of energy production facilities with a capacity of up to 2 MW from renewable resources through the instruments of “feed in tariff”.

**DCM No 99, dated 18.02.2005 “On Approval of the Albanian Catalog of Waste Classification”**


**DCM No. 319, dated 31.05.2018 “On the adoption of measures for integrated waste management costs”**

The Ministry of Tourism and Environment drafted and adopted the DCM no. 319, dated 31 May 2018 “On the adoption of measures for integrated waste management costs” with the support of the Swiss Decentralisation and Local Development Programme (DLDP). This act regulates and standardises the costs and fees calculation in order to fulfil the “Polluter Pays” principle.

The application of this document is binding for municipalities and has started in 2018. This normative act and the respective manual provide an easy to use, but advanced tool for the full cost and fee calculation for all municipalities in the country. The cost’s complete cycle provides full budgeting of the service from waste generation to its treatment, therefore also improving the service quality, whereas the fee provides a full cover of the cost as a main
principle of public services. Simple environmental and financial principles are provided and improved through the implementation of this model.

Intensive trainings are provided for municipalities and planned to continue until its use is acquired and optimized by all Local Self-Government Units.

The provision of a functional system requires further improvement of local databases regarding civil registry, properties, businesses, institutions, addresses, etc. Data integration will therefore ensure that the cost and fee model is fully operational and that citizens will be billed transparently, fulfilling the “Polluter Pays” principle.

**DCM No 418, dated 25.06.2014 “On separate collection of waste at source”**

Pursuant to Chapter IV of DCM 418 For the separate collection of waste streams:

1. Municipalities of 1st category, in accordance with determination of article 3 of Law No. 10119, dated 23.4.2009 "On territorial planning", as amended, should assign from the 31st of December 2016, the appropriate measures for the separate collection of waste, at least for: a) Paper; b) Metal; c) Plastic; and d) Glass;

2. Local government units, other than those defined under point 1, should assign these measures, from 31st of December 2018.

3. Local government units, from 31st of December 2020, should, for preparation, reuse and recycling of solid waste, including paper, metal, plastics and glass, reach the target, at least 50% of the total weight of waste generated in the year 2014.

According to Chapter V Objectives for reuse and waste recycling: Specific objectives to be achieved by local government units for reuse and waste recycling by weight, should be, as most below follows:

a) Paper / cardboard (60%);
b) Metal (50%);
c) Plastics (22.5%);
č) Glass (60%).

The legal framework for waste collection with separation at source is in force, but it is not enforced at all, as none of the municipalities in the country (despite initiatives being undertaken) collects waste by separating them first at source. However, 80 private companies operate in the country, collecting and processing different types of waste, such as: scrap of metals, paper, plastic, textiles, used tyres, etc. 26 of them treat and recycle plastic waste.

The above targets and deadlines were not met by the municipalities. Deadlines and targets provided for each measure have not been respected. There is a lack of funding for every measure, target, responsibility, or objective stipulated in this decision. For this reason, this decision should be reviewed, and updated in relation to the new deadlines and targets or objectives harmonized with Directive 94/62/EC “On packaging and packaging waste”, amended by Directive (EU) 2018/852. DCM should also be revised in a way that allows for consideration of costs related to infrastructure required to achieving these objectives.

**DCM No 608, dated 17.09.2014, “On setting the measures necessary for collection and treatment of bio waste, and criteria and deadlines for their reduction”**

According to Paragraph 4 of this decision separate collection of biowaste from local government units:

a) will be established for municipalities in the district centre in 2017,
b) will be established for other municipalities in 2018,
c) the total weight of biowaste going to landfill will be reduced to 50 % of the 2014 amount no later than 2021 (7 years after the date of the decision),

d) the total weight of biowaste going to landfill will be reduced to 35 % of the 2014 amount by 2026 (12 years after the date of the decision).

The above targets and deadlines were not met by the municipalities. Deadlines and targets provided for each measure have not been respected. There is a lack of funding for every measure, target, responsibility, or objective stipulated in this decision. For this reason, this decision should be reviewed, and updated in relation to the new deadlines and targets or objectives harmonized with Waste Framework Directive 2008/98/EC, amended by Directive (EU) 2018/851. DCM should also be revised in a way that allows for consideration of costs related to infrastructure required to achieving these objectives.


The decision aims at:

a. to prevent waste from generating packaging;

b. promote the separated collection, reuse, recycling and recovery of packaging waste, reducing the amount that is eventually disposed of;

c. establish rules for the production of packaging and its waste, management them at all stages, as well as to determine the entities responsible for their management.

Manufacturers of packaging materials and packaging use the best techniques available, as defined for them in Law no. 10448, dated 14.7.2011 "On environmental permits". These technologies contribute to:

a. reducing the amount of waste obtained from packaging;

b. prevention and reduction of packaging materials harmful to the environment;

c. the use of packaging by reusing, processing, and recycling it.

While DCM No. 177/2012 “On Packaging and Packaging Waste”, obliges producers of packaging to establish a reimbursement system that promotes the collection of packaging waste, the Law No. 8977, dated 12.12.2002 "On the tax system in the Republic of Albania" introduced a tax on plastic containers for liquids, such as bottles and cans, for both local produced products and imported products, e.g. soft drinks, water, milk, by-products, oil and detergents.

According to Chapter X of DCM No. 177/2012, any manufacturer of packaged goods or packaging that operates in the territory of the Republic of Albania will recover and recycle minimally the quantities of packaging and packaging waste, within time limits, defined as follows:

a) No later than June 30, 2017:

i) recovers or incinerates in waste incinerators with energy recovery 50-65% of waste from packaging generated in the territory of the Republic of Albania;
ii) recycles 25-45% by total weight of the materials contained in the packaging waste and at least 15% by weight for each material separately;

b) No later than December 31, 2019:

i) recovers or incinerates in waste incinerators with energy recovery 60% of packaging waste;

ii) recycles 55-80% by weight of the packaging;

iii) recycles, according to the type of packaging waste material:

- 60% of glass;
- 60% of paper and cardboard;
- 50% of the metal;
- 22.5% of plastic, counting only what is recycled back into plastic;
- 15% of wood.

The objectives set out in this chapter are mandatory to be achieved even at the level of each local government unit. However, the above requirements are not in line with the Directive (EU) 2018/852. Incineration of packaging waste is forbidden; only reuse and recycling is allowed. Deadlines for targets are obsolete. Targets as well. This decision should be harmonized with the Directive (EU) 2018/852, dated 30.05.2018.

The above targets and deadlines were not met by the municipalities. Deadlines and targets provided for each measure have not been respected. There is a lack of funding for every measure, target, responsibility, or objective stipulated in this decision. For this reason, this decision should be reviewed, and updated in relation to the new deadlines and targets or objectives harmonized with Directive 94/62/EC “On packaging and packaging waste”, amended by Directive (EU) 2018/852. DCM should also be revised in a way that allows for consideration of costs related to infrastructure required to achieving these objectives.

**Conclusion:** A thorough revision of the legal waste management framework is required, with focus on improving Law 10463 of 2011, “On the integrated waste management”, but also revising by-laws related to specific waste streams, and adopting new acts that will more define the roles and the responsibilities of the municipalities and waste generators. The purpose will be, along with its approximation with the EU regulatory framework, to adapt the required legal instruments to the country’s specific conditions and establish new time and quantity-related targets to attain strategic goals. Also, import restrictions of non-hazardous waste according to international laws, have to be adopted. Extended responsibilities of producers for the management of waste resulting from their products and conditions for their fulfilment have to be more accurately defined.

Several DCMs have been issued in implementation of the Law No. 10463/2011 “On Integrated Waste Management (IWM)”. These include DCM No. 608, of 17 September 2014 “On the Necessary Measures for Bio-Waste Collection and Treatment and Criteria and Timeframes for its Reduction”; DCM No. 418/2014 “On Separate Collection of Waste at Source”, DCM No. 177 /2012 “On Packaging and Their Waste”; or DCM No. 452/2012 “On Waste Landfills”.

These acts treat special aspects of the implementation of the Law No. 10463/2011 “On IWM”, they provide for responsibilities, stipulate objectives and the time limits for their fulfilment. But, they share a common feature: it is not possible for them to be implemented and there is a lack of funding for every act, responsibility, or objective stipulated in them.

On the other hand, regarding the objectives, the deadlines provided for in these acts have, in lots of cases, not been respected. For this reason, they should be reviewed, and updated in relation to the deadlines and the indicators or objectives they establish. Some of them are not even consistent with the Law No. 10463/2011 “On IWM”, therefore
it is necessity to redistribute the responsibilities and particularly to calculate the bill and funding resources for the actions contained in them.

The main problem with the waste management sector in Albania is the lack of a sound institutional and technical management plan, low level of implementation of law ans by-laws, such as waste collection according to legal targets, waste hierarchy, planning at regional and local level, separation at source and recycling of waste at the level of targets as set by the Strategy and by-law issued to ensure implementation of the law, setting up a useful database and an effective reporting and monitoring system. In terms of gaps and discrepancies between central and local government authorities, there is overlapping allocation of roles and responsibilities of various groups of interest and stakeholders, the waste collection system is not yet effective, it does not cover most of the territory and population of country, and neither ensures a safe final destination for waste treatment.

Law no. 8094, date 21.3.1996, “On the public waste disposal” needs to be abolished because it becomes an obstacle for municipalities to comprehend and implement integrated waste management principles.

While the Law on local self-government has defined “collection, disposal and treatment of municipal waste” as an own function, according to Law on integrated waste management, the municipality is responsible only to differentiated collection of four major waste streams, whereas responsibility for collection, disposal and treatment of bio waste, although is a typical household waste, is shared as a responsibility between the ministry, NEA and municipalities. With regard reuse and recycling, in one side, none of the deadline and targets for relevant objectives have been meet, while on the other side none of the decision or any other law have ensured for central government financial aid to support establishment of the Integrated Network of Treatment Facilities without which achievement of objectives would not be possible. Therefore, without ensuring a safe final destination for waste treatment, municipalities would not be capable to ensure integrated waste management. Licensing of activities to any kind of activity relevant to waste management is all central government responsibility. Municipalities still have not been subject of licensing as defined in the law on environmental permits nevertheless that they are legal person, and many of them carry out waste collection, disposal and treatment, as a direct task either with municipal departments or through municipal companies.

The most important revisions of the law and the bylaws are related to the following:

- Clear responsibilities for expanding coverage and ensuring waste collection to maximal extend possible;
- Clearly state that implementation of waste hierarchy should be an obligation which is not bypassed or overcame in one or any of the hierarchical steps of solid waste management;
- Revise timing targets and norms relevant to separation at source, reduction and recycling of waste.
- Ensure substantial resources to address key disposal and treatment infrastructure needs beyond those already scheduled for construction of incinerators.
- Clearly define the role and responsibility of various groups of interest and stakeholders.

2.4.1.1 Legal framework for hazardous waste

The Law No 10431/2011 “On environment protection” and the sector Law No. 10463/2011 “On integrated waste management” provide generic rules that regulate administration of hazardous waste. Hazardous waste should not be mixed with other categories of non-hazardous waste, or with other categories of hazardous waste. Generators of all categories of hazardous waste are responsible for their management from the production, collection, transportation and storing phase, together with other actors forming part of the waste management chain, such as the waste transporters, or the ones who treat the waste. They should label their hazardous waste according to the international and Community standards.
As required in the legal framework in force, all natural or legal persons who collect, transport and store hazardous waste should be provided with environmental permits provided for in Category III of Law No. 10081, of 23 February 2009 “On Licenses, Authorizations and Permits in the Republic of Albania”, which define the health and safety rules for the transport of hazardous waste.

Based on the standard for keeping the data on the hazardous waste amount, nature and origin and its final destination, at the moment there are two decisions in force, namely DCM No. 229, of 23 April 2014 “On the Adoption of Rules for Transferring Non-hazardous Waste and the Information that must be Included in the Transfer Document” and DCM No. 371 of 11 June 2014 “On Adoption of Rules on the Delivery of Hazardous Waste and on the Documents Accompanying their Delivery”.

Albania does not have even the basic and complementary infrastructure for management, treatment and disposal of hazardous waste. Sites for the construction of facilities for hazardous waste management, or reception centres, have not yet been defined in any region or city/town of the country. So far, no landfill for hazardous waste has been built in Albania. Also, Albania has no data on the amounts and movements of hazardous waste. Without these data proper management of hazardous waste cannot be established.

**DCM No. 178, dated 06.03.2012 “On waste incineration”**

The purpose of this decision is to set out detailed requirements for waste incineration and co-incineration, with the aim of preventing or limiting as much as possible the negative effects on the environment and the risks that result, for human health, from the pollution of caused by discharges from these processes into the air, soil, surface water and groundwater.

According to Chapter IV General conditions to be fulfilled to permit application: Notwithstanding the provisions of the Law on Environmental Permits, an application for an environmental permit to operate an incineration or co-incineration plant must include a description of the measures which guarantee that:

a) the plant is designed, equipped and will be operated in such a way that the requirements of this decision take into account the categories of waste that will be incinerate;

b) the heat generated during the incineration and co-incineration process will be recovered as much as possible, e.g., through the heat and power of the combined, generating steam from the process or providing heat to dwellings in that area;

c) waste will be minimized in quantity and hazard and, where possible, will be recycled;

d) the plant is designed, constructed, equipped and will operate in such a way as to prevent air emissions which cause a significant increase in the basic level of air pollution, in particular the exhaust gases will be discharged, in a controlled manner and in accordance with the relevant legislation on air quality, through a chimney, the height of which is calculated in such a way as to preserve human health and the environment;

According to Chapter V Conditions for environmental permit: The Environmental permit should also include the following information and requirements:

a) Clearly list the categories of waste that can be treated. The list must use, at least, the waste categories defined in the Albanian Catalog of Waste, as defined in DCM No. 99, dated 18.2.2005 “On the approval of the catalog for waste classification”, and to contain information on the amount of waste, where appropriate;

b) Include the total capacity of the waste incineration or co-incineration plant;
c) Specify the sampling and measurement procedures used to meet the obligations imposed for periodic measurements of air pollutants; and water.

The environmental permit issued for the operation of an incineration or co-incineration plant which uses hazardous waste, must also include the following information and requirements:

a) List the quantities of different categories of hazardous waste that can be treated;

b) To specify the maximum and minimum mass flow of those hazardous waste, their maximum and minimum calorific values, as well as the maximum content of contaminants in them, e.g., of PCBs, PCPs, chlorine, fluorine, sulphur, heavy metals.

According to Chapter VI General operating conditions: Incineration plants must be operated in order to achieve such incineration level that the total organic carbon (TOC) content of ash and slag that remain at the end is less than 3% or that their loss during ignition is less than 5% of the dry weight of the material.

According to Chapter XVI Monitoring and reporting: Control and monitoring of discharge to air, water and soil is also defined. The National Environmental Inspectorate must carry out, at least, twice a year inspections of incineration and co-incineration plants, in accordance with the Law No 10448/2011 “On environmental permits” and the Law No 10431/2011 “On environmental protection”.

This decision should be reviewed, and updated in relation to the Industrial Emissions Directive (IED) No. 2010/75/EU (IPPC Directive) in aim to provide more strict operation conditions for incinerators which will result in reducing discharge of pollutants into air, soil and water, causing healthy protection of the environment and public health. Temperature of incineration of non-hazardous and hazardous waste has to be higher than 1,600°C. Incineraors and filters for cleaning of exhaust gas have to be of Best Available Technology.


This decision applies to the waste from used tires of road vehicles, aircraft and other similar products, after the life cycle. The owner of used tires delivers the used tires free of charge to the collector and / or to the warehouse and / or to the used tire handler. In case of replacement of used tires with new tires at service points, the owner of used tires submits them to the service center. The collector of used tire waste submits them to the used tire handler by completing the waste transfer document, in accordance with the legislation in force for the transfer of non-hazardous waste. Used tire storage areas must be open with a concrete surface, surrounded by a perimeter wall at least 2 (two) m high, and equipped with a system for fire protection. Treatment of used tires and their waste includes operations, as follows:

a) Clothing for retransmission, for the purpose of their original use;

b) Recycling of non-tradable tires, through their grinding and use of granules as raw material for the tire manufacturing industry;

c) Recovery of unusable tires in order to obtain energy;

ç) The use of tires used as additional fuel for certain industrial activities.

Management of used tires is carried out by natural or legal persons, who has to poses Category III.1 licence according to Annex of Law no. 10081, dated 23.2.2009, "On licenses, authorizations and permits in the Republic of Albania", 76
and licence of subcategory III.2.B, according DCM No. 538, dated 26.5.2009, "On licenses and permits treated by / or through the National Licensing Center (NLC) and some other joint bylaws", as amended.

Waste from used tyres end up: (i) in municipal dumpsites becoming a comfortable habitat for rodents; (ii) being thrown to any uncontrolled places; (iii) burned in open environments causing fire and emitting dangerous emissions into the air (iv) or burned in lime/cement plants, emitting also dangerous emissions into the air. Because of this improper waste tires treatment, dangerous for environment and public health, used tire have special attention, the same as hazardous waste, nevertheless that used tires are classified as non-hazardous waste according to the EU List of waste, Commission Decision 2014/955/EU.

This decision has to be revised because the used tires should be fully recycled in rubber products implemented in the following areas: construction, traffic, sports and recreation, households, agriculture, etc. Recovery and incineration of used tires should be restricted. Also, DCM should be revised in a way that allows for consideration of costs related to infrastructure required to achieving the targets.


Used oils are classified as hazardous waste and are treated in compliance with Law No. 10463/2011, “On Integrated Waste Management” and particularly Article 27 of this Law. This waste category includes: used oils from motorized vehicles; used gearbox oils (greases); used mineral lubricating oils; used turbine oils; used hydraulic oils, waste and oily sludge from deposits, mixtures of oil with water and emulsions.

The Waste Directive (2008/98/EC), amended by Directive (EU) 2018/851 with regards to used oils, stipulates clearly that these oils, if technically possible, should be collected separately, possibly separated according to the different oil characteristics, and their treatment should follow the principle of waste hierarchy, where the prevention is a first priority, followed by the other processes.

Based on the framework Law No. 10463/2011 “On integrated waste management”, the Albanian Government adopted DCM No. 765, of 07 November 2012 “On Adoption of Rules for Separate Collection and Treatment of Used Oils”, with a focus on the lubricant, liquid or half liquid oils with a mineral or synthetic basis, which have become invaluable for the use they have been produced for. This decision determines the procedures related to prevention, preparation for regeneration, recovery and the controlled disposal of all used motor and industrial oils as well as the rules for defining extended manufacturer responsibilities.

As a hazardous category of waste, their spilling is strictly prohibited on surface, underground, territorial, maritime waters, in the drainage systems as well as in the sewerage system; depositing/spilling in the ground or on the waste produced through their processing, their processing if discharged in the air are above permitted norms; the spilling, throwing, abandoning, burying or mixing them with other waste and their transport or treatment by unauthorized operators.

The data received from SEFWI (State Environmental, Forestry and Water Inspectorate)\(^\text{14}\), report that there are 364 companies operating in the country for producing oils of diesel and oils generated from bituminous minerals, licensed by the NEA.

There are about 15 companies in the country having a license to operate in the field of collection, transport, preservation, treatment, recycling and processing of used oils, used lubricant oils and waste from hydrocarbons.

Based on INSTAT (Institute of Statistic) data on vehicles’ typology, as well as on some assumptions regarding consumption of oil from each category of means of transport, it turns out that 1.5 to 3.9 million litres of oil (2018)

\(^{14}\) Integrated Waste Management Strategic Policy Document and National Plan 2020-2035
can potentially be produced at the domestic level. The actual amount of oil collected is only 7 - 18% of the total amount of used oil.

DCM No 765/2012 gives advantage of processing used oils through regeneration based on use of BAT for regeneration of used oils. This decision also supports the recovery of used oils, in cases where regeneration is impossible, and development of appropriate policies for the disposal of used oils, in cases where the regeneration process or recovery is impossible.

Used oils have to be stored in separate containers and delivered to the entity that is equipped with license III.2.B, for the transport, recovery and / or disposal of used oils. Used oils are destroyed only after passing through the operations of:

a) processing, through regeneration in used oils regeneration plants, respecting the norms of environment. The base oils obtained through regeneration do not constitute hazardous or toxic waste and do not contain PCBs / PCTs in concentrations exceeding 50 ppm (parts per million);

b) controlled energy recovery, which has to do with the use of used oils after regeneration, as a subject spicy:

i) in used oils incineration plants, in order to obtain heat, with an installed capacity of 3 MW or more, respecting environmental norms;

ii) in used oils incineration plants, in order to obtain heat, with installed power below 3 MW, respecting DCM No. 435, dated 12.9.2002 "On the approval of norms of air emissions in the Republic of Albania "and is checked case by case;

c) safe disposal of used oils, not mixing them with PCBs / PCTs or other waste hazardous or toxic, during their controlled collection and discharge.

Used oils are not used for incineration when they constitute hazardous or toxic waste and when contain PCBs / PCTs in concentrations greater than 50 ppm.

The households are obliged to dispose used oil in a way applicable for separate collection; Oil producer is responsible to collect and transport such used oil.

Oil producers, before launching oils on the market for the first time on a professional basis, are provided with environmental permits category III.1 handled through the National Licensing Center (NLC), as well as based on Law No. 10448, dated 14.7.2011 "On environmental permits", and are registered in the register of oil producers established by the Agency for this purpose and provided with a registration number.

Persons, natural and legal, who transport and manage used oils, are provided with environmental permit of category III.1 and with license of subcategory III.2.B, provided in chapter III of DCM No. 538, dated 26.5.2009 "On licenses and permits treated by or through the NLC and some other joint bylaws", amended.

The producer of oils, for the products he puts on the market after December 31, 2014 finances, at least, safe collection, treatment, recovery and disposal of used oils.

This decision is fully aligned with the EU legislation. However, DCM should be revised in a way that allows for consideration of costs related to infrastructure required to achieving the targets.


Waste from batteries and accumulators is all waste generated by the degradation of all the types of batteries and accumulators, regardless of their form, volume or weight.

In the EU Member Countries, the sustainable management of the entire lifecycle of these products is governed by Directive (2006/66/CE) “On waste from batteries and accumulators”, amended by Directive 2013/56/EU and
Directive (EU) 2018/849, where the products containing hazardous substances, such as mercury or cadmium, are strictly prohibited to be introduced to the market, and the procedure of separated collection, recycling and their final treatment should be applied according to the sustainable development standards. This waste category is strictly prohibited to be deposited in landfills, or in incinerators.

In the course of the process of approximation of the environmental legislation to the EU Acquis, in 2012, the Albanian Government adopted DCM No. 866, of 04 December 2012 “On Batteries, Accumulators and Their Waste”. The purpose and the subject matter are in compliance with the ones of Directive 2006/66/EC. Hence, regarding the recycling norms of this waste category, no later than 2015, Albania should have recycled 25% of the average weight of batteries and accumulators and within the period to 2025, this rate shall amount to 65% of their average weight. Amount of batteries and accumulators presented in Albania is cca 3000 tonnes in 2018, as stipulated in Integrated Waste Management Strategic Policy Document and National Plan, 2020-2035. Even though not all the municipalities have reported at NEA regarding the amount of waste from batteries and accumulators, the reported amount of waste of batteries and accumulators in the market is estimated at making up for 16 % of the total of waste.

Manufacturers of all types of batteries and accumulators before launching on the market for the first time, are provided with environmental permits of category III.1, according DCM No. 538 dated 26.5.2009 “On licenses and permits processed by or through the NLC and some other joint bylaws”, amended, and are registered in the register of batteries and accumulators manufacturers. Operators engaged in management of all types waste batteries and accumulators are provided with a license of subcategory III.2.B and a environmental permit category III.1, according to the same DCM.

Placing on the market is prohibited for:

a) batteries or accumulators, installed in devices or not containing mercury more than 0.0005% of their weight;

b) portable batteries or accumulators, including those installed in devices containing cadmium more than 0.002% of their weight.

Manufacturers and / or distributors, who are provided with the license of the subcategory III.2.B, take the necessary measures to put into operation the collection schemes of waste batteries and portable batteries, through which:

a) enable end users to dispose of waste battery and portable batteries at close collection points easily accessible by them, e.g. points of sale of portable batteries and accumulators, taking into account population density;

b) inform the end users about the possibility of returning the battery waste and portable batteries at their points of sale;

c) take back from the points of sale the waste of portable batteries and accumulators;

ç) do not impose any fees to be paid by end users nor do force them to buy new batteries or accumulators at the moment they hand over the battery waste nd portable batteries.

Waste batteries and accumulators containing cadmium, mercury or lead are allowed to be disposed of in landfills for hazardous waste or in underground permanent storage, only if:

a) there is no final market for them;

b) there is a legal or sub-legal act that has adopted a national strategy for the prohibition of use of heavy metals, which based on a detailed evaluation study of environmental, economic and social impact, shows that disposal is a preferable choice vs recycling.

This decision has to be harmonized with the Directive (EU) 2018/849 (regarding targets) which amended Directive 2006/66/EC (amended by Directive 2013/56/EU). Also, DCM should be revised in a way that allows for consideration of costs related to infrastructure required to achieving the targets.
DCM No 957 dated 19.12.2012 “On waste from electrical and electronic equipment-WEEE” Waste from electric and electronic equipment (WEEE) means all the waste created by the degradation of the electronic and electric equipment. WEEE is composed of old household equipment (such as TV sets, video recorders, refrigerators, etc. as well as computers, mobile phones, tape-recorders, etc.). Most of the WEEE are hazardous due to their hazardous components. Cost of recovery of materials from WEEE is high.

Targets for collection, re-use, recycling and recovery of WEEE are defined by Directive 2012/19/EC on WEEE, amended by Directive (EU) 2018/849 (provided in Table 2, Chapter 2.1).

In 2012, the Albanian Government adopted its DCM No. 957 of 19 December 2012 “On Waste from Electric and Electronic Equipment”, which transposes Directive 2002/96/EC “On WEEE”, (repealed by Directive 2012/19/EC). The decision determines the 4 main actors in the lifecycle of the WEEE, as well as their duties from the manufacturing phase up to the treatment of the waste and its reporting:

i) The producers of the EEE should be equipped with a Category III Environment Permit, according to the legislation in force (DCM No. 538 dated 26.5.2009 “On licenses and permits processed by or through the NLC and some other joint bylaws”, amended) and should label their products. They, along with the distributors, who are also equipped with Category III Environment Permit, make the annual calculations of the amount of EEE produced and collected by the collection scheme they shall establish, and then they report this information to the respective Local Government Units (LGUs) for each calendar year; Manufacturers of EEE are obliged to take back WEEE coming from households and to establish a number of collection points.

ii) LGUs are responsible to ensure a high level of separate collection of WEEEs. The LGUs have the obligation to report to NEA about the subsequent year regarding the WEEE within April;

iii) The General Directorate of Customs registers the imports and exports of the EEE and the exports of the WEEE and report to NEA no later than March;

iv) NEA administers the register of the companies that produce and collect EEE and makes the final calculations regarding the recycled percentage of the products from the EEE.

For WEEE there are currently no registered companies dealing with the collection, transportation or treatment or recycling. This type of waste ends up in unregulated urban dumpsites.

Manufacturers may refuse to take back WEEEs, which:

i) due to pollution pose a risk to the health and safety of personnel;

ii) lack key parts;

iii) contain waste other than that of WEEEs.

d) WEEEs that refuse to be taken back are subject to management rules of hazardous waste according to law no. 10463, dated 22.9.2011 “On integrated management of waste”.

Collection, transportation and storage of properly collected WEEEs are performed by entities equipped with license of subcategory III.2.B. WEEEs which cannot be reused in their full form, shall be collected and transported to treatment sites / plants equipped with the license of subcategory III.2.B.

Manufacturers create individual or collective systems for treatment, recycling and recovery of WEEEs. The treatment of WEEEs is performed inside or outside the territory of the Republic of Albania. Manufacturers or third parties performing the handling, recycling and recovery, are provided with environmental permits of category III.1 and licenses of subcategory III.2.B of field III, according to DCM No. 538, dated 26.5.2009 “On licenses and permits processed by / or through the NLC and some other joint bylaws”.

Technical requirements for waste treatment are as follows:
1. Places where WEEE is stored (including temporary storage), before treatment, must have:
   − where necessary, associated impermeable surfaces/floors, with equipment for catching and collecting accidental discharges/drips with decanting equipment, cleaning – lubricating;
   − where necessary, coverings / ceilings to be protected from weather conditions.

2. Places where WEEE is treated must have:
   − scales to measure the weight of treated waste,
   − where necessary, impermeable surfaces / floors and coverings / ceilings to be protected from water that are also associated with capture devices and the collection of accidental discharges / drips and, where appropriate, also with decanting equipment, cleaning - lubricating,
   − suitable place for storage of disassembled spare parts,
   − containers suitable for storage of batteries, capacitors that contain PCB- / PCT and other hazardous waste, e.g. residues radioactive,
   − water treatment equipment in accordance with legislation on health and environment protection.

Targets established in this Decision are in line with the targets from EU Directive, 2002/96/EC “On WEEE”, which meanwhile became obsolete and repealed by Directive 2012/19/EC, amended by Directive (EU) 2018/849. Because of that, this decision has to be harmonized with the Directive (EU) 2018/849 (regarding targets) which amended Directive 2012/19/EC. Also, DCM should be revised in a way that allows for consideration of costs related to infrastructure required to achieving the targets.

### 2.4.2 Strategic documents and plans

Law No. 10463/2011 “On integrated waste management“ regulates integrated waste management planning which includes national, regional and local waste management plans.

#### National Integrated Waste Management Plan

National Plan for Integrated Waste Management stands at the top of the planning hierarchy of the sector. As stated in the article 11 of law 10463, the National Plan are developed through the ministries at the central level, therefore leaving municipalities and the regional council almost outside of discussion process. The Ministry responsible for environmental protection drafts the National Integrated Waste Management Plan, in accordance with objectives and principles of environmental protection, defined in Law No. 10431, dated 9.6.2011 “On environmental protection”, and in accordance with other requirements of Law No 10463/2011 “On Integrated Waste Management”.

The National Integrated Waste Management Plan should contain: analysis of the current situation of integrated waste management; analysis of measures to be taken to improve preparation for reuse, recycling, waste recovery and disposal without affecting the environment, guidelines on specific waste streams, including waste tyres, batteries and accumulators, waste oils, waste electronics and electronic equipment, action and financing plan that will support the implementation of objectives of the Plan and requirements of the law.

#### Regional and local integrated waste management plans

Each region/county drafts the regional integrated waste management plan for the territory under it jurisdiction, in accordance with the National Integrated Waste Management Plan and the requirements of article 10 of the Law No 10463/2011. Each local government unit or group of local government units drafts the local plan of integrated waste management for the territory under its jurisdiction, in accordance with the national plan and the regional integrated waste management plan and the requirements of article 10 of the Law No 10463/2011.
Regional and local integrated waste management plans are reviewed and updated (if required) at least every six years.

Each local government unit reports annually to the relevant county council on the implementation of local integrated waste management plan, while each county reports annually to the ministry on the implementation of the National Integrated Waste Management Plan and the regional or local integrated waste management plans for the territory under its jurisdiction in the format determined by ministers.

Albania has adopted the National Integrated Waste Management Strategy and Action Plan, 2018-2033, by virtue of DCM No. 175, of 19 January 2011. “The Strategy intends to serve to the waste management sector and to fulfillment of Albania’s conditions for European Union (EU) membership, to continuation of strengthening of economic institutions and regional security, and to Euro-Atlantic cooperation in the fields of security and economy”.

This major aim shall be achieved through the implementation of many priority measures, which are aimed at being implemented in two main phases: (i) the mid-term phase 2018-2022; and (ii) the long-term phase 2022-2033. Implementation of the Strategy shall be based on the implementation of the national legislation, aligned with the European Acquits, in particular with the EU’s Waste Framework Directive.

National IWM Strategy and Action Plan:
- defines the political direction regarding sustainable waste management until 2025,
- is based on governmental commitment to financing waste management – presents the main investment mechanisms in the waste sector,
- ensures separate collection of waste streams,
- encourages the development of businesses and markets for recycling and minimising waste.

Measures related to hazardous waste management are to:
- Establish of a database system on the hazardous waste,
- Implementation of new regulations,
- Development of a National hazardous waste management plan,
- Prepare Master Plans for specific waste streams, including hazardous waste,
- Prepare a Feasibility Study for a Hazardous Waste treatment Centre,
- Develop guidelines, protocols and training programmes for hazardous waste management.
- Ensure that hazardous waste generators manage the hazardous waste in accordance with legal requirement and published guidelines.

In addition to aiming to entirely transform the waste management sector, the Strategy shall serve the Government as an instrument for negotiating Chapter 27 in the context of its membership in the EU.

In the framework of the obligations deriving from the Constitution and the European Union integration process, the Ministry of Tourism and Environment has prepared a Integrated Waste Management Strategic Policy Document and National Plan (2020-2035) approved on 27 May 2020. This document tries to set priorities for the sector for the upcoming 15 years. Establishment of a strategic and regulatory framework in Albania to reduce the amount of waste generated and to ensure an integrated waste management in line with the objectives of the EU Waste Management in line with the objectives of the EU Waste Framework Directive and other international agreements.

National Strategy aims incorporating circular economy principles in the national waste management system. Closing of numerous non-compliant landfills and dumpsites remains a challenge. Separate collection of waste streams and economic instruments to promote recycling and reuse and to prevent waste generation remain limited. The

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The document states that the amount of waste generation is increased in the country in recent years, while the way they are managed has still room for improvement. The construction of new incinerators poses concerns in terms of compliance with the EU waste acquis including the waste hierarchy principle and the recycling targets. The enforcement and policing institutions roles and function should be clarified and strengthened. Implementation of the Strategic Policy Paper will require an essential institutional reorganization, to clarify the structures responsible for drafting and implementing legislation on integrated management of waste, as well as institutional tasks, to achieve the objectives concerning reduction, reuse and recycling.

Strategic goal 4 (SG 4) of Integrated Waste Management strategic policy and national plan: Human resources, awareness-raising and public participation in waste management and its Specific Objective 8 (SO 8): Strengthening of institutional and human capacities of municipalities and central institutions sets the following measures related to hazardous waste management:

- **Citizens are engaged and consulted in the course of drafting of Waste Management Plan**

  The municipalities will hold public hearings in every administrative unit, ensuring a balanced participation between men and women, groups of interest and the affected groups. The plan will offer various solutions whose main goal is to ensure maximum health and environmental protection at a cost that is affordable and acceptable for service recipients.

  Furthermore, municipalities must set up collection centers for hazardous waste generated by households, services and small industries, which must as well be transferred to the hazardous waste reception centers. The waste transfer document that contains the origin, amount and final destination records for each generating entity will consolidate the database of the hazardous waste amount and categories at the national level.

- **Establishment of a database on the hazardous waste (inventorying the waste inherited from existing industries, by industry currently generating hazardous waste)**

  For purposes of planning every hazardous waste management operation, it is critical to have accurate data on the quantity and relevant properties. A first step towards enhancing the system of statistics on hazardous waste is making operational the electronic system of the PRTR (Pollutant Release and Transfer Register), wherein every company shall report on transfer, generation, treatment and export of hazardous waste. Elaboration of standard guidelines on monitoring discharges or the training and assistance at work will offer the grounds for the business companies to meet their obligation to report.

- **Master Plans are prepared for specific waste streams, including hazardous waste.**

  Master Plans are required to establish separate waste management systems for specific waste. These include waste that will be subjected to Extended Producer Responsibility and other specific hazardous waste streams.

  - **Guidelines, protocols and training programmes are developed for hazardous waste management.**

    Guidelines will be prepared for the improved management of hazardous waste. These will include guidelines on categorization and labeling, separation of hazardous and non-hazardous waste at the production stage, establishment of collection centers for hazardous waste generated by households, services and small industries and safe storage standards. Training course for inspectorates in charge of inspecting public and private institutions that generate hazardous waste will be organized periodically. This will include emergency response and safety protocols in case of accidents.

- **Hazardous waste generators ensure management of hazardous waste in accordance with legal requirement and published guidelines and separate hazardous waste from non-hazardous waste.**

  Management systems for other specific streams, such as end-of-life vehicles, waste electric and electronic equipment, waste oils, batteries and accumulators will be implemented under Extended Producer Responsibility.
Waste reception and storage centers must be set up (the integrated hazardous waste collection network) where the large producers of hazardous waste are located. Further, all hazardous waste stored in unsafe conditions must be identified (such as pharmaceutical waste, industrial waste etc.). They must be categorized, repackaged, labelled and shipped to the reception centres. Furthermore, municipalities must set up collection centres for hazardous waste generated by households, services and small industries, which must as well be transferred to the hazardous waste reception centres. The waste transfer document that contains the origin, amount and final destination records for each generating entity will consolidate the database of the hazardous waste amount and categories at the national level.

Despite the fact that the Waste strategy and the law stipulates that the local government units are responsible and obliged to prepare the local integrated waste management plans, Tirana Municipality does not have one. According to the information received from the Cleaning and Waste Management Directorate, there is not any short-term plan to prepare one. Still Tirana Municipality is part of the GCF financed project implemented by EBRD on Climate Smart Cities. With the support of this project, Tirana Municipality is considering in putting forward to the project team, a number of climate friendly waste management projects.

The main policy document that covers this sector in Tirana Municipality is “The Green City Action Plan” (2018) which provides Municipal vision and a concrete set of actions to address the pressing environmental challenges affecting Tirana over the coming years, and to secure investment in priority environmental infrastructure projects. The Green City Action Plan is prepared with the support of EBRD and aims to enable people to enjoy a healthy and high-quality life in a green, resilient and inclusive Tirana that makes smart use of resources. This document puts a lot of emphasis in mobility, green spaces and climate change.

One of the eleventh Strategic Objectives of the Green City Action Plan, under the theme of Resource Management is dedicated to: reducing waste to landfill and increase waste recycling; improving the use of resources by recycling a larger proportion of waste and creating a process for reusing rather than disposing of unused items.

This theme also supports the concept of Circular Economy, whereby items are not produced, used and disposed of, but instead are reused, remanufactured, and their component parts are brought back into the economy as raw materials.

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17 [PowerPoint Presentation (ebrdgreencities.com)](https://ebrdgreencities.com)
3 INSTITUTIONAL SET UP OF ENTITIES RESPONSIBLE FOR HWM

3.1 Institutional framework of Armenia

The Republic of Armenia has a three-tier governance system – central state governance, regional state governance (10 marzes & Yerevan), and local self-governance (communities). It is regulated according to the Constitution of the RA and the RA Law “On Administrative-Territorial Division of the RA” (4 December, 1995), based on which Armenia is divided into 10 marzes (regions/provinces) and capital city of Yerevan, which is treated separately and granted special administrative status (regional and a status of a community), as the country’s capital. The chief executive in each of 10 marzes is the marzpet, appointed by the government of Armenia. In Yerevan, the chief executive is the mayor, appointed by the president.

Regions are divided into urban and rural communities (hamaynkner, singular hamaynk). Each community is self-governing and consists of one or more settlements (bnakavayrer, singular bnakavayr). Settlements are classified as either towns (kaghakner, singular kaghak) or villages (gyugher, singular gyugh). The capital, Yerevan, is divided into twelve semi-autonomous districts. Marzes differ in their territories, population size, number of communities and level of economic development.

There are ca. 1,000 settlements in Armenia, which are unified in 926 communities of which 48 are urban, 865 are rural and 12 are Yerevan district communities. About 68% of the country’s population lives in an urban area, i.e. in one of the 48 cities, and about 32% in a rural area. The largest city is Yerevan with more than 1 million residents, which means about 1/3 of the country’s population lives in the capital.

The analysis of institutional framework related to waste management in Armenia and Yerevan encompass the main actors involved in the sector with their competencies and functions including state governing authorities, territorial administration authorities, and local self-governmental bodies. Hazardous waste-related competencies are highlighted.

The policy development of the sector is led by the RA Government, while the Ministry of Territorial Administration and Infrastructure, the Ministry of Environment, and the Ministry of Health, as well as the regional level territorial administration authorities, participate in waste-related policy development.

The above-mentioned ministries are in charge of developing national programmes and plans and ensure their implementation. The territorial administration authorities and the local self-governmental bodies (LSGBs) carry out the implementation of the policies and national programmes and plans on the regional and local level. The LSGBs are responsible for the provision of municipal waste collection and disposal and sanitary cleaning services in communities. In case of emergencies where hazardous substances are involved (leakage of chemicals, large amounts of poisonous or infectious substances) it is the responsibility of the Ministry of Emergency Situations to oversee and ensure the proper handling of hazardous waste. Otherwise, the hazardous waste (including medical, C/D, industrial, lead batteries, mercury, poultry manure, etc.) is handled by licensed entities.

The current Waste governance institutional framework in Armenia is given in the following tables:
### Table 4 Policy making and inspection in Armenia

<table>
<thead>
<tr>
<th>Responsible body</th>
<th>Sub-Sector</th>
<th>Jurisdiction and obligation</th>
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<tbody>
<tr>
<td>Government of Armenia</td>
<td></td>
<td>Policy, including: ensuring economic mechanism to promote the introduction of low-waste technologies and waste collection and recovery and ensuring the creation of facilities for storing treated and non-recoverable waste</td>
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<tr>
<td>RA Ministry of Environment</td>
<td>Waste and Atmosphere Emission Management Agency</td>
<td>Policy</td>
</tr>
<tr>
<td>RA Ministry of Territorial Administration and Infrastructure</td>
<td>Department of Territorial support programmes and solid waste management</td>
<td>Policy, Waste Management Regulation, Work with local self-government bodies</td>
</tr>
<tr>
<td>RA Ministry of Health</td>
<td>National Center for disease control and prevention</td>
<td>Policy</td>
</tr>
<tr>
<td>RA Environmental and Mining Inspector Body</td>
<td></td>
<td>Inspection, Enforcement, Data Collection, Data reporting</td>
</tr>
<tr>
<td>Health and Labour Inspectorate</td>
<td></td>
<td>Inspection, Enforcement, Data collection, Data reporting</td>
</tr>
<tr>
<td>Territorial government authorities (non-hazardous waste)</td>
<td></td>
<td>Policy</td>
</tr>
</tbody>
</table>

### Table 5 Policy implementation and management data reporting in Armenia

<table>
<thead>
<tr>
<th>Local self-government bodies (non-hazardous waste)</th>
<th>Entities licensed to handle hazardous waste (includes medical, C/D, industrial, lead batteries, mercury, poultry manure, etc)</th>
<th>RA Ministry of Emergency Situations (hazardous waste)</th>
<th>RA Statistical Committee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collect Transport Dispose Landfill Landfill closure Data collection Data reporting Contracting and supervision of above activities</td>
<td>Collect Transport Dispose/treat Temporal storage Landfill Data collection Data reporting</td>
<td>Accidents and disaster response related to waste storage facilities</td>
<td>Reporting on data provided by agencies with some quality assurance</td>
</tr>
</tbody>
</table>
The following section provides an overview of the main actor’s competencies in waste management

Government of Republic of Armenia

According to the RA Law on Waste, the competencies of the RA Government in the area of handling of identified waste are the following:

a) Development of the state policy for the sector and ensuring its implementation;

b) Coordination of the activities of state governing authorities in the sector;

c) Ensuring economic incentives for the introduction of less wasteful technologies, collection of waste and recycling of waste;

d) Providing a procedure for the inventory, generation, disposal (liquidation, neutralization, removal) and recycling of waste;

e) Providing a procedure for the licensing of treatment, neutralization, storage, transportation, and disposal of hazardous waste;

f) Development of a list of banned and hazardous waste;

g) Providing the procedure for transboundary movement and removal of waste;

h) Ensuring the development of facilities for the storage of neutralized and non-recyclable waste.

i) Ensuring international cooperation in the area of waste management.

According to the RA Law on Waste Collection and Sanitary Cleaning, the competencies of the RA Government in the sector of waste collection and sanitary cleaning are the following:

1. The development of a state policy and coordination in the sector of waste collection and sanitary cleaning;

2. Coordination of state governing authorities in the sector of waste collection and sanitary cleaning;

3. Introduction of modern technologies for waste disposal, collection, sorting, transportation, storage, and mechanisms of safe removal.

2018 Decree 1310-A of the RA Prime Minister established a Working Group for the coordination of activities in the sector of household (municipal) solid waste management, disposal, and treatment of waste in the Republic of Armenia. The 22 members of this working group represent different government agencies.

RA Ministry of Territorial Administration and Infrastructure

According to the RA Law on Waste Collection and Sanitary Cleaning, the competencies of the state governing authority in the sector of waste collection and sanitary cleaning are as follows:

1. Participation in the development of the state policy for the sector of waste collection and sanitary cleaning;

2. Development of targeted regional plans in the sector of waste collection and sanitary cleaning;

3. Development and coordination of programmes aiming to improve waste collection services;

4. Development of draft legislation regulating the sector of waste collection and sanitary cleaning;

5. Coordination of the elimination (liquidation) of unsupervised and unlicensed landfills;

6. Engaging in international cooperation in the sector of solid waste management.

According to the Charter of the RA Ministry of Territorial Administration and Infrastructure, the following functions have been defined concerning the sector of waste management:

1. Ensuring the introduction of a waste collection system following international norms;

2. Development of an efficient, coordinated, and common policy of waste collection and sanitary cleaning in the marzes (provinces) of Armenia;

3. Development of proposals for effective mechanisms of waste collection and sanitary cleaning schemes of RA settlements, operation of landfills, and improvement of the contractual field of garbage collection in Armenian communities;
4. Implementation of activities towards the introduction of a system of solid waste\' treatment;
5. Implementation of activities towards the adaptability of Armenian communities to the effects of climate change as well as reducing the impacts of climate change.

In the Ministry of Territorial Administration and Infrastructure there is a Department of Territorial Programmes Support and Waste Management, which is divided into divisions and one of its is Division of Solid Waste Management. This ministry has one head of department, one head of division, five specialists and one deputy minister coordinating the field.

**RA Ministry of the Environment**

The RA Law on Waste defines the competencies of the environmental state governing authority in the sector of waste management:

- a) Taking part in the development of a state policy in the sector of waste management;
- b) Development of targeted programmes in the sector of waste management;
- c) State inventory of waste;
- d) Approving the limits of waste quantities to be disposed of by legal entities and sole proprietors;
- e) **Development of the list of hazardous and prohibited waste**;
- f) Development of a list of waste according to the categories of risks;
- g) Presenting recommendations related to the issuance of permissions for the transboundary movement of hazardous waste;
- h) Providing consent on the sites of facilities for waste disposal;
- i) Approving the waste profiles (passports) developed by entities generating waste;
- j) Establishment of a database on the volumes of waste generation;
- k) Implementation of an environmental impact assessment of complex plans and design documents for the construction, reconstruction and operation of polygons, complex facilities, structures, and other designated areas used during the generation, treatment, recycling, placement, and disposal of waste;
- l) Management of a state waste cadaster;
- m) Sharing information on less wasteful and zero-waste technologies with other government agencies;
- n) Development and management of a register for the generation, treatment and recycling facilities and disposal sites, as well as implementation of monitoring;
- o) Development of draft legislation regulating the waste management sector as well as adoption of normative acts within the frames of its authority;
- p) Signing agreements on international cooperation in the waste management sector and on issues related to transboundary movement of waste;
- q) Sharing information with international organizations and foreign countries on waste management;
- r) Approving the register reports and update forms for facilities generating, treating, and recycling waste;
- s) Approving recording sheets and update forms of the register of waste disposal sites;
- t) Approving model waste passports;
- u) Approving model forms for the calculation of waste generation norms and quantity limits for their disposal;
- v) Approving the list of industrial waste (including mining waste) as well as consumption waste generated in Armenia.

The Charter of the RA Ministry of the Environment defines the following functions in the sector of waste management:

1. Carrying out monitoring of the environment, as well as waste disposal sites;
2. Development and implementation of the Armenian government policy related to the sector of ecologically safe waste management and chemical materials;
3. **Classification of industrial (including mining) and consumption waste generated in Armenia and chemical substances used in the country according to their levels of risks;**

4. Development and implementation of a policy targeting waste generation and the reduction of their negative impact, beneficial recycling of waste from the environmental standpoint, development, and implementation of a policy for the hierarchy of waste usage.

5. State inventory of waste, agreement of waste profiles (passports), development and management of registers for the state cadaster of waste, waste generation, treatment and recycling facilities and disposal sites, approval of the waste quantity limits for placement.

The Ministry of Environment (ME) is in charge of development and implementation of waste policy. It has several sub-divisions and subordinated agencies with waste management responsibilities:

- *Division of Hazardous Substances and Waste Policy*

There are six employees in the Ministry of Environment dealing with waste, one deputy minister coordinating the field, and five employees of *Division of Hazardous Substances and Waste Policy*, one head of division and four specialists. In separate agency, which operates under the Ministry, *Waste and Atmospheric Emissions Management Agency*, there is eleven employees, eight of whom work especially with waste management. This agency has a department for coordination of waste passports and permits and a department for state cadastre and register management. The goals and objectives of the agency are:

1) Ensuring the reduction of harmful effects on the environment as a result of waste use;

2) Ensuring the prevention of harmful effects on the environment during cross-border transportation of waste;

ME collects administrative data on industrial and hazardous waste: Legal entities or private enterprises who generate industrial and hazardous waste and/or implement installation of treatment of industrial and consumption waste, provide primary data to the regional offices of the State Environmental Inspectorate of the ME (SEI) on an annual basis, using the reporting form provided for by Decree No 451-N (and approved by the Ministry of Justice). The SEI verifies the data, after which the reporting forms are sent to the Waste Policy Division of the ME for data processing, entry and analyses, as well as to the Environmental Monitoring and Information Center. The ME prepares summary reports for submission to the State Statistical Committee.

The ME maintains an administrative register on production and consumption waste. The *Waste Research Centre*, established by Decision of the Government of RA (No. 670-N dated May 19, 2005), supports the ME in among other classifying the waste generated, recycling and utilisation (recovery) units, collection sites, as well as in the collection and analysis of data.

*A Interagency Working Group Coordinating Country’s Waste Management Activities* has been set up under Prime Minister’s Office as an Intermunicipal committee obliged to issue the licence for Hazardous waste management. Department for Nature Protection of Yerevan Municipality participates in this Committee. The work of this Intermunicipal Committee is managed by the Ministry of Environment. The Committee organizes 1 meeting every two months. It serves as stakeholders’ coordination tools.

**RA Ministry of Health**

The RA Law on Waste defines the following competencies for the health care state governing authority in the area of waste management:

a) Development of requirements for the safety of human health in normative and technical documents related to waste management; development and overseeing the implementation of the requirements of hygienic norms, sanitary and anti-epidemic rules aiming **to exclude the harmful and hazardous impact on human**
**health** during the process of waste generation, collection, transportation, storage, processing, recycling, removal, disinfection, and burial

b) Development of priorities for measures aimed at the protection of human health from the negative impacts of waste and submitting them to the RA Government;

c) Consenting to the approval of locations for waste management facilities;

d) Identifying sanitary and hygienic requirements for outputs produced from waste as well as issuing relevant hygienic conclusions;

e) **Taking part in the development of the lists of waste according to the level of risks.**

The Charter of the RA Ministry of Health defines the following functions in the area of waste management:

1. Development of public awareness and health care education programmes and monitoring of its implementation;
2. Collection, analysis, and assessment of information on the health care system and the overall health situation of the population.

**RA Ministry of Emergency Situations**

The charter of the Ministry of Emergency Situations does not set any competencies directly related to waste unless it comes to their duties and responsibilities in emergency situations. In case of emergencies where hazardous substances are involved (leakage of chemicals, large amounts of poisonous or infectious substances) it is the responsibility of the Ministry of Emergency Situations to oversee and ensure the proper handling of hazardous waste. In practice, the ministry provides a lot of consultancy in cases such as **broken mercury thermometers, waste lighting devices that contain phosphorus, and other similar cases.**

**RA Urban Development Committee**

The Charter of the Urban Development Committee of the Republic of Armenia defines the following functions:

1. Separation of objects subject to special regulation, regulation of the sector of urban development and ensuring conditions for the development of construction;
2. Development of spatial development programmes aiming to improve the ecological situation of towns, reducing the negative impacts of urbanization on the environment, as well as increasing the level of adaptability to climate change.

**RA Territorial administration authorities (Marzes)**

According to the RA Law on Waste, the competencies of territorial administration authorities related to the sector of waste management are as follows:

a) Taking part in the development of the state policy in the sector of waste management;
b) Taking part in the development of state programmes in the sector of waste management;
c) Development and coordination of regional programmes in the sector of waste management within the boundaries of an administrative division;
d) Issuance of permits for waste disposal sites agreed with the relevant state authority;
e) Preparation of sanitary cleaning schedules within the boundaries of an administrative division and overseeing waste collection;
f) Prepare and update registers for waste generation, treatment, and recycling as well as disposal sites;
g) Elimination (liquidation) of unsupervised and unauthorized landfills with the boundaries of an administrative division;
h) Organizing public participation in the process of collecting non-hazardous waste with resource value within the boundaries of an administrative division.
Local self-government bodies

After the adoption of the Constitution of the RA (5 June, 1995) the system of local self-government was established in parallel with the establishment of the state government in public administration of the RA. Implementation of local self-government in the RA is regulated by the Constitution of the RA and its Articles 104-110 of the Chapter 7, which directly define the issues of local self-government, by the RA Law “On Local Self-Government”, which is based on European Charter of Local Self-Government, by other laws and legal acts. Armenia ratified European Charter of Local Self-Government in 2002. The local self-government is the right and power of the community to resolve on its own responsibility issues of local significance aimed at the welfare of the inhabitants in accordance with the Constitution of the RA and the RA Law “On Local Self-Government”.

Powers of the local self-government bodies consist of own responsibilities funded by the local budget, and delegated responsibilities funded by the state budget.

In Armenia local self-government is exercised only within communities level. It is a separate link of the public government. Each urban and rural community consists of one or more settlements.

Responsibilities of communities are as follows:

- Development of an effective, systematic, unified policy of garbage collection, sanitation in the community.
- Development of proposals for effective garbage collection-sanitary cleaning schemes of settlements in united communities, landfill operation-improvement of the contractual field of garbage collection.
- Implementation of climate change mitigation and adaptation activities in settlements.
- Community garbage collection - sanitation, provision of communal services is a mandatory task of the community, garbage collection - sanitation, as well as the implementation and organization of other powers provided by the Law of the Republic of Armenia “On garbage collection - sanitation”.
- Establishment of fees to be paid to the community budget by the community council for garbage collection, organization of sanitary cleaning, implementation of services in order to solve the problems of the community population and approval of the amount of those fees by the decision of the community council.

The RA Law on Waste provides the following competencies for a community mayor concerning the sector of waste management:

a) Supervising waste collection;
b) Preparation of sanitary cleaning schedules of territories;
c) Carrying out the elimination (liquidation) of unsupervised and unauthorized landfills;
d) Organizing public participation in the collection process of non-hazardous waste with resource value;
e) Supporting the introduction of a system of sorted waste in the community.

Article 43 of the RA Law on Local Self-Governance stipulates the organization of the waste collection and sanitary cleaning as the competence of the community mayor. The authorities of a community mayor and a council in relation to waste management and sanitary cleaning are foreseen by the RA Law on Waste Collection and Sanitary Cleaning Services.

Waste collection and sanitary cleaning activities are funded by the community budget, based on the decision of the community council, and implemented directly by community entities or by an operator selected in a procedure defined by the law on procurements.

The procedure for waste collection, including the minimum schedule for waste collection, is approved by the council of the community upon the submission of the community mayor while adhering to requirements of sanitary and
hygienic rules and norms defined by RA legislation. Moreover, waste must be collected before the containers are full (Law on Waste collection and sanitary cleaning).

According to the RA Government Decree № 1161-N of October 4, 2007, on defining the mandatory norms for the maintenance of common equity ownership in apartment buildings, disposal of household waste at least once every three days, and in case of the temperature > 50°C, every day.

It is worth noting that in the given situation self-governance of communities creates certain risks in terms of the poor implementation of waste collection responsibilities by some communities.

Waste collection in Armenia, as well as setting the fee for waste collection, approving the procedure for the implementation of the waste collection are all issues within the realm of authorities of local self-governing bodies.

Based on practice, the waste collection operators have low level of training and miss technical guidance on sustainable operation of waste management systems and infrastructure (bins, refuse collection vehicles - RCV, landfills, etc.) resulting in reduced lifespan of the systems and higher costs. Specifically, because of improper operation the lifecycle of the bins with wheels shortens as a result of wheel damage at the same time increasing inefficiency and service time for each collection point.

The Law on Licensing (ՀՕ-193) requires the entities that recycle, treat, store, transport, and place hazardous waste to have a permit issued by the RA Government along with undergoing an examination and certification. According to the Law on Waste (ՀՕ-159) and the List of waste classified by hazardousness (N 430-Լ) the unsorted municipal household waste has the 4th class of hazard, which should require any household waste transporting and landfilling operator to receive a license for their operation. In reality, no municipal waste collector in the country has a permit.

While unsorted municipal solid waste from residential households and household spaces of organizations has the 4th class of hazard, neither the waste collection operators nor the dumpsite’s operators go through an EIA or Expert Examination process required by the RA Law on Environmental Impact Assessment and Expert Examination (ՀՕ-110-Լ), which states that the following activities are subject to assessment and expert examination of Category A:

- Collection, storage, use, processing, treatment, disposal, liquidation, placement, and burial of hazardous waste;

- Installation of landfills or municipal waste recycling facilities to service communities with 15,000 or more residents or to receive at least 10 tonnes of waste per day, and/or treatment of municipal waste.

Environmental Protection and Mining Inspection Body of the Republic of Armenia (EPMIB)

The following competencies and controlling tasks related to waste management are defined by the Charter of the Body Environmental Protection and Mining Inspection Body of the Republic of Armenia:

1) Atmospheric air protection:
   f. maintenance of the requirements for storing or limiting the burning of industrial and municipal waste serving as sources of pollution with harmful gases and foul-smelling odors;

2) Use and protection of water resources:
   e. implementation of the requirements for the placement of waste burial sites having indirect negative impacts on water resources, as well as dunghills, cemeteries, and other facilities;

3) Land use and protection:
   a. maintenance of assigned limitations and norms as well as the implementation of other environmental measures aiming to protect lands from surface runoffs and winds, floods, eutrophication, salinity, pollution from industrial and municipal waste, chemical substances, landslides, soil degradation or other impacts deteriorating the soil;
4) Use and protection of flora and fauna:
   k. maintaining limits preventing the pollution of forests with industrial and municipal wastewaters, industrial emissions, chemical substances and waste;

5) Hazardous materials, industrial and consumption waste:
   a. Maintenance of requirements for the export, import and transit movement of hazardous materials and waste through the territory of the Republic of Armenia;
   b. Fulfillment of the normative requirements for the generation and placement of waste;
   c. Meeting the requirements for the profiling of waste and updating the register; compliance with the requirements of the waste passport and register maintenance procedure;
   d. Adhering to the rules for conducting state inventory of waste.

The monitoring and control are perhaps one of the weakest points in the country’s waste management sector. The reasons for it are the poor data collection mechanisms (including methodologies) to regularly acquire reliable figures on waste generation and other relevant indicators, poor infrastructure such as weighbridges to keep record of landfilled waste or cameras and other equipment to control illegal dumping of waste. The below mentioned poor capacities at labs to analyze waste and emissions also make monitoring and control in waste management difficult. Also, the insufficient capacity of the State Environmental and Mining Inspectorate as well as the poor technical capacity for control and detection of illegal dumping, causing the uncontrolled dumping to arise as one of the most significant issues in regard to almost all waste streams.

In the EU member states and in USA, there is a Environment Protection Agency (EPA) or a similar body to carry on regulatory, enforcement, licensing, permitting, and data collection functions, while the policy development is distributed between the key ministries engaged with the waste governance, and the inspection and enforcement is the role of the state inspectorates. Such agencies usually relief the burden from many minor ministerial divisions and state agencies overloaded with the duties and functions for which they lack resources and capacity. Forming such an agency should be considered as one of the solutions for the mentioned fragmentation issue.

**Health and Labour Inspection body of the Republic of Armenia (HLIB)**

The charter of the Health and Labour Inspection body of the Republic of Armenia (N 755-L, 11.06.2018) defines its main duties as follows:

- To manage risks in the areas of public sanitary and infection safety, medical services, distribution of pharmaceuticals and pharmaceutical activities, occupational health and safety;
- To oversee compliance to the requirements of the RA Laws and other legislation
- To implement preventive actions in the areas of public sanitary and infection safety, medical services, distribution of pharmaceuticals and pharmaceutical activities, occupational health and safety;
- Sampling for sanitary examination and laboratory examinations within the framework of control implementation of instrumental measurements;
- Methodical management of sanitary-hygienic-anti-epidemic control;
- Carrying out studies on the impact of environmental factors on the health of the population.

The HLIB charter does not define any duties, objectives or competencies directly relating to waste, however, many of them, particularly those concerned with sanitary inspection and control, includes waste-related issues. The HLIB is responsible for monitoring the safe handling of healthcare hazardous waste in medical institutions through World Health Organization The Infection Prevention and Control Assessment Framework (WHO IPCAF) tool. However, there is a need to enhance the monitoring and control capacities of the HLIB as reported by the representatives of the National Center for Disease Control and Prevention.
Environmental Monitoring and Information Center

The charter of the Environmental Monitoring and Information Center (EMIC) state non-commercial organization (N 31-U, 02.01.2017) defines its main subject and objectives as follows:

- To contribute to the high level of protection of the environment and natural resources (except for mineral reserves) through monitoring and through registering, analysis, provision, and storage of data on the environment and natural resources;
- To upload necessary data on the environment and natural resources to and maintain the shared environmental information library;
- **To conduct studies to maintain the classification system of the objects of waste generation, recycling, recovery, and disposal sites, as well as to collect and analyze data on waste handling and treatment low- or zero-waste technologies**;
- To create and maintain digital databases on specific components of the environment and natural resources information and to provide and receive this kind of information according to the RA legislation to and from the governmental bodies, NGOs, and the public.

The EMIC charter defines also the duties of the organization, some of which relate to waste, as follows:

- To conduct observations and studies of the use, qualitative and quantitative characteristics, composition, contamination by chemicals and radioactive materials and waste, as well as of the negative impacts on water resources;
- To conduct observations and studies of the soil contamination and qualitative changes as well as of other negative impacts on soil;
- To conduct observations and studies of the waste disposal sites and to present their negative impacts

National Center for Disease Control and Prevention

The Charter of the “National Center for disease control and prevention” defines the following functions concerning the sector of waste management:

1) Overseeing the maintenance of the requirements of the RA Legislation on ensuring the sanitary and epidemic safety of the population by business entities (except for the requirements of legislation related to food safety) as well as the implementation of preventive sanitary and epidemic measures;

2) Identification of the causes and conditions of communicable, professional, and non-communicable diseases and poisonings as well as overseeing the implementation of preventive sanitary and hygienic and sanitary and epidemic measures;

3) Implementation of instrumental measurements and sampling for conducting sanitary and hygienic and laboratory expert examinations within the frameworks of oversight;

4) Submitting recommendations to relevant authorities regarding the decisions to impose quarantines in order to ensure the sanitary safety of the population in Armenia;

5) In cases and procedures are foreseen by law, issuing orders for carrying out disinfections, the extermination of insects and rodents at sources conducive to the development and spread of communicable diseases, including parasitic diseases.

Privately-owned test labs

As of December 2019, there are 32 actually operating certified test laboratories in the country, most of which (more than 20) are privately-owned. According to the RA Law on Certification, starting from December 2012 the only entity
eligible to certify test laboratories is the “National Certification Body”. The State Environmental and Mining Inspectorate and the Environmental Monitoring and Information Center at the Ministry of the Environment reports unclear access to the lab testing facilities available in the republic. The mentioned agencies often have to make use of the better testing facilities of the National Center for disease control and prevention. Additionally, there’s weak technical equipment at labs for analysis of waste and emissions, specifically POPs, e.g. new POPs, UPOPs.

**Statistical Committee of the RA**

Statistical Committee of the RA – ARMSTAT, is part of the Presidential administration, and is thus independent from the government. The ARMSTAT has a supreme board of governance, i.e. the State Council, with 6 members. The State Council has the right to approve laws, decisions and forms, which can be published by the Ministry of Justice as normative acts. Responsibilities of ARMSTAT are as follows:

- Carries out the annual statistical survey on municipal waste. In addition it receives data from the ME on MW collection in rural areas.
- Publishes data on municipal waste, by city, and on industrial waste in regular publications and on its website.
- Receives and publishes the data on industrial waste from the ME.
- Environmental data are collected and processed by the Social and Environmental Statistics Division where 1 person is assigned to the task; however not full time.

The ARMSTAT\(^\text{18}\) provides the following data on solid waste in the country:

1. Generation of waste according to indicators and years;
2. Generation of waste according to the types of activities, categories of hazards, and years;
3. The amounts of waste transported to landfills;
4. The flow of hazardous waste (excluding household waste) according to indicators and years;
5. Environmental taxes and payments for nature use (e.g. landfill tax);
6. Expenditure for capital repair of fixed assets (e.g. recycling plants, etc.).

The data on waste reported by the committee is often unreliable because of data acquisition sources and methodology. For instance, the amounts of waste transported to landfills is reported by the municipalities to ARMSTAT. These amounts are calculated based not on weight measured via weighbridges but based on volumes of waste trucks. The diverse fleet of refuse collection vehicles – compacting and non-compacting – as well as varying density of waste allow for only rough estimates for the reported volumes of transported waste that are later converted to weight with certain factor.

Also, the data on waste is acquired from different sources by four entities and there is no coherence in its processing, analyzing, distributing, and publishing. The distribution and exchange of the collected data among the agencies is disorganized and complicated due to lack of clear protocols and tools for data exchange, which makes waste governance and decision making on all levels inefficient. It is strongly recommended that all waste-related data is collected and processed through one comprehensive centralized waste reporting on-line (web-based) tool for tracking and reporting waste data ensuring that public authorities make waste management information available to the public. This requirement should extend to private businesses and contractors handling waste.

The Law on waste sets out the Cadaster of waste to include the “Registry of the objects of generation, recycling and recovery of waste” and the “Registry of waste disposal sites.” It does not, however, include the waste collection and

transportation entities, so that the MSW operators in the country do not report data on collected and landfilled waste to the Cadaster. Only municipalities report this information based on rough volume estimations to the RA Statistical Committee. While the Register of waste should include both hazardous and non-hazardous waste, de facto only the information on hazardous waste is included.

**Administrative Districts of Yerevan**

For the purpose of effective local self-government and territorial management and for making local self-government institutions of Yerevan maximally accessible for population the city of Yerevan is divided into 12 administrative districts: Achapnyak, Avan, Arabkir, Davtashen, Erebuni, Kentron, Malatia-Sebastia, Nor Nork, Nork-Marash, Nubarashen, Shengavit, Kanaker-Zeytun. All population is urban population.

Waste is mainly managed by two Municipal Departments, Nature Protection Department and Communal Service Department. Other departments also play a role in waste management. Based on Order from the Yerevan Mayor, 2015 June 4, the functions of these two Department are approved by the decision n.1704-A.

**Communal Service Department**

This department is responsible for a number of activities. The purpose, tasks and main functions of the department are as follows:

1) In cooperation with the national executive bodies, develops programmes related to communal economy in the fields of Yerevan city, the Council of Elders of Yerevan; programmes aimed at the implementation of powers delegated by the state to the local self-government bodies; drafts of decisions and orders of the Mayor;

2) Is the customer of the works related to the field of communal economy implemented by the programme of the municipality. Participates in the elaboration of state programmes related to the topics coordinated by this Department, within the framework of its powers ensures their implementation in the administrative territory of the city of Yerevan.

3) Organizes the operation of communication channels, water supply, sewerage, gas supply, heating networks and other engineering structures, which are considered to be Yerevan’s property;

4) Organizes the sanitary cleaning of the streets, squares, parks, other public places of the capital, as well as the garbage removal works from apartment buildings and private houses;

5) Pursuant to decision No 727 of the RA President, dated 06.05.1997, exercises control over the works performed by the sanitary cleaning and garbage collection companies operating in the administrative territory of Yerevan;

6) Carries out control of contractual obligations by “Erebuni Makrutyun” LLC, which leases and operate the existing city’s official Nubarashen landfill.

This Department is divided in three units: Garbage collection and sanitation Unit, Life support Unit, Apartment building management Unit of work with bodies.

**Table 6 Structure of Department of Communal Services and Garbage collection and sanitation Unit**

<table>
<thead>
<tr>
<th>Department of Communal Services</th>
<th>No of employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>N Job Title</td>
<td></td>
</tr>
<tr>
<td>1 Head of department</td>
<td>1</td>
</tr>
<tr>
<td>2 Deputy head of department</td>
<td>1</td>
</tr>
<tr>
<td>3 Clerk</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Garbage collection and sanitation Unit</th>
<th>No of employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>N Job Title:</td>
<td></td>
</tr>
<tr>
<td>1: Head of Unit</td>
<td>1</td>
</tr>
<tr>
<td>2: Chief Specialist</td>
<td>2</td>
</tr>
</tbody>
</table>
The Garbage collection and sanitation Unit is responsible for general waste management. For now, number of employees in this section is sufficient. If the recycling activities will increase then the number of employees might not be sufficient.

**Nature Protection Department**

This Department is responsible for analysis of Environment protection monitoring data, provided by the Municipal Monitoring Centre, for planning what to do to improve nature protection. The main purpose is to ensure the implementation of the powers assigned to the Mayor of Yerevan in the field of nature protection. The tasks and functions of the Department derive from the powers assigned to the Mayor of Yerevan by legal acts in the field of nature protection called for their implementation. The purpose, tasks and main functions of the department are as follows:

1) Develops draft decisions and orders of the Yerevan Council of Elders and the Mayor in the field of nature protection.

2) Ensures the implementation and control of the requirements of the decisions, orders, decrees, other normative acts, documents of the Council of Elders, the Mayor of Yerevan, the authorized body of the state administration of nature protection.

3) Ensures the protection of the lands considered to be the property of Yerevan from landslides, floods, swamps, pollution with chemical, radioactive materials and industrial waste;

4) Exercises control over the implementation of the norms of the environmental legislation in the common land areas under the management of the Municipality in the city of Yerevan;

5) If necessary, participates in the inspections carried out by the territorial subdivision of the State Environmental Inspectorate;

6) Ensures the development of programmes, concepts and measures for the implementation of the state policy in the field of nature protection, and their implementation;

7) Develops proposals related to the subject field to be included in the socio-economic development programmes of the city of Yerevan;

8) Develops proposals on the improvement of the RA legislation and other normative acts in the field;

9) Supervises the work of “New Improvement” CJSC subordinated to the municipality;

10) Ensures the implementation of plant disease and pest control works in the lands owned by Yerevan;

11) After agreeing with the public administration body in the field of nature protection, the Council of Elders of Yerevan submits the list of necessary measures for the environment of Yerevan for each year and the schedule of their implementation;

12) Implements the works envisaged by the state environmental programmes in the city of Yerevan;

13) Supports the protection and use of reserves, especially protected areas of the sanctuaries located in the territory of Yerevan; the implementation of measures organized against poaching, illegal fishing and logging in that area;

14) Coordinates projects, programmes, other documents related to the field of nature protection within the scope of its authorities;

15) Cooperates with non-governmental organizations implementing environmental issues;
16) Develops and submits the annual and quarterly work programmes of the Department to the Secretary of Staff for submission to the Mayor for approval.

Data about structure of department, number and positions of employees are provided in the following table:

<table>
<thead>
<tr>
<th>Table 7 Structure of Department of Nature Protection</th>
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<tbody>
<tr>
<td>Department of Nature Protection</td>
</tr>
<tr>
<td>1: Head of Department</td>
</tr>
<tr>
<td>2: Deputy Head of Department</td>
</tr>
<tr>
<td>3: Chief specialist-dendrologist</td>
</tr>
<tr>
<td>4: Chief Specialist-Ecologist</td>
</tr>
<tr>
<td>5: Chief specialist Zoologist</td>
</tr>
<tr>
<td>6: Leading specialist</td>
</tr>
<tr>
<td>7: Clerk</td>
</tr>
</tbody>
</table>

Based on the above provided tables on engaged experts in both departments, there is a lack of experts for MSW and HV.

Based on the above provided tables on engaged experts in both departments, there is a lack of experts for MSW and HV management, including separate collection recycling, legislation improvement, etc.

Department for Nature Protection participates in work of Intermunicipal Committee, a Interagency Working Group Coordinating Country’s Waste Management, which activities has been set up under Prime Minister’s Office and which is obliged to issue the licence for Hazardous waste management. The work of this Intermunicipal Committee is managed by the Ministry of Environment. The Committee organizes one meeting every two months.

The Council of Elders

The Council of Elders, with 65 members is the highest body of Yerevan self-government and has the authority to elect and oversee the activities of the Mayor. It approves the charter and human resource policies for the municipality, administrative districts and entities in their jurisdiction. Local taxes, duties and fees for services delivered by the community are also set by the Council of Elders. In addition, it has the power to approve one year, four-year, and longer-term and special plans of city development, make decisions regarding the conservation and use of the green land in Yerevan and execute liabilities regarding waste removal and sanitary cleaning.

Yerevan also established a project implementation unit (PIU) for Sustainable Urban Development Investment Programme. The PIU executes projects related to urban infrastructure, institutional strengthening and programme management and capacity building. The PIU supervises the preparation and management of project contracts, quality of activities and deadlines.

On 20.04.2021, the Council of Elders also confirmed the draft decision on joining the “Covenant of Mayors for Climate and Energy” initiative. Accordingly, Yerevan undertakes the responsibility to reduce greenhouse gas emissions by 30% at least and to increase climate change adaptation in Yerevan by 2030. After joining the Covenant, various environmental measures aimed at climate change mitigation and adaptation are to be planned and undertaken.
3.2 Institutional framework of Poland

In Poland, the main tasks in the field of widely understood environmental protection are performed by the Ministry of Climate and Environment, in particular by: ensuring the implementation of laws and their compliance with EU policy, issuing regulations and orders, coordinating and controlling the work of government administration bodies. The Ministry is the body creating and regulating the legal framework for waste management including municipal waste. The ministry includes the Minister's Political Cabinet and the following organizational units:

- Budget Department
- District Heating Department
- Department of Education and Communication
- Electricity and Gas Department
- Department of Electromobility and Hydrogen Management
- Department of Nuclear Energy
- Department of European Funds
- Department of Geology and Geological Concessions
- Waste Management Department
- Department of Environmental Instruments
- Department of Forestry and Hunting
- Department of Geological Supervision and Raw Material Policy
- Department of Air Protection and Urban Policy
- Department of Nature Conservation
- Department of Renewable Energy Sources
- Law Department
- Department of Petroleum and Transport Fuels
- Department of International Affairs
- Department of Defense, Crisis Management and Security
- Department of Climate Transformation Strategy and Planning
- Office of the Director General
- Finance Office
- Control and Audit Office
- Minister's Office.

The Minister of Climate and Environment heads the government departments of Energy, Climate and Environment.

The Climate Unit covers climate and sustainable development issues, in particular concerning:

- participation in climate policy-making, including within the European Union, in particular in negotiations on international climate and sustainable development policies;
- implementation of the European Union’s climate policy, including management of funds for ecological and climate transformation, in particular management of auctions of greenhouse gas emission allowances and management of the funds obtained as a result, taking into account the country’s energy security, including the security of energy supplies, energy resources and fuels
- protection and shaping of the environment and the rational use of its resources, subject to the tasks of the minister in charge of the environment
- ecological living conditions resulting from the air protection, land surface protection, protection against noise and protection against electromagnetic fields
monitoring of compliance with environmental protection requirements and examination of the state of the environment;
- system for managing emissions of greenhouse gases and other substances and trading in greenhouse gas emission allowances;
- waste management, including as part of a closed-loop economy
- support, including promotion, of green innovations and technologies, taking into account the objectives of climate and energy transition;
- management and coordination of programmes to disseminate, develop and promote the use of low and zero carbon technologies, including in particular renewable energy sources and transport;
- socio-economic aspects of the environmental and climate transition;
- energy efficiency;
- development and use of renewable energy sources;
- environmental education and promotion of ecological living conditions - in the scope of tasks belonging to the department.

The organizational structure of the Ministry of Climate and Environment consists of Departments. The responsibilities of the Department of Waste Management include: initiating, developing and implementing the Minister’s policy and carrying out the Minister’s tasks in the field of waste management and protection of the earth’s surface resulting from the provisions of the law, except for conducting administrative proceedings and providing the Minister’s representation in proceedings before provincial administrative courts.

Regional level - The Office of the Marshal of the Mazowieckie Voivodeship in Warsaw

The main responsibility of the Mazowieckie Marshal Office is the preparation of regional development strategy, and development and implementation of regional policy measures. In general, as in all Polish regions, the major tasks of regional self-authority are: public education, including higher education, promotion and health protection, culture and monuments and care of monuments, social welfare, family support and foster care system, pro-family policy, modernization of rural areas, spatial management, public transport and roads, physical culture and tourism, consumer rights protection, defence, public safety, counteracting unemployment and activating local labour market, activities in the field of telecommunications, protection of employee claims in case of employer's insolvency.

Departments of the Marshall Office:
- Marshal’s Chancellery
- Sejmik’s Chancellery
- Department of Organization
- Department of Budget and Finance
- Department of Social and Health Policy
- Department of Agriculture and Rural Areas Development
- Department of Environmental Fees
- Department of Culture, Promotion and Tourism
- Department of Public Education and Sport
- Department of Estate and Infrastructure
- Department of Regional Development and European Funds
- Department of Owner Supervision and Investments
- Department of Control
- Department of Digitalization, Geodesy and Cartography
- Department of Environmental Policy, Geology and Hunting
Department of Waste Management, Emissions and Integrated Permits

Departments, each in their scope determined by the Regulations, perform the tasks of the voivodeship self-government, which are the responsibility of the Marshal and the Management Board, in particular regarding:

- interacting with:
  1. local government units;
  2. economic and professional self-government;
  3. government administration;
  4. universities and research and development units;
  5. non-governmental organizations;

- initiating and participating in the process of creating, liquidating and transforming voivodeship local government organizational units and equipping them with assets;

- exercising supervision over voivodeship self-government organizational units;

- preparation of draft legal acts of the Sejmik, the Management Board and the Marshal as well as drafts of other documents related to the department's operation;

- executing the legal acts of the Sejmik, the Management Board and the Marshal;

- preparation of information materials related to the development of the draft budget resolution, including the development of financial plans for the draft budget of the Voivodship in the part concerning the tasks of the department;

- disposal of budgetary resources in accordance with the budget classification on the basis of appropriate authorizations;

- keeping records of the budget funds involved and drawing up monthly reports in this regard;

- preparation and preparation of reports, including statistical analyzes and current information, on the implementation of tasks, in particular for the needs of the Sejmik, the Management Board and the Marshal;

- preparing draft voivodship programmes;

- ensuring the protection of classified information;

- preparation of draft agreements on entrusting the performance of public tasks of the Voivodeship to other voivodships and local self-government units from the area of the Voivodeship;

- handling individual matters within the agreed scope, including issuing administrative decisions;

- ensuring efficient customer service;

- cooperation with the Press Officer;

- liaising with other departments in matters requiring arrangements;

- performing tasks resulting from foreign and interregional cooperation.

Organizational chart of the Department of Waste Management, Emissions and Integrated Permits
The Department of Waste Management, Emissions and Integrated Permits carries out the assigned tasks under the direction of the Director of the Department. The Department consists of:

1) Section of Environmental Control (PZ-I);
2) Multi-member Position on Organisation and Finance of the Department (PZ-III);
3) **Section of Waste Management** (PZ-OP-I);
4) Section of Environmental Permits and Opinions (PZ-OP-II);
5) Section of Emissions and Air Protection (PZ-PI-I);
6) **Section of Waste Base and Information** (PZ-PI-II)

The tasks of the Waste Management Section include in particular:

1) preparing a draft provincial waste management plan and monitoring its implementation and implementation, as well as preparing a report on its implementation;
2) handling of municipal installations in particular:
   a) drawing up and transmitting for publication in the Public Information Bulletin a list of:
      ▪ functioning installations meeting the requirements for municipal installations,
      ▪ andmunicipal instalations planned for the construction, extension or modernization,
   b) issuing decisions:
      ▪ refusing entry in the list of municipal installations,
      ▪ the deletion of installations from the list of municipal installations;
3) receiving annual reports from municipalities on the implementation of municipal waste management tasks, verifying the data contained therein and drawing up an annual report on the performance of those tasks;
4) conducting waste management matters, including in particular:
a) approving a reclassification of hazardous waste into non-hazardous waste or objecting,
b) to provide the Minister responsible for the environment with a summary information on the number of notifications, decisions approving the reclassification of hazardous waste into non-hazardous waste and a decision to object,
c) issuing a decision to recognise an object or substance as a by-product,
d) issuing permits for the collection of infectious medical and veterinary waste,
e) issuing permits for the incineration of waste outside installations or facilities intended for that purpose,
f) issuing permits for the collection of waste and for the treatment of waste,
g) withdrawing permits for the collection of waste or for the treatment of waste,
h) issuing waste generation permits,
i) ruling on the allocation of funds from the security of claims to remove adverse effects or damage to the environment in the course of its waste collection or treatment activities,
j) approval of the instructions for the operation of the landfill,
k) ruling on the allocation of means of securing claims to remove adverse effects or environmental damage in connection with the operation of a landfill,
l) issuing consent for the extraction of waste from a closed landfill and from a waste dump,
m) author issuing approval for the closure of the storage site or a separate part thereof, at the request of the manager of the storage site,
n) adjudicating on the closure of a storage site or a separate part thereof, on the basis of expert reports drawn up,
o) transfer of rights and obligations arising from decisions taken for a landfill to an operator interested in taking over a landfill,
q) approval of extractive waste management programmes,
r) issuing permits for the operation of waste facilities,
s) the holding back of the extractive waste holder’s activities to the extent covered by the decision approving the extractive waste management programme or the permit to operate the extractive waste facility,
t) issuing consent for the closure of the extractive waste facility or parts thereof,
u) exempting the holder of the waste operating the extractive waste facility from the obligation to hold a financial guarantee or equivalent;
v) issuing decisions where, in view of the risk to human life or health, it is necessary to remove the waste without delay,
w) preparing calls for the omission or removal of infringements of environmental legislation and infringements of the conditions laid down in decisions and authorisations issued,
x) taking action to remove and manage waste, in connection with the adoption of a decision to withdraw a decision relating to waste management, annulment, annulment or expiry of a decision relating to waste management,
y) providing the examination board with the support of the examination board to conduct a waste management examination;
5) participation in inspections carried out by the Provincial Inspector of Environmental Protection:
a) before agreeing to close the storage site,
b) prior to the issue of a waste collection permit, a waste treatment permit and a waste generation permit taking into account the collection or treatment of waste;
6) collecting information and keeping a record of the nature, quantity and places of presence of substances presenting a particular risk to the environment;
7) providing information, at the request of the Chief Inspector of Environmental Protection, concerning:
a) the compliance of the recipient of the waste with the laws governing the carrying out of such activities, before the issue of an import authorisation for the waste into the country,
b) comply with the conditions of the recovery authorisation in place before granting the operator of the recovery operation a preliminary authorisation;

8) handling of cases relating to end-of-life vehicles, including in particular:
   a) agreeing on draft permits for waste collection activities for operators operating collection points,
   b) keeping lists of operators keeping:
      ▪ vehicle dismantling station,
      ▪ vehicle collection points,
   c) receiving notices from dismantling station operators that they have begun their vehicle dismantling activities, terminating or terminating contracts with operators operating vehicle collection points and keeping a register of those notices,
   d) the acceptance of copies of decisions of the authorities declaring the withdrawal of the waste collection authorisation for operators operating collection points and the keeping of a register of those decisions;

9) conducting environmental education related to the issue of a comprehensive approach to the implementation of the waste management plan;

10) conducting matters concerning cooperation with the Minister responsible for the environment, the National Fund for Environmental Protection and Water Management, the Regional Fund for Environmental Protection and Water Management in Warsaw, the Provincial Inspectorate of Environmental Protection and foreign partners in the field of tasks carried out by the Department;

11) conducting cases in the field of monitoring compliance with and application of environmental regulations and cooperation with the Department of Environmental Fees in this area.

The tasks of the Waste Base and Information Section include in particular:
1) keeping a database on the generation and management of waste in the Province;
2) receiving annual reports on waste generation and management and verifying the information contained therein;
3) calling on waste holders in writing to submit an adjustment to the annual reports on waste generation and waste management;
4) collecting copies of administrative waste management decisions issued by the competent authorities and keeping a register of those decisions;
5) granting eligible entities access to the database;
6) preparation and transmission of provincial reports on the basis of the ongoing DATABASE of the WSO;
7) adoption of lists of entities entered in the register of regulated activities for the collection of municipal waste;
8) analyzing data and creating statements illustrating waste management in the Province;
9) publishing information in a publicly available list of data on documents containing environmental and environmental information;
10) conducting cases concerning the monitoring and application of environmental regulations by waste producers and management, and cooperating with the Department of Environmental Charges in this regard;
11) sharing environmental information and its protection in cooperation with all organizational cells of the Department;
12) preparing draft administrative decisions refusing to make environmental information and its protection available and keeping a register of those decisions in cooperation with all the organisational units of the Department;
13) making public information available in cooperation with all the organisational units of the Department;
14) conducting matters related to the activities of the Regional Fund for Environmental Protection and Water Management in Warsaw;
15) coordinating the opinions and monitoring of and draft legislation on waste management and environmental protection in cooperation with all the organisational cells of the Department.
City level - City of Warsaw

A municipal waste management system was implemented in the Capital City of Warsaw on the 1st of August 2014 where the matters concerning municipal waste are being dealt by Municipal Waste Management Department. Its activities encompass the area of the entire City of Warsaw (the borough).

Municipal waste is collected and treated by companies chosen in a tender.

The scope of activities of the Warsaw Waste Management (Waste Management Department) includes in particular:

1. supervision over the municipal waste management system in the Capital City of Warsaw;
2. implementation of tasks in the field of solid waste and liquid waste management,
3. cooperation with the Marshal of the Mazowieckie Voivodeship on the design and update of the Voivodeship Waste Management Plan;
4. developing draft programmes, plans, strategies, regulations, requirements for entrepreneurs and residents in the field of environmental protection and maintaining cleanliness and order in the capital city Warsaw, within the scope of the Department’s operation, including giving opinions on the Voivodeship Waste Management Plan;
5. keeping a register of regulated activity in the field of collecting municipal waste from property owners;
6. control of entrepreneurs entered in the register referred to in point 4, in terms of meeting the conditions required for the performance of regulated activities;
7. preparing, for competent authorities, annual reports on the implementation of tasks in the field of municipal waste management;
8. receiving and analyzing reports from entities collecting municipal waste as well as from entities operating separate collection points for municipal waste;
9. preparing an annual analysis of the state of municipal waste management, referred to in Art. 9th of the Act of September 13, 1996 on Maintaining Cleanliness and Order in Municipalities;
10. coordination of activities of district offices in matters related to the acceptance of declarations on the amount of fees for municipal waste management and handling fees for municipal waste management paid by property owners;
11. cooperation with control authorities and organizational units of the Capital City of Of Warsaw in the scope of control and enforcement tasks related to municipal waste management conducted by entities in the capital city of Warsaw;
12. cooperation with recovery organizations, in particular in the field of selective collection of waste electrical and electronic equipment and waste batteries;
13. conducting proceedings in matters relating to the reliefs referred to in Art. 67a of the Act of August 29, 1997, the Tax Ordinance, in the repayment of liabilities due to the municipal waste management fee, in which the value of receivables exceeds the amount of twenty thousand zlotys;
14. making available on the Office's website and in a customary manner the information referred to in Art. 3 sec. 2 point 9 of the Act of September 13, 1996, on maintaining cleanliness and order in municipalities;
15. providing information on municipal waste collections carried out pursuant to art. 6s of the Act of September 13, 1996, on maintaining cleanliness and order in municipalities, under the so-called The "bridging programme";
16. conducting administrative proceedings regarding the imposition of fines on entities collecting municipal waste from property owners and entities running separate municipal waste collection points, in the cases referred to in art. 9x paragraph 1 and 2 and article. 9xa of the Act of September 13, 1996, on Maintaining Cleanliness and Order in Municipalities;
17. entering data into a publicly available list of data about the documents referred to in art. 22 sec. 1 of the Act of 3 October 2008 on the provision of information on the environment and its protection, public participation in environmental protection and on environmental impact assessments, within the scope of the Department's tasks;
18. developing directions of changes in the municipal waste management system based on the monitoring of available municipal waste processing technologies in terms of their actual use and impact on the achievement of recycling levels, as well as monitoring of available solutions, investments and projects for municipal waste processing consistent with the assumptions of the circular economy.

The Waste Management Department consists of the following nine internal organizational units/divisions with established names and office symbols:

- Municipal Waste Management System Division - GO-ZS;
- Citizen Service & Supervision Division - GO-KM
- IT Systems Division - GO-SI
- Contract Accounting Division - GO-RU;
- Finance and Budget Division - GO-FB;
- Communication and Organization Division - GO-KO;
- Solid and Liquid Waste Management Division - GO-OD;
- Waste Management Strategy Team - GO-SG;
- Legal Counsel Unit - GO-RP.

On the following graph, an organization chart of The Waste Management Department’s is presented:
Figure 3 Organization chart of the Waste Management Department (WMD) of the Warsaw Municipal Office
(Annex to order No 1615/2019 of the President of the Capital City of Warsaw of 28.10.2019)
The scope of activities of the Department of Municipal Waste Management System Management includes in particular:

- controlling entities collecting municipal waste and operating separate municipal waste collection points;
- coordinating and controlling activities related to selective waste collection, in particular expired medicines, mercury thermometers, raw material waste, batteries and used electrical and electronic equipment;
- verifying reports and information submitted by the entity performing its own task in the field of municipal waste management and forwarding the verification results to the appropriate organizational units of the Office;
- development of draft regulations regarding environmental protection and maintaining cleanliness and order in the capital city Warsaw in the field of matters specific to the Office;
- providing information referred to in the provisions of the Act on maintaining cleanliness and order in municipalities on the website of the Office and in a customary manner;
- keeping a register of regulated activity in the field of collecting municipal waste from property owners;
- controlling entrepreneurs entered in the register referred to in point 6 in terms of meeting the conditions required to perform regulated activities;
- receiving reports from entities collecting municipal waste from property owners, entities running separate municipal waste collection points and other entities collecting municipal waste, constituting fractions of municipal waste: paper, metals, plastic and glass, and verification of data contained in the reports;
- preparing an annual report on the implementation of tasks in the field of municipal waste management;
- carrying out an annual analysis of the state of municipal waste management in order to verify the technical and organizational capabilities of the Capital City of Warsaw Warsaw in the field of municipal waste management;
- keeping a register of contracts concluded by property owners for collecting municipal waste;
- cooperation with control authorities, organizational units of the Capital City of Warsaw Warsaw and the districts of control and enforcement in the field of municipal waste management carried out in the capital city of Warsaw;
- conducting administrative proceedings regarding the imposition of fines on entities collecting municipal waste from property owners, entities running separate municipal waste collection points and entities collecting municipal waste, constituting fractions of municipal waste: paper, metals, plastic and glass;
- performing the activities of the creditor in relation to the matters specified in point 13, pursuant to the provisions on administrative enforcement proceedings;
- preparation of draft responses to requests for disclosure of public information and information about the environment within the scope of the Department's tasks;
- entering, within the scope of the Department's tasks, data into a publicly available list of data on documents containing information on the environment and its protection.

The scope of activities of the Resident Control and Service Department includes in particular:

- field control of the implementation of contracts concluded with entities collecting municipal waste;
- control of cleanliness and order, including proper collection of municipal waste, in real estate located in the capital city in Warsaw;
- monitoring of activities and cooperation with the offices of the Office of the Capital City of Warsaw, districts, organizational units of the Capital City of Warsaw Warsaw and units of the capital city Of Warsaw with legal personality, in the implementation of tasks related to municipal waste management;
- cooperation with districts, organizational units of the capital city Of Warsaw, Provincial Inspector of Environmental Protection, Marshal of the Mazowieckie Province in the scope of proper municipal waste management by property owners;
- servicing residents within the scope of the Office's properties;
- coordinating matters related to handling notifications and complaints as well as interventions concerning the functioning of the municipal waste management system in the Capital City of Warsaw in Warsaw;
- cooperation with the Municipal Police of the Capital City of Warsaw, other services and district offices of the capital city Warsaw in matters relating to the competence of the Office;
- preparation of draft responses to requests for disclosure of public information and information about the environment within the scope of the Department's tasks.

The scope of activities of the Department of Information Systems includes in particular:

- analysis of the functioning, development and maintenance of the IT system;
- acquiring, processing, collecting, analyzing and sharing spatial information (GIS) related to the supervision and monitoring of the implementation of contracts with entities collecting municipal waste;
- verifying, using an IT system, the implementation of contracts by entities collecting municipal waste;
- preparing and submitting to the appropriate organizational unit of the Bureau a report on the performance of contracts by entities collecting municipal waste
- preparing of analyzes and reporting documents;
- developing a concept for the development and implementation of new functionalities of the IT system in cooperation with other organizational units of the Office and the competent offices of the City of Warsaw;
- keeping a register of users of the IT system;
- support for IT system users;
- preparation of draft responses to requests for disclosure of public information and information about the environment within the scope of the Department's tasks.

The scope of activities of the Contract Settlement Department includes in particular:

- control of compliance with the contractual requirements for entities collecting municipal waste;
- verifying reports and analyzes prepared by other organizational units of the Office;
- calculation and settlement of contractual penalties in connection with the implementation of contracts by entities collecting municipal waste;
- preparation of monthly settlements of contracts concluded with entities collecting municipal waste;
- preparation of reports and analyzes on the amount of municipal waste collected, in particular for the purposes of municipal waste management settlement, and forwarding them to the appropriate organizational units of the Office;
- control of municipal waste management in terms of contracts with entities collecting municipal waste, preparing reports and analyzes in this regard;
- preparation of draft responses to requests for disclosure of public information and information about the environment within the scope of the Department's tasks.

The scope of activities of the Finance and Budget Department related to waste management includes:

- preparation of payment instructions for performed collection and management of municipal waste;
- cooperation with the office competent in matters of taxes and enforcement in the field of collection of fees for municipal waste management;
- coordinating the activities of district offices in matters related to the acceptance of declarations on the amount of fees for municipal waste management and cooperation with departments for the district competent in budgetary and accounting matters in the field of handling and accounting for payments for municipal waste management;
- conducting proceedings regarding reliefs:
  - in the repayment of liabilities due to the municipal waste management fee, in which the value of the receivables exceeds the amount of PLN twenty thousand,
  - in the repayment of liabilities due to fines imposed on entities collecting municipal waste from
property owners, entities running separate municipal waste collection points and municipal waste collectors, constituting fractions of municipal waste: paper, metals, plastic and glass.

The scope of activities of the Department of Communication and Organization includes in particular:

- creating and implementing information, education and marketing policy for the capital city Warsaw in the area of waste management;
- operating the Office's website: www.czysta.um.warszawa.pl;
- preparing, updating and publishing, in consultation with the competent organizational unit of the Office, information on the pages of the Public Information Bulletin within the scope of the Office's properties;
- cooperation with district offices and external entities in the organization of information and educational events;
- cooperation with recovery organizations, in particular in the field of selective collection of waste electrical and electronic equipment and waste batteries;
- coordinating matters related to public consultations within the scope of the Office’s operation, including cooperation with the Center for Social Communication
- conducting international projects related to waste management;
- organizational and office services for the Office;
- supervision over the correct circulation of documents and sending correspondence to the Office;
- conducting social and human resources matters, training, handling delegations of domestic and foreign employees of the Office in cooperation with the competent office of the Office of the Capital City of Warsaw;
- conducting administrative and economic affairs of the Office, in cooperation with the competent office of the City of Warsaw Warsaw, including: handling matters related to ordering seals, official seals, correspondence forms and business cards;
- keeping records of the working time of employees of the Office;
- coordinating matters related to the intervention of deputies, interpellations of councilors, complaints, motions and petitions as well as requests for disclosure of public information received by the Bureau;
- keeping a register of external control;
- preparation of draft responses to requests for access to information on the environment within the scope of the Faculty’s tasks.

The scope of activities of the Department of Solid and Liquid Waste Management includes in particular:

- conducting administrative proceedings regarding:
  o waste generation permits,
  o permits for the generation of waste taking into account the requirements for permits for waste collection or waste processing permits,
  o waste collection permits and waste processing permits,
  o obligations of entities using the environment or facility managers (road, railway line, tram line, airport or port) to prepare and submit surveys ecological, in the event of circumstances indicating to possible negative impact of the entity or the manager object on the environment,
  o imposing an obligation to limit the impact on the environment and its risks and restoring the environment to the proper condition in the event of a negative finding environmental impact by entities using the environment,
  o permits to carry out activities in the field of emptying septic tanks and transport of liquid waste,
  o determining the scope and manner of performing obligations regarding requirements sanitation and environmental protection in the event of expiry or revocation permits to carry out activities in the field of emptying tanks drainage and transport of liquid waste;
- receiving information on the beginning, modification and ending conducting business activity by waste
electrical equipment collectors and electronic;
- preparing information, at the request of the Chief Inspector of Environmental Protection, regarding:
  - compliance of the waste recovery activity carried out by the recipient waste, in accordance with the legal provisions regulating the conduct of such activity,
  - compliance with the terms of the permit to operate in the field of waste recovery;
- keeping electronic records of granted and withdrawn permits for carrying out activities in the field of emptying septic tanks and transport of liquid waste;
- receiving, from those operating in the field of emptying tanks drainage and liquid waste transportation, quarterly reports including their verification;
- conducting administrative proceedings regarding the imposition of fines on entities operating in the field of emptying septic tanks and transport of liquid waste;
- carrying out the control of compliance of the use of the environment with the issued decisions and applicable law;
- handling cases in the field of administrative enforcement in the cases provided for legal regulations;
- cooperation with competent authorities in the field of the Faculty's activities;
- accepting information from natural persons who are not entrepreneurs about the type, amount and places of occurrence of special substances threat to the environment, including asbestos;
- periodically submitting information to the Marshal of the Mazowieckie Voivodeship about the type, amount and places of occurrence of special substances environmental hazard;
- collection and processing of information on use and disposal asbestos-containing products under the Asbestos Base;
- giving opinions on planning documents in the field of the Faculty's operation;
- preparation of substantive opinions on:
  - the environmental conditions for projects that may have a significant effect on the environment,
  - draft local spatial development plans,
  - draft decisions on development conditions and decisions on the location of investments public purpose;
- entering, within the scope of the Faculty's tasks, data to the publicly available list of data on documents containing information on the environment and its protection;
- preparation of draft resolutions of the Council of the Capital City of Of Warsaw and the mayor's orders within the scope of the Faculty's operation;
- preparing draft replies to requests for information public and information about the environment within the scope of the Faculty's tasks.

The scope of activities of the Waste Management Strategy Team includes in particular:
- monitoring investments and projects important for the functioning of the municipal waste management system in the Capital City of In Warsaw;
- preparing information, analyzes and reports for the President and the Council of the Capital City of Warsaw Warsaw and other bodies and institutions;
- analyzing the applicable regulations in the field of waste management and initiating changes to these regulations;
- cooperation with the Marshal of the Mazowieckie Voivodeship on the design and update of the Voivodeship Waste Management Plan;
- issuing opinions on the Provincial Waste Management Plan;
- monitoring of available waste treatment technologies, in particular in terms of their actual use and impact on the achievement of recycling levels by local government units;
- monitoring of available solutions for waste treatment, consistent with the assumptions of the circular economy;
- developing projects of programmes, plans, strategies and policies regarding waste, including in particular those ensuring the achievement of the required levels of recycling;
- preparation of draft responses to requests for disclosure of public information and information on the environment within the scope of the tasks of the Team.

The scope of activities of the Independent Multi-Person Workstation of Legal Advisers includes in particular:

- preparation of draft contracts and issuing legal opinions on documents, including administrative decisions and provisions, created in the scope of the Office's operation, including public procurement procedures;
- representation in litigation before common courts and administrative courts as well as public administration authorities in the scope of the Office's operation, with the exception of cases which, under the Office's regulations, fall within the scope of the office competent in legal matters
- monitoring the case law of common courts and legislative changes related to the activities of the Office;
- issuing opinions on the formal and legal compliance of draft internal legal acts with the provisions of law, with the exception of matters which, in accordance with the regulations of the Office, fall within the scope of the office responsible for legal matters
- giving opinions on draft responses to interpellations, complaints and motions as well as requests for disclosure of public information and information on the environment to the Office
- preparing draft authorizations and powers of attorney granted by the President in the scope of the Office's operation
- preparation of draft resolutions of the Council of the Capital City of Warsaw and the orders of the President in the scope related to the tasks of the Office;
- keeping a register of court cases;
- handling cases concerning the disclosure of public information.

Environmental Protection Department within the City of Warsaw; handles among others the issue of asbestos (asbestos removal grants).

Conclusions on HW competencies in Poland
The competences in the field of waste management are assigned in primary legislation: Environmental Protection Law, Waste Management Act, Act on ELVs, Act on WEEE, Act on batteries and accumulators.

Hazardous waste from households
All issues related to household waste collection and treatment are regulated in the Act on order maintenance of municipality. It is a responsibility of municipality to set up a system of collection of waste from private households and ensure its proper treatment.
This includes: building local facilities for household waste treatment (incl. sorting plants); organizing collection of household waste from private buildings. Municipality selects through a tender procedure companies that provide regular collection of waste at the territory of each municipality. If territory of municipality is bigger than 10,000 inhabitants, more than one company may be selected.
Permits for treatment of waste are issued by starosta (head of county, subregional/county level). If waste treatment facility requires IPPC permit, it is issued by marshall (head of region, regional/provincial level). Regional and sub-regional governments are responsible for waste management of all types of waste, except for household waste. Household waste management is responsibility of municipality and it is based on Act on order maintenance of municipality.
Establishment of network of stationary collection points to collect certain streams of hazardous waste that may be generated in private households: - outdated pharmaceuticals and chemicals - WEEE - batteries and accumulators - construction and demolishing waste Such places shall also accept certain non-hazardous waste e.g. used tyres, garden waste, discarded furniture and other oversized waste. Each municipality is obliged to establish min. one collection point and publish on its website the address(es) of such collection point(s).
Transport of hazardous waste - Currently waste carriers must be authorised by sub-regional authority starosta. In the transport permit starosta indicates the codes of waste, which carrier is authorised to transport. Since January 2018 all waste carriers will have to be registered in nationwide waste database and be given a specific registration number. Applications for registration will be sent to regional authorities (marshal).

### 3.3 Institutional framework of Albania

Law No 115/2014 “On Administrative and Territorial Division of Local Government Units in Albania” foresaw the administrative division in 12 regions and 61 municipalities. In the Region of Tirana lives 31% of total population organized in five municipalities. In Albania, waste is governed by the first two levels of government, which are: central government and local government. The disproportion of finances for public services between local and central government is extreme: 8% versus 92%.

The local government itself consists of the Government of the first level that represents the Municipalities and that of the second level that represents the Regional Council. At the central level there have been a number of changes regarding the responsible institutions with the creation and merger of Ministries, while at the local level Municipalities have always been directly responsible in providing the service, with a regulatory and planning intervention of the Region. While the responsibility for provision of waste management services is legally for the local self-governments, the programming and implementation of major funds (EU and National) are at the national level. Considering the requirement to implement technologies and approaches never seen before in Albania, then the repository of institutional knowledge is at the national level too. These issues are mostly typical of Municipal Solid Waste with the challenges of introducing household separation, recycling, and institutional management.

According to Law No 139/2015, municipalities are responsible within their jurisdiction for the collection, removal and treatment of solid and household waste. The government has invested heavily in drafting the legal and regulatory framework in line with European Union (EU) policies in the waste management sector. The problem remains with the implementation at the local level and whether these objectives are feasible. This difference has led to the inability to reach the agreed objectives.

Institutional capacities remain weak at all administrative and government levels, and even though there have been attempts by the municipalities to manage the territory, even with the closure of 89 existing non-sanitary landfills. Municipalities should have a role clearly reflected in the Sectoral Law on Integrated Waste Management, which does not clearly specify the specific responsibilities of the local government units for management and administration in accordance with the definition of the Law on local self-government, which stipulates that the collection, transport, storage and disposal/treatment of solid urban waste is under responsibility of municipalities.

Institutional management at the central level is divided into policy and investment management. For the policy management, the Ministry of Tourism and Environment is in charge of direct duties (DCM No. 509/2017) while for

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19 Local Government in Albania, Status Report, 2019
20 DoCM No. 509, of 13 September 2017 “On Determining the Field of State Responsibility of the Ministry of Tourism and Environment”
the investment management, the Ministry of Infrastructure and Energy is the main body in charge (DCM No.504/2017).21

The Ministry responsible for the environment

Ministry of Tourism and Environment (MTE), takes the lead in the general regulatory and policy framework for all types of waste and fully oversees the management of hazardous waste. In cooperation with other institutions, the MTE is the main institution responsible for drafting and implementing of the national strategy and of the action plan on waste management, waste management, policies, legislation, etc. Together with other dependent institutions, including National Environment Agency (NEA) and the State Inspectorate of Environment, Forests and Water (SEFWI), the Ministry has overall responsibility for setting up and monitoring the implementation of waste management system at regional and local level. Specific responsibilities of the MTE, as revised according to DCM No 509/2017, includes the following:

- Design and implement environmental policies, including waste treatment standards and the effects they bring to the air and the environment, air quality, noise, industrial pollution, chemicals, climate change and monitoring of environmental and water quality indicators, as well as environmental impact assessment;
- Drafting and monitoring the implementation of the National Strategy, National Plan and Regional Plans, drafting and developing of legislation and other bylaws to ensure the implementation of the National Strategy and Plan, with particular focus on implementing the waste hierarchy as defined in the Law No. 10463/2011 and subsequent bylaws;
- Issuance of permits to enterprises operating in the field of waste management, including the export and cross-border shipment of non-hazardous waste according to the rules of the Basel Convention;
- Organizing and managing data registers related to various issues of waste management, the determination and issuance of permits for construction of sites on purpose disposal of hazardous waste and for enterprises that transport, dispose of and treat hazardous waste.

This Ministry’s budget mainly includes the support for funding local costs related to projects funded by foreign sources. MTE has charged the Waste Management Sector to deal with waste related issues. It functions as part of Directorate of Conceptualising and Feasibility of Environmental Projects (DCFEP). This Directorate is responsible for programming and planning at the national level regarding waste legislation, including recycling and packaging directive. The DCFEP has 9 staff but only 3 are dedicated to the waste sector. A comparison with similar candidate countries going through Chapter 27 approximation highlights that the DCFEP will need far more relevantly qualified staff soon. On the other hand, the limited resources do not change the responsibilities imposed upon DCFEP to conduct strategic planning, programming and implementation for Albania to make progress in the discussion over negotiation.

MTE relies on the implementation and enforcement of environmental policies by the National Environmental Agency (NEA), State Inspectorate of Environment, Forests and Water (SEFWI) and Regional Environmental Agencies (REA), with branches throughout the country, which also interact with local authorities. Despite the wide range of responsibilities and authority given to these institutions according to legislation in force, the general opinion is that they operate with a limited number of staff, have shortages of basic equipment and facilities and have limited capacity. As such, their role is simply limited to the gathering information, that is often inaccurate and contradictory compared to the information of other institutions, even when it comes to the preparation and reporting of the Annual Report on Environmental Protection.

21 DoCM No. 504, of 13 September 2017 “On Determining the Field of State Responsibility of the Ministry of Infrastructure and Energy”
MTE also supports the meetings of the National Committee for Integrated Waste Management. The main line institutions/subordinate organisations/institutions operating under the dependence of the ministry responsible for environment, which regulate the sector and which have an important role are:

- The Sector for Preparation of Feasibility Studies for Environment, Clean up and Waste Treatment Projects;
- The National Environment Agency (NEA) and the network of the Regional Environment Agencies (REA); and
- The State Environment, Forests and Water Inspectorate (SEFWI).

**The Sector for Preparation of Feasibility Studies for Environment, Clean up and Waste Treatment Projects**
The Sector for Preparation of Feasibility Studies for Environment, Clean up and Waste Treatment Projects is composed of only 3 staff. This sector is answerable to the Directorate of Conceptualising and Feasibility of Environmental Projects and is the responsible structure in this Ministry to undertake responsibilities in waste management. The responsible administrative Ministry has limited personnel and capacities and a lack of equipment, as well as their tasks that are general and not clearly defined.

**The National Environmental Agency (NEA), and inspection structure related to environment and water**
NEA gives environmental permits for waste treatment installations and monitors environmental protection in all waste treatment installations.
The National Environment Agency, which functions is based on the DCM No. 568, dated 17 July 2019 “On the creation, organization and functioning of the National Environment Agency”, exercises its activity across the country and is organized in two levels:

a. Central level through the general directorate.
b. Regional level, through four regional environmental agencies (REAs).

The network of the Regional Environment Agencies is composed of 12 regional branches led by NEA at the Central Government level. The NEA has these main functions:

1. Ensuring environmental performance;
2. Environmental research and knowledge;
3. Environmental impact assessment;
4. Thematic inspection and supervision for meeting legal requirements and environmental conditions.

The main responsibilities of NEA and of the regional network in relation to waste management are related to:

- Monitoring and collection of data on management of waste generated by the municipalities and the regional authorities; aggregate collected data to national statistics.
- Determination of the place for the municipal waste disposal; and
- Issuance of environmental permits for the objects where waste is treated at the local level.

In the course of its authority, NEA is asked to ensure cooperation with local authorities.
Inspecting structures exercise their activity concerning the environment and waters as follows:

- Preparation of periodic reports regarding environmental assessment;
- Preparation and implementation of the National Plan on Environmental Monitoring;
- Provision of state supervision of environmental protection;
- Performing checks according to a thematic risk-based programme;
- Provision and supervision of the implementation of legal acts and by-laws;
- Review of complaints on administrative measures and fines imposed on subjects;
- Cooperation with other inspectorates;
- Exercise of any other function provided for in special laws related to environmental protection, environmental permits and inspection.
The State Inspectorate of Environment, Forests and Water (SEFWI)
The State Environment, Forests and Water Inspectorate (SEFWI) is responsible for ensuring and having control on the implementation of the laws governing environmental protection. SEFWI issues fines and has the authority to suspend and block all activities of every private or state authority violating the legal provisions on environment protection, integrated waste management and other laws dealing with the environment. The Inspectorate has the authority to report to other authorities and to publish the findings in a report on the overall condition of the environment in general, and on all the waste management aspects in particular.

Integrated Waste Management Committee
As one of the measures for the implementation of the Strategy in the Ministry of Environment, The Committee on Integrated Waste Management (CIWM) was established and operates due to the DCM No. 967, dated 25 February 2013 “On the organization and functioning of the CIWM”. The Committee is managed by the Deputy Minister of Tourism and Environment and is composed by some other deputy ministers and by the representatives of the stakeholders, including civil society organisations, donor organizations, the recycling industry and other sectors. The CIWM is supported by the National Waste Management Advisory Group (NWMAG, group of technical experts), established with an act of the MTE.

CIWM should convene no less than once every three months to review and adopt documents and acts related to waste management. CIWM also convenes to review improvement plans for existing disposal sites, deciding on measures to be taken and the transition period necessary for their implementation. From the legal point of view, the CIWM has a broad level of freedom and responsibility to prepare and implement its own programme regarding waste management, draft and propose the direction of newly drafted policies and legislation in the MTE and other executive duties. CIWM also coordinate policies, efforts and resources at the level to propose legislative and administrative measures for waste management and for drafting an annual report on the situation of waste management in the country.

The NWMAG is responsible for coordination among ministries, municipalities and other actors in the establishment and implementation of strategic policies. It has also the duty to provide technical support and advice to all actors involved in the waste management process and to design, implement and direct awareness–raising and education campaigns as well as to promote the initiatives of international cooperation.

Even though the field of responsibilities of the CIWM is very broad, the efficiency of this organisation is very low. Its role is very formal, there is no budget assigned for this organisation and none of the main decisions, for example, the one on incinerator network development, amongst others have not required any preliminary decision-making by the CIWM.

Ministry responsible for Infrastructure
The role of the Ministry of Infrastructure and Energy - MIE (former Ministry of Transport and Infrastructure) in the waste sector is based on Law No. 10463/2011 and on DCM No 504/2017, which defines the responsibilities revised at the level of central government. The field of operation of this Ministry regarding urban waste is extended in the waste territorial and infrastructure planning, including the National Agency for Territorial Planning, by the former Ministry of Urban Development. The ministry in charge of infrastructure exercises its activity in:

- Territorial planning and positioning of landfills and other waste treatment infrastructure.
- Drafting and implementation of development policies of urban waste infrastructure, development of landfill standards, better techniques and infrastructure of municipal waste and inert waste treatment.
- The coordination of policies on urban waste infrastructure regarding their implementation and monitoring and implementation of these policies. The direction, management, supervision and definition of technical standards of the waste disposal sites’ infrastructure.
MIE is the only central government institution that has a budget programme for Urban Waste Management in its medium-term budget. MIE covers investments for infrastructure and drafting of standards and best techniques for the management of municipal waste and construction and demolition waste, as well as the project cycle related to the construction (planning, design and implementation) of regional landfills. The Ministry also coordinates and monitors the activity of landfills/dumpsites, the use of regional landfills and incineration plants, determines the technical criteria for the study and makes the necessary preparations for the closure of urban landfills/dumpsites. This ministry has been responsible for collecting data on municipal waste and waste from construction and demolition, being for many years the main and only source of information about the amount of waste generated in the country.

In cooperation with the Ministry responsible for environment, the MIE has the authority to monitor the activities related to the municipal and C&D waste disposal and treatment, through the design, construction and implementation of landfills and incinerators. However, the recently adopted decisions regarding the procedures for studying and construction of the incinerator in Elbasan, as well as the ones proposed in Fier and Tirana, are managed by the MTE.

Cooperation between the two ministries is extended even to the issuance of regulations and monitoring of end of life vehicles (DCM, No. 705, of 10 October 2012), and management of ship generated waste (DCM, No 1104, of 28 December 2015).

From the organisational and administrative standpoint, the “Sector of Development Programmes for Urban and Solid Waste Treatment” has been established as part of the Ministry. The Sector is made up of 6 employees and is subordinated to the Directorate of Infrastructure and Territory Development Programmes (Directorate of Programmeeing of Wastewater and Waste - DPWW), which is in charge for waste sector infrastructure investments. DPWW has an important role in the planning of landfills, master plans, feasibility studies and investment in closure of dump sites in the country. The respective administrative unit has a limited staff both in terms of numbers and capacities and lacks equipment and well-defined tasks.

The Ministry responsible for infrastructure has an annual budget mainly earmarked to financial studies for detailed projects and investments for closing down the existing landfills, construction of new landfills and of other treatment facilities, including capital and operational costs of the incinerator of Elbasan and of Fier, which has not yet started to be constructed. The budget MIE includes the support for funding local costs related to the projects funded with foreign funds.

The new Government structure following the General Elections of June 2017, the mandate of the former Ministry of Urban Development (MUD) has been transferred to MIE, including the budgetary funds to be used for covering local costs of financial support by KfW for drafting of the Master Plan for Waste Management and development of a database and of the Management Information System based on the map of the location of landfills. The responsibilities of this Ministry also include regulation of industrial and mineral waste. Two special instructions are expected to be developed and drafted regarding industrial waste management, although the documents are not yet prepared and agreed upon.

**National Agency for Territorial Planning**

Line institution, the National Agency for Territorial Planning, is also transferred from the former Ministry of Urban Development to the MTE, by DCM No 504/2017. This Agency determines free zones for waste treatment infrastructure through local planning.
National Agency of Water Supply, Sewerage and Waste Infrastructure (AKUM)

The National Agency for Water, Wastewater and Waste Infrastructure was created in 2018 under the MIE according to DCM No. 431, dated 11 July 2018. The responsibility of the agency in the field of waste is territorial planning, waste infrastructure and the technical support of the policies of MIE.

Other ministries

Law No. 10463/2011 “On integrated waste management”, amended other ministries engaged in waste management such as the Ministry of Health and Social Protection (hospital waste), Ministry of Agriculture and Rural Development (agricultural waste), Ministry of Defense (military waste), Ministry of Finance and Economy (financial affairs).

Regional Level

Regional councils are the second-tier of local government in Albania, not directly responsible for waste management services at the local level but legally they are assigned to provide the regional policy framework through regional plans for waste management. Nevertheless, the councils are responsible for approving respective local waste management plans before they enter into force (article 13, Law No 156/2013, amending Law No 10463/2011). The national councils’ own function is the development and implementation of regional policies and their harmonization with the national policies. The councils develop and approve the regional plans for integrated waste management and report annually on their implementation to MTE (article 13, Law No 156/2013, amending Law No 10463/2011). Role of regional councils had been revised in the last few years, while National Integrated waste Management Strategy and Action Plan suggest a reduced role for the Regional Councils in waste management.

Local Self-Government Units (LSGU)

Law No. 139/2015 “On local self-government” regulates the organization and functioning of local self-government units and respective bodies in the Republic of Albania, as well as defines their functions, competencies, rights and obligations. Particularly, the “collection, transport, disposal and treatment of municipal waste” is set as the municipalities’ “own” function. Under this definition, municipalities have the right and the responsibility to manage service delivery in a way that best suits their specific conditions and to cooperate with other municipalities, set service fees and tariffs and a mechanism for revenue collection, and construct and administer facilities for waste treatment. Law No 8094 dated 21.03.1996 “On public waste disposal” is still referenced with regard to the current collection, transport and treatment of waste, and modern standards are still to be fully employed by all municipalities.

Specific waste management tasks for municipalities and regional councils are defined with Law No 10463/2011 “On integrated waste management”, as amended, and several bylaws, derived from the aforementioned law. Each LSGU or group of LSGUs shall establish a regulation for the control of the management of specific waste streams generated in its territory, including paper and cardboard, glass packaging, metal and plastic beverages and food, or the green mass from parks or home gardens. These rules might be stricter than the goals and requirements set out in the National IWM Plan. These regulations are approved by the Regional council.

Direct responsibilities of LGUs are related only to planning and reporting for waste management in their respective jurisdictions. Article 12, point 2 of the Law No 10463/2011 constitutes a legal obligation for every municipality in Albania to draft a local plan for the waste management in the territory under their jurisdiction, which have to be in line with national and respective regional waste management plans. This has been specified further under Law No 139/2015 “On Local Self–Government”, which conveys the full authority of establishing an integrated waste management to the local governments.

In Albanian municipalities, waste management generally falls under the responsibility of the Directorate of Public Services, but sometimes the Environment Directorate, or the Urban Planning Directorate. A municipality might operate with a local enterprise responsible for cleaning, greening and lighting. It is important to note that the
institutional framework of the LSGUs is diverse, and that the responsible sector that deals with waste is not always clearly defined. Thus, collecting reliable data from the municipalities proves to be a challenge.

Cleaning contracts are drafted and signed by the municipalities, also in accordance with the provisions of Law No 8094/1996 “On public waste disposal”. The model of these contracts does not offer the standards of waste management as outlined in Law No 10463/2011 “On IWM”, and the sub-legal acts deriving from it. At the local level, solid waste management services are either implemented with the municipalities own personnel and equipment or by private contractors.

Strengthening the role of municipalities is a vital component, deriving from the harmonization of the Law on Integrated Waste Management with the Law on local self-government. Municipalities are responsible for managing municipal waste, which is collected from, or in the name of, municipalities and include:

- Household waste and similar, including:
  - Bulky waste, e.g. old furniture,
  - Garden waste, leaves, prunings, street cleaning and public market waste;
- Waste from commercial activities, small businesses, offices and institutions;
- Waste from other municipal services related to parks, other green areas, etc.

Municipalities are mainly responsible for the operation of the cleaning service, waste collection and transfer to collection sites (transfer stations). Municipalities may establish and operate local interest centers for the separate collection of waste, including bulky, recyclable and biodegradable waste.

Source separation is an LSGU responsibility. Recycling systems for packaging and other specific waste should be established by the producers of products and/or the recycling industry under the Extended Producer Responsibility schemes.

According to Law on local self-government, the municipalities have the right and responsibility to:

- Organize the provision of the collection, transport, treatment and disposal services of municipal waste;
- Build, own and operate treatment centers;
- Levy service fees to cover costs of the service provision and collection of revenue.
- Organize and distribute the waste management service within the municipality and/or cooperate with one or more other municipalities, by using all legal and administrative means, including but without being limited to:
  - An administrative budgetary structure as part of the organisational structure of the municipality;
  - A municipal budgetary public legal person;
  - The independent Municipal Public Unit;
  - Management or the service contract with private or public operators as third parties;
  - Every other form according to the provisions of laws on concessions and public-private partnerships. The specific tasks for the Municipalities and the Regional Councils are stipulated by Law No. 10463/2011 “On Integrated Waste Management”, as amended, and some bylaws, pursuant to the above-referred-to law.

But, this law fails to clearly stipulate specific management and administration responsibilities for the municipalities, in compliance with the definition of Law on Local Self-government, which provides for the collection, transportation, annihilation and treatment of the municipal solid waste as a function of municipalities.

Waste separation at source in at least in four different types, as well as waste collection until 31 December 2018 were made obligatory with DCM No. 418, dated 25.06.2014, On the differentiated collection of solid waste. This obligation, however, was not met by the municipalities: While the majority of municipalities so far did not show any effort on the waste separation at source, serious efforts by Tirana Municipality in cooperation with the Italian city
of Verona were undertaken in terms of waste separation but eventually failed, due to lack of awareness raising in citizens and lack of maintenance.

The role and responsibilities of municipalities to gather and report waste data are specified particularly in DCM No. 687/2015 “On the Implementation of Rules for Keeping, Updating and Publishing Waste Statistics”, which has entered into effect on 1 January 2019.

Tirana Municipality

Tirana Municipality has a dedicated directory for cleaning and waste management in the capital. One of the directorate of General directorate of Public Works within the Tirana-self government is Cleaning and Waste Management Directorate with total of 16 employees plus director. It is divided into two sectors (sections): Sector of Cleaning and Urban Waste Management Monitoring and Sector of Supportive Policies Related to Abusive Deposit Control.

The Cleaning and Waste Management Directorate (CWMD) manages issues related to the provision of a quality service in the field of cleaning, in accordance with the strategies and the national plan for urban waste management by applying policies and strategies for a better quality management and according to urban waste standards. Also, the CWMD is responsible for the implementation of strategies, policies and plans of the respective field where it operates, as well as for programmes, activities and processes, which must be managed in accordance with the principles of legality and transparency.

Responsibilities:

- CWMD approves and sets objectives in accordance with the approved policies and strategies, ensuring the expansion of this service in accordance with the urban development plan of the city by collecting information, analyzing and identifying existing problems on the situation of waste collection, transportation and disposal;

- Approves the annual and medium-term investment planning, in order to achieve the foreseen standards of this vital service for the city and the citizens;

- Cooperates with other policy-making structures to solve various problems on the situation of waste collection, transportation and disposal;

- Directs the work related to the management and financing of all contracts, including periodic, technical and financial reporting on the progress of their implementation, as well as the control of situations and documentation prepared for financing.

The sector of Cleaning and Urban Waste Management Monitoring has the following responsibilities

- Supervises and coordinates the work related to the implementation and financing of all contracts, including periodic, technical and financial reporting on the progress of their implementation as well as the control of situations and documentation prepared for financing;

- Supervises and coordinates the process of controlling situations and documentation prepared for financing;

- Monitors the realization of service quality for all contracts, based on the terms of the contract;

- Verifies and controls the work of contractors and realizes stable cooperation;

- Proposes standards and technical specifications and evaluates the situation based on the available information, for the management of the cleaning activity of the city, suggesting and making the most efficient decisions;

- Collaborates closely with other policy-making structures and manages the work of providing information
Context analysis in three partner cities

on waste management in Tirana, in order to actively inform the community;
- Cooperates with the concession company, private operators and structures subordinated to the Municipality of Tirana for waste disposal;
- Processes data coming from the concession company, private operators and structures under the Municipality.

The responsibilities for the sector of Supportive Policies Related to Abusive Deposit Control are:
- Organizes the work related to the collection of data on abusive waste discharges, performing the processing and reporting of information to the direct superior;
- Identifies and monitors abusive discharges in the field;
- Cooperates with the private operators of the area and the structures subordinated to the Municipality of Tirana, which cover the cleaning service for intervention and elimination of the areas ascertained with abusive waste deposits;
- Follows the problems to the requests and complaints forwarded by the citizens or other state or private entities, to the relevant structures for abusive deposits;
- Organizes and attends presentations of the environmental education plan in cooperation with the Directorate of Environmental Policies and Education;
- Realizes the promotion of the necessary information in order to discipline and separate the waste.

The main structure of the Tirana Municipality is presented in the diagram below. For the purpose of this Baseline study for “Capital cities collaborating on common Challenges in Hazardous Waste Management” only the General Directorate of Public Works, where CWMD is placed is detailed till the sector level.
Context analysis in three partner cities

Figure 4 The main organisational structure of Tirana Municipality
Responsibility of producers and other businesses

Producers and other business actors, public or private service operators, and other operators licensed to manage different categories of waste should abide by the conditions of the permits/licenses and shall take technical, technological and organizing measures to encourage the prevention, recovery, recycling, and final safe disposal of waste. They should ensure the monitoring and reporting of generated, collected, recovered and disposed waste.

Role and responsibilities of the citizens

The main role of citizens in the waste management system is reducing the amount of generated waste, undertaking composting initiatives at home (at least in rural areas) and participating in household waste separate collection, recycling, recovery and disposal systems according to municipal rules and programmes. Their main purpose is to prevent waste generation, to minimize the amount of waste disposed of in the public waste collection system, to separate the waste at source, as well as provide the service fee in the amount and conditions set forth by the municipalities they belong to.

The citizens should cooperate with the municipality in common programmes for the implementation of the waste hierarchy steps.

Allocation of responsibilities between central and local governance and waste producers is given in the following table:
### Table 8 Allocation of responsibilities among central and local government and waste producers with regard IWM22

<table>
<thead>
<tr>
<th>Area subject of responsibility</th>
<th>Level of Authority</th>
<th>Exercising of authority</th>
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<tbody>
<tr>
<td></td>
<td>Central Government</td>
<td>Regional Council</td>
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<tr>
<td>Collection and disposal of municipal waste</td>
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<tr>
<td>Separate collection and disposal of bio waste</td>
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<td>Separate collection and disposal of 4 recyclable waste (paper/cardboard, etc)</td>
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<tr>
<td>Collection, disposal of hazardous and specific streams</td>
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<td>Selection and treatment of bio waste</td>
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<td>Selection and treatment of recyclable waste</td>
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<td>Recovery</td>
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<tr>
<td>Collection, disposal and treatment of other specific waste streams including hazardous and specific streams</td>
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<td>Planning</td>
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<td>Reporting</td>
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<td>Monitoring</td>
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<td>Licensing</td>
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<td>Permission</td>
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<td>Development and construction permits</td>
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<tr>
<td>Licensing Trans-boundary movement</td>
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<td>Waste ownership after delivery</td>
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<tr>
<td>Cost calculation and fee setting</td>
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</tr>
</tbody>
</table>

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1 Direct exercising authority of a competence/task is understood to include competence / task for which an authority is directly involved with its delivery

2 Indirect exercising of authority of a competence / task is understood to include competence / task for which relevant authority are indirectly (not as an own right) involved in the delivery

3 Direct exercising authority of a competence/task is understood to include competence / task for which an authority is directly involved with its delivery

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22 A_T1.2.2_Legal Assessment, Final report, 2017
4 EXISTING WASTE MANAGEMENT SYSTEMS

4.1 Existing waste management systems in Yerevan, Armenia

4.1.1 Municipal waste composition and quantities

Data on waste quantities are unreliable because the amount is calculated based on waste truck volume and daily number of discharges since the weighbridge does not exist on the currently used landfill.

According to estimation of Yerevan Municipality representatives, waste generated by the citizens of the whole City (1,084,000, based on the statistic of Armenia, 2020) is minimum 400,000 tonnes/y. It is 369 kg per capita per year or 1 kg per capita per day. Data for 2019 are not available while estimated generated municipal solid waste in Yerevan city in 2018 was 310,000 tonnes/y, 850 t/day.

The municipal waste composition was determinate within the project “Waste Quantity and Composition Study (WQCS)” (published in 2020), initiated by the American University of Armenia (AUA) Acopian Center for the Environment in partnership with the Government of Armenia. The study has been funded by the AUA Manoogian-Simone Research Fund and has involved a team of three Swedish consultants working closely with the AUA and the Ministry of Territorial Administration and Infrastructure (MTAI) from May to September 2019, Sampling and analyses were carried out in Yerevan and five other cities in Armenia. The research team decided to carry out three tests in Yerevan, based on a stratification strategy with three distinguished areas defined:

- **Test 1: Sub-area 1: High-rise residential areas with waste chutes:**
  About 50 bins mostly of size 1,100 L were collected in 5 districts with high-rise buildings and waste chutes.

- **Test 2: Sub-area 2: Villas and low-rise residential area, curbside bin collection:**
  About 50 bins of size 1,100 L were collected in 5 districts with low-rise buildings and curb-side collection.

- **Test 3: Sub-area 3: Commercial areas with high restaurant density**
  About 50 bins of size 1,100 L were collected in 5 districts with commercial areas with a high density of restaurants.

The report “Waste Quantity and Composition Study (WQCS)” has been developed by the Swedish consulting firm LL Miljökonsult, part of the company group LL Bolagen, which carries out waste collection services and sanitary cleaning in Stockholm, Sweden, in March 2020. Obtained results are shown in the following table and diagram.
Table 9. Average waste weight and percentage per fractions and tests

<table>
<thead>
<tr>
<th>Primary fraction</th>
<th>Secondary fraction</th>
<th>Average weight (kg)</th>
<th>Percentage, %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Test 1</td>
<td>Test 2</td>
</tr>
<tr>
<td>Organic</td>
<td>Kitchen waste</td>
<td>38.88</td>
<td>10.36</td>
</tr>
<tr>
<td></td>
<td>Garden waste</td>
<td>1.87</td>
<td>34.71</td>
</tr>
<tr>
<td></td>
<td>Other biodegradable (e.g. bones, animal</td>
<td>0.82</td>
<td>1.59</td>
</tr>
<tr>
<td></td>
<td>remains, feces)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paper and cardboard</td>
<td>Newspaper and print</td>
<td>1.67</td>
<td>0.83</td>
</tr>
<tr>
<td></td>
<td>Corrugated cardboard</td>
<td>2.51</td>
<td>3.12</td>
</tr>
<tr>
<td></td>
<td>Paper packaging</td>
<td>2.19</td>
<td>1.54</td>
</tr>
<tr>
<td></td>
<td>Other paper (e.g. postcards, books with</td>
<td>0.50</td>
<td>0.38</td>
</tr>
<tr>
<td></td>
<td>hard cover, tickets)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Styrofoam</td>
<td>0.11</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td>Dense (hard) plastic packaging</td>
<td>3.20</td>
<td>2.61</td>
</tr>
<tr>
<td></td>
<td>Other plastics (e.g. toys, disposable</td>
<td>0.88</td>
<td>1.85</td>
</tr>
<tr>
<td></td>
<td>cutlery, tooth brushes)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glass</td>
<td>Glass packaging</td>
<td>5.34</td>
<td>2.98</td>
</tr>
<tr>
<td></td>
<td>Other glass (e.g. drinking glasses, mirror</td>
<td>0.56</td>
<td>0.73</td>
</tr>
<tr>
<td></td>
<td>glass)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metals</td>
<td>Metal packaging</td>
<td>0.62</td>
<td>0.60</td>
</tr>
<tr>
<td></td>
<td>Other metals (e.g. frying pans, cutlery,</td>
<td>1.30</td>
<td>3.55</td>
</tr>
<tr>
<td></td>
<td>screws)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other inorganics</td>
<td>All other inorganics (e.g. cat sand,</td>
<td>1.88</td>
<td>8.81</td>
</tr>
<tr>
<td></td>
<td>ceramics, stones, gravel)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazardous</td>
<td>All hazardous waste (e.g. syringes and</td>
<td>0.36</td>
<td>0.30</td>
</tr>
<tr>
<td></td>
<td>other sharp objects, medicine, paints and</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>solvents, oils, pesticides)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mixed WEEE</td>
<td>All electric items, battery or high voltage</td>
<td>0.27</td>
<td>0.13</td>
</tr>
<tr>
<td>Other</td>
<td>Wood</td>
<td>0.28</td>
<td>0.22</td>
</tr>
<tr>
<td></td>
<td>Textiles</td>
<td>8.57</td>
<td>6.02</td>
</tr>
<tr>
<td></td>
<td>Diapers, sanitary napkins, etc.</td>
<td>4.26</td>
<td>2.76</td>
</tr>
<tr>
<td></td>
<td>Other, not applicable elsewhere (e.g. shoes,</td>
<td>1.91</td>
<td>2.98</td>
</tr>
<tr>
<td></td>
<td>rugs, bags, rubber)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The authors of this Study have concluded that hazardous waste fraction and WEEE (electrical appliances, including batteries, etc.) fractions can only be found in small volumes, which is odd considering the absence of separate collection systems for these fractions. This is however typical for other tests in similar areas and cities, according to their previous experience. It could indicate that the hazardous waste is disposed of elsewhere; for example, liquid hazardous waste as oils, solutions, paint, etc. may be emptied in the sewage network system or at dumpsites.

Regarding WEEE (electrical appliances) there is private company who collect this type of waste from the streets, beside bulky waste and C&D waste.

Regarding healthcare waste from medical institutions, it should not be included in hazardous waste fraction because, according to Armenian legislation, all healthcare units must have a contract with licenced treatment companies. Currently, there are minimum two licenced companies that collect and treat the hazardous waste generated in hospitals and healthcare outpatient units. The companies collect waste from some of the hospitals several times a week. The project team didn’t study their daily operation, meaning that it cannot be confirmed that these companies are able to extend collection services to all healthcare related operations with such a high frequency and considering
that only in-house collection vehicles can be used. Also, the project team didn’t investigate if all hospitals and healthcare units have such contracts and verify the total waste amounts treated.

4.1.2 Waste collection

Yerevan Municipality/City is divided into 12 urban districts and most of the population is urban or partly urban with only one district being rural. Until summer 2019, the MSW in all 12 districts was collected by private company Sanitek Armenia (the branch of Sanitek international group, Lebanon, Beirut), starting from December 2014. As the citizens and municipal government were not satisfied with the quality of their services, the Municipality urgently established, on 20.05.2019 (registration date), the PUC titled Community Agency “Waste removal and sanitary cleaning of Yerevan” (CA “WRSCY”), to whom general management of the MSW in the whole city, in all 12 districts, has been given.

The PUC is fully owned and managed by the Municipality. The work of CA “WRSCY” is under the responsibility of the Communal Service Department/Unit of Sanitary Cleaning and Waste Collection and Deputy Mayor. The waste collection rate is 100% and it is collected once or twice per day. The PUC performs cleaning of the all streets in the City as well. This company also performs emergency cleaning whenever and wherever is needed in the City.

The legal status of PUC is not-for-profit; CA “WRSCY” is not eligible to generate profit. The Municipality has established the PUC, which in fact does not have a licence for MSW management, collection and disposal. According to the Law on waste management the waste collection and disposal, waste management in general, can be performed by a company who has the licence for such activity. The Municipality had no time to wait for the PUC to obtain the licence, because in summer 2019, it was urgent to replace the existing private company in charge of waste management by a new entity. For this reason, the Municipality established the PUC for general waste management, without licence, justifying this decision with the fact that Municipal Government is obliged to perform waste management. Without license, the PUC cannot be registered as an enterprise and is not eligible to generate profit.

The Municipality/Communal Service Department equipped the PUC with the following new equipment in summer 2019:

- 9,000 containers of 1,100 L for MSW collection, in dark green colour.
- 50 vehicles for MSW collection, in orange colour, with the press plate and of the following volumes:
  - 17 pcs of 22 m³,
  - 4 pcs of 19 m³,
  - 5 pcs of 17.8 m³,
  - 8 pcs of 16 m³ (Kamaz),
  - 5 pcs of 8 m³,
  - 10 pcs of 12 m³ (Gazon),
  - 1 pcs of 5 m³, Hundai,
  - 11 vehicles for streets cleaning: 9 pcs of 5 m³, and 2 pcs of 0.6 m³ (for narrow streets and sidewalks).

PUC use 36 collection vehicles out of 50 collection vehicles; the rest of 14 collection vehicles are in reserve. The volumes of 36 collection vehicles in usage are as follows:

- 6 pcs of 12 m³,
- 2 pcs of 8 m³,
- 4 pcs of 19 m³,
- 8 pcs of 16 m³,
- 13 pcs of 22 m³,
- 3 pcs of 17 m³.
PUC works in 2 shifts. PUC’s waste disposal department has one head/director, 24 personnel responsible for 12 administrative districts, 90 drivers, 150 workers. Maintenance of the vehicles and containers is mostly outsourced. PUC have capacity to do small repairs only. As PUC has a large parking area which is fully used for vehicles, there is no available space for establishment of CAC (Civic Amenity Centers) within the territory of PUC.

PUC do not have a weighbridge. Also, there is no weighbridge at the existing landfill. This means that PUC dispose of collected waste at existing landfill without measurement. The containers are dedicated for MSW collection from households, commerce, institutions, and from the industry and health institutions but only for the waste similar to household waste. The industry, retail services, restaurants, health institutions, etc., are not obliged to provide containers for their own purpose. They use the Municipal containers for MSW.

As for industrial waste that is not of the household type, but from the industrial process, industrial entities dispose of it in their environment/neighbourhood, in an uncontrolled manner.

The PUC do not have containers, and subsequently do not provide services, for separate collection of recyclable waste, neither for green waste or hazardous waste.

The main problem in MSW collection is waste generated by households in 2,900 multi-apartment buildings with central discharge channel/chutes in which waste is dumped and collected indoors at the end of channel on the ground floor of the building, i.e. a central waste room. PUC already placed few containers near these buildings. Households on the first, second and third floors dispose their waste in these containers, households on upper floors still use the chutes.

PUC does not collect the waste from central pipes in this tall building. This service is performed periodically by a private company, contracted by the Municipality, with open trucks and special equipment for transfer of waste from the central room to the truck and for cleaning of the central channel/chute and the waste room. The Municipality publishes tenders to contract a private company to collect the waste from chutes and waste rooms and to transport the collected waste to the existing landfill, quarterly. The odour around these buildings, especially near the rooms where waste is dumped is very problematic, especially during the summer season.

The Municipality plans to close the chutes and to place containers for MSW collection nearby these multi-apartment buildings. It is estimated that minimum 2,000 containers of 1,100 L are needed to implement this plan. To realize this plan, households in these buildings have to sign a consent letter for the chutes to be closed and replaced with containers. Many inhabitants are not willing to grant their consent, especially households on upper floors. The Municipality plans to convince inhabitants to agree, especially having in mind that central waste room can be renovated into some office space or shop and rented out. Money earned from the rent could be used for maintenance of the building.

In case the PUC will take over collection of MSW from the central pipes, the PUC needs additional vehicles (8 collection trucks of 10 m$^3$) and additional employees (16 drivers and 32 workers).

There is no database on MSW collected, recycled, disposed, not from the PUC, not from the Municipality or the Ministries, not in the existing landfill, neither by the Armenian Statistical Office. Database on MSW and HW generation, collection, treatment and disposal has to be established as soon as feasible.

**Collection fee**

According to article 5 of the RA Law on Waste Collection and Sanitary Cleaning Services, the waste collection fee is a mandatory fee paid to the community budget or an extrabudgetary account. The fee rates are set by the community council. The fee for waste collection is defined by article 14 of the aforementioned law and may be maximum 400 AMD per month for each resident or it may be defined according to the area of the residential building or apartment, setting at maximum 25 AMD per square meter.
The fee for MSW collection for households is fixed, as 200 drams (ADM) per capita per month. This fee is very low and remains unchanged for a long time now. The Municipality plans to establish a new formula for calculation of this fee and increase it. The industry, commerce, health institutions, etc. pay the fee for MSW collection established as per m² of their working place. For example, the fee for commercial facilities (including markets), food and other service facilities is 50 to 100 AMD per square meter per month. The Municipality makes a decision on this fee level per m². This fee is also rather low.

In general, the fee has to be increased, gradually, to cover all costs of MSW collection, transport, recycling/treatment and disposal. It should be about 5 times higher but the real waste collection and management costs have to be calculated first in order to at least cover operating costs. Possible solutions to ensure revenue collection could be to include these costs as a percent in electricity or water bills. To avoid power supply cuts, all electricity users duly pay their bills.

Representatives of the Administrative departments in each district issuing the bills to all generators, households, industry, commerce and institutions, and collect the payment. Efficiency of payments collection is ca. 80%. It has to be improved. It is regulated by the Order of the Yerevan City Council, December 23, 2011, N360-N decision, Registration of payers for waste disposal, calculation of waste fee, as well as collection of that fee, V. Garbage collection fee calculation and payment terms. The reporting period for calculating the garbage collection fee is the calendar month, and the payment period for each month is the 15th of the month following the given month. In case of late payment of the garbage collection fee for each day overdue from the 1st of the month following the given month, the garbage collector shall pay a penalty in the amount of 0.15% of the unpaid garbage payment fee for the whole period after their payment, but not more than 180 AMD per day.

The insufficient level of registration and collection of service fees significantly reduces the funds available for the implementation of waste collection and modernization of the system. The community receive financing from state budgets as subsidies, parts of which are spent on waste collection and sanitary cleaning. In the planning of community budgets for 2019 the incomes for waste collection increased and the costs on the other hand went down.

Finances are set aside in the community budgets for the implementation of waste collection and sanitary cleaning services. The funds are allocated for landfill operation as well. Only about 30 % of community budgets are formed locally, while the rest is provided by the RA state budget.

The entity generating hazardous waste pays licensed companies for the collection, transportation, neutralization, and liquidation of those waste. On average the hazardous waste handling service for medical institutions varies from 450 to 650 AMD per kg depending on location and the amounts of generated waste. The medical waste treating companies make revenue also by receiving expired products from cosmetics retailers.

### 4.1.3 MSW sorting and recycling

The Municipality also established a new, non-profit company (but income generating), the “Landscape gardening and environmental protection” community non-commercial organization (“LGEP” CNCO), responsible for packaging waste sorting, and bio-waste composting, beside landscape gardening, in January 2020. The LGEP is fully owned and managed by the Municipality. The company operates under the responsibility of the Nature Protection Department and Deputy Mayor.

At the end of December 2020, the Municipality started a pilot project on sorting of recyclables/packaging waste. The LGEP CNCO selected 135 collection points for recyclables, in all 12 districts of the City, and the Municipality equipped each of them with 3 containers (1 blue container of 1,100 L for plastic collection; 1 yellow container of 1,100 L for paper and cardboard collection; 1 black container of 240 L for glass collection).

Municipality provided, to LGEP, 5 pcs of 8 m³ compactors (Gazon, closed, with press plate) for collection of paper and partly plastic, and 4 pcs Mercedes box/truck, of 15m³, for collection of glass and plastics.
LGEP started sorting and collection of cardboard and glass in 2020, the but collection of all four types of packaging waste in all 135 collection points started at the beginning of March 2021. The PUC collects the selected packaging waste once per day, in the evening, and transports collected recyclables to recycling companies.

LGEP company sells all collected recyclables to contracted recycling companies (paper to Narek Zargaryan P/E, plastic to Armplast LLC, glass to Saranist LLC, cardboard to Karton-Tara LLC). At the end of each year, LGEP publishes the tender for selection of recycling companies. Every month, LGEP issues the bills to the recycling companies. The selling prices are approximately, for paper 80 AMD/kg, for plastic 90 AMD/kg, for glass 24 AMD/kg, and for cardboard 40 AMD/kg.

Sorting quality seems to be sufficient. It is the result of on-going visibility campaign on packaging waste sorting, prepared by the Municipality, started at the end of 2020. But quantity of sorted packaging waste is still below the expectation. Collected quantities for paper and cardboard, for glass and for plastics are far below of 1%, which is very low having in mind that content of paper and cardboard in MSW is 13%, of glass is 6%, and of plastics is 17%. Assumption is that only 5-6% of city population is included in packaging waste sorting, because the number of collection points is very low. Approximately 50% of packaging waste can be separated at source, meaning that 50% of population can follow the rules on waste sorting. Other 50% can be separated at landfill. Because of that, it is important that the sorting line is established at/near the new landfill.

The main task of the LGEP is maintaining of parks and green areas in the city. They started composting at small section on the plot where they have greenhouses for plants, in March 2021. They only compost the leaves collected on the plot and in the parks. Only 1 worker works on compost handling. The obtained humus will be used for own purpose, to feed the flowers and trees on the plot, because of small quantity. For now, LGEP do not plan to increase humus production, neither to sell it on market, despite the fact that the market for humus exist.

LGEP have 600 full-time workers and in the summer, they hire an additional 200 seasonal workers. Out of 600 workers, about 40-50 workers work on the collection and transport of recyclable waste. Working time is 24 hours/day, 7 days/week.

LGEP have surplus of containers, 135 red containers of 1,100 L, still not intended for any of recyclable collection. They are considering option to use them for separate collection of hazardous waste or for metals and metal packaging. Also, they plan to start collection of aluminium cans, in spite the fact that interest for aluminium cans recycling is not so high. It is very important to start collection of aluminium cans at source relatively soon. For now, LGEP needs 2 more collection vehicles to collect packaging waste. Those two collection vehicles are planned to be procured this year.

The number of segregated collection points, 135, established by LGEP, in March 2021, is very low. It has to be significantly increased, and separation at source of bio-waste and hazardous waste have to be established in aim to prevent the packaging waste, hazardous waste and biodegradable waste to be disposed at the future new sanitary landfill. LGEP plans to extend the number of collection points up to 600. It means that they need about 1,500 pcs of additional containers, 3 times more collection vehicles, and 3 times more additional workers. By their assumption, approximately one collection point is needed per 1,000 inhabitants. This means that 1,000 collection points should be established in Yerevan as the final plan in next 1-2 years.

There is a significant problem related to the collection of bulky waste and Construction & Demolition waste (CDW), bio-waste, hazardous households waste, metals, WEEE, batteries and accumulators, etc., because the efficient separate collection is not established yet. PUC cannot do it as PUC don’t have open trucks neither mechanization needed to transfer the waste from the street to the truck. Whenever PUC’ workers see this bulky waste placed in containers, they take it out, by hand, and place it next to the containers.

There is a common practice of placing CDW waste in garbage bins or next to garbage bins designated for municipal solid waste. According to the data provided by the company carrying out CDW collection in Yerevan, every month
about 2,000 cubic meters of CDW are collected and transported to the landfill. In addition to that, the operator also collects the bulky waste that residents simply leave next to the bins meant for the household waste. It is likely that some residents ask contractors to take bulky items like furniture, kitchen appliances, etc., to the landfill or bring them there themselves.

The private company Davars LLC, which is contracted by Yerevan municipality to collect construction and demolition waste, usually on call, also collects bulky waste as an extra service. This implies that the bulky waste volume at present is very low. The company uses three open trucks to collect the waste and dispose it at two registered dumpsites. Before, the company took the waste to the landfill in the Ajapnyak district of Yerevan, but this landfill was closed in 2018.

Like in any other country, there is an informal market where people sell the old items like furniture to friends or through internet sites. This reduces the waste going to dumpsites or landfills and is part of an increasing circular economy.

Based on all the above information MSW collection and separation in Yerevan performed by 4 companies is as follows:

1. PUC, Community Agency, owned by Municipality, collect MSW from the containers and by the vehicles provided by the Municipality, and dispose of collected MSW at the official city’s landfill.

2. Private company, contracted by Municipality, on quarterly base, collect MSW from central pipes, by own vehicles and equipment, and dispose of collected MSW at the official city’s landfill.

3. Private company, contracted by the Municipality (Davars LLC), collect bulky waste, WEEE and CDW from the streets, by own vehicles and equipment, and dispose of collected waste at the official city’s landfill.

4. LGEP, owned by the Municipality, collect packaging waste from the containers and by the vehicles designated for separate collection of packaging waste and provided by the Municipality; the collected packaging waste is intended for further sell to recycling companies.

Beside these four companies there are private companies which collect the following waste:

1. Private companies, contracted by healthcare institutions/hospitals, collect healthcare waste, from own containers and by own special vehicles, in aim to do recycling, treatment and final disposal of such waste in own recycling plants.

2. Private companies collect, by own vehicles, packaging waste, metal, WEEE, waste batteries and accumulators, etc., in aim to do recycling of such waste, from the streets, from the companies and institutions which generate such waste.

Beside private companies there are informal groups, mostly of Roma people, who also collect packaging waste, metal, WEEE, waste batteries and accumulators, etc., directly at the Municipal landfill. The collected waste is then sold to the recycling companies.

The Municipality has not initiated a separate collection of hazardous waste, neither of green waste. Also, there are no official plans for implementation of this kind of waste separation.

IN conclusion, recycling activities, separation at source of paper, cardboard, PET and glass have to be increased as soon as feasible and extended to the new recycling materials as follows:

- aluminum and metal cans,
- ferrous and non-ferrous metals,
- wood,
- bulky waste,
- construction and demolition waste, etc.
Also, separation at source should be established, in one year, for the following waste:

- green waste and/or kitchen waste,
- waste edible oil.

The same requirement is for household hazardous waste as well. Separation at source has to be established for all types of HHW. The representatives of the Municipality have some plans for the existing PUC to provide with needed licences and to procure the needed equipment for collection of all above mentioned waste.

LGEP started process to obtain the licence for HW collection. In the Statute of LGEP it is included that LGEP segregates the MSW, including HW. For collection of HW LGEP plans to purchase red containers of 1,110 L which can be divided for collection of different types of HW: batteries, lamps, mobile phones, maybe televisions, computers, etc. In fact, they plan to collect only part of WEEE. They do not plan to collect any other electrical waste as refrigerators, cookers and other huge home electrical appliances, which cannot be stored in containers. Also, they do not plan to collect all other types of HW like detergents, cleaning agents, used mineral oils such as engine and gear oils and lubricating greases, used kitchen oils, containers contaminated with these substances; acids and alkalis; paints, dyes, paint remnants, varnishes, solvents, pesticides, thinners, wood preservatives, chemical kits, adhesives, enamel paints, weed killers, fertilizers, as well as all containers contaminated with these substances, toner and printer cartridges, accumulators, chemicals, pharmaceutical waste, used car tyres, etc.

There are no legal documents for separate collection, transport and treatment of any type of waste, no guidelines and methodology for waste inventory, no measurements, no proper statistical data provision and collection.

**Currently, there are no Civic Amenity Centers in Yerevan that could collect recyclable waste, packaging waste, neither household hazardous waste separately.**

The Municipality contracted the concept design for CAC last year. Also, the Municipality already selected three locations for Civic Amenity Centers (CACs): a small one in Arabkir district, and large CASs in two districts: Avan and Nor Nork. Detailed design of CAC is prepared for all 3 locations. Location in Arabkir is close to the city center, operation of this CAC will be monitored; it might not be of permanent character. The location selection in fourth district, Malatia-Sebastia is under discussion. For now, the only tender for construction of CAC in Avan is in progress. The selected Work Contractor will have to provide the construction permit.

Location selection for CACs is under responsibility of Municipal Construction and Improvement Department. Supervision of works will be under responsibility of this Department, LPEG, Design Company and Nature Protection Department. The CAC will be used for collection of bulky waste, including WEEE, construction and demolition waste from households, in small quantities, waste textiles, etc.

The land of selected locations in Avan is owned by the Yerevan Municipality. Land of selected locations in Arabkir and Nor Nork is owned by the community but provided to LGEP for planting. In the past, every district had its own LGEP. Now, one LGEP covers whole city.

The idea about CACs was initiated by the Sorting Department of the LGEP to store collected packaging waste before delivering to recycling companies, to store collected hazardous households waste, WEEE, bulky waste, hazardous chemicals, automotive waste, C&D waste generated by households, car tyres, etc. Beside that purpose, CAC would make it possible the generators of household waste from districts, like residents/households, small companies, craft workshops and shops from districts to bring that kind of waste in aim to reduce the fee for waste collection and disposal, even to earn the fee for stored recyclable waste. The idea of LGEP is to establish cca 5 CACs in Yerevan Municipality for the beginning, and about 20 points as parking area for collection vehicles and to increase the number of collection points from existing 135 to about 600 in near future as first step, and up to 1,000 collection points as second step. Collection of bulky waste can be performed once or twice per month, as fixed day for all households and small companies; collection of C&D waste can be performed as on call collection, etc.
However, the CACs have to be established in most of 12 administrative districts of Yerevan Municipality. It is of high importance the CACs to be within a reasonable distance to the residents in aim they not to spend too much time and money to dispose their separately collected household waste at CAC, including household hazardous waste.

Before the tender for CAC in Avan would be published, a number of decisions have to be announced as follows: main functions, the number and type of containers and vehicles, types of waste which have to be collected and stored, disposition of the containers, and financial sources.

Beside containers and vehicles, LGEP will most probably need the following equipment to be supplied at CACs: the shredder for branches shredding before composting; pressing machine for pressing and packaging of waste paper, cardboard, and plastic; the crusher for C&D waste crushing after separation of wood, metal, asbestos, and other components from C&D waste. Concrete, asphalt and stone, crushed into small particles can be used as raw material for production of new asphalt base, as daily cover for waste disposed at the landfill, etc.

Either PUC or LGEP can take over separate collection of biowaste, bulky waste, C&D waste, and hazardous waste, and management of CACs as well, but for these services, they need additional investments, additional employees, vehicles, containers, etc.

Regarding hazardous waste, LGEP plan, as first step, to collect HW and to store it in Civic Amenity Centers. Around existing landfill there are several sites as possible HW storage sites CACs. As second step, LGEP plan to sell it/export in other countries, because for now, there is no market for HW waste. This idea has to be carefully analysed because the export of waste is not a realistic option considering the international treaties and regulations in the surrounding countries, Turkey, Iran, Azerbaijan, also considering that transport/import of hazardous waste is forbidden in Georgia.

The awareness campaign on separate collection of waste has to be intensified in next months aiming the CACs to be established in some of 12 districts in short time period. Information and guidelines on waste management should be developed and disseminated. This could be coordinated with a general campaign for public awareness regarding waste, recycling and other environmental issues. For hazardous waste in general, it is not crucial to know the exact volumes but rather to raise awareness with both the general public and other waste generators on what is hazardous and how should it be sorted, stored, handled and transported. One example would be the hazardous components in construction and demolition waste. Behind households/residents, training and education of businesses and industry is also necessary.

4.1.4 MSW disposal

The existing landfill, Nubarashen city dumpsite, is located at 4, Nubarashen highway which was put into operation in the 1950s. It is 9-10 km away from the city center and occupies the area of 52.3 ha. Land of dumpsite is owned by the Municipality. This land is not dedicated to waste disposal officially. The dumpsite is operated by the private company “Erebuny Mkarutyun” LTD which pays the rent for the land to the Municipality.

Currently, 1,000-1,200 tonnes of MSW is dumped here daily (annually 365,000-440,000 tonnes). Roma people working for this private company press the waste and neutralize it by covering with the layer of soil of 25-30 cm. This company also put the soils over generated leachate stream, avoiding flowing of leachate far away and avoiding bad odours. Recently, the Municipality installed a fence of 2 m height around the dumpsite and a check point to prevent illegal dumping. Also, a simple wheel washing facility has been constructed.

There is no special landfills for hazardous (especially highest, 1st class of hazard) substances in the entire Armenia, neither in Yerevan Municipality, which leads to uncontrolled dumping and accumulation of hazardous waste at Nubarashen dumpsite, and other locations. In rare cases, the generators who act responsibly trying to find proper ways to dispose hazardous waste end up keeping the later upon the request of the respective authorities. As a result,
objects containing mercury and other hazardous substances end up in dumpsites. There is also no funding for treatment of waste with 1st class of hazard, e.g. mercury containing lamps, etc.

The Nubarashen dumpsite is the largest one in Armenia. There is no weighbridge and incoming vehicles are not registered or monitored, and thus, the types and volumes of deposited waste can only be approximately estimated. There is no sorting line before dumping, meaning there is no separation of municipal waste, including hazardous waste streams. Roma people perform sorting of recycling waste, like plastic, paper, metal, etc., by hands. They sell selected recyclables on the market without any registration of the quantities and without any payment to the Municipality (except for the rent paid by the company working in the landfill).

The Nubarashen landfill is the only one in Armenia where landfill gas extraction for CDM has been installed. The project “Nubarashen Landfill Gas Capture and Power Generation Project in Yerevan” was initiated by the Japanese company Shimizu Corp. in 2005 with an estimated CO₂-equivalent reduction of 2.16 million tonnes. The contract between Yerevan Municipality and “Shimizu” corporation has been signed on March 10, 2009. On the whole, the realization of the project will take 16 years. The treaty is valid till 2023, and by that time it is estimated that 512 thousand tonnes of CO₂ will be reduced. The installation only covers a minor part of the whole area, though. It is not clear whether the gas pump station is still active. In any case, there is no utilization of the gas apart from flaring (thus converting it from the strong greenhouse gas methane to less potent carbon dioxide). The project is fully financed by the Japanese party. The facility ownership was transferred to the Armenian party. Operation of gas combustion is carried out by “Nor Barekargum” CJSC.

There is one more dumpsite, located in Ajapnyak district along Tichina street at the former gravel stone mine operated by the Spandaryan industrial unit. By the Yerevan city Mayor’s June 30, 2016 N 2391-A decree, a 10 ha area of the mentioned mine was allocated for landfilling of construction and demolition waste (CDW) and a permit to operate the dumpsite for CDW has been given to Davars LLC. However, starting from 2005, the area seems to have been used to dump both CDW and municipal solid waste as indicated by fires and smoke visible on satellite images. The landfill extends over a large area and contains municipal waste, textiles, CDW waste but also certain amounts of industrial waste of all types, such as WEEE, etc. In 2018, some parliamentarians initiated the blockage of the access to the dumpsite. The closure of the dumpsite has led to uncontrolled illegal dumping of CDW in several locations around the city of Yerevan.

Following the National Waste Strategy of 2015, developed by the Armenian state and Yerevan Municipality, the EU funded project “Yerevan Solid Waste Project” (reference C-368688), with budget of EUR 8,220,000, and with duration of 30.12.2015-31.12.2023, has been established, comprising closure of two dumpsites, Nubarashen, the largest in Armenia, and Ajapnyak, and replacing them with a new, EU compliant landfill near the current site of Nubarashen, for an investment total cost of EUR 26 million, to which EUR 2.4 million additional funds may be added for technical assistance support. The project, construction of a new sanitary landfill and 10 years’ operational responsibility before the landfill is turned over to the Municipality, was tendered in 2019, funded by the EBRD. The tender for selection of the contractor for works is under progress. It is expected to be completed before the end of 2021. The loan component is 16.0 million EUR, half of it from the European Investment Bank (EIB) and the other half from EBRD. The new landfill site will serve the city of Yerevan, as well as to urban and rural communities of Aragatsotn and Armavir provinces/marzes. The existing dumpsites in Nubarashen and Ajapnyak will be closed and conserved. The programme also envisions to produce 1.8-2.0 MW of energy.

The new landfill will be operative in about 2 years. The New Company responsible for the operation of the new landfill is already established by the Municipality/Communal Service Department. Presently there are 3 employees related to the financial issues. Operating staff will be employed in next years. The loan cover construction works, mobile equipment, trainings and the initial operating budget. It is supposed that loan (and design) also includes weighbridge and all landfill bottom sealing and top sealing layers as requested by the EU Directives. Also, the closure
of existing landfill, which is in fact a dumpsite, has to be closed properly, according to EU rules, to prevent further negative impact to environment, in next two-three years as well.

The design on which the tender for construction of new landfill is prepared, does not include a sorting line, neither a cell for disposal of hazardous waste. It is very important that the sorting line is established at the new landfill. Also, it is very important that the cell for disposal of hazardous waste is included in design.

Besides that, it is very important the recycling and treatment plants for household hazardous waste are constructed in Yerevan, and elsewhere in Armenia. The national authorities and authorities of Yerevan Municipality should prepare a feasibility study and action plan for the implementation of all of above mentioned facilities for treatment, recycling and disposal of hazardous waste, in parallel with providing the necessary funds, most of them as donor funds and/or loans from European and/or international financial institutions.

Private investors had proposed pyrolyze treatment but this solution has been discarded as too expensive and dangerous. There is a legal act, issued by the Ministry of Health, that hazardous waste, shall not be incinerated.

According to the above provided information, in spite that norms and regulations for management of hazardous waste in Armenia are relatively well-developed, there is still no single ESM (Environmentally Sound Management) facility for treatment of hazardous waste (e.g. mercury containing lamps or thermometers, batteries, etc.) in the entire Republic. Until today, there has been no decree or legal act requiring design and construction of an ESM facility that would receive waste with 1st class of hazard for treatment or at least storing.

Particularly, hazardous waste, such as alkaline, carbon zinc, and lithium household batteries currently end up in mixed municipal waste, i.e at dumpsites, while they can be easily diverted from landfills. In general, until now there has been no requirement for separate collection of hazardous waste. Also, separate collection of batteries is not implemented in Armenia despite that the waste batteries are classified as having 4th class of hazard and thus their transport and storage require permits according to the Law on Licensing (ՀՕ-193). Additionally, an environmental tax will apply for storing the household batteries. There are private companies which are collecting batteries, based on obtained permits.

4.1.5 Legal entities licensed for hazardous waste management

There are recycling factories for hazardous waste in Armenia. Volume of waste in Armenia is limited due to size of population, the fact that majority of inhabitants live in Yerevan. There are 2 cement factories, in vicinity of Yerevan, which can incinerate waste. They use temperatures between 1,000°C and 1,600°C. It means that these two cement factories have technical possibility to incinerate MSW, especially bio-waste and hazardous waste. In Saracharian, there is a metal smelter factory which can serve for metals recycling and also can incinerate hazardous waste.

The following table lists the companies that have a permit for hazardous waste management, and are located in the territory of the City of Yerevan. Some of the licensed companies have ceased operations and they are not shown in the table. Project representatives conducted a Market Survey on Waste Recycling in the Republic of Armenia by contacting each of these companies to interview them and obtain information regarding equipment, workers, the type and amount of waste collected and treated, treatment/disposal technologies, etc. Some companies did not want to participate in the interview, while the answers were shown below the table.

There is a well-developed infrastructure and market for repaired electric equipment such as refrigerators, washing machines, vacuum cleaners, irons, boilers, A/C systems, and cooking appliances like mixers, blenders, toasters, ovens, etc. There are several online platforms for second-hand electric equipment repaired and put on the market. For example, Sarnaran.am platform is specialized on refrigerators and freezers repaired and sold for affordable prices, up to 90,000 AMD.
HHW, WEEE

Hazardous healthcare waste is incinerated (and collected) by two companies, which incinerate also hazardous waste from cosmetic industry and pharmaceutical companies, pharmacies, oils, paints, varnishes, etc. This companies are as follows:

1. “Ekologia V.K.H.”, LLC, Armavir Region,
2. “Ecoprotect” LLC, Yerevan.

There is also the company, “Eco Group” International, from Yerevan, which applied for permit to collect, store, treat, incinerate and dispose most of HHW. They plan to do chemical treatment of 8 types of HHW, capacity up to 20,000 tonnes per year, and thermal treatment of 3 types of waste, capacity up to 50,000 tonnes per year.

Lead batteries, WEEE

The recovery of lead from old batteries is usually done by smaller entities like car shops selling and replacing batteries. These entities recycle lead independently or sell the old batters to companies that do recycling and most probably export. There are three companies having received a permit from RA Governments for recycling batteries, namely:

1. “Edmet” LLC licensed in 2015 to recycle, neutralize, store, transport, and install hazardous waste (to store used lead batteries for future export)
2. “Metexim” LLC licensed in 2016 to recycle, neutralize, store, transport and install hazardous waste (to collect, store, and transport used acid batteries and for storage and export of metal scrap).
3. “Ecosystem” LLC, licensed in 2019, collection, transportation, storage of hazardous waste, used lead-acid batteries.

All of collected lead batteries are exported to Iran. In 2020, Edmet exported 1,800 tonnes, Ecosystem 900 tonnes, Metta group 1,000 tonnes (they do not operate from 2020). In 2021, until May 2021, Edmet exported 1,758 tonnes, Ecosystem 1,000 tonnes. Metexim is not operative from 2020 because of COVID 19, the same as Metta group. The quantity of lead batteries exported from Armenia to Iran was 7,022.00 tonnes in 2017, 6,365.16 tonnes in 2018, 4,691.02 tonnes in 2019, and 3,700.00 tonnes in 2020. This is huge quantity because this waste is collected from Yerevan and other places in Armenia and from, beside households, commerce and institutions.

C&D waste, hazardous

1. “Khachhar” LLC, Yerevan, treat waste of asphalt concrete slabs and asphalt concrete mixture.

Waste tyres and waste oils

1. The “AmEska” LLC treats waste tires and waste oils through pyrolysis to produce fuel and carbon black. There are no existing facilities treating any other kind of waste through pyrolysis.

Cartridges, Advertising banners, WEEE

There are companies which treat HHW like Cartridges, Advertising banners (polypropylene), WEEE, as non-hazardous waste, without having permit for treatment of such waste. Such companies are:

1. “Armplast” LLC, Yerevan. They dismantle WEEE to plastic and metal components; plastic is recycled, metal is sold to metal recycling companies. They also accept or collect plastic molds of batteries, metal parts of which they sell to batteries processing companies. They also grind, granulate empty cartridges and advertising banners and produce polyethylene coatings, pipes and bags from it. This company plan to apply for permit for collection and treatment of hazardous waste.
2. “Ecoplastik”, LTD, Yerevan. They grind, granulate empty cartridges and advertising banners and produce polyethylene coatings, pipes and bags from it. Demand exceed supply. Daily demand of this type of recycled waste is 300-800 kg. Ecoplastik cannot fulfill this demand.

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<thead>
<tr>
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<th>Activity type and place</th>
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</thead>
<tbody>
<tr>
<td>1. “Ekologia VKH” LLC, Neutralize Hazardous Waste</td>
<td>The license was redrafted on the basis of the GoA decree N N1370-U, issued on 22.09.2011 (N1614-A, issued on 17.11.2011) License No 3-11, issued on 10.10.2011 indefinitely</td>
<td>Vagharshapat city (Echmiadzin city), Armavir Region, Yerevan, RA&lt;br&gt;&lt;i&gt;Medical waste&lt;/i&gt;&lt;br&gt;&lt;i&gt;Hazardous waste&lt;/i&gt;&lt;br&gt;Waste oils (machine, petrol and kerosine, kitchen), Used car tires, HHW (Cartridges, Advertising banners (polypropylene), Solvents, fuel, solvent-based paints, liquids (acids, alkaline), photo chemicals, poisons, Cleaning and polishing chemicals, detergents, Pesticides, fertilizers and other garden chemicals, Swimming pool or spa bath chemicals, Aerosols, anti-freeze, Oil-soaked rags, used oil-filled equipment, Pharmaceutical preparations, drugs).</td>
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<tr>
<td>2. “EcoProtect” LLC, Recycle, Neutralize, Store, Transport and Install Hazardous Waste (to recycle and dispose clinical, medical and other types of waste, as well as contaminated food of animal origin)</td>
<td>Issued on 09.08.2011, on the basis of the GoA decree, N 1045-U, Issued on 28.07.2011</td>
<td>Yerevan city, RA,&lt;br&gt;&lt;i&gt;Medical waste&lt;/i&gt;&lt;br&gt;&lt;i&gt;Hazardous waste&lt;/i&gt;&lt;br&gt;Waste oils (machine, petrol and kerosine, kitchen), Used car tires, HHW (Cartridges, Advertising banners (polypropylene), Solvents, fuel, solvent-based paints, liquids (acids, alkaline), photo chemicals, poisons, Cleaning and polishing chemicals, detergents, Pesticides, fertilizers and other garden chemicals, Swimming pool or spa bath chemicals, Aerosols, anti-freeze, Oil-soaked rags, used oil-filled equipment, Pharmaceutical preparations, drugs).</td>
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<tr>
<td>3. “Edmet” LLC, Recycle, Neutralize, Store, Transport and Install Hazardous Waste (to store used lead batteries for future export)</td>
<td>Issued on 15.10.2015, on the basis of the GoA decree, N N1153-U, Issued on 08.10.2015</td>
<td>Yerevan city, RA,&lt;br&gt;&lt;i&gt;Hazardous waste:&lt;/i&gt;&lt;br&gt;WEEE (Large home appliances such as fridges, cookers, microwaves, toasters, washing machines, dishwashers, vacuum cleaners, etc.)&lt;br&gt;Accumulators (lead accumulators).</td>
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<tr>
<td>4. “Metexim” LLC, Recycle, Neutralize, Store, Transport and Install Hazardous Waste (to collect, store, and transport of used accumulators-lead batteries and to collect, store and export of metal scrap)</td>
<td>No 17, Issued on 16.09.2016, on the basis of the GoA decree, N 933-U, Issued on 08.09.2016</td>
<td>Yerevan city, RA,&lt;br&gt;&lt;i&gt;Hazardous waste:&lt;/i&gt;&lt;br&gt;WEEE (Large home appliances such as fridges, cookers, microwaves, toasters, washing machines, dishwashers, vacuum cleaners, etc.)&lt;br&gt;Accumulators (lead accumulators).</td>
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5. “Ecosystem” LLC, collection, transportation, storage of hazardous waste, used lead-acid batteries

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<tr>
<th>Series - HW - N 000003, issued on 21.06.2019, indefinite</th>
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<tbody>
<tr>
<td>Yerevan city, RA</td>
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<tr>
<td>Hazardous waste: Accumulators (lead accumulators).</td>
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6. The decree of the RA Minister of Nature Protection on issuing a license to “Khachhar” LLC for collecting, transporting, storing, and recycling of the hazardous waste in form of pieces of asphalt and concrete mixture and building demolition waste.

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<tr>
<th>27-U, Series - HW - N 000001, issued on 31.01.2019 indefinite</th>
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<tr>
<td>Yerevan city, RA, ‘</td>
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7. “AM-ESKA” LLC, Recycle, Neutralize, Store, and Transport Hazardous Waste (to recycle tires, oil waste, rubber, plastic waste, bags, containers (polyethylene), cartridges, files and other office solid waste, advertising banners (polypropylene), household appliances (polystyrene))

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<tr>
<td>Kotayk region, RA</td>
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<tr>
<td>Hazardous waste: HHW {Advertising banners (polypropylene), Oil-soaked rags, used oil-filled equipment}. Waste oils (Machine oil, Petrol and kerosene, Kitchen oil), Used car tyres, C&amp;D waste (Petroleum contaminated soils/macadams).</td>
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8. "Eco Plast" LLC, license for collection, storage and export of hazardous and non-hazardous plastic waste, PE and PP,

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<td>Yerevan</td>
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<tr>
<td>Hazardous waste: HHW {Cartridges, Advertising banners (polypropylene)}.</td>
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9. “ArmPlast” LLC, license for collection, storage and processing of hazardous and non-hazardous plastic waste, HDPE, PE, LDPE, PP,

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<td>Yerevan, Ararat, Artashat, Armavir, Astarak</td>
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<tr>
<td>Hazardous waste: HHW {Advertising banners (polypropylene)}. Batteries (lead, alkaline, manganese, acid, mercury, lithium, cadmium, carbon-zinc, etc.). WEEE {Large home appliances such as fridges, cookers, microwaves, toasters, washing machines, dishwashers, vacuum cleaners, etc.; TVs, LCDs, plasmas, monitors, printers, VCRs, cell phones, telephones, radios, computers, laptops, headphones, computer keyboards, antennas, connecting cables, cameras, etc.; Fluorescent lamps and tubes, high intensity discharge (HID) lamps, compact fluorescent lamps and LED lamps and tubes, mercury lamps}.</td>
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</table>

| Title |
| License |
| Activity type and place |

8. “Ekologia VKH” LLC, Neutralize Hazardous Waste

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</table>
| 9   | "EcoProtect" LLC, Recycle, Neutralize, Store, Transport and Install Hazardous Waste (to recycle and dispose clinical, medical and other types of waste, as well as contaminated food of animal origin) | Issued on 09.08.2011, on the basis of the GoA decree, N 1045-Ա, Issued on 28.07.2011 | Yerevan city, RA, *Medical waste*  
**Hazardous waste**  
Waste oils (machine, petrol and kerosine, kitchen), Used car tires, HHW (Cartridges, Advertising banners (polypropylene), Solvents, fuel, solvent-based paints, liquids (acids, alkaline), photo chemicals, poisons, Cleaning and polishing chemicals, detergents, Pesticides, fertilizers and other garden chemicals, Swimming pool or spa bath chemicals, Aerosols, anti-freeze, Oil-soaked rags, used oil-filled equipment, Pharmaceutical preparations, drugs). |
| 10  | "Edmet" LLC, Recycle, Neutralize, Store, Transport and Install Hazardous Waste (to store used lead batteries for future export) | Issued on 15.10.2015, on the basis of the GoA decree, N N1153-Ա, Issued on 08.10.2015 | Yerevan city, RA, *Hazardous waste*  
WEEE (Large home appliances such as fridges, cookers, microwaves, toasters, washing machines, dishwashers, vacuum cleaners, etc.)  
Accumulators (lead accumulators). |
| 11  | "Metexim" LLC, Recycle, Neutralize, Store, Transport and Install Hazardous Waste (to collect, store, and transport of used accumulators-lead batteries and to collect, store and export of metal scrap) | No 17, Issued on 16.09.2016, on the basis of the GoA decree, N 933-Ա, Issued on 08.09.2016 | Yerevan city, RA, *Hazardous waste*  
WEEE (Large home appliances such as fridges, cookers, microwaves, toasters, washing machines, dishwashers, vacuum cleaners, etc.)  
Accumulators (lead accumulators). |
| 12  | "Ecosystem" LLC, collection, transportation, storage of hazardous waste, used lead-acid batteries | Series - HW - N 000003, issued on 21.06.2019, indefinite | Yerevan city, RA  
**Hazardous waste**  
Accumulators (lead accumulators). |
**Hazardous waste**  
C&D waste (Waste of asphalt concrete slabs and asphalt concrete mixtures). |
recycling of the hazardous waste in form of pieces of asphalt and concrete mixture and building demolition waste.

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<td>No license</td>
<td>Yerevan Hazardous waste HHW (Cartridges, Advertising banners (polypropylene)),</td>
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<td>9. “<strong>ArmPlast</strong>” LLC, license for collection, storage and processing of hazardous and non-hazardous plastic waste, HDPE, PE, LDPE, PP,</td>
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<td>The license was redrafted on the basis of the GoA decree N 1370-U, Issued on 22.09.2011 (N1614-A, issued on 17.11.2011) License No 3-11, issued on 10.10.2011 indefinitely</td>
<td>Vagharshapat city (Echmiadzin city), Armavir Region, Yerevan, RA Medical waste Hazardous waste Waste oils (machine, petrol and kerosine, kitchen), Used car tires, HHW (Cartridges, Advertising banners (polypropylene), Solvents, fuel, solvent-based paints, liquids (acids, alkaline), photo chemicals, poisons, Cleaning and polishing chemicals, detergents, Pesticides, fertilizers and other garden chemicals, Swimming pool or spa bath chemicals, Aerosols, anti-freeze, Oil-soaked</td>
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<tr>
<td>No.</td>
<td>Company Name</td>
<td>Services Provided</td>
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<tr>
<td>16</td>
<td>“EcoProtect” LLC</td>
<td>Recycle, Neutralize, Store, Transport and Install Hazardous Waste (to recycle and dispose clinical, medical and other types of waste, as well as contaminated food of animal origin)</td>
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<tr>
<td>17</td>
<td>“Edmet” LLC</td>
<td>Recycle, Neutralize, Store, Transport and Install Hazardous Waste (to store used lead batteries for future export)</td>
</tr>
</tbody>
</table>

1. “Ekologia VKH” LLC, Margaryan st. 41, Vagharshapat city, Armavir

**Equipment, prices and workers**

**Collection:**

- Gazelle, 2.5 tones, closed van (thermos), old 2 years,
- Plastic container of 60-80 liters, old 2 years,
- Workers: 6 people.
- Additional equipment and workers needed: 2 more vans and 8 workers.

**Storage place (Address: Margaryan st. 41, Vagharshapat city (Echmiadzin city)):**

- Containers of iron, 4 pcs of 10 tones, old 6 months
- Workers: 4 people.

**Treatment:**

- Incinerator placed in storage place. They are incinerating the collected waste, such expired food, expired medicines, oils, paints, varnishes, etc. The incinerator can incinerate all types of hazardous waste. The incinerator works in 3 shifts, each shift burns 2.5 tonnes of waste at a temperature of 1600 degrees. It is biological waste disposal plant which has super-powerful filters, after which the neutralized gas is released in atmosphere. In addition, the stove has a heat exchanger that cools exit gas before release into atmosphere. The company informed that their permit cover all HHW waste, plus waste oils and waste tires.
Market

Price for collected and incinerated waste: 600 AMD/kg. In fact, it is from 60 to 1500 AMD/kg. It depends on whether they accept the waste or collect it, the quantity, the type of waste. The company is paid by various companies, organizations, institutions, which deliver waste for disposal under a basic contract or on a one-time basis. A collection or acceptance order can be received from any area if it suits the interests of their business.

2. “Eco Protect:, LLC, Yerevan

Data are still in collection phase. However, the company treat the same waste as Ekologia VKH, and use the similar incinerator for disposal of hazardous waste.

3. EDMET" LLC, Yerevan, Shiraki St., 82/9, Shengavit district, RA,

Equipment and workers

Collection, Storage, Treatment:

Activity: Purchase of scrap metal from the population and from organizations, and production and selling of products in order to make a profit. The company has a foundry and produces aluminum and copper waste / scrap / and ingots. The maximum productivity for the two types of bars together is 4,500 t/y. Secondary aluminum and copper ingots are mainly used as raw materials in various industries, in particular, secondary aluminum is widely used in the production of silicon-aluminum alloys, profiles, and secondary copper in electrical engineering, alloying, etc. Secondary aluminum and copper can be further processed as pure metals, especially in the cable and aviation industries, as well as in the manufacture of various household items. The metal residue produced as a result of production is separated, stored, accumulated, and when it reaches the required quantity, it is burned for the second time, further the resulting residue, waste is used in construction as a mixture soil mass. The company do exported 1,800 tonnes of lead batteries to Iran in 2020, and 1,758 tonnes in 2021 until May 2021.

4. “Metexim” LLC, Yerevan, Azatutyun 27/1, RA,

Equipment and workers

Collection:

More than 20 trucks with a capacity of 4-18 tonnes are used.

Dozens of equipment like bins and containers.

Trucks and bins and containers are bought from 2000 to 2021.

Equipment is placed at two places: in the City of Yerevan and in Sayat Nova village, Ararat region.

Collected quantities: Non-ferrous metals - about 3 tonnes per day, about 90 tonnes per month, about 1000 tonnes per year; Ferrous metal - more than 300 tonnes per day, about 1,000 tonnes per month, about 400,000 tonnes per year.

More storage space is needed for more collection equipment.

Workers: 200 employees.

The waste buying price fluctuates a lot, depending on the situation on the world market and depending on the domestic policy of the country (for example, the export permit). Average buying prices are: lead - 600 AMD/kg, copper - 4,000 AMD/kg, aluminum - 700 AMD/kg, ferrous metal - 40,000 AMD/ton.

Storage (City Yerevan, Azatutyun 27/1, and Gyumri, v. Sayat Nova Ararat region):
Indoor and outdoor areas are quite large, used for waste storage. Containers are placed in open area. They are old from 2010 to 2021. They store cca 1,000 tonnes of waste per month. Land is rented. They need bigger storage area. Existing infrastructure: asphalt road, electricity, water supply, fence, gate, scale, etc.

Workers: 90 employees.

**Production/treatment:**

Foundry site № 1 in the Ararat province (Gyumri, v. Sayat Nova), implements a stock up, processing, sorting out and loading of ferrous and non-ferrous metal scraps. Further in the process of re-melting the aluminum & aluminum alloy scraps in the appropriate furnaces the foundry produces aluminum ingots.

The working process begins at the stock up site, where the received product under goes radiation testing. The product is being accepted & weighted on the electronic scales. Aluminum and aluminum alloy scraps are being sorted by the type & the chemical contents, then carried out a mechanical cleaning and separation from iron, plastic and other materials. The sorting of the product is one of the most important stages of raw material processing. Certain types of the product are being briquetted. The recycled product is being transported to the casting plant. There are installed two furnaces with the appropriate equipment & loading, unloading lines.

The first furnace is designed for the casting and cleaning. The production capacity is about 150-200 tonnes per month. The first furnace produces iron-free aluminum melts, which are subsequently transferred to the second furnace for secondary melting.

The second furnace is of the reflective type from HIDROER MAK SAN plant.

The production capacity is about 200-250 tonnes of finished products per month. The sorted aluminum is being automatically loaded into the furnace. The loading and melting process is being performed gradually, accompanied by the preliminary analyses. During casting process are used appropriate ligatures, flues & other necessary additives & components to obtain aluminum alloy that meets certain standards.

The plant has a quality control laboratory that uses a NITON X-ray spectrometer and a stationary multi-base optical emission analyzer Was Lab Foundry Master.

Unloading is carried out through a conveyor line. The metal is poured into molds and extracted after cooling. Afterwards it is sorted, marked by type, weight, analysis, after which the ingots are transported to the packaging site, bounded, weighed and transported to the loading site.

The shipment of finished products is carried out by cars or containers through the customs terminal.

**Market**

The all collected ferrous metal is sold to other companies in the domestic market, and it is exported, mainly to the Islamic Republic of Iran. Non-ferrous metals are first smelted, then sold. The aluminum is processed into aluminum ingots and sold. Market demand is very high. Mainly iron cables are used in the construction industry, and non-ferrous metals are mainly exported or used by small enterprises in the production of wires.

5. **“Ecosystem” LLC, Yerevan, Armenia**

Data are still in collection phase. However, the company treat the same waste as Ekologia VKH, and use the similar incinerator for disposal of hazardous waste.

6. **“Khachhar” LLC, Yerevan, (95a Hovsepyan), Artashati highway, 1st Lane, 6/2 Building, (Shengavit district), RA,**

**Equipment and workers**

*Collection, Storage, Treatment, Market:*
They are engaged in road construction works in different regions of Armenia and have their own asphalt factory, where they process the destroyed asphalt. When paving the streets, the old asphalt scrapped with their equipment is accumulated in the landfill, later it is crushed in a special mill and reused in road construction. Other construction waste, asbestos pieces, they do not recycle.

7. “AmEska” LLC, City Abovyan, Arzni highway, 2/1/2, Kotayk Province, RA,

Equipment and workers

Collection:

Vehicles: 6, with containers, capacity of 2,000 kg (from 2001 year), 3,500 kg (from 1998 year), 10,000 kg (from 1981 year), 22,000 kg (from 2012 year), 25,000 kg (from 2013 year) and 25,000 kg (from 2011 year). Vehicles are applicable for all waste processed.

200 l barrel, 0.1-0.5 m³ bins and 1 m³ containers in store area. They do not have containers in rural and urban areas.

Workers: 2 drivers and 2 workers.

One shipment of waste can range from 10,000 to 280,000 AMD, depending on the place of transportation.

Quantity of each type of waste collected per day, month and per year, and for last 3 years (estimation):

<table>
<thead>
<tr>
<th>Waste type</th>
<th>Quantity *</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Per day</strong></td>
<td><strong>Per month</strong></td>
<td><strong>1 year</strong></td>
</tr>
<tr>
<td>Used tires and other rubber items</td>
<td>4,300</td>
<td>171,500</td>
</tr>
<tr>
<td>Engine, hydraulic, compressor oils that have lost or consumed properties</td>
<td>-</td>
<td>18,500</td>
</tr>
<tr>
<td>Contaminated bags</td>
<td>-</td>
<td>15,400</td>
</tr>
<tr>
<td>Oiled rags, oil and air filters</td>
<td>-</td>
<td>2,280</td>
</tr>
<tr>
<td>Plastic</td>
<td>-</td>
<td>675</td>
</tr>
<tr>
<td>Other</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Storage (Address: City Abovyan, Arzni highway, 2/1/2):

There are 6,000 m². The land is rented. There is various waste storage sections / closed and open and waste treatment in the closed area. Existing infrastructure: asphalt road, electricity, water supply, fence, gate, scale, etc. There is surplus in storage capacity.

Production/treatment:

Treatment-neutralization section / closed / is at the same place as storage.

Equipment: Treatment-neutralization line has capacity of 5,000 kg / day, operative since 2014.

Tire cutting machine, 1,000-3,000 kg / h, from 2019.

Workers: 13.

"AM-ESKA" was initially engaged in the processing of worn-out tires collected from Yerevan and adjacent settlements, as from mining companies in the RA - also in the collection, accumulation and processing of oil filters, air filters, which results in technical carbon, diesel fuel and scrap metal. Pyrolysis method is used, they do not burn the tires.

Large truck tires are collected and transported to the company's premises, where they are sorted and stored. The composition and structure of the tires are taken into account when choosing the method of further processing.
large used tires are divided into 40 cm parts by a special cutting machine and loaded into a rotating reactor, which is heated by the combustion of natural gas or fuel oil. At a certain temperature, hydrocarbon gas is released, which is used to further heat the reactor. Oil vapors are released, which are subjected to condensation and cooling, and then sent to storage. At the end of the reaction, the reactor is gradually cooled. Steel wires and Carbon dust (technical carbon) are removed from the reactor, after which the reactor is unloaded and a new phase begins. Carbon dust is shifted and stored in bags for further sale. The scrap metal is pressed and stored.

Service stations (vulcanization points) operating in or near Yerevan have no obligation to hand over the proper processing of tires or oil and air filters. As a result, financial difficulties have arisen for the company in connection with the further collection and transportation of this waste. At present, the Company works only with mining companies and even with them not regular.

**Market**

<table>
<thead>
<tr>
<th>Waste type</th>
<th>Unit measure</th>
<th>Unit price / AMD, including VAT and transport</th>
<th>Seller</th>
</tr>
</thead>
<tbody>
<tr>
<td>Used tires and other rubber items</td>
<td>kg</td>
<td>85-250</td>
<td>We</td>
</tr>
<tr>
<td>Engine, hydraulic, compressor oils that have lost or consumed properties</td>
<td>l</td>
<td>45</td>
<td>To us</td>
</tr>
<tr>
<td>Contaminated bags</td>
<td>kg</td>
<td>100-500</td>
<td>We</td>
</tr>
<tr>
<td>Oiled rags, oil and air filters</td>
<td>kg</td>
<td>250-700</td>
<td>We</td>
</tr>
<tr>
<td>Plastic</td>
<td>kg</td>
<td>50-150</td>
<td>We</td>
</tr>
<tr>
<td>Other</td>
<td>kg</td>
<td>50-300</td>
<td>We</td>
</tr>
</tbody>
</table>

8. “Armplast” LLC, Yerevan, Haghtanak street, 11, RA

**Equipment and workers**

**Collection:**

Gazelle, 12 m³, 2 pcs, purchased in 2003.

Ford, 15 m³, purchased in 1991.

No any bin is placed. The company collect the waste directly from companies which generate the waste. Also, the company is buying the waste from the «Landscape gardening and environmental protection» community noncommercial organization, «LGEP» CNCO.

Workers: 2 drivers, 2 workers.

Costs of collection and transport of waste: 1,000,000 AMD/month.

Additional equipment needed: 2 more modern vehicles (new).

Also, 2 more drivers and 2 more workers are needed.

**Storage (Address: City Yerevan, Haghtanak street, 11):**

There are 200 sqm indoor (stone building) and 1,800 m² open areas. The land is private. Waste sorting is carried out in the open area, and waste storage and recycling in the closed areas. Existing infrastructure: asphalt road, electricity, water supply, fence, gate, scale, etc. No storage equipment is required. There is surplus in storage capacity. The average monthly turnover of the company is 50,000 kg, the existing area allows to accommodate 4 times more waste than the mentioned amount. 1 cubic meter of storage space accommodates an average of 50 kg of waste types that we accept. No storage costs are incurred as Armplast do not have waste accumulation.
Workers: 5 people.

Production/treatment:
The same place as storage place. Treatment is physical treatment: sorting, grinding, granulating, producing polyethylene coatings and bags. The processing plant has 1 to 20 years old production equipment: crushing machines (grinder), washing machine, dryer, melting-granulating devices, molds and thermoplastic automatic equipment. Labour costs, for the recycling of plastic waste with the existing equipment, are 150-170 AMD per 1 kg. Costs of plastic waste recycling are 80-150 AMD per 1 kg. After recycling plastic waste, Armplast produce some hangers, cups, and the rest they sell to other companies that produce buckets, vases, and other household items.

Workers: 10 people.

Market
Armplast sell the plastic waste to waste processing companies without recycling but they also sell the recycled waste. The market demand (local-foreign) is greater than the supply. Also, the market demand is much higher than the amount of recycled waste. Recycled waste is needed by companies that make a variety of products from them, which are used in household, construction and other industries. It is important to stress that Armplast recycle plastic waste only, non-hazardous mostly and hazardous in small quantities.

The fee that company pay for the waste is 20-150 AMD per kilogram depending on the type of waste. The waste listed in table below are sold to relevant processing companies. Depending on the type of waste the selling price fluctuates in the range of 40-200 AMD.

<table>
<thead>
<tr>
<th>The amount of waste collected and sold (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of waste</strong></td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>1 Paper</td>
</tr>
<tr>
<td>2 Cardboard</td>
</tr>
<tr>
<td>3 Glass</td>
</tr>
<tr>
<td>4 Aluminum containers</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The amount of waste recycled and sold (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of waste</strong></td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>1 Polyethylene terephthalate</td>
</tr>
<tr>
<td>2 Plastic bags</td>
</tr>
<tr>
<td>3 Hard plastic and polyethylene containers</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

Note: Ecoplastik use hazardous waste, cartridges and advertising banners, for production of plastic products, pipes, etc., at the same equipment which is used for treatment of non-hazardous waste. It is not allowed. They mix non-hazardous waste with hazardous waste. It is not clear if they obtained the license only for collection, storage and treatment of non-hazardous plastic waste, or for hazardous plastic waste as well.

9. “ECOPLASTIK” LTD, Shirak 90, City Yerevan

Equipment and workers

Collection:
The company do not collect the waste; they do not have the collection equipment, neither workers/collectors. They do not export the waste. They accept the waste from waste producers at storage/treatment area and produce the product/granules which they sell to recycling companies.

**Storage (Address: Shirak 90, City Yerevan)**

Urban area in Yerevan city, rented. Indoor and outdoor areas are used for sorting and treatment. Existing infrastructure: asphalt road, electricity, water supply, fence, gate, scale, etc. Storage and production/treatment areas are different.

“Big bag” bags, polymer bags 1 ton.

On average, 800 kg of recycled waste is received per day. In total, storage capacity is up to 50-60 tonnes of waste per day.

Workers: 8 people, for storage and treatment.

**Production/treatment:**

Placed in storage area. Treatment is physical treatment: sorting, growing, granulating, producing polyethylene coatings and bags. They are buying the following waste from the waste collectors, in average: HDPE, LDPE 10-15 tonnes, ABS, PS, PSS 5-7 tonnes, PP 3-5 tonnes, PVC 1-3 tonnes, cellophane 8-10 tonnes. After treatment, Ecoplastik sell produced plastic items, pipes, plastic products to manufacturers. The mentioned types of plastic are accepted for treatment, as mixed, at average price of 150 AMD, sold after treatment - 380 AMD.

Equipment: agglomerators-4 pcs, granulators-2 pcs, mills-2 pcs, washing lines-2 pcs, separate grows-2 pcs, cellophane manufacturing lines-2 pcs, sewing machines-2pcs, presses-2pcs. Some of the equipment are used on rental basis. Also, some of the equipment is obsolete. Maximum capacity of equipment for treatment is cca 20 tonnes per each type of waste. In case of work at maximum capacity, additional workers are needed.

Workers: 9 people as regular, plus extra people whenever is needed.

Costs per 1 kg of recycled waste: Salary: 70-80 AMD, electricity: 44-51 AMD, water: 5 AMD / kg, rent: 12 AMD / kg, loss: 10-20%, 10-33 AMD / kg, tax: 10-15 AMD / kg, depreciation: 10 AMD, bags and other expenses: 4 AMD.

**Market**

Depending on material and quantity, Ecoplastik buying the waste from waste producers/sellers at price 50-150 AMD, from waste collectors at price 80-250 AMD. The range of selling price is 250-500 AMD. According to Ecoplastik’s analysis, the demand exceeds the supply, the sorted polymers are treated and sold fully. Some manufacturers even import secondary raw materials due to the demand. Daily demand of the above type of recycled waste is 300-800 kg. Ecoplastik cannot fulfil this demand. It is necessary to add properly organization of the waste sorting. The waste which remains as not manufactured, have been disposed at the municipal landfill.

**Note:** Ecoplastik use hazardous waste, cartridges and advertising banners, for production of plastic products, pipes, etc., at the same equipment which is used for treatment of non-hazardous waste. It is not allowed. They mix non-hazardous waste with hazardous waste. It is not clear if they obtained the license only for collection, storage and treatment of non-hazardous plastic waste, or for hazardous plastic waste as well.

10. “Hrazdan Cement Corporation” LLC

**Licence**

The licenses are not available yet. In December 2019, the company held the first round of EIA hearings on waste disposal in Kotayk and Gegharkunik Provinces, at the factory premises. But the further progress was not on due to
several reasons of which one is COVID. The company expresses its readiness to obtain licenses related to all type of municipal waste.

**Type of waste to be covered by license (to be used as energy source)**

**Non-hazardous waste**

Bio-waste
- Kitchen waste,
- Wood, branches,
- Bush trimmings,
- Wooden waste from cutting the trees,
- Waste from cutting the grass.

**Hazardous waste**

HHW (Pesticides, fertilizers and other garden chemicals, Pharmaceutical preparations, drugs)

Waste oils
- Machine oil,
- Petrol and kerosene,
- Kitchen oil,
- Used car tyres.

**Equipment and workers**

**Production/treatment:**

The plant is ready to sort and neutralize 100% of municipal waste. Working temperature of cement furnaces is 2000°C. The plant is ready to use as source of energy used tires, mixed municipal waste, biowaste, organic pesticides, used oils, pharmaceutical waste, sewage sludge from WWTP. In fact, the plant is ready to replace almost 90% of fossil fuel with above mentioned waste.

Also, the plant is ready to use, as raw materials in cement production, ash and waste from metal smelting, etc.

**Note:** «HRAZDAN CEMENT CORPORATION» LLC is ready to fulfill all the legal requirements related to the above-mentioned waste neutralization process, including the acquisition of licenses at a certain period of time (as required by law).
4.2 Existing waste management system in Warsaw, Poland

4.2.1 Introduction/General data

The most important changes in the field of municipal waste management were brought about by the amendment to the Act on Maintaining Cleanliness and Order in Municipalities in 2011. The main assumption of the new Act was the obligatory takeover by municipalities of the property owners’ responsibilities in the field of municipal waste management. The new waste management system was introduced in Warsaw on February 1, 2014. Residents then began to separate garbage at home into three main groups:

- segregated waste (dry paper and cardboard, plastic bottles and other packaging made of plastic, juice cartonnes and cans) - collected in the red container
- glass waste - collected in a green container
- mixed waste - collected in the black container

In 2013 the city started cooperation with ElektroEko, which collects electro-waste from residents (e.g. by collecting large electro-waste directly from homes). The scope of cooperation is successively extended.

In October 2015, 2 Civic Amenity Sites (PSZOK) were opened, one is designed to serve the right bank and the other the left bank part of the city.

As a complement to the stationary points, Mobile Civic Amenity Sites (MPSZOK) have also started to operate. Mobile collection points run twice a week, stopping at specific points in the city at specific times. Thanks to this, residents who cannot deliver their troublesome municipal waste to the PSZOK have the opportunity to do so by bringing their waste to the MPSZOK.

According to the Regulations of maintaining cleanliness and order on the territory of the Capital City of Warsaw, as of 2019 the municipal waste collection system is in force, divided into 5 fractions: paper, metals and plastics, glass, bio and mixed waste.

The introduction of the new waste collection system was combined with extensive information and education campaigns addressed to all Warsaw residents.

The City is also carrying out investment activities aimed at improving the municipal waste management system, among others through modernization and expansion of the installation system and a plan to build a PSZOK with an education zone and a point for repair and reuse of non-waste items.

Thanks to the actions taken, each year Warsaw achieves higher levels of recycling and preparation for reuse of the following municipal waste fractions: paper, metals, plastics and glass:
The Mayor of the Capital City of Warsaw prepares annually an analysis of the condition of municipal waste management. The analyses are available in the Public Information Bulletin: https://bip.warszawa.pl/Menu_podmiotowe/biura urzedu/GO/ogloszenia/Analiza+stanu+gospodarki+odpadami+komunalnymi.htm

4.2.2 Description of overall separate collection system operating in Warsaw

The Council of the Capital City of Warsaw entrusted the City of Warsaw’s own task in the field of municipal management, consisting in the management of municipal waste, to a single municipal commercial law company, i.e. Municipal Cleaning Company in the Capital City of Warsaw Sp z o.o. (MPO) with its registered office in Warsaw at 43 Obozowa St. Subsequently, on 12 December 2017. The City of Warsaw signed an executive agreement with MPO on the provision of public services in the field of waste management, defining the detailed conditions for the implementation of the entrusted task.

The following types of selectively collected municipal waste are collected from properties in Warsaw:

1. "paper", as paper, including cardboard, paper packaging waste and cardboard packaging waste - classified under the code 15 01 01 - paper and cardboard packaging;
2. "metals and plastics", as metal waste, including metal packaging waste, plastic waste, including plastic packaging waste, multi-material packaging waste - classified under code 15 01 06 - mixed packaging waste;
3. "glass", as glass packaging waste - classified under code 15 01 07 - glass packaging;
4. "green waste" as green waste excluding unshredded tree branches and boughs - classified under code 20 02 01 - biodegradable waste;
5. "bio", as bio-waste - kitchen waste, excluding waste of animal origin and fats, generated in households - classified under code 20 01 08 - biodegradable kitchen waste;
6. "bio - gastronomy markets" as bio-waste from gastronomy and markets - classified under code 20 01 08 - biodegradable kitchen waste;
7. "bulky waste" as bulky waste, including furniture and mattresses - classified under code 20 03 07 - bulky waste;
8. "Mixed waste" as waste remaining after separation of separately collected fractions - classified under code 20 03 01 - unsorted (mixed) municipal waste.

There are 109,501 collection points throughout Warsaw. At household collection points, only the municipal waste listed above is collected. Hazardous waste is collected at CAS's and Mobile CAS's. The collection of WEEE is conducted in every district on Sundays by non-profit organization that has an agreement with the City. Warsaw intends to supplement the existing municipal waste collection system by setting up containers for small electro-waste (telephones, hair dryers, etc.) in places accessible to residents. There is a strong demand on that matter expressed by citizens. Once the extended producers’ liability is implemented, it may be necessary to change the selective packaging waste collection systems for recycling.

Municipal waste collected from property owners is directed to MPO's own installations and to installations selected by MPO in a tender procedure.

- Selectively collected waste (paper, metal, plastics, glass) is directed, directly or through another waste collector, to waste recovery or disposal installations, according to the waste treatment hierarchy. Waste from the selective collection is first directed to a waste sorting plant. Then, as a result of sorting the individual fractions, waste is directed to recycling plants (glassworks, paper mills, plastics recycling plants); the non-recyclable waste fraction (high calorific value) is used to produce RDF alternative fuel that can be used in cement plants or waste incineration plants. In Poland, there is a ban on landfilling waste fractions with an energy value of more than 6 MJ.
- Non-segregated (mixed) waste is sent directly to the mechanical-biological waste treatment plant and the thermal waste treatment plant. Warsaw mixed waste is taken to 17 waste processing plants. These are private and municipal plants. All these plants meet the regulations in force in Poland.
- Hazardous waste collected at Civic Amenity Centers (PSZOKs) and Pharmacies is directed to waste disposal installations, most often to waste incineration plants.
- Large-size waste, WEEE is sent to waste treatment plants. Waste is disassembled, and waste fractions separated from it are directed to recovery and disposal, respectively.
- Biodegradable waste is sent to a waste composting plant for organic recycling. They are used to produce soil conditioner or compost.

Below the information on the amount of waste collected and handled in Warsaw in 2020 is presented.

**Table 10 Information on the amount of waste collected and handled in Warsaw in 2020**

<table>
<thead>
<tr>
<th>No.</th>
<th>Type of waste/waste group</th>
<th>Mass of collected and gathered individual types of municipal waste in 2020. [t]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Unsorted (mixed) municipal waste (20 03 01)</td>
<td>496 481.41</td>
</tr>
<tr>
<td>2.</td>
<td>Raw material waste, of which</td>
<td>146 305.52</td>
</tr>
<tr>
<td>2.1</td>
<td>&quot;Paper waste&quot; (15 01 01)</td>
<td>47 155.16</td>
</tr>
<tr>
<td>2.2</td>
<td>Waste &quot;metals and plastics&quot; (15 01 06)</td>
<td>60 100.85</td>
</tr>
<tr>
<td>2.3</td>
<td>Waste &quot;glass&quot; (15 01 07)</td>
<td>38 689.48</td>
</tr>
<tr>
<td>3.</td>
<td>BIODEGRADABLE WASTE, of which</td>
<td>78 001.04</td>
</tr>
<tr>
<td>3.1</td>
<td>Green waste (20 02 01)</td>
<td>35 893.55</td>
</tr>
<tr>
<td>No.</td>
<td>Type of waste/waste group</td>
<td>Mass of collected and gathered individual types of municipal waste in 2020. [t]</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>3.2</td>
<td>Bio-waste from households (20 01 08)</td>
<td>40 602.39</td>
</tr>
<tr>
<td>3.3</td>
<td>Bio-waste from catering operations (20 01 08)</td>
<td>1 489.74</td>
</tr>
<tr>
<td>4.</td>
<td>Bulky waste (20 03 07)</td>
<td>28 214.09</td>
</tr>
<tr>
<td>5.</td>
<td>OTHER WASTE, of which</td>
<td>4 484.60</td>
</tr>
<tr>
<td>5.1</td>
<td>WEEE Waste</td>
<td>2 165.44</td>
</tr>
<tr>
<td>5.2</td>
<td>Waste of used batteries</td>
<td>8.06</td>
</tr>
<tr>
<td>5.3</td>
<td>Waste of PREVENTED MEDICINES</td>
<td>148.52</td>
</tr>
<tr>
<td>5.4</td>
<td>Waste of mercury thermometers</td>
<td>0.07</td>
</tr>
<tr>
<td>6.</td>
<td>Construction and demolition waste</td>
<td>7 896.61</td>
</tr>
<tr>
<td>7.</td>
<td>Waste collected at the CAS’s</td>
<td>7 301.99</td>
</tr>
<tr>
<td>8.</td>
<td>Waste collected at municipal waste collection points</td>
<td>9 479.37</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL OF ALL MUNICIPAL WASTE</strong></td>
<td><strong>778 164.68</strong></td>
</tr>
</tbody>
</table>

**Information of waste treatment installations:**

Each installation must meet stringent conditions set out in the Act on Nature Protection and the Act on Waste and implementing regulations. The condition for the installation to operate is to obtain a decision from the competent authorities: District Governor or Province Marshal on waste processing or an integrated permit covering the entire scope of the plant's operation (waste generation, collection, processing).

The premises of the plants must be fenced and monitored by a camera system with the function of recording images and storing them for a period of 30 days. In the case of some facilities, there is an obligation to provide real-time images to the inspection authorities of the Voivodship Inspector of Environmental Protection. The plant accepting waste must have a weighbridge for weighing waste transports installed at the entrance. All waste is recorded.

From January 2020, records of all waste are kept in the BDO waste database\(^\text{23}\) (Polish national system). Access to this system is available to registered entrepreneurs, municipalities and other public authorities.

Warsaw at the end of 2020 began the modernization and expansion of the municipal waste thermal treatment plant to a capacity of 305,200 T/year. The project includes the construction of two new process lines with a capacity of 132,600 T/year each and the maintenance of the existing line with a capacity of up to 40,000 T/year.

Only mixed municipal waste will be sent to the thermal processing plant. Waste straight from the garbage trucks will be poured into a bunker, mixed and then incinerated. The plant will not accept industrial or hazardous waste. There will also be no composting facility.

\(^{23}\) https://bdo.mos.gov.pl/
The table below provides the data on the mass of municipal waste transferred to the available treatment plants and facilities. The table contains the data on the type of installation to which municipal waste was transferred, the disposal and recovery process codes, as well as waste codes. The mass data are given separately for each type of facility and by that the calculated percentages of the share of waste that is treated in a certain manner. The data in the table is divided into two main parts - Waste collected from property owners from the Capital City of Warsaw and Waste accepted at the Civic Amenity Centers (CAC).

Table 11 List of installations where municipal waste was collected and handed over to from the inhabitants of the Capital City of Warsaw in 2020. (Source: Own study based on data and information contained in the reports submitted by entities collecting and handling municipal waste from the Capital City of Warsaw)

<table>
<thead>
<tr>
<th>No.</th>
<th>Type of installation to which municipal waste was transferred</th>
<th>Disposal process (recovery process R/disposal process D)</th>
<th>Waste code</th>
<th>Mass of municipal waste transferred [T]</th>
<th>TOTAL:</th>
<th>Percentage share [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Waste recycling facilities</td>
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## Context analysis in three partner cities

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<td>D10</td>
<td>20 01 13*</td>
<td>1.57</td>
<td>98.27</td>
<td>1.39%</td>
</tr>
<tr>
<td></td>
<td>D10</td>
<td>20 01 26*</td>
<td></td>
<td>12.55</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>D10</td>
<td>20 01 31*</td>
<td></td>
<td>0.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>D10</td>
<td>20 01 37*</td>
<td></td>
<td>84.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL:</td>
<td></td>
<td></td>
<td>7 047.35</td>
<td>7 047.35</td>
<td>100.00%</td>
<td></td>
</tr>
</tbody>
</table>

**Companies collecting municipal waste from the Capital City of Warsaw** The City of Warsaw has been divided into 9 Tasks, which cover one or more districts of the Capital City of Warsaw:

1) Task No. 1 - includes Bielany and Żoliborz districts;
2) Task No. 2 - includes the districts of Białołęka and Targówek;
3) Task No. 3 - includes the districts of Mokotów;
4) Task No. 4 - includes the districts of Ochota, Ursus and Włochy;
5) Task No. 5 - covers the districts of Praga-Południe and Praga-Północ;
6) Task No. 6 - includes the districts of Rembertów, Wawer and Wesoła;
7) Task no. 7 - includes the districts of Śródmieście;
8) Task No. 8 - includes the districts of Ursynów and Wilanów;
9) Task No. 9 - includes the districts of Wola and Bemowo.
In individual districts, municipal waste is collected by the following Operators:

1) Municipal Cleaning Company in the Capital City of Warsaw Sp. z o.o. (Polish: Miejskie Przedsiębiorstwo Oczyszczania w m.st. Warszawie Sp z o.o. - MPO) - Task no. 4, 7 and 9;
2) PPHU LEKARO Jolanta Zagórska - Task no. 5 and 6;
3) Consortium of companies: SUEZ Polska Sp. z o.o and REMONDIS Sp. z o.o - Task No. 8;
4) Consortium of companies: REMONDIS Sp. z o.o and SUEZ Polska Sp. z o.o - Task No. 3;
5) BYŚ Wojciech Byśkiniewicz - Task No. 1;
6) Consortium of companies: PARTNER Ltd., PARTNER Dariusz Apelski and JARPER Sp. z o.o - Task 2.

**Table 12 Ownership structure of companies in Warsaw**

<table>
<thead>
<tr>
<th>Company</th>
<th>Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipal Cleaning Company w m.st. Warszawie Sp. z o.o (MPO)</td>
<td>owned by the City of Warsaw</td>
</tr>
<tr>
<td>PPHU LEKARO Jolanta Zagórska</td>
<td>private entities with 100% Polish capital, run by natural persons (family businesses)</td>
</tr>
<tr>
<td>PARTNER Sp. z o.o., PARTNER Dariusz Apelski and JARPER Sp. z o.o</td>
<td>private entities with 100% Polish capital, run by natural persons (family businesses)</td>
</tr>
<tr>
<td>SUEZ Polska Sp. z o.o. and REMONDIS Sp. z o.o</td>
<td>international companies with foreign capital</td>
</tr>
</tbody>
</table>
Information about the vehicles used:

Dustless vehicles: known as popular "garbage trucks" are used to collect municipal waste. They are equipped with a compacting element.

They can be single- or multi-compartment and are designed for emptying two- and four-wheeled containers with capacities ranging from 120 L to 1100 L. These vehicles can also be equipped with HDS devices and devices for emptying containers exceeding 1100 L.

The vehicles are equipped with the GPS system, which continuously monitors the route of the vehicle and additionally with a weighing system and RFID, which registers data regarding waste collection, i.e. date, time of collection, coordinates, the weight of collected waste and RFID number of the container.

Multi-chamber garbage trucks are designed to collect selectively collected recyclable waste and bio-waste. These vehicles have two or three chambers, which makes it possible to collect waste of different fractions, without mixing them.

All vehicles meet emission standards from Euro 3 to Euro 6. Some vehicles are of new generation with low-emission CNG drive. Currently, MPO has CNG-powered vehicles

- Dustless 26 pcs.
- Containers 6 pcs.

The remaining tracks are box trucks, box trucks with HDS equipment or hook lift trucks for transporting containers.

Box-body vehicles are used for transportation of post-renovation waste, rubble and glass collected in the process of selective collection, as well as other materials.

Some vehicles are equipped with HDS crane for waste loading. These vehicles empty bell-type or underground containers for selective waste collection and are used to collect bulky waste.

The number of staff in charge of waste management and information about Municipality budget on waste management

Municipal waste management in Warsaw is carried out on the level of the Waste Management Department and the level of 18 Districts.

The Waste Management Department is responsible for implementing, supervising and controlling the municipal waste collection and management system in the city. It consist of 9 Divisions with specific tasks.

The tasks of the District Offices include accepting declarations from property owners on the amount of payment for municipal waste management, fee settlements, fee collection and servicing residents.

| Table 13 Operating costs of the municipal waste management system in Warsaw |
|-------------------------------------------------|---------------|----------------|
| OPERATING COSTS OF THE MUNICIPAL WASTE MANAGEMENT SYSTEM IN THE CAPITAL CITY OF WARSAW (in PLN) | 2020 | PLAN 2021 |
| Employees in the districts | 102 | 97 |
| Employees in Waste Management Department | Around 38 | 63 |
| **System administration support** | 15 663 730.14 | 17 099 300.00 |
**Context analysis in three partner cities**

### Operating Costs of the Municipal Waste Management System in the Capital City of Warsaw (in PLN)

<table>
<thead>
<tr>
<th>Category</th>
<th>2020</th>
<th>PLAN 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salary fund</td>
<td>15 656 306.14</td>
<td>17 062 015.00</td>
</tr>
<tr>
<td>Expenses for the employee</td>
<td>6 424.00</td>
<td>36 285.00</td>
</tr>
<tr>
<td>Maintenance of the Office</td>
<td>1 000.00</td>
<td>1 000.00</td>
</tr>
<tr>
<td><strong>Municipal waste management and environmental protection</strong></td>
<td><strong>1 243 573 642.53</strong></td>
<td><strong>1 225 000 000.00</strong></td>
</tr>
<tr>
<td>Municipal waste management</td>
<td>1 240 426 693.68</td>
<td>1 220 935 000.00</td>
</tr>
<tr>
<td>Municipal waste collection</td>
<td>330 999 782.47</td>
<td>363 206 935.00</td>
</tr>
<tr>
<td>Municipal waste management</td>
<td>905 099 160.34</td>
<td>852 000 000.00</td>
</tr>
<tr>
<td>Operation and maintenance of the CASs</td>
<td>4 140 231.97</td>
<td>4 998 065.00</td>
</tr>
<tr>
<td>Article 6s returns</td>
<td>2 182.40</td>
<td>10 000.00</td>
</tr>
<tr>
<td>Opinions, analyses, expert opinions</td>
<td>116 665.50</td>
<td>520 000.00</td>
</tr>
<tr>
<td>Other</td>
<td>68 671.00</td>
<td>200 000.00</td>
</tr>
<tr>
<td><strong>Environmental education on proper handling of municipal waste</strong></td>
<td><strong>3 146 948.85</strong></td>
<td><strong>4 065 000.00</strong></td>
</tr>
<tr>
<td>Maintenance and upkeep of greenery</td>
<td>50 220.00</td>
<td></td>
</tr>
<tr>
<td>Environmental undertakings</td>
<td>149 497.60</td>
<td></td>
</tr>
<tr>
<td>Participation in exhibitions, fairs, promotional events</td>
<td>22 000.00</td>
<td></td>
</tr>
<tr>
<td>Epidemic activity</td>
<td>31 492.80</td>
<td>65 000.00</td>
</tr>
<tr>
<td>Media coverage</td>
<td>166 972.64</td>
<td></td>
</tr>
<tr>
<td>Social dialogue, surveys of residents, social communication</td>
<td>2 726 765.81</td>
<td>4 000 000.00</td>
</tr>
<tr>
<td><strong>Culture and protection of national heritage</strong></td>
<td><strong>20 000.00</strong></td>
<td><strong>-</strong></td>
</tr>
<tr>
<td><strong>Total amount spent from the budget of the Capital City of Warsaw</strong></td>
<td><strong>1 259 257 372.67</strong></td>
<td><strong>1 242 099 300.00</strong></td>
</tr>
</tbody>
</table>

**Municipal fees on waste**

According to the regulations of the Act on Maintaining Cleanliness and Order in Municipalities, municipalities have a choice of four methods for calculating rates:

- per the area of the apartment,
- per water consumption,
- per person,
- per household.
Until March 31, 2021, there was a lump sum billing per household. The waste fee rate also depended on the type of property. The data are summarized in the table below.

**Table 14 The fees for March 2021 for different household types**

<table>
<thead>
<tr>
<th>Property type</th>
<th>March 1, 2020, to March 31, 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Method</td>
</tr>
<tr>
<td>inhabited, developed with a multi-apartment building</td>
<td>per household</td>
</tr>
<tr>
<td>inhabited, developed with a single-family building</td>
<td>per household</td>
</tr>
<tr>
<td>uninhabited</td>
<td>per the number of emptying of the containers and their type</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>the occupied part of a mixed property</td>
<td>as for an inhabited property</td>
</tr>
<tr>
<td>the unoccupied part of a mixed property</td>
<td>per the area of the property</td>
</tr>
<tr>
<td>hotel services</td>
<td>per the amount of water consumed</td>
</tr>
<tr>
<td>a holiday home or other property used for recreational and leisure purposes</td>
<td>lump sum</td>
</tr>
</tbody>
</table>

From August 2020 uninhabited properties were excluded from the municipal waste management system (apart from the municipal ones).

Citizens of Warsaw have repeatedly reported that the lump sum billing method in force until March 31, 2021, was unfair. It did not take into account, for example, how many people lived in the apartment.

From April 2021 new rules apply in Warsaw for calculating waste management fees - the rates depend on the amount of water used.

The new rate of the monthly fee for owners of single-family properties and multi-family houses will be calculated according to the rate: PLN 12.73 (2.8 €) per 1 m³ of water consumed.

The fee will be calculated based on the average water consumption in 6 consecutive months selected by the property owner from the last year.

For both multi-family and single-family properties, residents will not pay for unused water (i.e., water used to water the garden, for example) as measured by an additional water meter. It will be deducted. The amount of water used in common parts of the property (e.g. for washing staircases) is included in the waste payment.
If there is no water meter in the property or the property is not connected to the water mains or there is no data for water consumption for 6 consecutive months, the fee will be calculated according to the formula:

- inhabited property: number of inhabitants x 4 m³ of water x 12.73 PLN (2.8 €),
- mixed real estate, for the unoccupied part (e.g. a delicatessen in a tenement house, a beauty salon in a multi-family block of flats): norms of water consumption according to the attachment to the resolution 676/2019 x 12.73 PLN (2.8 €) per 1 m³.

The usage-based billing method is the only method that allows residents to influence the amount of the fee. Everyone, by using water rationally and responsibly and saving it, can reduce their waste bills. Saving water will also have a positive impact on the environment. In the current situation of climate change, more frequent droughts and higher temperatures, this is especially important.

For families with a Large Family Card, a shelter programme will be introduced. Each person qualified for support will receive about 25 PLN (5.5 €) per month to cover the costs of waste payment. Residents who are in a difficult financial situation will receive a special purpose allowance from the city. The income criterion of the programme is PLN 1,848 (406 €) net per person in a household.

All money from collected municipal waste management fees is used to cover the costs of system operation:

- Collection and management of waste according to contracts - including bulky waste such as furniture.
- Maintenance of the Civic Amenity Sites (Polish: PSZOK) - these are points where residents can, free of charge, hand over waste that is not collected directly from their property. Additionally, there are also Mobile CASs (MPSZOK).
- Environmental education;
- Other waste management costs, e.g. costs of administration of the system.

From the collected fees the municipality may cover the costs of equipping the property with containers or bags for waste collection and the costs of maintaining those containers in the proper sanitary, orderly and technical condition. In Warsaw the estimated lack of payments amounts to 17.67% (efficiency of waste bills collection is 82.33%).

Inhabitants of the town have been equipped with containers and bags and are guaranteed to have the containers washed at least every 3 months.

**Waste inspection**

**Inspection of selective waste collection on properties by municipal waste collection companies**

In case when a property owner does not fulfill the obligation of selective collection of municipal waste (keeping the assortment purity of given waste fraction), employees of companies collecting municipal waste report such irregularity to the city, through the Municipal Contact Centre Warsaw 19115, e.g. that in the container for paper there is waste improperly sorted (other than paper and cardboard), contaminated with other waste. Then such waste is collected as unsorted (mixed) waste on the date designated for collection of mixed waste. The owner of the property will be informed by a red sticker placed on the container about the lack of selective waste collection.
Incorrect segregation of waste can result in increased fees - up to double the rate. If you do not segregate your waste you may also put yourself or the whole housing association at risk of penalties.

**Inspection of properties by the Warsaw Municipal Guard**

For many years Warsaw Municipal Guard officers have been controlling properties located on the territory of the Capital City of Warsaw, concerning compliance and application of the provisions of the Act on Maintaining Cleanliness and Order in Municipalities and Regulations on Maintaining Cleanliness and Order in the City of Warsaw. For this purpose, they have received authorization from the President of the City of Warsaw, which gives them the right to enter the premises. The owner is obliged to allow guards holding such authorization to conduct inspections.

Inspection activities concern in particular the verification of the proper management of municipal waste, i.e. collection and disposal of municipal waste collected on the property.

From September 2020, municipal guards have received new powers. They may impose a fine on the property owner for failure to submit a declaration concerning. The guards pointed out to the residents the necessity of making a declaration of the municipal waste management fee, and in case of properties excluded from the municipal waste management system (companies, office buildings, etc.) they informed about the necessity of having an individual contract for municipal waste collection with an entity entered in the register of regulated municipal waste collection activities from the area of the Capital City of Warsaw.

The pandemic condition introduced in March 2020 has significantly changed the organization of social life and the way the City Hall works. The necessity to stay at home or limit movement has changed the needs of the citizens of Warsaw. The number of control activities also decreased.

In 2020, almost 5.6 thousand controls were carried out on the owners of properties where residents reside, as well as on the owners of properties where no residents reside but municipal waste is generated. During the interventions during which irregularities were found, more than 400 fines were imposed and more than 700 measures of educational influence (e.g. orders, instructions) were applied. In 3 cases a motion to the Court was filed for punishment.

**Warsaw 19115 City Contact Centre**

Through the hotline 19 115, available 24 hours a day, 7 days a week, the portal http://warszawa19115.pl/ and the application for smartphones, residents can report any irregularities in the functioning of the municipal waste management system. Thanks to this platform, notifications are registered and handled on an ongoing basis.
In 2020, the Warsaw helpline recorded over 250,000 notifications (an average of 680 daily notifications) concerning waste issues. Each report is given an individual number, and the matter is simultaneously forwarded to the waste collection company for clarification.

In the case of reported overfilling of containers, the waste collection companies can provide additional containers or increase the frequency of collection. At the same time, an information campaign is being conducted in the public space promoting the need to crush packaging waste, especially cardboard boxes before throwing them away.

Residents most frequently reported bulky and green waste collection, overfilling of containers, collection of waste not according to the schedule, insufficient number of containers/bags or damage to a container, and litter lying in public places.

In the Capital City of Warsaw, municipal waste is collected from almost 80,000 properties and almost 1,800,000 inhabitants. It is the largest undertaking of this type in the country. Each observation or recommendation is considered by our Office individually and constitutes a valuable hint for improving the quality of services within the municipal waste management system in the city.

### 4.2.3 MSW collection, sorting, recycling and disposal

**Door-to-door collection of source-separated waste and Door-to-door collection of co-mingled recyclables - Municipal waste containers and bags used:**

- **Single-family housing**

In single-family housing, a container for mixed waste and bags for fractions collected selectively is used.

For municipal waste collection bags are used that meet all of the following conditions:

- capacity from 60 to 120 liters;
- made of LDPE polyethylene foil or equivalent material thick enough to ensure resistance to tearing, without the addition of cadmium, lead or other elements harmful to the environment;
- UV, low temperature and chemical resistant;
- transparent or translucent to allow visual inspection of contents in color:
  - blue - for collection of paper waste,
  - yellow - for collection of metal, plastic and multi-material waste
  - green - to collect glass packaging waste
  - brown - to collect bio-waste
  - grey - for collection of green waste.

- **Multi-apartment buildings**

Containers are used to collect municipal waste in multi-family buildings, including

1. two-wheeled containers with a capacity of 120 liters and above, and four-wheeled containers with a capacity of 660 liters and above, adapted, following the Polish Standard, to the combing or rotary loading mechanisms of vehicles designed to collect municipal waste
2. containers with a capacity of 1,100 liters or more;
3. underground and semi-subterranean containers with a capacity of 120 liters and above, having their own container hoisting system or whose emptying system enables the use of truck cranes with universal single coupling.
Containers marked with appropriate color and labeled with a visible sign specifying their purpose are used to collect municipal waste:

- for paper waste collection containers - blue with the inscription "Paper";
- for containers intended for the collection of metal, plastic and multi-material packaging waste - yellow with an inscription "Metal and plastic";
- for containers intended for the collection of glass packaging waste - green with a sign "Glass";
- for containers intended for the collection of kitchen bio-waste, subject to point 5, brown with "Bio" inscription;
- for containers for collection of bio-waste from gastronomy facilities and market places - brown with inscription "Bio - gastronomy/market place"
- for containers for green waste collection - grey with the inscription "Green Waste";
- for containers intended for mixed waste collection - black with inscription "Mixed waste";
- containers for bulky waste - any color except those specified in points 1-7, with the inscription "Bulky waste".

In the case of underground and semi-underground containers, the requirements for marking the containers apply to their flaps and inlet elements.

Waste fractions of paper, metals, plastics and glass, for which the recovery and recycling rates were calculated in 2020, are also collected at scrap metal and recyclable material collection points.

Table 15 Information on the mass of waste transferred for reuse and recycling by entities collecting and accepting waste from the area of the City of Warsaw in 2017 – 2020

<table>
<thead>
<tr>
<th>Waste pick up entities/collectors entities</th>
<th>Mass of municipal waste fractions of paper, metals, plastics and glass sent for reuse and recycling [t]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2017</td>
</tr>
<tr>
<td>Pick up entities</td>
<td>55 519.13</td>
</tr>
<tr>
<td>CAS’s operators</td>
<td>45.53</td>
</tr>
<tr>
<td>Collectors entities</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>55 564.66</strong></td>
</tr>
</tbody>
</table>

Civic Amenity Sites (PSZOKs)

Before October 2015, there were no Civic Amenity Sites, and now two stationary Civic Amenity Sites are operating, the so-called CAS (Polish: PSZOK), which are located in the area of Warsaw. They accept segregated municipal waste from households free of charge and the waste collected at CAS facilities is handed over to municipal waste treatment facilities in accordance with applicable laws. The point is to collect municipal waste such as items made of plastic, metal, wood, used tires, or debris carried out independent repairs, and above all hazardous municipal waste, such as paints, varnishes, adhesives, detergents and chemicals and their packaging, fluorescent lamps and batteries. The inhabitants can deliver on their own, with cars weighing up to 3.5 tonnes, selectively collected municipal waste from households.

The municipality’s obligation to establish a PSZOK (Points of Selective Collection of Municipal Waste) results directly from the Act on Maintaining Cleanliness and Order in Municipalities. Both CASs are run by private companies under a public procurement contract. Both CASs accept 40 types of municipal waste (described by codes) from Warsaw residents, including hazardous waste. Separate municipal waste collection points accept municipal waste from Monday to Friday from 2:00 p.m. to 8:00 p.m. and on Saturdays from 9:00 a.m. to 8:00 p.m., except public holidays.
PSZOKs are supported by appropriately adjusted and marked vehicles, the so-called mobile municipal waste selective collection points (MPSZOK or Mobile CAS).

Information for residents on the use of PSZOK (stationary CAS) and MPSZOK (Mobile CAS), as well as a list of locations of municipal waste collection points and the MPSZOK work schedule can be found at websites: City Hall https://warszawa19115.pl/-/pszok-mpszok-punkty-selective-waste-municipal-1, and on the Contractors’ websites.

The details for the two CAS facilities currently operating in the city of Warsaw:

<table>
<thead>
<tr>
<th>CAS for right-bank Warsaw located at 1 Płytowa St., 03-046 Warsaw and is being run by a consortium of companies PARTNER Sp. z o.o. and PARTNER Dariusz Apelski;</th>
<th>Phone: 22 811 08 53; <a href="http://www.partner-apelski.pl/pszok.php">www.partner-apelski.pl/pszok.php</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS for left-bank Warsaw located at 1 Zawodzie St., 02-981 Warsaw run by P.P.H.U. LEKARO Jolanta Zagórska</td>
<td>Phone: 22 185 52 51; <a href="http://www.lekaro.pl/oferta/pszok">http://www.lekaro.pl/oferta/pszok</a></td>
</tr>
</tbody>
</table>

Each PSZOK is operated by 1 to 2 employees. An employee checks whether the waste brought by the resident is collected at the PSZOK. If the type of waste or its quantity indicate that it was not produced in the household, the employee refuses to accept it. Then the resident must hand the waste over to the company dealing with its management. The waste is weighed and an employee shows the resident which container to put the waste into. Residents put the waste into the containers by themselves. The exception is hazardous waste, which is put in the containers by the staff member himself, or the staff member supervises its placement in the container by the residents.

An employee keeps a daily record of waste. He records the type and weight of waste and the number of residents who visited the PSZOK on a given day. On the basis of the daily registers a monthly report is made to the municipality. The municipality maintains a database on types and quantities of waste accepted at the PSZOK and on the number of persons who deposit waste at the PSZOK.

In 2021 Warsaw started preparatory work for the construction of a municipal PSZOK (not private). Currently, parcels are being prepared and municipality is preparing the necessary documentation. Anticipated completion date late 2023 early 2024.

The company operating the PSZOK must:
1. have legal title to the land,
2. have a waste collection permit issued by the authority,
3. equip PSZOK with devices, containers and/or bins for collection of municipal waste brought by the residents and provide a lockable, roofed room with an area of not less than 15 m² inaccessible to residents, for collecting hazardous municipal waste brought by residents and municipal hazardous waste collected in MPSZOK. The company provides at least one container or a bin for each type of municipal waste collected in MPSZOK;
4) provide space in the PSZOK for unloading of municipal waste brought in by the residents;
5) provide space in PSZOK for temporary storage of waste before transport, loading of municipal waste collected at the PSZOK and for maneuvers of vehicles used for waste transport;
6) guarantee that the residents have free access to the places where containers or bins have been placed;
7) provide:
   a) car weighbridge, located at the entrance gate, with a capacity of 30 T,
   b) weighbridge or pallet scales with a load of max. 150 kg,
c) hardening and sealing the ground of the PSZOK area and equipping this area with devices enabling the proper management of rainwater and industrial wastewater from the entire facility,
d) fencing the entire area of PSZOK, in a way that protects against unauthorized access of people and animals, and equipping it with a lockable entrance gate with a mechanism that allows you to control the movement of vehicles entering and leaving,
e) lighting the entire area of PSZOK,
f) 24-hours monitoring, covering at least such elements of PSZOK as: entrance to the PSZOK area and exit, vehicles scales, containers and bins for waste collection, rooms for hazardous waste collection,
g) make signs on the containers informing about the type of collected waste.

The types of waste accepted at CAS:
- paper and cardboard packaging;
- metal and plastic packaging (e.g. beverage and food cans, PET bottles, cooking oil containers);
- glass packaging (e.g. empty bottles, jars, glass cosmetics packaging);
- packaging containing residues of or contaminated by dangerous substances,
- engine oil, detergent, and crop protection product containers;
- pressurised aerosol containers;
- used vehicle or household fire extinguishers or extinguishers past their expiry date;
- motor vehicle, motorcycle or bicycle tyres;
- concrete, brick rubble, ceramics, tiles, being municipal waste from renovation works carried out independently;
- glass (window and door colourless glazing) and mirrors;
- clothing and textiles (blankets, curtains, tablecloths etc.);
- textile packaging (e.g. jute bags);
- solvents, acids and alkali (caustic substances);
- photochemicals;
- crop protection products;
- cooking oil and edible fats;
- used engine oil or engine oil past its expiry date;
- paint, paint packaging, including paint packaging containing dangerous substances; glue and glue packaging containing dangerous substances;
- printer ink, toners;
- adhesives and resins, including adhesives and resins containing dangerous substances;
- binders and esins and binders and resins containing dangerous substances,
- detergents (in the manufacturer’s unit packaging);
- wood containing dangerous substances;
- wood i.e. wooden boxes, boards etc.;
- plastic waste - flower pots, buckets, window boxes, bowls, garden furniture etc.;
- metal waste - bicycle frames, bicycle wheels, hangers, equipment casing, door handles, metal parts, etc.;
- fluorescent tubes or lamps, energy-saving lamps, mercury-in-glass thermometers;
- cooling and air-conditioning devices, e.g. fridges, refrigerators, household air-conditioning units;
- waste electrical and electronic equipment e.g. radio receivers and television sets containing mercury lamps, dishwashers, gas and electric cookers, monitors;
- washing machines, vacuum cleaners, CD and DVD players;
- accumulators and batteries;
- medications past their expiry date;
- non-medical waste generated at private households as a result of injecting medicinal products and blood level monitoring, in particular needles and syringers,
- bulky waste; furniture;
- biodegradable waste (e.g. grass and leaves);
- and any other separately collected municipal waste fractions.

The type of waste **not accepted** at CAS:
- waste other than municipal waste;
- unsorted mixed municipal waste;
- materials containing asbestos;
- tar paper, tarpaulins, and construction polystyrene;
- waste in packaging which is damaged to an extent which causes leakage of the substances inside the packaging;
- waste in quantities indicating that the waste has been generated in the course of business activities.

Waste requiring packaging should be in tight and undamaged packaging with an original label, which will enable identification of the waste during transfer to the PSZOK. Used cooking oil and oil from gardening tools can be returned to the PSZOK in sealed and undamaged substitute packaging without the original labels. Biodegradable waste is accepted in bulk. Waste should be put out of bags or other packaging into a marked container. PSZOK does not accept biodegradable waste from cooperatives, housing communities, etc.

CAS and Mobile CAS facilities are only dedicated to municipal waste. The removal of waste containing asbestos is governed by special legal regulations. It is also not allowed to bring to the CAS any waste generated from business activities to which separate waste management laws apply. Hazardous waste can only be accepted in original packaging. There are a total 5 MPSZOK vehicles working in Warsaw. MPSZOK is run by the same companies that run PSZOK. **Mobile Civic Amenity Sites**, so-called MCAS (Polish: MPSZOK), are specially adapted and labelled vehicles intended for the collection of municipal waste, including hazardous waste, from households free of charge. MCAS operate in the Warsaw area, based on a kerbside collection round system, two times a week (Wednesdays between 11:00 a.m. and 6:30 p.m., and on Saturdays between 10:00 a.m. and 5:30 p.m.), stopping at indicated times at 40 designated locations within the city area. The estimated stopover time at each of the locations is 90 minutes.

Waste types that **are accepted** at the MCAS:
- oil containers, other than cooking oil containers, detergent, and crop protection product containers;
- packaging containing residues of or contaminated by dangerous substances e.g. packaging for detergents, pesticides;
- pressurized aerosol containers;
- used vehicle or household fire extinguishers or extinguishers past their expiry date;
- solvents, acids and alkali (caustic substances);
- photochemicals;
- crop protection products e.g. herbicides, insecticides;
- fluorescent tubes or lamps, energy-saving lamps, mercury-in-glass thermometers;
- cooking oil and edible fats;
- used engine oil or engine oil past its expiry date;
- paint, paint packaging and paint packaging containing dangerous substances;
- binders and resins and binders and resins containing dangerous substances;
- printer ink, toners;
- glue, glue packaging;
- adhesives and resins;
- detergents, including detergents containing dangerous substances (in packaging unit of the manufacturer);
- small waste electrical and electronic equipment, with a size of each external dimension of no more than 25 cm;
- plant protection products not containing dangerous substances;
- batteries, accumulators.

Waste types that are not accepted at the MCAS:
- unsorted mixed municipal waste;
- materials containing asbestos;
- construction and demolition waste;
- large waste electrical and electronic equipment;
- bulky waste;
- waste in packaging which is damaged in an extent which causes leakage of the substances inside the packaging;
- biodegradable waste etc.

In 2020, selective collection points were visited by nearly 49 thousand residents, who brought a total of 7,301.99 tonnes of waste, including 242.76 tonnes of hazardous waste.

**Table 16 Types of waste collected at the PSZOK by waste codes.**

<table>
<thead>
<tr>
<th>Lp.</th>
<th>Waste code</th>
<th>Waste type - catalogue name</th>
<th>Common language names of waste to be displayed on tags in PSZOK</th>
<th>Container type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>15 01 01</td>
<td>paper and cardboard packaging</td>
<td>paper and cardboard packaging</td>
<td>A</td>
</tr>
<tr>
<td>2.</td>
<td>15 01 06</td>
<td>mixed packaging waste</td>
<td>metal and plastic wastes</td>
<td>A</td>
</tr>
<tr>
<td>3.</td>
<td>15 01 07</td>
<td>glass packaging</td>
<td>container glass</td>
<td>A</td>
</tr>
<tr>
<td>4.</td>
<td>15 01 09</td>
<td>textile packaging</td>
<td>textile packaging</td>
<td>A</td>
</tr>
<tr>
<td>5.</td>
<td>15 01 10*</td>
<td>packaging containing residues of or contaminated by dangerous substances (e.g. plant protection products of toxicity classes I and II - very toxic and toxic)</td>
<td>packaging containing residues of or contaminated by dangerous substances</td>
<td>A</td>
</tr>
<tr>
<td>6.</td>
<td>15 01 11*</td>
<td>metal packaging containing a dangerous solid porous matrix (e.g. asbestos), including empty pressure containers</td>
<td>pressurised aerosol cans, used or expired fire extinguishers from vehicles and households</td>
<td>B</td>
</tr>
<tr>
<td>7.</td>
<td>16 01 03</td>
<td>waste tyres</td>
<td>waste tyres</td>
<td>C</td>
</tr>
<tr>
<td>8.</td>
<td>17 01 01</td>
<td>concrete waste and concrete rubble from demolition and renovation</td>
<td>concrete and concrete rubble</td>
<td>C with opening doors</td>
</tr>
<tr>
<td>9.</td>
<td>17 01 02</td>
<td>brick rubble</td>
<td>brick rubble</td>
<td>C with opening doors</td>
</tr>
<tr>
<td>10.</td>
<td>17 01 07</td>
<td>mixed waste and scrap of concrete, bricks, tiles and ceramics, other than those mentioned in point 1w 17 01 06</td>
<td>mixed waste of concrete, bricks, tiles, terracotta etc.</td>
<td>C with opening doors</td>
</tr>
<tr>
<td>11.</td>
<td>20 01 02</td>
<td>glass</td>
<td>Window glass, door glass, clear glass, mirrors</td>
<td>A</td>
</tr>
<tr>
<td>12.</td>
<td>20 01 10</td>
<td>clothing</td>
<td>clothing</td>
<td>A</td>
</tr>
<tr>
<td>13.</td>
<td>20 01 11</td>
<td>textiles</td>
<td>textiles</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>Code</td>
<td>Description</td>
<td>Substances</td>
<td>Category</td>
</tr>
<tr>
<td>---</td>
<td>-----------</td>
<td>-----------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>14.</td>
<td>20 01 13*</td>
<td>solvents</td>
<td>solvents</td>
<td>A</td>
</tr>
<tr>
<td>15.</td>
<td>20 01 14*</td>
<td>acids</td>
<td>acids</td>
<td>D</td>
</tr>
<tr>
<td>16.</td>
<td>20 01 15*</td>
<td>alkalis (corrosive substances)</td>
<td></td>
<td>D</td>
</tr>
<tr>
<td>17.</td>
<td>20 01 17*</td>
<td>photographic reagents</td>
<td>photographic reagents</td>
<td>A</td>
</tr>
<tr>
<td>18.</td>
<td>20 01 19*</td>
<td>plant protection products of classes I and II of toxicity (very toxic and toxic, e.g., herbicides, insecticides)</td>
<td>plant protection products containing dangerous substances</td>
<td>A</td>
</tr>
<tr>
<td>19.</td>
<td>20 01 21*</td>
<td>fluorescent lamps, energy-saving fluorescent lamps</td>
<td>fluorescent tubes and other waste containing mercury</td>
<td>E</td>
</tr>
<tr>
<td>20.</td>
<td>20 01 23*</td>
<td>refrigeration and air-conditioning equipment, e.g., refrigerators, freezers, household air-conditioners</td>
<td>equipment containing freons</td>
<td>C</td>
</tr>
<tr>
<td>21.</td>
<td>20 01 25</td>
<td>cooking oils (expired used)</td>
<td>edible oils and fats</td>
<td>A</td>
</tr>
<tr>
<td>22.</td>
<td>20 01 26*</td>
<td>used or expired automotive engine oils</td>
<td>oils and fats other than those mentioned in 20 01 25</td>
<td>A</td>
</tr>
<tr>
<td>23.</td>
<td>20 01 27*</td>
<td>paints, printing inks, inks containing dangerous substances</td>
<td>paints, inks, adhesives, binders and resins containing dangerous substances</td>
<td>A</td>
</tr>
<tr>
<td>24.</td>
<td>20 01 28</td>
<td>inks, printing inks, inks, printer toners, adhesives, binders and resins</td>
<td>paints, inks, adhesives, binders and resins other than those mentioned in 20 01 27*</td>
<td>A</td>
</tr>
<tr>
<td>25.</td>
<td>20 01 29*</td>
<td>detergents containing hazardous substances</td>
<td>detergents containing hazardous substances</td>
<td>A</td>
</tr>
<tr>
<td>26.</td>
<td>20 01 30</td>
<td>detergents</td>
<td>detergents other than those mentioned in 20 01 29*</td>
<td>A</td>
</tr>
<tr>
<td>27.</td>
<td>20 01 31*</td>
<td>cytotoxic and cytostatic drugs</td>
<td>medicines</td>
<td>E</td>
</tr>
<tr>
<td>28.</td>
<td>20 01 32</td>
<td>medicines</td>
<td>medicines other than those mentioned in 20 01 31*</td>
<td>E</td>
</tr>
<tr>
<td>29.</td>
<td>20 01 33*</td>
<td>accumulators and batteries</td>
<td>batteries and accumulators included in 16 06 01*, 16 06 02* or 16 06 03* and unsorted batteries and accumulators containing these batteries</td>
<td>D</td>
</tr>
<tr>
<td>30.</td>
<td>20 01 34</td>
<td>batteries and accumulators</td>
<td>batteries and accumulators other than those mentioned in 20 01 33*</td>
<td>B</td>
</tr>
<tr>
<td>31.</td>
<td>20 01 35*</td>
<td>TVs, monitors</td>
<td>discarded electrical and electronic equipment other than those mentioned in 20 01 21* and 20 01 23* containing hazardous components</td>
<td>C</td>
</tr>
<tr>
<td>32.</td>
<td>20 01 36</td>
<td>large electrical and electronic appliances</td>
<td>waste electrical and electronic equipment other than 20 01 21*, 20 01 23* and 20 01 35</td>
<td>C with opening doors</td>
</tr>
<tr>
<td>33.</td>
<td>20 01 37*</td>
<td>wood containing dangerous substances</td>
<td>wood containing dangerous substances</td>
<td>C</td>
</tr>
</tbody>
</table>
2020 was a year of breaking records. Selective municipal waste collection points (PSZOKs) were visited by 43,500 residents, and mobile selective municipal waste collection points (MPSZOKs) by nearly 5,400. It's about 95 percent more people than in 2019.

This translated into 120 percent increase in the amount of all delivered waste. In 2019, PSZOK and MPSZOK collected 3,283 tonnes of waste, and in 2020 as much as 7,305 tonnes.

Record increases in segregated waste

The largest increase (compared to 2019) was recorded in the following types of waste:

- edible oils and fats: jump from 419 kg to 2.4 tonnes - an increase of 384%.
- paints: a jump from 46.5 tonnes to nearly 125 tonnes - an increase of 168%.
- detergents: a jump from 2.8 tonnes to 5.6 tonnes - an increase of 100%.
- batteries and accumulators: jump from 1.9 tonnes to 3.64 tonnes - an increase of 90%.
- waste electrical and electronic equipment: a jump from 87.9 tonnes to 188.8 tonnes - an increase of 115%.
- bulky waste: jump from 661 tonnes to 1,902 tonnes - an increase of 188%.
- textiles (eg curtains, cloths, bags): a jump from 14.3 tonnes to 35 tonnes - an increase of 145%.
- clothing: a jump from 16 tonnes to 47.2 tonnes - an increase of 193%.
- construction and demolition waste: a jump from 1,610 tonnes to 3,633 tonnes - an increase of 126%.

There was also an increase of over 100 percent in waste such as paper, tires, glass and acids. Residents also provided about 94 percent more biodegradable waste – it was collected 154.5 tonnes.

Mobile CAS’s:

- Left-bank Warsaw, served by 3 PPHU LEKARO vehicles
- Right-bank Warsaw, served by 2 vehicles of the PARTNER Consortium.
Context analysis in three partner cities

Figure 9 Mobile CAS

Figure 10 Interior of the Mobile CAS with designated waste bins
Table 17 Quantities and types of hazardous waste collected at the CAS’s in 2020.

<table>
<thead>
<tr>
<th>No.</th>
<th>Waste codes</th>
<th>Type of waste</th>
<th>PARTNER</th>
<th>LEKARO</th>
<th>TOTAL</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15 01 10*</td>
<td>Packaging containing residues of or contaminated by dangerous substances (e.g. plant protection products of toxicity classes I and II - very toxic and toxic)</td>
<td>0.927</td>
<td>16.111</td>
<td>17.038</td>
<td>7.02%</td>
</tr>
<tr>
<td>2</td>
<td>15 01 11*</td>
<td>Metal packaging containing a dangerous solid porous matrix (e.g. asbestos), including empty pressure containers</td>
<td>3.860</td>
<td>8.426</td>
<td>12.286</td>
<td>5.06%</td>
</tr>
<tr>
<td>3</td>
<td>20 01 13*</td>
<td>Solvents</td>
<td>0.293</td>
<td>1.340</td>
<td>1.633</td>
<td>0.67%</td>
</tr>
<tr>
<td>4</td>
<td>20 01 14*</td>
<td>Acids</td>
<td>0.190</td>
<td>0.242</td>
<td>0.432</td>
<td>0.18%</td>
</tr>
<tr>
<td>5</td>
<td>20 01 15*</td>
<td>Alkalis</td>
<td>0.364</td>
<td>0.651</td>
<td>1.015</td>
<td>0.42%</td>
</tr>
<tr>
<td>6</td>
<td>20 01 17*</td>
<td>Photographic reagents</td>
<td>0.427</td>
<td>0.603</td>
<td>1.030</td>
<td>0.42%</td>
</tr>
<tr>
<td>7</td>
<td>20 01 19*</td>
<td>Plant protection products of toxicity classes I and II (very toxic and toxic, e.g. herbicides, insecticides)</td>
<td>0.000</td>
<td>0.836</td>
<td>0.836</td>
<td>0.34%</td>
</tr>
<tr>
<td>8</td>
<td>20 01 21*</td>
<td>Fluorescent tubes and other waste containing mercury</td>
<td>0.804</td>
<td>1.375</td>
<td>2.179</td>
<td>0.90%</td>
</tr>
<tr>
<td>9</td>
<td>20 01 23*</td>
<td>Equipment containing CFCs</td>
<td>10,666</td>
<td>26,306</td>
<td>36,972</td>
<td>15.23%</td>
</tr>
<tr>
<td>10</td>
<td>20 01 26*</td>
<td>Oils and fats other than those mentioned in 20 01 25</td>
<td>6,616</td>
<td>7,154</td>
<td>13,770</td>
<td>5.67%</td>
</tr>
<tr>
<td>11</td>
<td>20 01 27*</td>
<td>Paints, inks, adhesives, binders and resins containing dangerous substances</td>
<td>8.575</td>
<td>10.752</td>
<td>19.327</td>
<td>7.96%</td>
</tr>
<tr>
<td>12</td>
<td>20 01 29*</td>
<td>Detergents containing hazardous substances</td>
<td>0.473</td>
<td>1.327</td>
<td>1.800</td>
<td>0.74%</td>
</tr>
<tr>
<td>13</td>
<td>20 01 31*</td>
<td>Cytotoxic and cytostatic drugs</td>
<td>0.002</td>
<td>0.150</td>
<td>0.152</td>
<td>0.06%</td>
</tr>
<tr>
<td>14</td>
<td>20 01 33*</td>
<td>Batteries and accumulators including batteries and accumulators included in 16 06 01, 16 06 02 or 16 06 03 and unsorted batteries and accumulators containing these batteries</td>
<td>0.169</td>
<td>0.813</td>
<td>0.982</td>
<td>0.40%</td>
</tr>
<tr>
<td>15</td>
<td>20 01 35*</td>
<td>Discarded electrical and electronic equipment other than those mentioned in 20 01 21 and 20 01 23 containing hazardous components</td>
<td>14.933</td>
<td>31.939</td>
<td>46.872</td>
<td>19.31%</td>
</tr>
<tr>
<td>16</td>
<td>20 01 37*</td>
<td>Wood containing dangerous substances</td>
<td>12.807</td>
<td>73.630</td>
<td>86.437</td>
<td>35.61%</td>
</tr>
<tr>
<td></td>
<td>TOTAL [t]</td>
<td></td>
<td>61.106</td>
<td>181.655</td>
<td>242.761</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

*In addition to these quantities 2.000 T of 20 01 25 edible oils and fats was collected in Warsaw in 2020 at the CAS’s
Biodegradable waste (grass, leaves) and kitchen bio-waste are collected from the property of residents. Biodegradable waste such as grass, leaves are collected at the CAS’s.

Bio-waste is collected separately in the city only from 2019. This is the waste fraction, which selective collection is still developing and the amount of collected waste is systematically increasing. Certainly, this fraction will be the biggest challenge in the coming years, due to the underdeveloped network of installations dealing with their management in the province.

Biodegradable waste is transferred to a waste composting plant. In 2019-2020, these waste were mainly transferred to the composting plant located at 1 Kampinoska Street belonging to the MPO company. In addition, biodegradable
waste is transferred to other installations carrying out the composting process with the relevant permits for the processing of this waste. Once MPO builds a biogas plant, this fraction will be directed to the fermentation process.

In 2020, a total of 35,893.55 t of biodegradable waste and 41,845.5300 t of biodegradable kitchen waste were collected.

**Table 18 Biodegradable waste amounts in Warsaw**

<table>
<thead>
<tr>
<th>Waste type</th>
<th>Quantity (tonnes)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green waste (20 02 01)</td>
<td>35,893.55</td>
<td>46.03%</td>
</tr>
<tr>
<td>Bio-waste from households (20 01 08)</td>
<td>40,602.39</td>
<td>52.06%</td>
</tr>
<tr>
<td>Bio-waste from gastronomy operations (20 01 08)</td>
<td>1,489.74</td>
<td>1.91%</td>
</tr>
<tr>
<td>Total biodegradable waste</td>
<td>77,985.68</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Collection points for certain HW types other than CAS’s and MCAS’s**

**Medicines and thermometers:**

Apart from the collection at the CAS’s and MCAS’s, the City of Warsaw collects expired medicines at 616 pharmacies and mercury thermometers at 170 pharmacies. In 2020, a total of nearly 150 T of expired medicines and 72 kg of mercury thermometers were collected.

**Waste Electrical and Electronic Equipment**

The collection of WEEE is conducted in every district on Sundays by a non-profit organization that has an agreement with the City. Residents may bring waste electrical and electronic equipment free of charge at points designated in each district of Warsaw. In 2020, a total of nearly 1.9 thousand T of various types of waste equipment was collected.

In Warsaw, there is also a programme of a free collection of large electro-waste (e.g. washing machines, electric stoves, fridges) directly from homes. On this occasion, small equipment may be collected as well.

**Batteries**

In addition, in over 650 educational institutions and some offices of the Districts and Offices of the Capital City of Warsaw, there is a collection of used batteries. During the action in 2020, more than 8 tonnes of batteries were collected.

**Warsaw Landfill information**

By decision of December 20, 2016, the Marshal of the Mazowieckie Voivodeship agreed to the closure of the Radiowo landfill. After January 1, 2017, only soil and debris waste and a soil-improving agent werehave been sent to the landfill in order to complete the reclamation process (making a reclamation cover and sowing grass). From January 1, 2017, residues from the mechanical-biological waste treatment process have been directed to another RIPOK (Regionalnych Instalacji Przetwarzania Odpadów Komunalnych - Regional Municipal Waste Treatment Facilities) landfill in the central region.

The Radiowo landfill has an area of 17.6 hectares and is located at the northwest border of Warsaw in the Stare Babice Commune and partly in the Bemowo district. From the north, it is adjacent to Municipal Waste Disposal Plant (Zakład Unieszkodliwiania Odpadów Komunalnych), owned by Municipal Cleaning Enterprise (Miejskie Przedsiębiorstwo Oczyszczania – MPO) in the Capital City of Warsaw Sp. z o.o. The landfill was established in 1962 and municipal waste was stored there until 1991. Since 1992, it has been a technological facility accepting the so-
called ballast waste from the composting plant. From 2012, only post-process waste, i.e. after undergoing a mechanical and biological treatment process, was sent to the landfill.

Figure 13 The closed Radiowo landfill

List of companies engaged in recycling, treatment and disposal of municipal and hazardous household waste:

Municipal waste collected from property owners and waste collected at CAS’s, MCAS’s and Pharmacies is directed in the first place to installations selected by the MPO Company for waste management.

In 2020, municipal waste collected from property owners was directed to the following companies that process waste or operate a transfer point. A transfer point is a location where waste is transferred to a waste management facility after a batch is collected.

These companies, if the final waste management process did not take place at their facility, forward the sorted waste (paper, metals, plastics, glass) to the recyclers. The City does not keep a record of recyclers, so there is no comprehensive list. The laws of the market determine which recycler the waste will go to.

Number of entities holding permits for hazardous waste activities (issued by the President of the Capital City of Warsaw) is 17.

<table>
<thead>
<tr>
<th>Waste code</th>
<th>Name and address (street, number, zip code, city postal code, town) Installation where the waste is accepted</th>
<th>Weight of accepted waste in [t]</th>
</tr>
</thead>
<tbody>
<tr>
<td>150101</td>
<td>CIGO Studzianki ul. Spółdzielcza 36, 16-010 Wasilków</td>
<td>541,14</td>
</tr>
<tr>
<td></td>
<td>Geminus ul. Stawy 5, 02-467 Warszawa</td>
<td>151,72</td>
</tr>
<tr>
<td></td>
<td>GIA Sp. z o.o. ul. Sienna 86, 00-815 Warszawa</td>
<td>9,08</td>
</tr>
<tr>
<td></td>
<td>Hamburger Hungarie Spółka z ograniczoną odpowiedzialnością, 2400 Dunaujvaros, Papirgysri ut 42-46 działka 3663/1</td>
<td>746,413</td>
</tr>
<tr>
<td></td>
<td>HETMAN punkt przeładunkowy, ul. Turystyczna 38, 05-830 Nadarzyn</td>
<td>569,75</td>
</tr>
<tr>
<td></td>
<td>Installation for mechanical processing of waste from selective collection; Byś Wojciech Byškiniewicz; ul. Wólczyńska 249, 01-919 Warszawa</td>
<td>10639,69</td>
</tr>
</tbody>
</table>

Table 19 List of companies engaged in treatment and disposal of municipal and hazardous household waste, including the type of waste (waste code) and the quantities accepted
| Installation MBP PPHU "LEKARO" na Woli Duckiej gm. Wiązowna; Wola Ducka 70A, 05-408 Glinianka | 18808,68 |
| Progroup Paper PM2 GmbH Oderlandstrabe 110 d-15890 Eidenguttenstadt | 3418,219 |
| Trade and Production Company Przesmyślaw Olejnik Wąbiewo 26; 64-061 Kamieniec | 332,1 |
| TRANSSHIPMENT POINT MPK PURE HOME SP. ZO.O. 05-300 MIŃSK MAZOWIECKI UL DŹWIGOWA NR DZIAŁKI 4004/173 | 613,98 |
| TRANSSHIPMENT POINT PPHU "LEKARO" na Woli Duckiej gm. Wiązowna; Wola Ducka 70A, 05-408 Glinianka | 41,816 |
| Remondis Sp. z o.o., transshipment point, ul. Zawodzie 18, 02-981 Warszawa | 3126,269 |
| Remondis Sp. z o.o., Mechanical-biological treatment plant for municipal waste, ul. Zawodzie 18, 02-981 Warszawa | 1736,503 |
| Stora Enso Poland S.A. Pulp and Paper Installation, Al. Wojska Polskiego 21, 07-401 Ostrołęka | 3861,95 |

**150101 Total** 44597,31

<table>
<thead>
<tr>
<th>150106</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIGO Studzianki ul. Społdzielcza 36, 16-010 Wasilków</td>
</tr>
<tr>
<td>Installation for mechanical processing of waste from selective collection; Byś Wojciech Byskiniwicz; ul. Wólczyńska 249, 01-919 Warszawa</td>
</tr>
<tr>
<td>Installation for mechanical and thermal processing of waste in Różankach, Różanki 12, 14-240</td>
</tr>
<tr>
<td>Installation for mechanical and thermal processing of waste in Różankach, Różanki 12; 14-240 Susz</td>
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<td>Installation MBP PPHU &quot;LEKARO&quot; na Woli Duckiej gm. Wiązowna; Wola Ducka 70A, 05-408 Glinianka</td>
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<tr>
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<tr>
<td>Description</td>
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<td>Remondis Sp. z o.o., Mechanical-biological treatment plant for municipal waste, ul. Zawodzie 18, 02-981 Warszawa</td>
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<td>Plant for mechanical-biological processing of mixed municipal waste, ul. Turystyczna 38, 05-830 Nadarzyn</td>
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<td>Description</td>
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<td>Composting plant: PROSPRECO POLSKA sp. z o.o. Jawiszty Podleśne działka nr</td>
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<td>Composting plant: PN-WMS Sp. z o.o. Composting installation for biodegradable waste, Międzyliceł 1, 05-326 Poświętne</td>
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**200108 Total** 2610,88

**200201**

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**200201 Total** 42832,75

**200301**

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<td>Bioelektra Group S.A. Działki nr 2/19. obręb Różanki, gmina Susz, powiat Łącki, Susz</td>
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<tr>
<td>Chemeko-system sp. zo.o Waste Management Facility, 54-519 Wrocław;</td>
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City Municipal Installation for mechanical-biological processing of municipal waste in Stawnicy, gm. Złotów
### Context analysis in three partner cities

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<tr>
<th>Company/Installation</th>
<th>Address</th>
<th>Value (PLN)</th>
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<tr>
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### Context analysis in three partner cities

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<td><strong>FINAL TOTAL</strong></td>
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4.3 Existing waste management systems in Tirana, Albania

4.3.1 Introduction/General data

Waste management in Albania can be considered still in its beginnings, as the country has exercised and exercises cleaning function as the original concept of waste management. The approach to waste management was fundamentally divided regulatory and legal in 2011 with the adoption of the National Integrated Waste Management Strategy and Action Plan 2018-2033 and the adoption of the Law on integrated waste management in September 2011. These legal changes shifted management of waste from ordinary cleaning according to the standards set by the Law on public waste disposal of 1996 (law which is still in force) in integrated management according to the best European standards set by the law on integrated waste management.

The new Integrated Waste Management Strategic Policy Paper, 2020-2035, endorsed in May 2020, tries to set priorities of the sector for the upcoming 15 years and states that the amount of waste generation is increased in the country in the recent years, while the way they are managed has still room for improvement. Implementation of the IWM Strategic Policy Paper will require an essential institutional reorganization, to clarify the structures responsible for drafting and implementing legislation on integrated management of waste, as well as institutional tasks, to achieve the objectives with regard to reduce, reuse and recycling.

The Law on integrated management of waste requires the implementation of the principles of the framework Law on environment protection and the principles of integrated waste management, which set the level of management at a very high level of quality protection. The most essential principles on which waste management is based are the: "Polluter pays" principle and the "Extended responsibility of the waste producer" principle. Other principles for integrated waste management are applied in accordance with the provisions of Law No 10431/2011 “On environmental protection” and Law No 10463/2011 “On integrated waste management”, such as: The principle of prevention and taking precautionary measures; Principle of replacement and / or compensation; The principle of integrated approach; The principle of mutual responsibility and cooperation; The principle of the right to information and public participation; The principle of promoting activities for environmental protection.

So far the local government units, responsible for waste management in the country, do not have the tools, capacities, know-how and financing to manage this waste, which mostly end up in lakes, rivers and the seas, damaging not only the flora and fauna but tourism sector as well.

There are no plans drafted yet to carry out the assessment of the concentration levels of heavy metal in packaging. There is no data-base in place for managing the package and packaging waste (which is responsibility of NEA). There are no plans yet related to hazardous waste management.

Waste management (meaning collection and disposal of waste in landfills, dumpsites and /or incinerators) is performed in all urban areas, while this is not the situation about rural areas. Waste is mainly dumped in identified damps/landfills from Local Self-Government Units but there are unknown quantities that are thrown in unauthorized placed, along rivers, roads and near settlements.

4.3.2 Municipal waste composition

Precise waste data in Albania is a major problem that leads to numerous consequences with the management system. Data are collected by several institutions such as the Ministry of Transport and Infrastructure - MTI until 2016 (when administrative and territorial reforms has been introduced), National Environmental Agency - NEA.
The majority of municipalities do not have access to sanitary landfills equipped with weighbridge, data are based on the number of truckloads that are dumped on the dumpsite or landfill, thus, the amount of generated waste is only estimated. Annual waste quantities generated in Albania are significantly different: in 2015, reported annual waste amounts are: 951,397 tonnes by MTI, 1,142,964 tonnes by INSTAT and 2,641,498 tonnes by AKM.

However this data approach was better in 2016, which remains the last reference year until the expected improvement of the situation with implementation of DCM no. 687, dated 29.7.2015 "On the approval of rules for keeping, updating and publishing waste statistics", which entered into force on January 1, 2019.

Local government units are obliged to complete the reporting format for annual statistics on waste generated within their territory of jurisdiction. Each year, within 31 January, they submit such forms to the relevant Region Council, to the NEA and to the ministry in charge of infrastructure. This decision sets obligations for the ministry in charge of agriculture, infrastructure, health and industry to complete forms with data on the waste statistics from the sectors of their competence. They submit such forms to the NEA within 10 February each year. NEA collects and updates waste statistics and reports them to the Ministry of Tourism and Environment - MTE, within 28 February each year. MTE uses the data to produce the 3 annual reports on waste statistics at the national level. Such report shall be made publicly available through the ministry’s official website.

Albania is one of the countries with the lowest generation of waste per capita in Europe, 373 kg / inhabitant in 2016 according to INSTAT, but Albania is also lacking behind in waste separation at source and in territory covered by waste collection.

In Albania, the district of Tirana has the highest MSW production, followed by the district of Fier, Gjirokastra and Vlora. Also in the district of Tirana, as in other most urban areas of the country, waste is collected and transported by private companies of waste collection.

The Tirana district population represents about 26.8 % of the country's population and the average population density is 472.49 inhabitants/km², compared with 97.4 inhabitants/km² nationwide. The density mainly reflects the concentration of the population in local units within a rather small area.

Below are given waste quantities generated in Tirana between 2013 and 2016 and reported by the Ministry of Transport and Infrastructure (currently MIE) and the Institutes and Statistics - INSTAT.

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<td>kg/inhabitant</td>
<td>543</td>
<td>491</td>
<td>343</td>
<td>405</td>
<td>413</td>
<td>469</td>
</tr>
</tbody>
</table>

Data available on the INSTAT website refers to the whole Albania so the waste amount generated in Tirana from 2017 to 2020 is not available.

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25 Currently MIE (Ministry of Infrastructure and Energy)
Data shows that 1.09 million tonnes of urban waste were managed in Albania in 2019, marking a decrease by 18%, compared to 2018. The annual amount of urban waste managed per person, nationwide, was 381 kg in 2019 and 462 kg in 2018.

**Table 21 Total urban waste managed by generating sources (kg/capita) in Albania**

<table>
<thead>
<tr>
<th>Years</th>
<th>Total annual waste, tonnes</th>
<th>Municipal and similar waste</th>
<th>Industrial waste managed together with urban waste</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>tonnes</td>
<td>%</td>
</tr>
<tr>
<td>2013</td>
<td>940,160</td>
<td>827,828</td>
<td>88.0</td>
</tr>
<tr>
<td>2014</td>
<td>1,228,884</td>
<td>970,818</td>
<td>79.0</td>
</tr>
<tr>
<td>2015</td>
<td>1,413,233</td>
<td>1,142,964</td>
<td>81.0</td>
</tr>
<tr>
<td>2016</td>
<td>1,300,373</td>
<td>1,072,236</td>
<td>83.0</td>
</tr>
<tr>
<td>2017</td>
<td>1,253,913</td>
<td>1,109,399</td>
<td>88.5</td>
</tr>
<tr>
<td>2018</td>
<td>1,325,071</td>
<td>1,097,705</td>
<td>82.8</td>
</tr>
<tr>
<td>2019</td>
<td>1,086,692</td>
<td>945,024</td>
<td>87.0</td>
</tr>
</tbody>
</table>

The coverage level of the population with municipal waste management services in 2019 was 87.9%, marking an increase of 22.2% compared to the previous year which is showed in the following diagram:

**Figure 14 Population coverage rate with community waste services in Albania**

According to the National IWM Strategy, Tirana’s coverage of waste collection services was 85% in 2016.

In the following table, the composition of municipal waste in Albania expressed as a percentage, is shown.
Table 22 Waste composition (%)

<table>
<thead>
<tr>
<th>Years</th>
<th>Organic</th>
<th>Wood</th>
<th>Paper, Paperboard</th>
<th>Glass</th>
<th>Plastic</th>
<th>Textile</th>
<th>Metal</th>
<th>Health care residues</th>
<th>Hazardous (not hospital)</th>
<th>WEEE</th>
<th>Inerts</th>
<th>Other</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>41.0</td>
<td>4.0</td>
<td>12.0</td>
<td>7.0</td>
<td>14.0</td>
<td>3.0</td>
<td>3.0</td>
<td>1.1</td>
<td>9.0</td>
<td>3.0</td>
<td>2.1</td>
<td>0.8</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>50.2</td>
<td>6.1</td>
<td>8.7</td>
<td>4.0</td>
<td>9.1</td>
<td>2.6</td>
<td>5.8</td>
<td>0.9</td>
<td>8.1</td>
<td>3.7</td>
<td>0.5</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>51.4</td>
<td>4.6</td>
<td>9.9</td>
<td>4.5</td>
<td>9.6</td>
<td>2.9</td>
<td>4.8</td>
<td>0.5</td>
<td>1.1</td>
<td>8.2</td>
<td>2.5</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>49.5</td>
<td>5.8</td>
<td>7.9</td>
<td>4.2</td>
<td>10.0</td>
<td>2.8</td>
<td>3.4</td>
<td>0.2</td>
<td>0.8</td>
<td>11.9</td>
<td>3.3</td>
<td>0.03</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>45.9</td>
<td>3.9</td>
<td>9.5</td>
<td>4.8</td>
<td>16.8</td>
<td>3.2</td>
<td>2.7</td>
<td>0.2</td>
<td>1.2</td>
<td>7.4</td>
<td>3.4</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>61.2</td>
<td>5.1</td>
<td>7.7</td>
<td>3.8</td>
<td>9.7</td>
<td>2.2</td>
<td>1.5</td>
<td>0.2</td>
<td>1.0</td>
<td>5.5</td>
<td>0.1</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>58.4</td>
<td>2.4</td>
<td>7.6</td>
<td>3.2</td>
<td>9.0</td>
<td>5.6</td>
<td>1.8</td>
<td>0.1</td>
<td>1.4</td>
<td>7.7</td>
<td>1.7</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>51.09</td>
<td>4.56</td>
<td>9.04</td>
<td>4.50</td>
<td>11.17</td>
<td>3.19</td>
<td>3.29</td>
<td>0.46</td>
<td>3.23</td>
<td>6.77</td>
<td>1.94</td>
<td>0.61</td>
<td></td>
</tr>
</tbody>
</table>

The largest share is biodegradable waste (organic), which is mostly food waste. Figure 4 shows the quantities of hazardous waste and WEEE calculated in tonnes.

The following diagram shows that the amount of hazardous waste decreased almost four times in two years (from 2014 to 2016), followed by three years with uniform amounts, and in 2019 the value was reduced by half again. The
quantities of waste from electrical and electronic equipment moved similarly, whose values since 2015 vary from 10,400 tonnes to 15,400 tonnes.

Figure 16 Hazardous waste and WEEE amount (2013-2019) in Albania

4.3.3 Waste collection

Companies (private or owned by local authorities) contracted by local authorities carry out the collection of municipal solid waste. Bigger settlements contract more than one company, such as Tirana. These companies usually operate all the waste management activities in the given settlement from collection to disposal. Contracted companies usually do other cleaning activities in the settlements, which cannot be considered as part of waste management (e.g. washing of streets in the summer) and maintain green areas.

The collection infrastructure in Albania is poor, as often the number of containers is insufficient. Equipment and collection (containers and trucks) are not according to European standards and need renovation in continuously.

The city of Tirana is divided into seven cleaning zones, where one public and six private cleaning services operate. In the framework of the Memorandum of Cooperation concluded in December 2015 between the Municipality of Tirana and the Municipality of Verona in the Republic of Albania, the two local government units have agreed to cooperate in several areas of services, the object of the Municipality of Tirana, such as the service of cleaning, management, collection and disposal of waste.

**Red Zone, Service Operator "Eco Tirana"**

- Collection and transportation of urban waste and markets for non-differentiated waste with 450 containers (1.7 m³); 680 vacancies per day, (450 vacancies at night and 230 vacancies during the day);
- Collection and transportation of urban waste and markets for differentiated waste (many plastic and cellulosic materials) with 450 containers (1.7 m³); 680 vacancies per day, (450 vacancies at night and 230 vacancies during the day);
- Collection, transportation of waste from selected packaging, through the door-to-gate system (1,850 subjects);
- Maintenance of Landfills during the day as well as cleaning of construction waste and bulky abandoned, including free booking and towing service for families, large waste (266 landfills);

**The eastern area** is divided into three cleaning areas respectively:

**Service operator: "Infinit Constructions" sh.p.k », Eastern Zone 1**

- Collection and transportation of urban waste and markets (containers 1.7 m³) 401 emptying / day (350 emptying at night and 51 emptying during the day);
- Maintenance of the landfill during the day and collection of construction and bulky waste (109 landfills);

**Service operator: “T.T.A Alba-Lam” sh.p.k », Eastern Zone 2**
Context analysis in three partner cities

- Collection and transportation of urban waste and markets (container 1.7 m³) 551 emptying / day (377 emptying at night and 174 emptying during the day);
- Maintenance of waste collection site during the day and collection of construction and bulky waste (110 collection points);

**Service operator: “Shpresa” sh.p.k ”, Eastern Zone 3**

- Collection and transportation of urban waste and markets (container 1.7 m³) 653 discharges / day (570 discharges at night and 83 discharges during the day);
- Maintenance of waste collection site during the day and collection of construction and bulky waste (170 collection points);

The western area is divided into three cleaning areas respectively:

**Service operator: “Korsel” sh.p.k ”, Western Zone 1**

- Collection and transportation of urban waste and markets (container 1.7 m³) 653 emptying / day (600 emptying at night and 53 emptying during the day);
- Maintenance of the landfill during the day and collection of construction and bulky waste (175 collection points);

**Service operator: “Fusha” sh.p.k ”, Western Zone 2**

- Collection and transportation of urban waste and markets (container 1.7 m³) 401 emptying / day (373 emptying at night and 28 emptying during the day);
- Maintenance of the landfill during the day and collection of construction and bulky waste (127 collection points);

**Service operator: “Alko-Impex” sh.p.k ”, Western Zone 3**

- Collection and transportation of urban waste and markets (container 1.7 m³) 730 discharges/day (652 discharges at night and 78 discharges during the day);
- Maintenance of the landfill during the day and collection of construction and bulky waste (244 collection points).

The waste collection services in Tirana, as well as in whole Albania, are performed based on a service contract. The cleaning contracts are drafted and signed by municipality also in accordance with the provisions of Law No. 8094, dated 21.3.1996, "On Public Waste Disposal". The model of these contracts does not provide waste management standards as defined in Law No. 10463 "On Integrated Waste Management", dated 22.09.2011, and bylaws deriving from it.

The terms of reference for the contracting of the waste collection services are drown by the Cleaning and Waste Management Directorate in close cooperation with the Legal Directorate.

Also, the Municipality of Tirana offers cleaning service within neighborhoods (quarters) and in the lake park, areas not covered by private economic operators, through the General Directorate of Cleaning and Greenery and the Parks and Recreation Agency, a budget enterprise under the Municipality of Tirana.

**The inspection**

The inspection service for all 7 waste zones in Tirana is done on a daily basis by the Sector of Monitoring of Urban Waste Cleaning, under the Cleaning and Waste Management Directorate. The inspection of the landfill is covered by another sector of this Directorate named Sector of landfill monitoring.

It is very difficult to ensure the contracts of the municipality with companies. They are neither available to the public or accessible in the municipality due to the personal data protection rule.
Regardless of the support of the specific Directorate dealing with waste management, the article of the contract dedicated to penalties was insured. According to the article 20 of the standard contract “The Contractor” is subject to prohibitions and penalties for unfinished work as follows:

- In cases when items of unfinished work are identified, provided by the contract, estimate by the Contracting Authority, Municipality of Tirana, then in addition to the ban on unfinished work, the Contractor will be penalized with 5 times the value of the respective item.
- In cases when the Contractor does not perform, with the quality required by the technical specifications of the contract, the service of the processes provided for any work item, in addition to the suspension of payment for the work item, the Contractor will be penalized with 2 times the value of the respective item.
- In case of non-complete repair of containers or their replacement (in order to meet the technical, aesthetic and hygienic conditions), within the deadline set above by the Contractor, the latter will be fined 25,000 ALL for each container, value which will be retained by the successor situation that will be presented for liquidation.
- The Contractor is obliged to equip his employees with uniforms in which the distinctive signs of the Contracting Company are clearly placed. In case of non-compliance with the above obligation, the Representatives of the Contracting Authority notify the Contractor of compliance with the obligations expressed above. In case the Contractor does not take action within 10 days from the receipt of the notification then they apply a fine to the Contractor in the amount of 25,000 ALL, the amount of the applied fine will be maintained from the next situation that will be submitted for liquidation.
- In case the Contractor does not fulfill the obligation defined in the contract according to article 17 and the chapter "Technical Specifications" for conducting Public Environmental Education, the supervisors of the Contracting Authority of the Municipality of Tirana apply a fine in the amount of 100,000 ALL. The contractor will be notified of the amount of the applied fine as well as the deadline set for the performance of the Environmental Education obligation. In case within 30 days from the receipt of the Notification, the Contractor does not realize the Public Environmental Education, the Contracting Authority decides the next penalty in the amount of 500,000 ALL. Penalties will be borne by the Contracting Authority in the next situation submitted for liquidation by the Contractor.
- In case the Contractor does not fulfill the obligation defined in the contract according to article 10.8 Special Obligations of the Contractor The representatives of the Contracting Authority notify the Contractor for the observance of the obligations expressed above. In case the Contractor does not take action within 30 days from the receipt of the notification then, apply a ban in the amount of 1,000,000 ALL. Measure which will be applied every month, until the obligation is fulfilled. The amount of the applied fine will be maintained by the subsequent situation that will be submitted for liquidation.

Currently, there is no separate collection of hazardous waste and no available data on the amount of hazardous waste generated in the country. There is no collection points, neither civic amenity centers in Tirana, nor in Albania. Also, there is no any plan to establish collection points and CACs for any type of waste (biowaste, recyclable waste, household hazardous waste, C&D waste, etc.).

**Cleaning Fee**

The Cleaning Fee is paid by all families, natural or legal persons, local or foreign, who reside and exercise economic activity within the territory of the Municipality of Tirana. The cleaning fee does not cover all costs from cleaning to final disposal or recycling. Regardless, the percentage collected from the cleaning fee goes for waste management and green spaces.

Based on article 14, of law no. 68/2017, point 1 “On local self-government finances”, Local self-government units have the right to set fees for a service provided by these units or for a right granted to individuals, natural and / or legal persons.
In points 2 and 3 of this article are provided:

2. The level of the fee is oriented towards covering the cost of public service provided by the local self-government unit;

3. Local self-government units can set tariffs only for public services, the consumption or benefit of which is measurable for users or beneficiaries, using appropriate instruments to ensure access, quality, quantity and cost affordable by all.

The cleaning fee is set to cover the costs of the cleaning and waste treatment service, based on the cost of these processes.

Residents of Tirana pay a fixed fee according to the areas of housing A, B and C, annual cleaning fees respectively 5000 ALL (~40 EUR), 2000 ALL (~16 EUR) and 1000 ALL (~8 EUR) per year and for businesses from 3500 ALL (~28 EUR) to 450,000 ALL (~3670 EUR) per year. In summary, the total fee collected by family members for 2016 is 680 million ALL (~ 5.2 million Euros) and from business entities ~ 930 million ALL (~ 7.2 million Euros), together 12.5 million Euros per year.

The cost of cleaning for the Municipality of Tirana, significantly exceeds the revenues generated by the collection of the respective fee. This in conditions when the quality of cleaning has increased significantly in recent years. The efficiency of bill collecting was 92% in 2020. Currently the Municipality of Tirana manages the waste collection and disposal service through contracts with private operators operating in this field as well as in a certain area through the joint stock company Eco Tirana sh.a., in which it owns 51% of the shares.

In general:
- Cleaning for waste management services are very low and the current determination of the tariff level is not aimed at cost recovery.
- Despite low tariffs, in many cases the efficiency of tariff collection is also low;
- As a result of low tariffs and low tariff collection rate, most of the costs for waste management services are paid from the general municipal budgets;
- In many cases municipalities are not able to pay on time the agreed costs for private service providers, therefore a considerable debt has been accumulated.

Since there is no way out of municipal budgets to significantly reduce other costs, the only reasonable option for financing improved services would be a significant increase in tariffs in line with the polluter pays principle.

It is assumed that high costs for the implementation of national policies are the main reason for the lack of implementation. According to Albanian legislation, municipalities are responsible for financing waste management services. With regard to municipal waste, tariffs are set by municipal councils. The fee should cover the costs of waste management, from collection to final disposal. Although waste management fees vary widely between Albanian municipalities, in general, cost recovery through fees, as well as the fee collection rate, are at unsatisfactory levels. Moreover, the implementation of the national strategy and plan leads to a significant increase in current costs.

In addition to the waste collection and disposal service, in 2018 the financial effects in Tirana deriving from the Concession Contract no. prot. 6597 dated 31.08.2017 "On construction of landfill, incinerator and rehabilitation of existing landfills in Tirana and electricity generation" Waste treatment area Tirana (ZTMT). This contract was realized through a PPP procedure by the Albanian Government, the Ministry of Environment and was delegated for implementation to the Municipality of Tirana and other municipalities of the Tirana Region. This agreement has also regulated the financial commitment plan of the government and the Municipality of Tirana. This plan provides for financial cost recovery for the minimum amount guaranteed to the concessionaire in a ratio of approximately 80% by the government and 20% by the municipality, a ratio which increases each year in favor of the municipality while
decreasing in favor of the government. Any deposit above the guaranteed minimum amount must be financially covered by the Municipality of Tirana.

### 4.3.4 MSW sorting and recycling

Despite the regulatory framework (DCM No. 418 dated 25.06.2014, "On the separate collection of waste at source"), which obliges the local authorities to organize a separate collection of waste with a three-bin system, it is rarely done systematically in settlements, and therefore there is no available data related to the generation or recycling of specific waste streams. Usually, mixed waste is discharged into the waste bins. The separate collection has only been introduced to date within the frame of several pilot projects funded by intergovernmental organizations (IGOs) and civil society organizations – CSOs. These have been implemented in numerous settlements around the country, targeting the at-source separation of paper and cardboard, PET and other recyclable plastic and metal (mostly aluminum cans) waste streams from other types of waste. In rural areas, the projects also covered the separate collection of organic and (small-scale) agricultural waste from households.

Albania has a low recycling rate of plastic waste at nearly 5 percent of the total amount of generated waste. According to the Albanian Institute of Statistics (INSTAT), every citizen in the country created an average of 39.6 kg of waste in 2016. This figure ranks Albania among the countries with a high rate of plastic waste generation. In 2019 WWF published a report on plastic pollution in Mediterranean Sea. This report pointed out that Albania, is one of the most problematic countries, with the highest percentage of untreated plastic waste, 73%. Furthermore, the World population review indicates that Albania has generated 73,364 tonnes of plastic waste during 2020.

Recycling has progressed compared to a few years ago. Companies collecting metals, plastics, paper and glass and recycling them are set up. Collection of other waste streams like hospital waste, batteries, oils, WEEE, has also started, but it is still in its initial phases. Attempts to segregate waste in the source are done frequently, but with no positive result. This is due to the complete lack of infrastructure but also awareness public. There is no local government unit in the country that does the waste segregation (at least in two waste streams).

Until today, Municipality of Tirana has not succeeded in the 3R (reduction, reuse, recycling) activities. Sporadic pilots are either done with the support of civil society organisations or with Eco Tirana. In 2015, Eco Tirana initiated the segregation and disposal of waste in 2 waste bins (recyclable and others), which did not functions for a number of reasons. Waste reduction is not yet actively promoted in the society although reuse and recycling activities are implemented by the activities of the private sector.

There are around 300 waste pickers (informal sector), mostly Roma people, who recover recyclable materials from the waste bins placed in the town, mainly metals such as aluminum cans, steel cans, plastics, paper, cardboard, glass in addition to the said materials in total amount of about 42 tonnes per day (as per the only study done in the waste sector, by JICA, in Tirana Municipality in 2012). In 2012 (according to JICA report) only 6-7% of the total municipal waste collected was recycled.

In order to comply with the Law and super-ordinate plans to reduce the waste volume for landfill, the Municipality Tirana should:

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27 World Bank Document
30 https://worldpopulationreview.com/country-rankings/plastic-pollution-by-country
• prepare the plans and programmes for education and public information to the waste generators to raise awareness for waste reduction and sorting of recyclable waste at source and implement the plans and programmes immediately,
• study the measures for fulfill the target levels set in the new national integrated waste management strategy,
• organize composting activity groups for education and instruction for composting at administrative units outside the metropole area (agriculture intensive zones) and/or through collaboration with the farms in the neighbouring area of Tirana,
• establish the links of Municipality of Tirana with the recycling industry, dealers, waste pickers, and residents to support and assist recovery of more recyclable materials and recycling

Recycling factories use recovered materials organized by Association of Recyclers of Albania (ARA). ARA reports that it has about 32 members\(^ {32}\), collecting and processing different types of waste, such as: scrap of metals, paper, plastic, textiles, used tyres, etc. They are all private recycling companies, which operate in Albania. The head of the association, Mr. Bardhyl Baltëza indicates that only 8 factories are operating actively. Few factories are of large scale, most of them are of small scale.

Mr. Baltëza, reported that the market value of investments of this industry amounts to about 234.2 million Euro. He also reported recently in a public media, that with the planning of the incinerators, as well as the economic crises hitting the country after the 2019 earthquake and COVID 19, currently the recycling industry works with only 15-30 percent of capacity, is on the verge of bankruptcy and leaving Albania\(^ {33}\). Analyzing the data of these recycling factories, the total waste recycling ratio is very low.

To illustrate this, for example, in Albania, according to the data published by INSTAT, about 1.72 million tonnes of waste were produced in 2018, of which 1,523,256 was Municipal Solid Waste (MSW), with non-urban waste (industrial or perhaps inert) accounting for 198,185 tonnes per year. According to 2018 data, each resident produces about 0.35 t/waste/year of MSW. Of the total MSW generated in 2018, approximately 923,316 tonnes (or 60.61%) are deposited, of which 401,755 tonnes (26.37%) is deposited in a sanitary landfill, and the rest of 13,01% is dumped illegally.\(^ {34}\) There are no data on the amount of recycled waste and even raw estimations can only suggest that it is between 5 and 12 % on the national level, in total. The discussion over data is seen also between INSTAT [Albanian Statistical Institute] who claims of a percentage equal to 18.5% or 245,040 tonnes of recycled waste, whereas the Association of Recyclers of Albania claims for 10%.\(^ {35}\)

### 4.3.5 MSW disposal

All waste collected in Tirana is disposed of at Sharra dumpsite. It is 7 km in southwest of Tirana with a total surface of 55,000 m\(^ 2\). It started operating in 1995 as an open dumpsite. In 2007, with the support of the Italian Government, in Sharra dumping site was implemented landfill technology using conventional methods of capping and biogas venting which never operated due to technical issues and lack of human resources. As of September 2011, the incoming waste amount for disposal at Sharra dumpsite is computed at 720 ton per day approximately.

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\(^ {33}\) https://euronews.al/al/me-pak-fjale/2020/10/07/shoqata-e-ricikluesve-industria-ne-prag-te-falimentimit
\(^ {34}\) CoM 418, dated 27.05.2020, p. 26
\(^ {35}\) UNECE. Albania Third Environmental Performance Review, Geneva 2018. P.147
Tirana municipality has not yet an incinerator. It is planned to be constructed in the location where the existing landfill of Tirana is situated, with capacity of 920 ton/day. Capacity of operative incinerator in Elbasan is 150 ton/day. Planned capacity of third incinerator, planned in Fier, is 240 ton/day. Below is a google map of the landfill location, where the incinerator will be located as well as the situation of the incinerator in the bigger Tirana map.

The concession company Integrated Energy BV SPV (IEBV) was contracted in August 2017 aiming to manage, administer and carry out the works for the construction of the Tirana Waste Treatment Area, T.W.T.A. Sharra, based on the concession contract “For Landfill Construction, Incinerator and Rehabilitation of Existing Landfills in Tirana and for Electricity Production”, signed in August 2017. After construction, IEBV will take care of the operation and maintenance process over a 30-year period, with a concession of the form BOT (construction, operation and transfer of ownership and operation, at the end of the Concession Contract).
In this project, 8 lots will be built, comprising the rehabilitation of the existing Sharra landfill, and construction of the following plants and objects: Waste to Energy Plant (WTE)/Incinerator, waste water treatment plant WWTP with leachate treatment plant LTP, landfill for urban waste, landfill for inert waste, landfill for ash and industrial waste (hazardous waste), material recovery facility (MRF) for waste separation, stabilization plant (composting plant), etc.

According to a preliminary estimate, the concesor expects to handle a volume of 550-800 tonnes of waste per day, equivalent to a maximum amount of 292,000 tonnes of urban waste per year. These waste will be generated by the Tirana region.

The municipalities that will be part of the project, will deposit the waste in this plant and will pay the estimated value of 29.05 euros per ton of waste which will be deposited.

**Concession rights**

*Liability for minimum quantities of urban waste*

Throughout the duration of this contract, the Contracting Authority through the Local Units of Tirana Region, guarantees the Concessionaire in relation to its supply with the Minimum Guaranteed Amount of Urban Waste, which is about 1,000 t/day. In case the amount of Urban Waste submitted to the Concessionaire is less than the Minimum Guaranteed Amount of Waste, then the Municipality of Tirana will pay to the Concessionaire the difference between the total value of the price per Ton of Urban Waste for the amount of Urban Waste submitted to the Concessionaire as above. and the total value of the Guaranteed Minimum Amount of Urban Waste multiplied by the price per Ton of Urban Waste. There is doubt that Tirana can generate 1,000 t/day.

**4.3.6 Legal entities licensed for hazardous waste management**

Sixteen permits for hazardous waste management have been issued in Albania. Only three companies perform recycling of the household hazardous waste and their data are given herein bellow. It means that there is the capacity and market for batteries, accumulators, WEEE and packagings of hazardous chemicals. The only problem is that none of the companies are located in Tirana. Company Invmet Albania is close to Tirana, ca. 50 km.

1. **Pirro Oil, Bulgarc. Korce**

   **Permit:** Type B “Transfer station for hazardous waste”.

   **Type of waste:** 16 06 01* lead batteries, 16 06 02* Ni-Cd batteries, 16 06 03* mercury-containing batteries.

   **Further treatment on site:** No further on-site treatment is performed.

   Reuse, recycle or treat on site: Recovery, storage, storage and packaging in the facility where the activity takes place.

   **On-site disposal / treatment method:** The waste, after undergoing the packaging process, is transported to the licensed entities for recycling and / or their final treatment / disposal.

   **Methods and technological processes:**

   At the disposal of this activity, the subject has placed a covered silo, a transport vehicle, a fork for loading stuffed pellets and good hygienic and functional conditions are applied. BATTERIES are collected from all car services in the country. Storage capacity 1,000 tonnes / year, 12,000 pieces. There is no treatment, only packaging, storage, labeling and transportation of this waste. Recycling is performed in the dismantling and recycling factories of the farms in the state of Macedonia.

2. **SHEGA-TRANS, Berxull, Vore, Tirane**

   **Permit:** Type B "Hazardous waste transfer station"
Type of waste: The company has permit for number of hazardous waste, including the following household hazardous waste: 17 02 04* glass, plastic and wood containing or contaminated with hazardous waste (hazardous packaging waste); 15 01 11* metallic packaging containing a hazardous solid porous matrix (for example asbestos), including empty pressure containers; 16 01 04* end-of-life vehicles; 16 06 01* lead batteries; 20 01 33* batteries and accumulators included in 16 06 01*, 16 06 02* or 16 06 03* and unsorted batteries and accumulators containing these batteries.

Further treatment on site: No further on-site treatment is performed.

On-site disposal / treatment method: Temporary storage and transfer to licensed operators for further processing and handling.

Methods and technological processes:
In the facility where the activity takes place there will be no processes of processing, recovery, packaging. Recycling, disposal, but hazardous waste will be temporarily stored and transferred to licensed operators for processing, treatment and further disposal of this waste.

3. Invimet Albania, Superstrada Lezhe-Milot, km 7, Gajush, Shenkoll, Lezhe

Permit: Type B "Storage of scrap metal / metal scrap that do not contain hazardous materials. Warehousing, treatment, repair or renovation of waste electrical and electronic equipment (WEEE). Transfer station for hazardous waste. Transfer station for non-hazardous waste ">

Type of waste: Among others: 20 01 35*. Discarded electrical and electronic equipment other than those mentioned in 20 01 21 and 20 01 23 containing hazardous components.

Further treatment on site: Grinding mill.

On-site disposal / treatment method: Collection, packaging, transportation and treatment, recycling, final disposal by licensed entities.

Methods and technological processes:
The collected waste is partially processed with special equipment installed where the catalyst is separated in the metal part for scrap and internal ceramics. The ceramic part is then inserted into a grinder which consists of a rotating tank with spheres of lead inside which crush and grind the ceramic, turning it into fine powder.

The powder is packed in synthetic bags with double layer which do not allow the dust to penetrate out of them. This powder is the product that is exported to the recycling factory.

Waste catalysts and metal parts disassembled from tools, which are subjected only to the selection process and then packaged and sent for recycling.

Electrical parts (circuits of various files extracted from electronic devices) are collected by different manufacturers, stored, packaged, in plastic boxes and after collecting a quantity suitable for transport are exported to factories for processing, recycling or disposal.
5 METHODS AND TOOLS APPLIED TO INFORM AND INVOLVE CITIZENS IN HAZARDOUS WASTE MANAGEMENT

Yerevan

In Armenia, there is a need for raising the level of awareness on adequate waste management among public, different levels of national government and local self-governments. Projects for raising awareness are usually implemented by NGO’s and within the frameworks of community development projects of international organizations, which are carried out very irregularly and are not enough to provide mass awareness. NGO’s mainly touch upon issues related to composting and waste separation topics with a specific highlight on the development and implementation of practical models at schools.

EcoAghb NGO has been implementing awareness campaigns since February of 2018, carrying out separation of waste directly on busy streets while engaging passers-by, university, and school students. Very often residents of apartment buildings join these flash mobs, which are carried out once or twice every month after getting proper approvals for it by the municipality. Such awareness campaigns are also carried out in different villages of Armenia. The NGO, together with the “White Brigade” initiative organize cleaning-day campaigns in various public places through engaging locals and sorting waste, which is then sent to be recycled. 36

“Clean Armenia” is an initiative running from 2017 to improve the cleanliness of the cities, villages, parks, roads, and other places through public participation and raised public awareness. It organized a number of country scale clean-ups as well as developed in 2018 one of the smartphone applications allowing citizens to report littering places using public participation GIS tools.

“CLEANUPARMENIA” is an initiative involving 10,000 volunteers in all regions of Armenia. It independently organizes the World Cleanup Day Armenia getting to clean around 300 areas around the country including Lake Sevan.

In September 2015 the EU initiated and funded 2-year project called Biomass heating solutions for rural development. It aimed to raise the level of local public awareness and acceptance, promote the benefits of use of biomass for domestic heating and develop a set of decision-making tools for social enterprises to sustainably produce and utilize biomass in heating applications in rural areas.

In 2018, the AUA Acopian Center for the Environment, with support from UNDP, developed environmental training packages for decision makers in ministries, state authorities, regional and local self-governing bodies. A significant portion of these trainings was on Sustainable Waste Management.

The only educational institution that have courses dedicated to or containing topics on waste management is the National Polytechnic University of Armenia. The courses designed both for bachelor’s and master’s programmes include topics on zero-waste technologies, radioactive and hazardous waste management, industrial and household waste management, and mining waste management among other topics.37

Another example of such an educational institution is the American University of Armenia that has several general education courses that cover topics on waste as well as a special course on solid and hazardous waste management basics.

36 WGA Report, 2020
37 Ibid.
Armenian educational system, specific programmes and individual courses must include more topics on solid waste management and circular economy, covering aspects of waste hierarchy from prevention and reduction to environmentally sound disposal of waste.

There are no specific awareness programmes for the public regarding household hazardous waste management, neither for hazardous waste in general, except for medical waste management.

As a measure within the strategic goal (SG7: Human Resource and Participation) of the National Integrated Waste Management Strategy and Action plan, 2018-2033, Albania, it is envisaged citizens to be engaged and consulted in the drafting of Waste Management Plans. Plans will be drafted with the participation of the community. The municipalities will hold public hearings in every administrative unit, ensuring a balanced participation between men and women, groups of interest and the affected groups. The plan will offer various solutions whose main goal is to ensure maximum health and environmental protection at a cost that is affordable and acceptable for service recipients.

**Warsaw**

The City of Warsaw is currently carrying out educational and information activities on waste hierarchy, proper segregation of municipal waste, and benefits resulting from the choice of selective collection. These actions are addressed to various groups of recipients.

Launched in November 2019, the #SegregujNa5 search engine, which includes an ever-expanding database of user-submitted waste types, has been very popular.

In 2020, SegregujNa5 search engine was visited by about 3.5 million people, and since its launch in November 2019, there have been more than 4 million visitors. It is as if every Varsovian visited it more than 2 times. Almost 80 percent of users are those who have used the tool more than once. Anyone who doubts where to properly dispose of a particular waste, e.g. medicine blister packs, can check it in our search engine at [https://segregujna5.um.warszawa.pl/](https://segregujna5.um.warszawa.pl/) both on the computer and on the phone. As a result of the search you will find the answer as to which container you should throw your waste into, e.g. glass, bio or mixed, as well as an additional hint. In case of blisters it is information that expired drugs should be given to a pharmacy. If the search does not include the item you are looking for, the user can submit a question to the City Hall in order to complete the search list.

The city posts educational and informational materials in public spaces, print, online, and social media. In September/October 2019, a new batch of informational materials was released, including in English, Russian, Ukrainian. It was made possible to independently download the electronic version of the above-mentioned materials from the waste information website - now the materials are available at [https://warszawa19115.pl/-/materialy-dopobrania](https://warszawa19115.pl/-/materialy-dopobrania). Educational materials about the waste management system were distributed to all districts and handed out during the Department's information campaigns or other related events.

The city also conducted a campaign called "Ecopoukładani" during which a record-breaking collection of electro-waste was recorded. On 20 June 2020 an educational action called "Ecopoukładani" took place in 6 locations, during which about 17 tonnes of electro-waste was collected. The purpose of the event was to propagate environmentally friendly behaviors and to promote recycling among Warsaw citizens as a chance for reasonable management of limited natural resources of Earth. For bringing the electro-waste the residents received plant cuttings - flowers, both annual and perennial. In addition, a collection of clothes was held at Plac Defilad organized by the portal ubraniadooddania.pl, the proceeds from which were allocated for the benefit of senior citizens. The proceeds were donated to senior citizens. 19 tonnes of waste electrical and electronic equipment and over a ton of batteries were collected.
The inhabitants cast 21,075 votes for the project called “Eco points in the whole city”. The project involves the creation of an interactive map that allows you to find places where you can find, including:

- battery containers,
- electronic waste collection points,
- hanger for unnecessary clothes and other places where clothes can be returned,
- Eateries,
- containers for plastic caps,
- boomerang bags - a place where you can leave or pick up bags,
- CAS and Mobile CAS.

**Tirana**

None of the methods and tools for informing and involving citizens in hazardous waste management have been established in Tirana, Albania.
6 FORMER, ON-GOING AND PLANNED PROJECTS AND INITIATIVES ON HAZARDOUS WASTE MANAGEMENT

6.1 Former, on-going and planned projects and initiatives on HWM in Yerevan

Civil Amenity Centers

City of Yerevan plans to build three Civil Amenity Centers for which locations have been selected: the small one in Arabkir district, and the big one in two districts: Avan and Nor Nork. Detailed design of CAC is prepared for all 3 locations. Location in Arabkir is close to the city center, operation of this CAC will be monitored; it might not be permanent. The location selection in the fourth district, Malatia-Sebastia is under discussion. For now, the only tender for the construction of CAC in Avan is in process of publishing. The Work Contractor has to provide the construction permit.

CACs project was initiated by the Sorting Department of the LGEP with the aim of the LGEP to store collected packaging waste before delivering to recycling companies, to store collected hazardous households waste, WEEE, bulky waste, C&D waste generated by households, car tyres, etc. Besides that purpose, CAC would make it possible for the generators of household waste from districts, like residents/households, small companies, craft workshops and shops from districts to bring that kind of waste in aim to reduce the fee for waste collection and disposal, even to earn the fee for stored recyclable waste. LGEP started the process to obtain the licence for hazardous waste collection.

For hazardous waste collection, it is planned to purchase red containers of 1,110 l which can be divided for a collection of different types of WEEE: batteries, lamps, mobile phones, televisions, computers, etc.

Currently, the official collection of large electrical appliances (refrigerators, freezers, cookers, washing machines), as well as other hazardous waste (detergents, cleaning agents, used mineral oils such as engine and gear oils and lubricating greases, used kitchen oils, containers contaminated with these substances; acids and alkalis; paints, dyes, paint remnants, varnishes, solvents, pesticides, thinners, wood preservatives, chemical kits, adhesives, enamel paints, weed killers, fertilizers as well as all containers contaminated with these substances, toner and printer cartridges, accumulators, batteries, chemicals, pharmaceutical waste, used car tyres, etc), is not envisaged. But there are few private companies which are doing collection of part of HHW, based on obtained licences, with aim to do recycling (WEEE, used tyres, HHW) or to export to Iran (lead batteries).

New solid waste landfill

Nubarashen landfill is located about 12 km south of Yerevan center next to the district communities of Erebuni and Nubarashen. about 6-8 million tonnes of solid waste are estimated to have accumulated in the landfill.

The project area of the new solid waste site is located in the southeast of Yerevan, in the district of Erebuni and it is planned to design, construct and operate a new landfill with European standards on an area near the existing Nubarashen landfill with approximately 29 ha square, as well as to isolate the area of existing landfill (landfills) according to the same standards.

The whole territory of the new landfill is planned for 8.8 mln m³ volume of waste, which in case of annually 350 thousand ton estimated volume of waste in Yerevan will provide about 28 years of operation. Intended for municipal or similar but non-hazardous waste. Due to the change of waste volumes, particularly as a result of waste recycling the duration of landfill operation will increase.

It is planned to isolate the territory of the new landfill to be built from the existing landfill, construct a landfill corresponding to European standards with all necessary infrastructures needed for operation, isolating the bases with waterproof layers, constructing wastewater drainage systems and relevant reservoirs for the latter’s storage.
Further on, the collected wastewater will be used for spraying the waste, the purpose of which is to ensure permanent gas production by preserving the waste biological decomposition process. The gas collection from the mass of waste will be implemented through gas wells which will be connected to gas collection pipes. The gas will be forwarded from gas collection pipes through condensate collector for gas burning. The use of gas as an energy producer can be an alternative for gas burning. This energy can be used to meet domestic consumption, as well as for general use depending on the quantity of electricity got from generated gases. The new landfill will be separated by a fence, equipped with a waste weighing scale and wheel washing system, appropriate machinery necessary for waste compacting and levelling. It is also planned to build a proper entrance/exit for the landfill, administrative service building, analysis laboratory of waste, wastewater and surface water and other infrastructures.

However, there is no any plan to build any plant, chemical-physical or thermal, for treatment of hazardous waste. Also, there is no plan to build any landfill or underground storage for the disposal of hazardous waste.

6.2 Former, on-going and planned projects and initiatives on HWM in Warsaw

New Civic Amenity Sites

Since the launch of the two Civic Amenity Sites, increasing social demand has been observed to create new points in locations convenient for residents. More and more residents visit PSZOKs more frequently, and the mass of waste brought increases year by year municipalities. PSZOK is perceived very positively by the inhabitants, it is a place where the inhabitants can easily return waste and at the same time fulfill educational tasks. The inhabitants are aware that they are delivering hazardous and problematic waste in a safe way environment and comply with applicable regulations.

To promote the segregation of waste and to make it easier for residents to take advantage of the opportunity for waste management, including hazardous waste, was submitted by the City to the Investment Plan constituting an appendix to the Waste Management Plan for the province. Mazowieckie 2024 willingness to develop a network of CAS points in the capital city Warsaw, by organizing such points in each district. The construction of new CASs is also in line with the implementation of the # Warszawa 2030 strategy, operational goal 2.3. We use services closer to home and for the purpose of 3.2. We live in a clean environment.

In 2020, the City continued activities aimed at establishing in the capital city of Warsaw CAS with an education zone and a repair and reuse point for non-waste items. The investment of CAS construction has been entered in the Multiannual Financial Forecast of the Capital City of Warsaw for the years 2020-2050 (resolution of the Council of the Capital City of Warsaw No. XLII / 1279/2020 of December 10, 2019. on the Long-Term Financial Forecast of the Capital City of Warsaw for the years 2021-2050 ). The financing of the investment was secured in the city budget. The total amount spent on this goal is PLN 6,169,560. The investment will be implemented by the Capital City Development Authority (SZRM) in the years 2021-2023 in cooperation with the Waste Management Office of the City of Warsaw. In the course of the works, it was decided that the first one large CAS with a zone would be created education and a repair and reuse point for non-waste items. This will be a model and the first place of this type on the map of Warsaw. Activities carried out in CAS, related to the repair and re-use of things, fit into the idea of "zero waste". Promoting and encouraging the re-use of things will be one of the activities educational activities conducted at CAS. At this point, 1 site has been selected where the investment will be implemented.

Expansion of waste incineration plant in Warsaw

Warsaw will gain the country’s largest modern incineration plant, which will also deliver heat and electricity to over 10,000 households, planned for 2023.

In line with the Investment Plan for the Mazowieckie Voivodeship, which is an appendix to the Plan waste management for the Mazowieckie Voivodeship 2024, a strategic element of the system municipal waste management of the Capital City of In Warsaw there is an expansion of the thermal installation waste transformation,
located in Warsaw at ul. Zabraniecka 2. The project entitled "Expansion and modernization of the Solid Waste Treatment Plant Komunalnych at ul. Zabraniecka 2 in the Targówek district of the Capital City of Of Warsaw" was entrusted Municipal Cleaning Company in the Capital City of Warsaw Sp. z o. o. under the Agreement Executive Order signed between the Capital City of Warsaw, and the MPO on November 21, 2014. The planned investment includes the modernization and expansion of the plant to a capacity of 305,200 t/year. As part of the undertaking, it is planned to build two new lines of technology with a capacity of 132,600 t/year each and the maintenance of the existing line with a capacity of up to 40,000 t/year.

The undertaking is being carried out under a contractual arrangement based on 8 contracts, including Contract 5. "Design and expansion of the Thermal Waste Conversion Installation Komunalnych at the Municipal Solid Waste Disposal Plant (ZUSOK) in Warsaw" and Contract 6. "Delivery and assembly with the executive design of devices included in the technological line for the segregation of dry raw material waste on the premises Municipal Solid Waste Disposal Plant (ZUSOK) in Warsaw". In 2015, MPO started tendering procedures for service contracts related to the implementation Projects, ie Contract Engineer, Designer, Technical Assistance and Promotional Activities and educational, which ended with the signing of the agreements in question in 2016, which were valid until 2020 and have now been completed.

On November 30, 2020, an agreement was signed for the expansion of ZUSOK with POSCO Engineering & Construction Co., Ltd. SA Pursuant to the agreement, the Investment completion date is 36 months from the Commencement Date (the Commencement Date was determined by the Contract Engineer on January 11, 2021). The investment is scheduled to be completed by the end of 2023. Additional investments included in the Investment Plan, planned by the Municipal Cleaning Company in Capital City of Warsaw Sp. z o.o (MPO) there are the following tasks:

1. Construction of the Recycling and Environmental Education Center. The Recycling and Environmental Education Center will be a meeting place for scientists and specialists from the waste industry who will work together to popularize knowledge on waste, including selective waste collection, limiting the amount of waste generated and promoting the re-use of items. The center will also be a place where new innovative solutions for the future will be developed waste management. Implementation of the task consisting in the construction of the Center and facilities accompanying this modern facility is intended to spread knowledge of the path handling waste and the role of residents in the waste management system. It is planned create a reputable education center where meetings, exhibitions and can be held conferences. The center will be equipped with educational paths or squares that are in the way safe will illustrate the life cycle of the waste from the moment of weighing it during collection from the site collection until recycling, recovery or disposal.

As part of the construction of the Recycling and Environmental Education Center, on the premises of the plant located at ul. Kampinoska 1, the following projects are planned:

- a) construction of an installation for sorting waste paper, plastic, metal and glass with a processing capacity of 120 thousand T/year with the possibility of increasing to 150 thousand T/year,
- b) modernization/expansion of installations for processing bulky waste with a waste preparation point for reuse in the amount of 65 thousand T/year.
- c) modernization/expansion of installations for the processing of green waste in quantity 35 thousand T/year with the possibility of increasing to 40 thousand T/year, construction of a separate collection point for municipal waste. In 2020, an application for a decision on environmental conditions was prepared for ventures. Currently, activities related to the application submitted on 5 January 2021 to Office of the Capital City of Warsaw, i.e. verification of the submitted documentation during the proceedings in the case issuing a decision on environmental conditions.
2. Construction of a biogas plant receiving approx. 80 thousand T/year of waste. The biogas plant will be adapted to accept all bio-waste together with impurities (e.g. packaging, foil bags, canned food, jars, kitchen animal waste, dog droppings). A wet fermentation technology was chosen which provides for recovery/recycling organic at a minimum level of 75%. The investment involves the production of Bio Methane in quantity 10 million m³ per year and the production of high-quality compost (no pollution) in the amount of 50 thousand tonnes annually. In the fourth quarter of 2019, the concept and environmental impact report for the investment were prepared and an application for a decision on environmental conditions was submitted. Still, today proceedings are underway to issue a decision on environmental conditions for the venture. The implementation of this investment is essential for the growing quantities of selectively collected bio-waste. In the face of the adopted policy of "circular economy", an important element of the management system of municipal waste is to increase the amount of waste transferred for recycling. To achieve the assumed goals, it will be important to build a good-quality waste sorting installation selectively collected. In a circular economy, materials that can be subjected to recycling, they will be fed back into the economy as new raw material, Collected "at the source". Raw materials in sorting plants will be segregated into individual fractions and then transferred to recyclers.

**Additional containers for small electro-waste**

Warsaw intends to supplement the existing municipal waste collection system by setting up containers for small electro-waste (telephones, hair dryers, etc.) in places accessible to residents. There is a strong demand on that matter expressed by the citizens. Once the extended producers’ liability is implemented, it may be necessary to change the selective packaging waste collection system for recycling. For the time being it is not planned to introduce any changes in the existing municipal waste collection system.

**Circular Economy in Poland**

The Polish Roadmap “Transformation toward Circular Economy” was adopted by the government in September 2019. The Polish CE Roadmap is the result of the CE Working Group established in 2016 by the Ministry of Development.

A special area of the Polish CE roadmap is dedicated to municipal waste management, in which some specific recommended actions are indicated, such as changes in legislation, improvement in the waste management system, prevention of food waste, and education of residents about the importance of CE implementation in everyday life. There are some small achievements in the CE implementation in Polish municipal waste management. The municipal waste generation in Poland was increasing in previous years, to 329 kg per capita in 2018; however, it is still one of the lowest in the EU. Municipal waste recycling in Poland was also increasing in last years, from 26.5% in 2014 to 34.3% in 2018; however, this value is unsatisfactory because it is below the European average. Further activities in the scope of development of municipal waste treatment infrastructure should be implemented, as well as encouraging all citizens to take actions to support the government’s activities in the field of implementation of the CE in the country. The current paper presents the inventory of recommended actions that should be taken by governments and the residents themselves, such as:

- Regenerate—landfill remediation and use of selected municipal waste fractions for economic purposes;
- Share—sharing the products with co-users, such as cohousing, clothes sharing, and reuse of products;
- Optimize—most optimal solutions in the waste recovery and disposal processes and comprehensive management of all waste streams;
- Loop—remanufacturing products or components and recycling/recovery of raw materials;
- Virtualize—virtual solutions in everyday life to reduce the amount of generated waste;
• Exchange—replacement of household appliances with items with a higher energy class. The indicated solution can be also adopted in other municipal waste management systems as the recommended direction in the process of the transformation towards CE in Europe.

6.3 Former, on-going and planned projects and initiatives on HWM in Tirana

The Green City Action Plan of Tirana (2018-2033) provides set of actions to address the pressing environmental challenges affecting Tirana over the coming years. Within Resource Management, two measures related to waste management are proposed:

➢ Implementation of household waste collection and separation in order to achieve 40% recycling rate and minimise waste sent to landfill.

- Household waste recycling centre across the city to enable the bulky waste collection, reuse of usable items and a wider range of recyclable materials such as WEEE, textiles, construction waste and gardening waste.

Implementation of household waste collection and separation

It is planned to extend separate dry recyclables and residual waste collection service to the whole of Tirana and provide sites for the collection of bulky waste from households and small businesses. The service extension should also consider improvements in the collection process, e.g. intermediate transfer stations to enable smaller collection vehicles in narrow streets. The plan is to cover 90% of residential buildings with weekly MSW collection by 2022. This action will also span across the rural areas, where collection and recycling services are not currently provided. Estimated costs are based on 30 trucks, 10,000 bins of each type and a depot site at Sharra landfill and amount: ~15,000 EUR capex and ~19,000 EUR opex over 5 years.

Household waste recycling center (HWRC)

Household waste recycling centers, are usually run by local authorities which decide what can be accepted on the site and provide facilities for the disposal of a range of household waste streams. The UK National Assessment of Civic Amenity Sites (NACAS), following empirical research, concluded that the maximum throughput of any HWRC site should be 17,250 tonnes/annum and:

- Maximum catchment radii should be 5-8 km,
- Maximum driving time to site for residents 20 mins,
- Maximum number of resident it serves: 120,000,
- Maximum number of households: 50,000.

Following these recommendations, at least 4 HWRC’s shall operate in the city of Tirana and they should be accessible by the main public transport line, which is in Tirana’s case by bus. Potential sites for household waste recycling centres are shown on the following map:
The MSW generation in Albania is 337kg/capita in 2016 with collection coverage in Tirana 85% in 2018. It is planned to collect the following waste streams with the estimated quantities: batteries (25 tonnes annually), rubber (251 tonnes), WEEE (389 tonnes), wood (1,795 tonnes), textiles (6,278 tonnes), inert waste (9,040 tonnes). Estimated costs are based on reference cost for UK and amount: ~12,000 EUR capex and ~4,000 EUR opex over 5 years.

Within the “Integrated waste management strategic policy document and national plan 2020-2035”, SG4: Human Resources, awareness-raising and public participation in waste management, the following implementation measures are planned:

- M28. Establishing a database on hazardous waste (inventorying the waste inherited from existing industries, by the industry currently generating hazardous waste).
- M29. Master Plans preparing for specific waste streams, including hazardous waste.
- M30. Developing of guidelines, protocols and training programmes for hazardous waste management.
- M31. Hazardous waste generators ensure management of hazardous waste in accordance with legal requirement and published guidelines and separate hazardous waste from non-hazardous waste.

Waste incineration plant

In 2017, the Ministry of Tourism and Environment selected the Dutch company Integrated Energy BV to build an incinerator and rehabilitate Sharra landfill used by the Tirana Municipality. A public-private partnership for “landfill construction, incinerator and rehabilitation of existing landfills in Tirana” is under a concession for a period of 30 years. The new incinerator plant which will produce electricity and a new landfill will be built south and east of the existing landfill in Tirana. The construction of the new landfill and incinerator is still in progress. It is not planned incineration of special and/or hazardous waste such as asbestos residues, pressurized gas in cylinders, toxic and carcinogenic materials, acids, caustic solutions, chemical product with high exothermic reaction etc, but only municipal solid waste. In the document Integrated Waste-to-Energy in Albania – The Municipal Solid Waste Project in Tirana38, a list of waste codes suitable for incineration is provided.

7 ANALYSIS OF MAIN CRITICAL ELEMENTS IN EACH PARTNER CITY

7.1 Main critical elements in Yerevan

MSW collection

The PUC dispose of collected MSW at the existing landfill without measurement, since the weighbridge is not installed which leads to a lack of data on collected and disposed of municipal waste.

There is no database on MSW collected, recycled, disposed, not in PUC, not in Municipality or the Ministries, not in the existing landfill, neither in Armenian Statistical Office. Database on MSW and HW generation, collection, treatment and disposal have to be established as soon as possible.

Industrial waste that is not of the household type, but from the industrial process, industrial facilities dispose of it in their environment/neighbourhood, in an uncontrolled manner.

MSWM fees

The fee for MSW collection for households is very low, as 200 drams (ADM) per capita per month. This fee is very low and has remained unchanged for a long time now. The industry, commerce, health institutions, etc. pay the fee for MSW collection established as per m² of their working place. The Municipality decides on this fee level per m². This fee is also low. In general, the fee has to be increased, gradually, in aim to cover all costs of MSW collection, transport, recycling/treatment and disposal. The efficiency of MSW bill payments collection is ca. 80%.

MSW sorting

Separation of waste at source just started, in very small percentage. Only 5-6% of the population is included in the separation of waste at the source, households. Separation on the sorting line does not exist. Approximately 50% of packaging waste can be separated at the source, meaning that 50% of the population can follow the rules on waste sorting. Other 50% can be separated at the landfill. Because of that, the sorting line needs to be established at a new landfill.

The number of collection points, 135, established by LGEP, in March 2021, is very low. It has to be significantly increased in aim to prevent the plastics, recyclable and biodegradable waste to be disposed at the future new sanitary landfill. There is a huge problem related to the collection of the bulky waste and C&D waste, bio-waste, hazardous household waste, metals, WEEE, batteries and accumulators, etc., because the efficient separate collection is not established yet. The Municipality engages the private company, selected quarterly, to collect this bulky waste, like furniture or technical appliances, on-call. This company also collects C&D waste and on-call.

There is no market survey report on recycling companies, which type of waste and in which quantity, they collect, store, treat and/or dispose the recycling waste. There are no data on the selling prices and who are the final beneficiaries of the recycled waste.

MSW disposal

The existing landfill is in fact dumpsite, which does not have installed weighbridge and geocomposites for protection of groundwater and soil. A new sanitary landfill is urgently needed.

MSW management

Based on the provided list of engaged experts, there is a lack of experts for MSW and HW management, separation, legislation, in both Municipal Departments.

Waste management is a priority for the Government. In 2019 a State Strategy was developed, with the objective to be able to deal 80% of the waste, 5 years from now. After that Nurabayan landfill can be converted in a forest.
Initially, they had even foreseen introducing sorting in the regions but could not be done because of Covid-19 pandemic.

**Waste legislation**

Based on local legislation, Law on waste 159-N, 2004, there is no obligation for Yerevan City, nor for Republic of Armenia, to draft National, Regional or Municipal Waste management Plans. It is a huge difference comparing to the EU Directive on the waste framework, 2008/98/EC, in which preparation of the Waste Management Plans on the national or local level, are requested as the top priority. Also, there are two national lists on waste classification comparing to one prescribed in EU legislation. Decree on the List of Consumer and Industrial waste, 342-N, 2006, and Decree on the List of waste classified by the level of hazard, 430-N, 2006, use the waste codes which are different than those prescribed by the EU Decision on establishing a list of waste, 2000/532/EC.

### 7.2 Main critical elements in Warsaw

According to the Provincial Waste Management Plan for the Mazowieckie Province for 2016-2021 including the years 2022-2027 the main critical elements concerning hazardous waste management are:

- high costs of modern and innovative technologies allowing to reduce the number of arising waste,
- improper handling of hazardous waste in small and medium-sized enterprises,
- lack of mutual correlation between the existing systems of collecting hazardous waste from sources scattered,
- no network for collecting hazardous waste from households,
- unsatisfactory level of education and environmental awareness of the inhabitants of the voivodeship.

Besides the stated HWM issues there are challenges regarding separate collection:

In Poland, packaging producers are practically not financially responsible for placing plastics on the market. The rates are very low, and the entire cost of dealing with the waste later falls on the municipalities and their inhabitants. In Poland, the costs of waste disposal, e.g. plastic bottles, are covered by residents, while in Germany and Austria - waste producers, i.e. concerns. - [http://www.um.warszawa.pl/](http://www.um.warszawa.pl/)

The Ministry of Environment is currently working on an extended producer responsibility (ROP) system. The new system should encourage producers to design products and packaging in such a way as to prevent the generation of excessive waste and increase their recyclability. One of the key elements of the ROP system is to ensure producers' participation in co-financing the management of packaging waste that is contained in municipal waste collected from residents within municipal systems.

Bio-waste fraction will be a challenge in the coming years, due to the underdeveloped network of installations dealing with their management in the province.

Construction of the planned biogas plant receiving approx. 80 thousand T/year of waste will be a significant step towards resolving this issue. The biogas plant will be adapted to accept all bio-waste together with impurities (e.g. packaging, foil bags, canned food, jars, kitchen animal waste, dog droppings).

There are certain barriers to the implementation of separate collections. Despite informative campaigns, among residents who have decided on separate waste collection (based on declarations), some of them do not perform this. The main reasons for such a situation include (PL City Hall 2015a):
Context analysis in three partner cities

- Lack of available space in households needed for containers positioning;
- Lack of available space in households for bins/bags to collect waste fractions;
- Difficulties in splitting into different kind of fractions.

However, in the following years, the percentages of waste recycling share are rising – according to the Analysis of the state of municipal waste management for the Capital City of Warsaw for 2020.

7.3 Main critical elements in Tirana

Legislation

Albania has transposed 19 EU directives and regulations which represent the most important part of the EU acquis related to waste. Albania has legal base to establish sustainable waste management system. The implementation and enforcement of these laws is at a very low level, mostly because of the costs of waste management. The "polluter pays principle" is not functioning in the current MSW management system.

Planning on Municipality level

As it is said in subchapter 2.2.2, despite the fact that the Waste strategy and the law stipulates that the local government units are responsible and obliged to prepare the local integrated waste management plans, Tirana Municipality does not have one and currently there is no intention for its preparation.

Lack of data on quantity and waste composition

The existing data on the quantities of waste were not obtained by measuring the waste, considering that there is no weightbridge at the existing landfill, but by estimating based on the number of unloaded batches of trucks. Also, presented data on INSTAT website refers to entire territory of Albania, although each local government submits its own data. The composition of the waste has also not been determined, it is based on assumptions.

The amount and origin of generated hazardous waste is unknown, mostly due to the lack of data collection, which is partly due to the lack of separate collection of hazardous waste.

Waste collection and sorting

A separate waste collection system has not been established. There is no Civic Amenity Center for the separate collection of hazardous waste in Tirana, although the construction of an incinerator is underway and hazardous waste, including the types of waste generated in households, must not be incinerated.

Lack of transparent data on issued hazardous waste permits

There is no database available to citizens that includes a list of companies that have hazardous waste management permits.
8 CONCLUSIONS AND RECOMMENDATIONS FOR HWM IN THREE PARTNER CITIES

Conclusions on waste management in three Partner Cities correspond to the subchapters “Main critical elements”, respectively in Yerevan / Warsaw / Tirana, and the prioritization of actions is made according to several criteria (magnitude of impacts on human health and environment, ease of implementation, cost of implementation, relevant legal obligations).

Yerevan

The highest priority in improving the waste management system is to amend the national legislation; the most important step is to introduce into the legislation the obligation to develop a national and local waste management plans. It is necessary to harmonize all definitions of waste types with international conventions such as the Basel convention. This step has the highest priority since every other action in waste management has to be based on adequate legislation.

The harmonization of legislation must be accompanied by continuous training of officials in the field of environmental protection, as well as a possible increase in the number of employees.

The existing dumpsite where collected waste is disposed needs to be closed, rehabilitated and re-cultivated, given that due to the lack of a system for collecting leachate, landfill gases (e.g. methane) and other elements that a sanitary landfill must contain, otherwise it poses an exceptional danger to human health and the environment.

Before closing the existing landfill, it is necessary to build a new Nubarashen landfill, which is planned to be designed, constructed and to operate in accordance with the EU standards.

Since the landfill is planned to be for non-hazardous waste, its opening and use should be preceded by the construction of CAS for which locations have already been determined: the small one in the Arabkir district, and the large ones in two districts: Avan and Nor Nork. Although the results of public opinion polls have shown that residents have knowledge about the dangers of hazardous waste to the environment and human health, it is necessary to educate the population and continuously raise awareness. In parallel, better systems and dedicated facilities for hazardous waste need to be established.

Small commerce and industries should be included in the future system of HHW collection, meaning it should be allowed to deliver HW similar to the HHW into the designated containers placed at collection points and Civic Amenity Sites. This should practised until the establishment of adequate legal acts on this matter and separate collection systems, with a less strict timeframe. For now, there is no legislation or systems for such collection in Yerevan. That is why it is a good measure to include as many waste generators as possible in the proposed system in order to reduce the percentage of HW in mixed municipal waste containers. For now, commercial entities and other institutions do not have special contracts with the municipality or with the PUC to collect their waste, but they deliver it into the containers that are on the streets for mixed municipal waste.

The waste collection rate is already high, and bill collection is 80%. The fee for MSW collection for households is very low, as 200 drams (= 0.35 EUR) per capita per month and have not changed for a long time. The fee has to increase gradually to cover all costs of MSW collection, transport, recycling, treatment and disposal. The efficiency of MSW bill payments collection should also increase.

Waste separation at source has recently started, but only 5-6% of the population is included. It is necessary to stimulate citizens to separate packaging waste, for example with adequate financial rewards (discounts, coupons, etc.). Since the number of separate waste collection locations is small (135 places), it should be considered to assign stickers to citizens with QR codes on waste collection bags in which packaging waste is separated and left next to the container for municipal waste on certain days.
Warsaw

As Warsaw is a member state of the EU and has already implemented EU standards for HHW management practice there are no recommendations in terms of improving the legislation.

The key improvements, however, should be in terms of improving the household hazardous waste infrastructure, primarily by constructing additional Civic Amenity Sites (increasing the number of CAS per number of inhabitants) which would greatly improve the network for collecting hazardous waste from households. In addition, there is always room for improving the level of education and environmental awareness of the inhabitants of Warsaw, with the focus on HHW. Many responses obtained from the citizens’ survey suggested to increase the number of collection points and more information on collection and education on importance of proper HW disposal.

In addition, continuing to inform and educate the public about the functioning of waste management system, in particular regarding hazardous waste is purposefulness and its benefits taking into account the possibility of the citizen to dispose of waste in a way not hazardous to the environment and human health.

In Poland, packaging producers are practically not financially responsible for placing plastics on the market. The rates are very low, and the entire cost of dealing with the waste later falls on the municipalities and their inhabitants. In Poland, the costs of waste disposal, e.g. plastic bottles, are covered by residents, while in Germany and Austria - waste producers. - http://www.um.warszawa.pl/

The Ministry of Environment is currently working on an extended producer responsibility (ROP) system. The new system should encourage producers to design products and packaging in such a way as to prevent the generation of excessive waste and increase their recyclability. One of the key elements of the ROP system is to ensure producers' participation in co-financing of the management of packaging waste that is contained in municipal waste collected from residents.

Bio-waste fraction will be a challenge in the coming years, due to the underdeveloped network of installations dealing with their management in Warsaw and the Mazowieckie province. Construction of the planned biogas plant receiving approx. 80 thousand T/year of waste will be a significant step towards resolving this issue. The biogas plant will be adapted to accept all bio-waste together with impurities (e.g. packaging, foil bags, canned food, jars, kitchen animal waste, dog droppings).

There are certain barriers to the implementation of separate collections. Despite information campaigns, among residents who have decided on separate waste collection (based on declarations), some of them do not perform this. The main reasons for such a situation include (PL City Hall 2015a):

- Lack of available space in households needed for containers positioning;
- Lack of available space in households for bins/bags to collect waste fractions;
- Difficulties in splitting into different kind of fractions.

However, in the following years, the percentages of waste recycling share are rising – according to the “Analysis of the state of municipal waste management for the Capital City of Warsaw for 2020”.

Tirana

Given that Albania has harmonized its legislation with the EU, and that the implementation of laws is at a low level, it is necessary to start implementing regulations and adopt the necessary plans and strategies (the highest priority is Waste management plan for Tirana), although there are currently no clear plans for their elaboration. Also, targets provided in the legislation have to be updated in accordance with the current EU legislation.
There are currently plans to build a waste incinerator, which is intended for non-hazardous municipal waste and must not incinerate hazardous waste. Also, there is currently no plan in Tirana to establish a separate collection of hazardous waste from households that is the subject of this Study. It is important that the establishment of CAC and/or mobile CAC, as well as continuous education and awareness waste and the importance of its separate collection/separation at source precede the construction of the incinerator.

After the incinerator is built, or in case of a change of plans for the sanitary landfill, it is necessary to establish a proper database on waste streams since the amounts of incinerated and disposed waste will be measured at the entrance to the site. In addition, although the data are currently based on an estimate of the number of trucks unloaded, it is not possible to obtain data for each municipality/city on the statistical office website (INSTAT). It can be concluded that the data need to be more transparent. The websites of the competent authorities need to be updated and contain more information.

**General recommendations for all three cities**

These recommendations will be presented through several factors that determine success of separate collection of HHW. Although these recommendations are general, certain distinctions will be made between cities, depending on the topic.

**Economic incentives**

- Safe disposal options for HWM should be provided at zero or low cost increases in the collection rates (this is especially relevant for Tirana and Yerevan as life standards in these cities is on a lower level than in Warsaw, and also these cities do not possess currently any significant infrastructure for household HWM).
- The producers should be made responsible for managing HHW through an EPR scheme which would ensure sustainable financing of the collection facilities and rise the incentives for eco-design of products and packaging (Poland has semi-developed and is developing an EPR scheme).
- It is recommended to investigate the possibilities for outsourcing door-to-door or on demand services for HHW collection to private waste operators, which could improve the cost efficiency.
- Innovative collection facilities could be effective in collection while being cost-efficient, such as various solutions for mobile CASs, especially for Tirana and Yerevan until they provide fully operational Civic Amenity Sites.

**Legal enforcement**

- A legal obligation should be set to provide the necessary infrastructure for sorting at source in apartment buildings and houses (in Yerevan and Tirana). Such an obligation in addition to hands-on support services (on-site visit, communication templates) significantly improves sorting of HHW in apartment blocks and houses. This is especially important for buildings in Yerevan which still have central pipes for mixed municipal waste.
- Local authorities can identify priorities by taking samples and monitoring the concentrations and types of HHW in residual waste, which would then shift their attention to devising adequate solutions and improvements on these issues.
- Investigating fly-tipped waste sites, can sometimes help trace waste producers. The risk of penalties can help stimulate behavioural change in waste producers.

**Customized facilities**

- CAS, as key collection and temporary storage facilities for the large diversity of potential HHW streams, they should be user-friendly, which means providing the following to its potential users: long opening hours,
accessible location and a high density CAS grid, to increase the collected HHW volumes. This is meant especially relevant for Yerevan and Tirana as they are yet to plan or establish their future CASs, but as well as for Warsaw, which currently has only two CASs. As Warsaw has plans to put additional CASs into operation in the future, the locations should be chosen so that the CAS grid is as effective as possible.

- Related to the previous point, periodic pick-up systems and mobile CAS can help overcoming space limitations in high density and urban areas and also fill the gaps in the CAS grid to improve its effectiveness. The periodicity and location of the collection facilities need to be well communicated through all conventional channels and also through user-friendly modern digital tools as much as possible for all groups of households to return their HHW, and to incentivize them by presenting the environmental benefits. Warsaw has some of these mechanisms in place already but could always work on upgrading them.

- Shop take-backs and on-demand collections at home can be provided by the local authorities and EPR collection schemes to further improve the CAS and periodic pick-up systems (not related to Warsaw since Warsaw has an option for every resident to order the collection of WEEE and batteries from their home; in some stores there are collections of batteries and in some pharmacies there are collections of expired medicines and mercury thermometers).

- For specific HHW types such as asbestos, local authorities can minimize health risks and illegal disposal by offering a possibility for stream-specific services, such as collection of bound asbestos at home in a standardized packaging (this is not relevant for Warsaw since the city covers up to 100 percent of the costs of dismantling, packing, exporting and transferring them to a hazardous waste landfill).

**Engaging communication**

- In order to reach all segments of the population and better relate the message, local authorities should disseminate the instructions and information on available facilities for HHW via different channels including social media.

- Awareness and engagement of citizens can also be improved by involving local stakeholders in the collection of HHW, such as neighbourhood associations, civil society organisations and social groups.

- Children can be very impactful as recycling ambassadors. By investing in their education on the importance and instructions to collect HHW (courses, site visits, etc.) they can raise awareness and transfer the incentive indirectly to the older generations.

- With providing adequate instruction and awareness at CASs, the quality of the recovered resources can significantly improve.

- Local authorities and EPR compliance organizations should use simple messages and non-technical language in translating the legislation to prevent confusion of consumers faced with the broad range of HHW and complicated terminology.

- Sorting behaviours and habits can be encouraged and improved by highlighting the hazards of throwing HHW in sewers or other inappropriate disposal routes.

This specific set of recommendations is also more directed to Tirana and Yerevan as Warsaw already has in place some effective mechanisms for communicating with its citizens on various waste management issues, however their
Figure 18 Separate collection for Hazardous Household Waste (HHW) - (source – Guidance for separate collection of MSW)
II

VIENNA – MODEL CITY FOR BENCHMARK ANALYSIS
1 Overview of legislation and institutional responsibilities for WM in Austria and Vienna

1.1 Federal level

The Federal Constitution Act (B-VG) understands the term "waste management" to refer to the sum of all measures for the prevention, reduction, recovery, and safe treatment and disposal of waste (all types). In terms of constitutional law, the Federal Government has the authority to adopt and enforce regulations relating to hazardous waste (Article 10(1)(12) of the Federal Constitution Act); it shall be entitled to do this for other waste if there is a need for uniform legislation to be enacted. With the enactment of the Waste Management Act 2002, Federal Law Gazette I No 102/2002 (Waste Management Act 2002), the Federal Government made extensive use of its "authority in case of need" and issued a number of nationwide uniform regulations on hazardous and non-hazardous waste. The states hold jurisdiction over the removal of municipal waste and the planning of disposal sites for non-hazardous waste. There are other waste management provisions in other relevant laws, e.g. in the Industrial Code 1994 and the Mineral Raw Materials Act.

For certain types of non-hazardous waste, including packaging waste, biogenic waste and construction and demolition waste, this authority in case of need has been claimed by the Federal Government. The Waste Management Act 2002 (Federal Law Gazette I No 102/2002, as amended) and associated ordinances bring together key areas of regulation in this regard concerning hazardous and non-hazardous waste and, in addition, transpose EU law in Austria. The most significant stipulations regulated at federal level in connection with collection and treatment responsibilities are briefly summarized as follows:

- **Waste labels, classification and traceability**: Waste must be classified accordingly and an assessment undertaken as to whether the waste in question is hazardous or non-hazardous. In addition, records and reports concerned with ensuring the traceability of the waste streams must be carried out (List of Waste Ordinance, Ordinance relating to the determination of hazardous waste and hazardous household waste, Waste Record-keeping Ordinance, Ordinance on Waste Balance sheets).

  The Federal Government also provides guidelines within the framework of the Waste Management Act 2002, inter alia, concerning the handover, transport and treatment of hazardous waste (consignment notes). The Waste Management Act 2002 also contains provisions on specific waste streams as well as on transboundary shipment.

- **Extended producer responsibility**: Retailers of packaging, electrical equipment, motor vehicles and batteries must set up and operate a collection and recovery scheme that allows the end user to surrender these products free of charge as soon as these accumulate as waste. Furthermore, coordinating bodies are set up which are responsible, inter alia, for ensuring coordination of the information provided to the final consumers, including coordination of the financial settlement of the services undertaken by the municipalities and municipal associations (Waste Management Act 2002, Packaging Ordinance, WEEE Ordinance, Batteries Ordinance).

- **Collection of biogenic waste**: If biogenic materials are not recovered in the immediate vicinity of the household or the production site, this biogenic waste must be supplied for separate collection or taken to a designated collection point (Ordinance on the separate collection of biogenic waste).

- **Collection of hazardous household waste**: As required, but at least twice a year, the municipalities (municipal associations) shall implement or commission the implementation of a separate collection (hand-over point) of hazardous household waste, unless provision is made for these substances to be...
collected in the municipality (in the area covered by the association) in an alternative manner (Waste Management Act 2002).

- **Collection of waste electrical and electronic equipment (WEEE) from private households and of waste portable batteries and accumulators:** The municipalities (municipal associations) shall set up a hand-over point for WEEE from private households and for waste portable batteries and accumulators. WEEE and waste portable batteries and accumulators must be accepted free of charge at these hand-over points. The municipalities (municipal associations) may pass these on to collection and recovery schemes.

- **Waste treatment (disposal and recovery):** Waste treatment operators must satisfy corresponding requirements regarding their activities or the operation of their plants. Among other things, their task is to ensure that no avoidable risks for man and the environment shall arise from the transport, storage and treatment of the waste, as well as from the secondary raw materials produced or from the substances ultimately disposed of (Waste Treatment Obligations Ordinance, Recycled Construction Materials Ordinance, Compost Ordinance, Recycled Wood Ordinance, Waste Incineration Ordinance, Ordinance on Mobile Plants for Treating Waste, Landfill Ordinance 2008).

- **Collection and treatment of waste which is not similar to domestic waste:** The polluter himself must ensure the removal and disposal or recovery of waste from trade and industry which is not similar to domestic waste


All waste management principles and regulations of the European Union are transposed into the Federal law. Due to the distribution of competencies in Austrian Federal Constitution pursuant to Article 10, Paragraph 1, Item 12 of the Federal Constitutional Law (BVG), as mentioned above, the federal government for hazardous waste and the federal states for non-hazardous waste responsible. In addition, the federal law on sustainable waste management (Waste Management Act 2002 - AWG 2002) and numerous ordinances as well as the Vienna Waste Management Act (Wr. AWG) are issued. In addition to this distribution of competencies, the federal government can also make regulations for non-hazardous waste if there is a need to issue uniform regulations (competence based on the need). If such uniform regulations are issued, the state cannot regulate or the relevant state statutory provisions will be partially replaced.

**OBJECTIVES AND PRINCIPLES OF WASTE MANAGEMENT**

The Waste Management Act 2002 is based on precautionary principles and on the principle of sustainability and is aligned in accordance with the following objectives (Article 1(1) of the Waste Management Act 2002):

- Protecting humans, animals, plants, their livelihoods and their natural environments,
- minimizing emissions from air pollutants and climate-relevant gases,
- conserving resources (raw materials, water, energy, countryside, land, landfill volumes),
- no higher risk potential resulting from the recovery of primary raw materials,
- landfill of waste arising from treatment without risk to future generations.

The following five-stage hierarchy is taken as the basis for the Act and for ordinances based thereon (Article 1(2) of the Waste Management Act 2002):

- Waste prevention (qualitative and quantitative),
- preparation for reuse,
- recycling,
- other recovery, e.g. energy recovery,
- disposal.
The objectives and principles of waste management in the Waste Management Act 2002 are finally completed by the definition of "public interests" which must not be negatively affected under any circumstances when dealing with waste (in particular the collection, transportation, storage and treatment of waste (see Article 1(3) of the Waste Management Act 2002)). The avoidance of any negative effects on these public interests is also relevant for:

- the classification of an item as waste in the objective sense,
- general treatment requirements for waste holders,
- the collection or treatment of waste,
- the approval of collection and recovery systems,
- the approval of treatment plants,
- waste treatment orders.

OBLIGATED PARTIES UNDER THE WASTE MANAGEMENT ACT 2002

**Waste holders** – Article 2(6) subparagraph 1 of the Waste Management Act 2002

A waste holder is defined as the generator of waste or the person in possession of waste. The term "holder" is used in the Act for any such person who holds physical control of the item. The prerequisite for the possession (physical control) and ownership of waste by a person is that the waste is located within their domain, whereby the custody is determined according to the prevailing opinion. It is not under any circumstances a question of the permanent physical availability of the goods to the owner, but rather it is simply down to the fact that objects located in a specific area belonging to a person have traditionally been recognised by others as being foreign goods. The individual in question whose instructions or ideas must be followed when carrying out the work and who determines what work must be carried out, shall in effect exert their influence and shall have custody of the materials and the resulting waste according to the prevailing opinion. This complies with the case law of the Supreme Court and Administrative Court (see Supreme Court 23 February 1993, 1Ob516/93; 4 September 1998, 6Ob211/98t; 18 September 1991, 1Ob22/91; Administrative Court 20 February 1990, 90/01/0010).

The term "waste holder" is understood to be an umbrella term for waste producers, waste collectors and waste processors.

**Waste producers** – Article 2(6)(2) of the Waste Management Act 2002

A waste producer shall mean any such person whose activities produce waste ("original waste producer") and/or anyone who carries out pre-processing, mixing or other treatment types resulting in a change in the nature or composition of this waste.

The aforementioned criteria (i.e. physical control, general prevailing opinion, power of disposal) shall also be used for assessing the attributes of waste producers.

**Waste collectors** – Article 2(6) subparagraph 3 of the Waste Management Act 2002

A waste collector is any such person who picks up waste produced by others either by himself or through others, accepts the waste or is legally entitled to pick up or accept the waste.

The Waste Management Act 2002 accordingly makes a distinction with respect to the two different versions of the term "waste collector":

- waste collectors who have the waste in their physical custody given that they (or their own staff) pick it up or accept it;
- waste collectors who are only legally entitled to pick up or accept the waste.
With respect to this second version, the waste does not actually have to be physically acquired or physically transferred. The decisive point here is whether a person is authorised or not to make decisions himself (in accordance with civil law) on the acquisition, transfer or retention of waste.

The contractor who picks up the accumulated waste shall either be regarded as a waste collector or transporter according to the agreement in place. The person who brought the waste to the waste collector or waste processors in accordance with the contract shall be decisive for assessment purposes. If the contractor is free to choose which waste processors he will bring the waste to, then he shall qualify as a waste collector within the meaning of Article 2(6) subparagraph 3 of the Waste Management Act 2002.

**Waste processors** – Article 2(6)(4) of the Waste Management Act 2002

A "waste processor" is any such person that either recovers or disposes of waste.

**OBLIGATIONS OF WASTE HOLDERS**

The general obligations of waste holders are compiled in Article 15 to Article 23 of the Waste Management Act 2002. It shall, in particular, be standardised that the objectives and principles of Article 1 of the Waste Management Act 2002 must be observed with respect to the collection, transport, storage and treatment of waste and the handling of waste within the meaning of sustainable waste management, and any negative effects on the various public interests must be avoided. In addition to general and specific treatment requirements, obligations on keeping records, obligations in connection with the transfer and transportation of hazardous waste (consignment note) and notification and registration obligations, a number of special conditions are also specified for the treatment of waste (PCB-containing waste, waste oils, hazardous household waste, fats and oils and demolition waste).

The **obligations** of the waste holder include:

- General treatment requirements for the waste holder (Article 15 of the Waste Management Act 2002),
- Specific treatment requirements for the waste holder (Article 16 of the Waste Management Act 2002),
- Obligation for waste holders to keep records (Article 17 of the Waste Management Act 2002),
- Declaration of the transfer of hazardous waste by means of consignment note (Article 18 of the Waste Management Act 2002),
- Attachment of the consignment note for the transportation of hazardous waste (Article 19 of the Waste Management Act 2002),
- Notification and registration obligation for the original waste producer of hazardous waste (Article 20 of the Waste Management Act 2002),
- Registration obligations and maintenance of data in the electronic master data register for specific waste holders (Article 20 and Article 21(3) of the Waste Management Act 2002).

The **specific obligations** of the waste collector and processor include:

- Obligation to report a consignment note (Article 18 of the Waste Management Act 2002),
- Obligation to keep electronic records on the type, quantity, origin and whereabouts of waste (Article 17 in conjunction with the Ordinance on Waste Balance Sheets),
- Obligation to prepare and provide electronic notification of annual waste balance sheet (Article 21(3) of the Waste Management Act 2002 in conjunction with the Ordinance on Waste Balance Sheets),
- Obligation for landfill holders to prepare and provide electronic notification of waste input/output (Article 21(4) of the Waste Management Act 2002),
- Appointment of an executive manager in accordance with waste laws (only under certain conditions; Article 26 of the Waste Management Act 2002) or a responsible person.
LAWS GOVERNING THE PROFESSION OF WASTE COLLECTORS AND PROCESSORS

Anyone who collects or treats waste shall require a permit from the Head of the Provincial Government in accordance with Article 24a of the Waste Management Act 2002. This permit shall be issued upon the fulfilment of a number of specific conditions contained in the Act. The essential criteria include:

- suitability of collection or treatment for each type of waste,
- evidence that public interests are not negatively affected in accordance with Article 1(3) of the Waste Management Act 2002,
- evidence of professional knowledge and skills,
- reliability and
- conformity with the objectives and principles of the Waste Management Act 2002.

Authorised parties pursuant to Article 24a(2) of the 2002 Waste Management Act are not subject to this obligation to obtain authorisation.

The Head of the Provincial Government may issue a number of requirements, conditions or time limits, and may withdraw granted permits under certain conditions (see Article 25a(5) and (6) of the Waste Management Act 2002).

Prior to the commencement of duties, waste collectors and processors must register in the electronic plant and personal data register (Article 21 of the Waste Management Act 2002).

If the various activities surrounding the collection and treatment of hazardous waste are not to be performed by an individual (e.g. in the case of a limited company/GmbH), or if the permit applicant cannot demonstrate himself that he has the necessary technical knowledge and skills in relation to the activity that is to be performed, then a full-time person must be appointed as an executive manager in accordance with waste laws (Article 26(1) of the Waste Management Act 2002). By way of derogation from this, municipalities must name a competent person in accordance with Article 26(4) of the Waste Management Act 2002. If the various activities surrounding the collection and treatment of non-hazardous waste (or asbestos cement) are to be carried out by a legal entity, then a responsible person must also be named (Article 26(6) of the Waste Management Act 2002). A responsible person shall, for example, be a person who is authorised to represent the entity externally, such as the commercial director or a responsible person in accordance with Article 9 of the Administrative Penalty Act.

WASTE DATA COLLECTION – ELECTRONIC NOTIFICATION OF WASTE BALANCE SHEETS

The Ordinance on annual waste balance sheets (Ordinance on Waste Balance Sheets) was promulgated in Federal Law Gazette II No 497/2008 on 23 December 2008 to collect basic data in order to fulfil EU reporting requirements, improving data resources for waste management planning and the traceability of waste streams. The main content of the regulation is the annual obligation for waste collectors and processors subject to record-keeping requirements to submit annual waste balance sheets to the responsible Head of the Provincial Government; this is already provided for in Article 21(3) of the Waste Management Act 2002.

A comprehensive balance sheet notification must be compiled each year and must in particular include details on acquisitions of waste from other legal entities, transfers of waste to other legal entities, internal waste movements and storage information.

Furthermore, the Ordinance on Waste Balance Sheets contains provisions relating to the registration of waste collectors and processors (i.e. supplements to the master data) in the electronic register in accordance with Article 22 of the Waste Management Act 2002, the electronic keeping of records on the type, quantity, origin and destination of waste and the electronic transmission of records and summaries if required by the authorities.
By introducing the concept of waste balance sheets and electronic record-keeping requirements, should help improve the traceability of waste streams as well as improve transparency in the proper collection and treatment of waste.

The introduction of Electronic Data Management in this area will enable a reduction in the necessary administrative costs for data collection and monitoring, especially when compared to paper-based operating procedures.

Concerning the keeping of records, the existing provisions for data collection contained in the Ordinance on the recording obligation for waste 2003 (Waste Record-Keeping Ordinance 2003) for waste collectors and processors shall be replaced by the Ordinance on Waste Balance Sheets. The recording requirements contained in Article 1 to Article 4 of the Waste Record-Keeping Ordinance 2003 are only directed de facto to waste producers and to those particular waste collectors and processors who are excluded from the scope of the Ordinance on Waste Balance Sheets.

WASTE MANAGEMENT IN ENTERPRISES

The use of proven instruments for promoting corporate waste reduction and recovery in practice is compulsory for enterprises above a certain size.

**Waste officer (Article 11 of the Waste Management Act 2002)**

A professionally qualified waste officer must be appointed in businesses with more than 100 employees. The appointment or dismissal of the waste officer shall be notified immediately to the district commissioner's office or to the municipal authorities in cities with their own by-laws.

The waste officer has a number of duties to provide information and advice related to any corporate waste management issues, including any waste management issues with respect to procurement. The business owner shall support the waste officer in the exercising of his duties.

**Waste management concept (Article 10 of the Waste Management Act 2002)**

A waste management concept (WMC) shall be created for plants whose operations generate waste and where more than 20 workers are employed. A WMC provides information on the type, quantity, origin and location of all waste generated during the operation of the plant, as well as on measures that are in place for the prevention and treatment of waste.

**HAZARDOUS WASTE**

In accordance with Article 4(2) of the Waste Management Act 2002, the Federal Minister for Agriculture and Forestry, Environment and Water Management shall be authorised by means of regulation to determine all waste types that are hazardous. The inclusion of a substance in the list does not necessarily mean that this substance is waste under all circumstances. Determining whether a substance is waste comes down to whether it meets the subjective or objective definition of waste.

To do this, the hazardous properties listed in Annex III of Waste Framework Directive 2008/98/EC, as amended by Regulation (EU) 1357/2014 (e.g. "explosive", "oxidising" "flammable", "irritating to skin and eyes", "specific target organ toxicity (STOT)/aspiration hazard", etc.) should be used. Furthermore, all waste types that are deemed to be hazardous at Union level must be included.

Annex III of Waste Framework Directive 2008/98/EC was last amended by Commission Regulation (EU) No 1357/2014 of 18 December 2014 and the hazardous properties were adjusted to EU CLP Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures (CLP Regulation). Due to the amendment of the List of Waste Ordinance, the hazardous properties of waste that have been harmonised by virtue
of EU Regulation No 1357/2014 shall be fed into the List of Waste Ordinance and/or hazardous properties that have not been harmonised as of yet shall be specified more precisely at a national level. Furthermore, the provisions on the assessment of hazardous properties considering Commission Decision No 2014/955/EU as well as the criteria relevant for the assignment to the individual waste types shall be adapted accordingly.

In Austria, hazardous waste is determined by the List of Waste Ordinance, Federal Law Gazette II No 570/2003. The current waste catalogue can be found on the EDM portal (www.edm.gv.at).

The following are deemed to be hazardous waste in accordance with Article 4 of the List of Waste Ordinance:

1. Waste that is explicitly described as hazardous in more detailed catalogues. The decisive part is the appendix "List of waste" to the List of Waste Ordinance, which the ÖNORM S 2100 "List of waste", issued on 1 October 2005, declares as binding along with the changes to the List of Waste Ordinance.
2. Waste which contains hazardous substances to a certain extent, or which is mixed with such substances, meaning that, even with a basic assessment such as an evaluation of the relevant mass fraction, a hazardous property in accordance with the List of Waste Ordinance cannot be excluded.
3. Specific types of excavated material:
   - Excavated material from sites where, as a result of handling substances which are hazardous for soil or water, there is reason to suspect a hazardous property as per Appendix 3 (e.g. metal or mineral oil processing plants, petrol stations, dry cleaners, factories within the chemical industry, gas works or contaminated sites); this shall apply to all areas of the site in which these substances were handled;
   - Excavated material from sites if contamination becomes apparent in the course of excavation or clearing activities and there is reason to suspect a hazardous property as per the List of Waste Ordinance;
   - Excavated material from sites if there is reason to suspect a hazardous property as per the List of Waste Ordinance as a result of contamination due to a breakdown or an accident;
   - Excavated material that does not fall into one of the above points, but which is determined by chemical analysis as being contaminated in such a way that it has at least one hazardous property as per the List of Waste Ordinance.
4. Waste that was classified as being hazardous and subsequently solidified (stabilised), i.e. tightly embedded in a matrix, shall be deemed to be hazardous even after solidification (stabilisation).

The List of Waste Ordinance definitively governs which types of waste are hazardous. It is inevitable that, for certain hazardous waste types in marginal areas, non-hazardous waste that does not have any hazardous properties is also included. In order to take this fact into account and to help production processes move towards "cleaner production", evidence may be provided in individual cases to prove that waste listed as being hazardous has no hazardous properties (declassification).

The declassification in Article 7(3) of the Waste Framework Directive and Article 3 of Decision 2000/532/EC establishing a list of waste, last amended by the Commission Decision of 18 December 2014 applies across the EU.

Member States have the option of issuing provisions that require the waste holder to provide sufficient evidence in exceptional cases that certain types of waste contained in the catalogue do not have any hazardous properties.

This option and a declassification procedure is implemented in Article 4(3) and (7) of the Waste Management Act 2002.

The declassification can be introduced by

- the waste holder or landfill holder for a certain amount of a specific waste (single-batch declassification),
the waste producer and landfill holder for specific waste from a defined energy generation, production or waste treatment process with consistent quality in relation to the limit values to be complied with for the respective treatment (waste stream declassification) or
the waste producer and landfill holder for specific waste from a defined energy generation, production or waste treatment process with consistent quality in relation to the limit values to be complied with for the respective treatment (recurring waste declassification),

by means of notification. The competent authority is the Federal Minister for Agriculture and Forestry, Environment and Water Management.

In accordance with Article 16(1) of the Waste Management Act 2002, since 16 July 2001 it has been prohibited to deposit hazardous waste on above-ground landfills, i.e. the waste must either be declassified (if permitted) prior to any above-ground landfilling or subjected to alternative treatment processes. The sole exception is asbestos waste, which may be landfilled above ground under certain conditions for non-hazardous waste (see Article 10 of the Landfill Ordinance 2008).

REGULATORY POWERS UNDER THE WASTE MANAGEMENT ACT 2002

The Waste Management Act 2002 sets out the basic framework for waste management legislation. The detailed configuration and implementation is typically reserved for the Federal Minister for Agriculture and Forestry, Environment and Water Management, along with partial consultation with the Federal Minister for Science, Research and Industry, by means of regulation.

The following ordinances are related to the Waste Management Act 2002:

- Ordinance on Record-Keeping Obligations for Waste (Waste Record-Keeping Ordinance), Federal Law Gazette II No 341/2012;
- Ordinance on Determining Quotas for Delimiting Household Packaging and Commercial Packaging (Packaging Definitions Regulation), Federal Law Gazette II No 10/2015, as amended by Federal Law Gazette II No 29/2016;
- Ordinance on Determining Total Collection Quotas for Household Packaging (Compensation Order Household Packaging) Federal Law Gazette II No 275/2015;
- Ordinance Appointing the Non-Profit Packaging Coordination Body (VKS) as the Coordinating Authority, Federal Law Gazette II No 38/2015;
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- Ordinance Appointing the WEEE Coordination Body (Elektroaltgeräte Koordinierungsstelle Austria GmbH) as the Coordinating Authority, Federal Law Gazette II No 206/2015;
- Ordinance on Quality Requirements for Compost from Waste (Compost Ordinance), Federal Law Gazette II No 292/2001;
- Ordinance on Waste Oil (Ordinance on Waste Oil 2002), Federal Law Gazette II No 389/2002;
- Ordinance on Mobile Plants for the Treatment of Waste, Federal Law Gazette II No 472/2002;

The most significant waste management Ordinances and Plans stipulate the following:

**Landfill Ordinance**

The Landfill Ordinance, Federal Law Gazette II No. 39/2008 as amended, prescribes a number of criteria that must be met for a waste depositing. Among other things are the technical conditions at landfills in terms of Site security, base sealing, base drainage system and surface coverage, and regulations governing operation of the landfill, the waste acceptance, duties of the landfill supervision, the documentation and monitoring obligations and obligations of the waste owner are detailed.

**Ordinance on waste electrical and electronic equipment**

With the Electrical Equipment Ordinance, Federal Law Gazette II No. 121/2005 as amended, the principle of manufacturer responsibility was introduced. Therefore, the manufacturers within the meaning of the regulation are, in particular producers and importing traders, obliged to take back electrical and electronic equipment that has been placed on the market and for appropriate reuse or treatment and collection and to achieve recovery rates.

The ordinance also contains provisions on product design and on avoidance of certain pollutants (environmentally hazardous substances such as lead, mercury, cadmium, certain flame retardants) in the production of new electrical and electronic equipment.
Furthermore, it standardizes the obligation of manufacturers to inform end consumers and operators of treatment facilities.

**End-of-Life Vehicle Ordinance**

The aim of the regulation on waste prevention, collection and treatment of end-of-life vehicles, BGBI. II No. 407/2002 as amended, is to determine measures to avoid in particular hazardous waste from vehicles, reuse and to intensify the recovery of end-of-life vehicles and their components. The amount of waste to be disposed of should be in the sense of sustainable material management and an improvement in the environmental situation. This should be included in the life cycle of vehicles by all economic operators, in particular through the obligation to directly deal with the treatment of end-of-life vehicles involved.

**Packaging Ordinance**

The Packaging Ordinance, Federal Law Gazette II No. 184/2014 as amended, primarily aims at the reuse of packaging and avoidance of packaging waste and then restricts the use of hazardous substances in packaging. Beyond that, the Ordinance determines recycling quotas for individual packaging materials and organizes the collection and recycling systems.

**Recycling Building Materials Ordinance**

The Recycling Building Materials Ordinance, Federal Law Gazette II No. 181/2015 as amended, defines requirements that demolition of structures to be fulfilled, such as the implementation of a pollutant investigation and a recovery-oriented dismantling of buildings. In addition, the regulation contains quality specifications for the recycled building materials to be produced and defined depending on possible areas of application for re-use.

**Ordinance on the Collection of Biogenic Waste**

The Biowaste Ordinance, Federal Law Gazette No. 68/1992, as amended, stipulates that certain biogenic waste - if they are not used in the immediate vicinity of the household or the business premises - to be made available for a separate collection or are to be brought to a designated collection point.

**Compost Ordinance**

The ordinance of the Federal Minister for Agriculture, Forestry, Environment and Water Management on quality requirements for compost from waste, Federal Law Gazette II No. 292/2001 as amended, regulates the quality requirements for composts from waste, the type and origin of raw materials, labeling and placing on the market as well as the end waste property.

**Contaminated Site Remediation Act**

Aim of the contaminated site remediation law, Federal Law Gazette No. 299/1989 as amended, is the financing the securing and remediation of contaminated sites. Contaminated sites are old deposits and old sites as well as through them contaminated soils and bodies of groundwater, which present significant health hazards to people or the environment. A contribution obligation is made, for example, by the deposit or justified the incineration of waste. In addition, the contaminated site remediation law Regulations regarding the nationwide registration of suspected areas and the assessment of the hazard posed by them as well as for implementation of remediation of contaminated sites.

**Waste Evidence Ordinance**

The AWG 2002 lays down recording and information obligations for waste owners regarding the type, the amount, origin and location of the waste. These are specified in the Waste Evidence Ordinance adopted in 2012 and aimed primarily at the first-line of waste producers.
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Ordinance on Waste Treatment Obligations

The Waste Treatment Obligations Ordinance lays down minimum requirements for the collection, storage, transport and treatment of certain waste such as: electrical and waste electronic equipment, batteries and solvents.

The Federal Waste Management Plan contains an inventory of the Austrian Waste management Treatment principles for numerous types of waste and a Waste prevention programme. The federal waste management plan is to be drawn up every six years.

1.2 Provincial level

The provinces primarily hold jurisdiction over the municipal removal of municipal waste, the associated levying of waste charges and the design of plants for this waste. All nine federal provinces have enacted their own waste laws in this regard, in some cases with associated ordinances. Typically, provisions on the following areas can be found in the provincial waste management laws or in the corresponding ordinances:

- the collection and treatment of mixed municipal waste, bulky waste and biogenic waste,
- provincial waste management planning (including waste prevention measures),
- public relations work and providing information for the population,
- the enactment of removal orders by the municipalities,
- the establishment of waste management associations,
- obligations incumbent upon the property owners (and users) in the context of waste disposal,
- the obligation to connect to municipal collection or the obligation to tender delivery to the same,
- the setting and prescription of tariffs by the municipalities.

Vienna Waste Management Act

The Vienna Garbage Collection Act was passed on July 1, 1994 by the Wr. AWG) - Law on the Avoidance and treatment of waste and the collection of a fee required for this in the area of the State of Vienna, LGBl. for Vienna No. 13/1994 replaced.

The Wr. AWG contains, among other things, provisions on the collection and disposal of garbage as well as on Creation of the Vienna waste management plan and a waste prevention programme.

According to § 2 Wr. AWG has the Viennese state government to draw up a waste management plan, regularly - every six years - to update and publish. In the Viennese Waste management plan are the waste management forecasts and the related, for Realization of the necessary measures in terms of waste policy in the area of the State of Vienna - taking into account the federal waste management plan. To create the Waste management plan, the council of environmental experts can make recommendations submit and advise the state government. The contents of the waste management plan can be found in Chapter 1.

Before the state government takes a decision, the waste management plan subject to a strategic environmental impact assessment (SEA).

In addition, the Vienna provincial government is now obliged to draw up at least every six years a waste prevention programme. The aim thereby pursued is decoupling economic growth from the environmental impacts associated with waste generation. The content of the waste prevention programme can be found in Chapter 1.

The decision on the waste prevention programme must also be preceded by a strategic environmental assessment under certain conditions.

In the second section of the Wr. AWG various instruments for waste prevention and reduction are provided. According to § 10 Abs. 1 Wr. AWG the federal capital Vienna as The holder of private rights, for example, is obliged
to procure work materials and durable goods, if possible, to use materials that are compatible with both the production and use as well as collection and treatment as waste cause as little environmental pollution as possible. In addition to the regulations on waste concepts and pollutant investigations for construction sites - which are meanwhile due to specifications of the Recycling Building Materials Ordinance - the second section also contains requirements to create a waste concept for and for the mandatory use of reusable products at events.

**Provincial Waste Management Plans**

The federal provinces are obliged to develop provincial waste management plans, reports and/or policies at regular intervals based on the respective Provincial Waste Management Act. In addition, several federal provinces shall publish annually updated waste management reports or statistics on waste on their websites. The most up-to-date provincial waste management plans and published waste statistics of the federal provinces are listed below.

Vienna developed and published the following plans and statistics (according to the data provided in the Federal Waste Management Plan 2017):

- Viennese waste prevention programme and the Viennese waste management plan (planning period 2013 - 2018) within the framework of the strategic environmental assessment 2011/2012;
- Waste statistics;
- Performance report 2015 from the Waste management, street cleaning and vehicle fleet department (MA 48).

### 1.3 Waste management competences

**Government Agencies responsible for guidance on waste**

**Country Level:**

Bundesministerium für Nachhaltigkeit und Tourismus (BMNT) – Federal Ministry for Sustainability and Tourism; Umweltbundesamt (UBA) – Environment Agency Austria.

**City level – Vienna**

Municipal Department 22 - Environmental Protection in Vienna (MA 22);

Political Level: Geschäftsgruppe für Umwelt und Wiener Stadtwerke;

Wiener Umweltanwaltschaft – Advocacy of the Environment Vienna;


**Waste management competences of the municipal authorities (Magistrat)**

The waste management tasks of the Municipality of the City of Vienna include both official (mainly MA 22) and operational tasks (MA 48).

Most of the official tasks and expert activities in the field of waste management are performed by the **Vienna Environmental Protection Department - MA 22.** The main tasks are the enforcement of the **AWG 2002** and the **ordinances of the AWG 2002.**

The operational area of waste collection, waste treatment and street cleaning is entrusted to the **Municipal Department 48 - Waste Management, Street Cleaning and Vehicle Fleet.** MA 48 sees itself as a customer-oriented organization and has therefore successfully introduced management systems for quality monitoring and ongoing quality improvement of services. MA 48 holds the following certificates:
- Environmental management system according to EN ISO 14001 : 2004;
- Occupational safety management system according to OHSAS 18001 : 2007;
- Quality management system according to EN ISO 9001 : 2008;
- Risk management system according to ONR 49001 : 2008;
- Complaint management system ISO 10002:2004 / Cor. 1:2009;
- Energy management according to EN ISO 50001:2011;
- Compliance management according to ISO 19600:2014 and ONR 192050:2013;
- Environmental management according to EMAS III (Eco-Management and Audit Scheme);
- Specialist waste management company (EFB).

Further certificates:
- Excellent city cleaning by DEKRA (Deutscher Kraftfahrzeug-Überwachungs-Verein – (German Motor Vehicle Inspection Association)).
- Austrian Compost Quality Seal;
- European Compost Quality Seal;
- Austrian Ecolabel for the Earth "Good Ground."

It is the responsibility of MA 48 - as required, but at least every 6 years - to update the Vienna Waste Management Plan. In 2013, the Vienna Waste Prevention Programme (AVP) was drawn up for the first time, which is also updated at least every 6 years.

In accordance with the principle of proximity and self-sufficiency in waste disposal, the City of Vienna endeavors to recycle or dispose of the waste generated in Vienna, in particular municipal waste, in an environmentally sound manner.

If the municipal waste volume cannot be treated completely with the facilities described below, the City of Vienna must build appropriate facilities itself or have the waste treated by third parties.

In order to guarantee secure and high-quality recycling and treatment, strategically important facilities such as thermal waste treatment plants, the waste logistics center, landfills, composting plants and biogas plants are built and operated by the City of Vienna itself.

Within the scope of its activities, the Vienna Environmental Ombudsman’s Office (WUA) is committed to sustainable and environmentally friendly waste management in Vienna. In addition to its legal mandate as a party in AWG and UVP procedures, it tries to set initiatives and contribute its expertise above all at the strategic level. Thus, the WUA has already been involved in the creation and implementation of the following previous Viennese SEAs:

- Vienna Waste Management Plan 2001,
- Vienna Waste Management Concept 2007,

With the amendment of the Vienna Waste Management Act, LGBl. for Vienna No. 17/2006, the Vienna Environmental Ombudsman’s Office as SEA environmental body according to the Vienna Waste Management Act has a right to be heard in the determination of the scope of investigation and the level of detail of the environmental report and a separate right to information and comment on the draft of the Vienna Waste Management Plan and the environmental report.
Waste collectors and waste handlers

Waste that must be collected and treated must be handed over to authorized waste collectors or waste handlers. As of March 2017, 202 Viennese companies were authorized to collect and/or treat non-hazardous and hazardous waste.

Authorized waste collectors and waste handlers can be found in the electronic register via the website www.edm.gv.at under the item "Search for registered persons".

2 Waste management system

2.1 General information

The total population of the city of Vienna is 1,867,582 inhabitants, in the area of 41,487 ha (City of Vienna, MA 23, 2017), with an average population density of 4,502 inhabitants /km². 40% of the population live in multi-family houses, 60% in (semi)detached houses. The average household size is 2.06 persons. The GDP in 2017 amounted to 47,700 €/capita. The total population of Austria is 8,795,073 inhabitants in the area 8,858,000 ha (Statistik Austria, 2017).

The Formal waste sector is publically owned and operated and there is no “Informal” waste sector in the city of Vienna. Every day, up to 265 waste collection vehicles of MA 48 are on the road to collect the waste. The municipal solid waste management services are financed through household fees as well as through Extended Producer Responsibility.

Waste operations in place:
- 4 publically owned and operated waste incineration plants;
- 1 publically owned and operated compost plant;
- 1 publically owned and operated biogas plant;
- 1 publically owned and operated sanitary landfill for residuals of waste incineration.

All the residual waste of the city of Vienna is treated in Vienna, no waste is exported for treatment. Recyclable materials are partly exported to recycling facilities in other counties of Austria.

2.1.1 Classification of MSW

Waste from households or from enterprises that produce waste that is similar to household waste. All recyclables, residual waste and hazardous waste from households and bulky waste from households fall within the term “municipal solid waste”. MSW that was treated but did not change its chemical and physical characteristics severely still falls under the term MSW.

MSW Generation in Vienna is 1,024,407 tonnes per year, that is 549kg per capita per year.

The waste amount collected from households and small businesses by MA 48 in 2013:
- Including inert waste: 1,036,879 t, (excluding inert waste: 969,269 t);
- Residual waste 627,657 t (residual waste bin: 508,695 t);
- Used material 228,212 t (“Altstoffe”); 
- Organic waste 107,237 t;
- Problematic/hazardous waste 6,164 t;
- (Inert waste 67,610 t).
2.1.2 **Collection coverage and types**

Vienna has full coverage with differentiated separate collection schemes, no co-mingled collection of waste streams is in place, 100% of the waste is formally collected and treated. The residuals of waste incineration are landfilled. Source separation of different waste streams is practiced as follows:

- Bins for residual waste and wastepaper are present in every apartment building and are emptied one to six times per week;
- Scrap metal, glass (white and colored separately) and plastic bottles are collected separately at publicly situated collection points (4.363 around the city);
- In areas where the majority of people live in houses with gardens, organic waste is collected separately.
- **Hazardous waste from households** can either be brought back to the distributor (batteries, electronic waste), to publicly situated collection points (4 around the city, located at big markets) or to recycling centers (17 around the city).

**Waste Composition (Waste Management Plan Vienna, 2016)**

- Residual Waste 70%,
- Paper & Cardboard 16%,
- Organic waste 9%,
- Glass (white and stained) 3.8%,
- Plastic bottles 0.8%,
- Scrap metal 0.4%.

**Waste Management Practice (estimated)**

- 59% - Incinerated in waste to energy plant (residual waste),
- 22% - formal recycling (Paper & cardboard, glass, scrap metal, plastic bottles),
- 9% - composting (garden waste and green kitchen waste),
- 8% - sanitary landfill (inert material from construction waste),
- 2% - anaerobic digestion in biogas plant (food waste).

**Recovery Rates by material (estimated)**

- Paper and Cardboard: 56% recycled,
- Colored glass: 63% recycled,
- White glass: 40%,
- Recycled Plastic: 10% recycled,
- Scrap metal: 77% recycled,
- Wood: 79% recycled,
- Garden waste & green kitchen waste: 46% composted.
- Food waste: 20% energy recovery through anaerobic digestion.

The responsible organization for the collection of municipal waste accumulated in the City of Vienna is the Municipal Department “MA 48 - Waste Management, Street Cleaning and Vehicle Fleet” of the City of Vienna (https://www.wien.gv.at/umwelt/ma48). The Waste Management Act for Vienna stipulates the compulsory collection of residual waste and recyclables for the entire municipal territory. Vienna introduced separate waste collection already in the early 1980s, by 1991 this system covered all of Vienna. For the separate collection of waste, the following systems are established: a collection of recyclables via bins/containers (in total ~ 200 000; for paper, glass, metal, plastic bottles, and bio-waste; for commercial enterprises, additional containers for plastic foils and
kitchen scraps are available as well), bulky waste removal, skip service (for bulky waste, recyclables, tree cuttings), civic amenity sites, and mobile and stationary collection points for hazardous waste.

**Paper and cardboard:** Separate collection system for newspapers, magazines, catalogues, brochures, writing paper, letters, etc.; door-to-door collection via bins/containers (with red lid and label), if possible, close to the front door of a building; bring system: civic amenity sites (especially for large cardboard boxes), bring collection points (in decentralised locations, e.g. at street corners), markets.

**Glass:** Separate collection of clear and coloured glass in either two separate containers (for pouring and lifting) or one two-chamber container (for lifting); door-to-door collection partially for large apartment complexes, however mainly bring system: bring collection points in public locations, in addition, collection at civic amenity sites.

**Plastic (bottles only):** the separate collection includes all hollow plastic items, containers with yellow lid and label; door-to-door collection partially for large apartment complexes, since 2013 the City of Vienna also offers door-to-door collection of plastic bottles in one-family house areas by means of “yellow bags”; commercial enterprises are provided with containers with flat lids and without locks for collecting plastic foils; however, the collection mainly via bring system: containers for plastic bottles at bringing collection points in public locations, in addition, collection at civic amenity sites;

**Metal:** Scrap metal collected includes beverage cans, other metal packaging and small metal objects; door-to-door collection partially for large apartment complexes, however mainly bring system: containers with blue lid and label at bringing collection points in public locations, in addition, collection at civic amenity sites.

**Bio-waste:** Door-to-door collection of plant matter in less densely inhabited zones with numerous gardens via bins/containers with brown lid and label (waste of animal origin from households disposed of as residual waste, for catering industry especially designated kitchen waste bins); bring-system: in condensed urban areas, public bins for garden waste, tree cut, uncooked vegetables and food waste are installed on sidewalks and in parking lanes, in addition: civic amenity sites to dispose of green waste.

### 2.1.3 Elements of the separate collection system

**Door-to-door collection of source separated waste**

The collected fractions by the door-to-door collection of source separated waste practice are Paper, glass (clear and coloured glass), plastic (bottles only), metal, bio-waste (+ kitchen and canteen waste from catering industry).

**Collection frequency and bins/containers number and type**

**PAPER**

Collection frequency is at least once a week with 44 collection routes. There are approximately 92 160 containers (in total: 96 000 bins/containers for separate collection of paper in Vienna of which 96 % is provided for door-to-door collection and 4 % is provided for bring collection points (~ 3 840). Bins/container types are mostly 120 l and rarely 240/770/1 100 l in volume.

**GLASS**

Collection frequency is at least every four weeks with 2 collection routes. There are approximately 3 819 bins/containers and of the total of 6 700 bins/containers for separate collection of glass in Vienna, 57 % provided for door-to-door collection, 43 % provided for bring collection points. Bins/container types are mostly 120 l and rarely 240/770 l, 750, 2.000/3.000l lifting containers.
METAL
Collection frequency is at least fortnightly with 4 collection routes. There are approximately 3,720 bins/containers and of the total 6,200 bins/containers for separate collection of metal in Vienna, 60% provided for door-to-door collection, 40% provided for bring collection points. Bins/container types are 240/770 /1,100 l.

PLASTIC (BOTTLES ONLY)
Collection frequency is at least fortnightly with 11 collection routes. There are approximately 7,800 bins/containers (in total: 13,000 bins/containers for separate collection of plastic bottles in Vienna, 60% provided for door-to-door collection, 40% provided for bring collection points). Bins/container types are 240/770 /1,100 l.

Since 2013 the City of Vienna also offers door-to-door collection of plastic bottles in one-family house areas by means of “yellow bags”.

BIO WASTE
Collection frequency in the winter months is 2-weekly, and during vegetation phase (usually from 6 April, depending on weather situation) weekly with 32 collection routes. There are approximately 83,300 (in total: 85,000 bins/containers for separate collection of bio-waste in Vienna, 98% provided for door-to-door collection, 2% provided for bring collection points). Bins/container types are mostly 120 l and rarely 240/770 l.

KITCHEN AND CANTEEN WASTE FROM CATERING INDUSTRY
Collection frequency is at least once a week with 4 collection routes and there are 2,500 bins in total (only for door-to-door collection) with 120/240 l bins/container types.

Coverage of collection for the listed waste types for door to door collection reached 100% in the following years:
- Paper: households 100%, businesses 100% (since 1970s),
- Glass: households 100%, businesses 100% (since 1977),
- Metal: households 100%, businesses 100% (since 1985),
- Plastic: households 100%, businesses 100% (since 1980s),
- Bio-waste: households 100%, businesses 100% (since 1991).

Source of funding
The financing of the collection and treatment of all municipal waste is based on the residual waste fraction in order to create an incentive for separate waste collection. Thus property owners are charged a quarterly waste management fee calculated from the volume of the residual waste containers installed on their properties and the frequency of bin emptying. This residual waste management fee finances the collection and treatment (e.g. including operation of civic amenity sites etc.) of all municipal waste in Vienna except packaging material (and used electrical appliances, batteries). The more material is collected separately, the smaller the container volume that needs to be installed, and the lower the cost. Additional PAYT charge: e.g. civic amenity sites offer waste locks for residual waste, however, they charge € 2 per 150 L of residual waste to be disposed of.

The collection and treatment of packaging material is financed via manufacturers and importers according to the principle of producer’s responsibility. Fees from collection and recovery systems (e.g. ARA-System, “Altstoff Recycling Austria”) and revenues from the marketing of recyclables contribute as a source of funding. Thereby, costs for the collection and sorting of licensed packaging waste can be completely covered.

In 2014, the annual waste management fee for a standard single-family house (average waste arising) on average was € 229.32.
Bring Collection Points (containers publicly installed in parking lanes or on sidewalks)

The collected fractions for Bring Collection Points are paper, glass, plastic (bottles only), metal, bio-waste and the total number is 4300 (246.9 per 100,000 inhabitants). There are 1,850 bring collection points with the collection of 3 or more recyclable fractions (called “Altstoffsammelinseln”) and 450 bring collection points with the collection of 1 or 2 recyclable fractions (called “dezentraler Standplatz”).

Problematic materials - waste separation and collection

Various household items such as varnishes and cleaning agents, which can be handed in at the problem material collection.

Problem materials do not belong in the dustbin or down the drain. Thrown away carelessly, they are not only harmful to the environment but can also endanger human health and the habitat of animals and plants. For this reason, a separate collection of hazardous waste from households was started in Vienna as early as 1985. To date, collection volumes have increased almost tenfold.

Collection

In Vienna, the collection of problematic materials is carried out both via the Civic Amenity Sites and via the problematic materials collection sites (stationary and mobile). Retailers also play a major role in the collection of problematic materials:

- Large electrical appliances, refrigerators, display screen equipment, small electrical appliances and gas discharge lamps are taken back free of charge step by step (buy new appliance, hand in old appliance) from a sales area of 150 square meters. (Ordinance on Waste Electrical Equipment §5, Para. 2),
- Batteries (exact designation: used appliance batteries) are also taken back by the trade. (Battery ordinance §9, para. 4),
- Old medicines can be handed in at pharmacies free of charge.

Suitable for the collection of problematic materials:

Problematic materials:

- Batteries: Device batteries, button cells and rechargeable batteries (up to 5 kg),
- Vehicle batteries from passenger cars (one piece),
- Old medicines without boxes,
- Hypodermic syringes and needles from private households (only in a puncture-proof container),
- Used mineral oils such as motor oils, gear oils and lubricating greases, as well as all containers up to five liters contaminated with these substances, cleaning rags and filters,
- Acids, alkalis,
- Photographic chemicals such as developer, fixing and stop baths (unmixed) up to five liters,
- Stain removers and cleaning agents, spray cans,
- Paints, varnishes, thinners, cleaning agents, wood preservatives, chemical boxes, glues, enamel paints, weedkillers, fertilizers, and all containers contaminated with these substances,
- Metallic mercury, thermometers containing mercury, mercury switches,
- Unknown, unidentifiable substances (if possible with the packaging).

Used materials

- X-ray images,
- Toner and printer cartridges,
- CDs and DVDs without cases,
- Used cooking oils and fats,
- Waste electrical equipment,
- Gas discharge lamps such as fluorescent tubes or energy-saving lamps,
- Small electrical appliances (up to a maximum edge length of 50 centimeters) such as hair dryers, blenders, irons, calculators, cell phones, etc.
- Display screen equipment (up to a maximum edge length of 50 centimeters): This can only be handed in at the waste disposal sites and mobile problem material collection points; display screen equipment is not accepted at the stationary problem material collection points at the markets.

(Free drop-off always refers to household quantities only).

Not suitable for problem material collection:
- All other used materials,
- Residual waste,
- Bulky waste, large waste electrical appliances (edge length greater than 50 centimeters) such as washing machines, dishwashers, microwave ovens, refrigerators, televisions or computers. These are to be disposed of free of charge at the garbage tip.
- Fireworks, other explosive materials such as explosives, radioactive materials etc. There are authorized disposal companies for this.

Note: Toxic substances should always be kept out of the reach of children.

Recycling and disposal.

Recyclable substances and substances that cannot be incinerated are taken to the central problem substance collection point. There, the substances are re-sorted and handed over to the appropriate recycling and disposal companies. Raw materials from the old electrical equipment, such as metals and plastics, are recycled. Toner cartridges are refilled. All other problematic materials are disposed of at Fernwärme Wien's Simmeringer Haide hazardous waste incineration plant.

- Approximately 7,000 tonnes of problematic materials and hazardous waste are collected each year.
- Acids and alkalis are recycled by regenerating them.
- From batteries, the acids are regenerated and the metal parts are recycled.
- In the recycling of fluorescent tubes, glass, mercury and luminescent dust are separated.
- CDs and DVDs are processed into plastic granulate.
- Silver is recovered during the recycling of X-ray images.
- Used cooking oils are processed into biodiesel and used in the Lobau composting plant as a climate-neutral substitute for fossil fuels for vehicles and equipment. Up to 880 tonnes of carbon dioxide are thus saved each year.

Recycling and disposal is elaborated in more detail in the Chapter Treatment of the communally collected waste in Vienna.

**Bring-in Civic Amenity sites - Mistplätze**

These facilities will be described in more detail, as they are the critical link in hazardous household waste management infrastructure.
The waste disposal sites are a free service facility of the Vienna City Administration. They were created so that the Viennese can dispose of waste in household quantities conveniently and in an environmentally friendly manner. Room and apartment clearing out do not fall under this.

Tasks of the Civic Amenity sites:

The Civic Amenity site acceptance regulations ensure the smooth handling of up to two million entries to the Viennese Civic Amenity site per year. These easy-to-handle regulations are also used in the interest of the customers of the Civic Amenity site.

Whereas in the early days the focus was purely on the proper disposal of waste, today's refuse sites have evolved into service facilities. Intact old goods can also be handed in here in the "48er-Tandler-Box". These are made available to the 48er-Tandler or benefit charitable causes. A free book swap in converted phone booths can be done at all dumpsites. A maximum of five books may be exchanged at one time.

Short-term excess residual waste can be disposed of in the residual waste locks, for which a fee is charged.

Available free of charge at some Civic Amenity sites:

Up to half a cubic meter of compost made from biogenic waste can be collected free of charge at the Civic Amenity sites - with the exception of the Civic Amenity site in Ottakring - depending on availability. Since it is a natural product, supply bottlenecks may occur.

Available at the problematic material collection point at the Civic Amenity sites are:

- The peat-free soil "Guter Grund," made from Vienna compost, is available in 18- and 40-liter bags at a price of 4 euros and 6 euros, respectively.
- The leaf bag costs 1 euro per 100-liter bag.
- The battery collection box is available free of charge.
- With the Vienna gift sack, there is an attractive, practical and, above all, reusable solution for every occasion to avoid packaging waste.
- WÖLI containers are provided: 3-liter tubs for used cooking oils and fats for the home (free of charge) or the 25-liter Gastro-Wöli for restaurants (5 euros for the first collection).
- Rain barrels made from old waste containers are available for 10 euros each.

Small businesses in Vienna are offered the opportunity to dispose of small quantities of waste generated during adaptation and renovation work in Viennese apartments (not house renovations).

The collected fractions for Bring-in Civic Amenity sites are Paper, glass, plastic (bottles), metal including beverage cans, green waste (in addition: bulky waste, electrical appliances, used tyres, problematic household (hazardous) waste as well as objects that are still in working order and thus need not yet be scrapped).

As a rule, a maximum of one cubic meter of waste can be delivered to the Bring-in Civic Amenity site once a day. More detailed information can be found in the acceptance regulations of the waste sites. For some waste fractions, such as asbestos cement or tires, other quantity limits are specified.

The use of Vienna's Civic Amenity Sites is subject to certain quantity limits and conditions. The delivery of larger quantities of non-hazardous waste, for example in the case of apartment clearances, is subject to a fee (except for old electrical appliances) and is possible at the Rinterzelt. For the delivery of problematic materials in household quantities, there is a problematic material collection point at each Civic Amenity Site.
Vienna – model city for benchmark analysis

Maximum delivery quantity:

- As a rule, the total of all materials handed in may not exceed 1 cubic meter per delivery. For some waste fractions, such as asbestos cement and tires, other quantity limits are specified.
- As a rule, private individuals are allowed to drop off 1 cubic meter per delivery once a day at the waste site.
- Commercial vehicles are only allowed to deliver 1 cubic meter of non-hazardous waste once a day.
- It is not permitted to circumvent the quantity regulations by unloading in front of the manure site and carrying in old materials or waste. Partial unloading is also prohibited.
- Delivery with vehicles with Viennese license plates.

Note: Different acceptance regulations apply at the Ottakring Mistplatz.

- Private car without trailer: once a day per 1 cubic meter of waste,
- Private car with trailer: once a day per 1 cubic meter of waste,
- Private flatbed or bus with a maximum permissible total weight of 3.5 tonnes: 1 cubic meter of waste per day,
- Commercial vehicles with a maximum gross weight of 3.5 tonnes: 1 cubic meter of non-hazardous waste once a day. Hazardous waste may not be delivered.
- Vehicles with a gross vehicle weight exceeding 3.5 tonnes: Delivery of waste is not permitted.
- Delivery with vehicles with non-Vienna license plates.

Note: Different acceptance regulations apply at the Ottakring waste disposal site.

- Private car without trailer: once a day per 1 cubic meter of waste.
- Private car with trailer: Delivery of 1 cubic meter of waste is possible once per quarter. However, the form "Exception to the acceptance regulations" must be filled in.
- Private flatbed or bus with a maximum permissible total weight of 3.5 tonnes: Delivery of 1 cubic meter of waste is possible once per quarter. However, the form "Exception to the Acceptance Regulations" available on site at the waste disposal site must be filled in.
- Commercial vehicles up to 3.5 tonnes maximum permissible total weight: The delivery of waste is not permitted.
- Vehicles with a maximum permissible gross weight exceeding 3.5 tonnes: The delivery of waste is not permitted.

The following waste fractions that are accepted at the Bring-in Civic Amenity sites are distinguished:

*Used cooking oils*

- Deep-frying and frying fats, oils from pickled foods, spoiled cooking fats (all free of impurities) best in the WÖLI (Vienna oil collection bucket) at 3 liters or in the Gastro-WÖLI at 25 liters.

*Waste materials (Altstoffe)*

- Waste paper, white and colored glass, scrap metal, plastic bottles;
- CDs and DVDs: without sleeves;
- Packaging styrofoam: White, clean, unglued styrofoam without labels, adhesive or paint residues, block Styrofoam;
- Used textiles: Clean women's, men's and children's clothing, underwear, bed, table and household linens, wool blankets, comforters and pillows, stuffed animals, belts, bags, shoes;
- Cardboard boxes: brown and gray packing cardboard boxes;
- Plastic foils: large plastic packaging foils.
Construction-demolition waste
- Asbestos cement, corrugated cement: one cubic meter, but not more than 90 by 90 centimeters in size;
- Construction waste:
  - Residual materials from domestic construction work (masonry parts, sand, plaster, plaster, tiles);
  - Flat glass, wired glass, mirror glass, etc.
  - Maximum 10 construction waste bags or half a cubic meter loose.

Organic waste (Biogene Abfälle)
Up to 2 cubic yards of organic waste may be dropped off per delivery. This includes:
- Tree and shrub cuttings (e.g. rootstocks, branches with a diameter of more than 20 centimeters).
- Leaves (possibly with a leaf bag).
- Harvest residues from fruit and vegetables.
- Lawn cuttings, weeds.
- Christmas trees.

Waste electrical equipment
- Appliances or parts of appliances in household quantities.
- Large electrical appliances: these are all appliances with an edge length of more than 50 centimeters. Examples are:
  - Washing machines, clothes dryers, ironing machines, dishwashers, electric stoves, ceramic hobs, heaters, dishwashers, electric guitars et cetera.
- Small electrical appliances: These are all appliances with an edge length of less than 50 centimeters. Examples include.
  - Irons, blenders, coffee makers, electric pepper mills, razors, electric toothbrushes, blood pressure monitors, radios, CD players and VCRs, DVD players, tools such as drills or hand-held circular saws, computer accessories such as keyboards, printers, mice, USB sticks, consoles, telephones and headsets, et cetera.
- Refrigerators and freezers: refrigerators, freezers, air conditioners for private use. 2 pieces may be handed in per delivery.
- Appliances with less than 1,000 grams of refrigerant. Large commercial appliances, such as refrigerated display cases, please bring to the Rinter tent.
- Display Screen Equipment:
  - TV sets, computer monitors, laptops and notebooks.
- 2 Devices or parts of devices.

Old goods (items in good condition)
- intact old goods like electrical appliances, books, furniture, toys, sports equipment et cetera, but please no residual waste.

Wood
- Pure, untreated wood (for example, clean wooden pallets).
- Fiberboard.
- Coated or varnished waste wood.
- Pressed chipboard.
- Fruit crates, boxes, firewood and construction timber.
Vienna – model city for benchmark analysis

- One cubic meter, for bulky items also more than one cubic meter.

**Car tires**
- Car tires (also studded tires) up to a maximum tire diameter of 130 centimeters, with or without rims (maximum 5 pieces).
- Waste tires from trucks and special vehicles up to a maximum tire diameter of 130 centimeters please to the sintering tent.

**Problematic substances/household hazardous waste**
- Toxic and hazardous waste usually generated in private households.
- Normal household quantities (no trade).
- For pharmacies: one 120 l bag per day for old medicines without boxes and without syringes.
- Certain hazardous waste from the commercial sector can be delivered to the Rinter tent for a fee.

**Residual waste**
- The disposal of municipal residual waste is subject to a fee and is charged directly to the properties. The service offer has been extended by the introduction of chargeable residual waste locks at Civic Amenity sites: short-term excess quantities (for example, due to removals or celebrations), which cannot be disposed of in the conventional residual waste container, can thus be disposed of at all dung sites.
- At all waste sites, residual waste can be disposed of in coin-operated compactors for up to 150 liters for a fee of 2 euros.

**Bulky waste**
Bulky waste cannot be disposed of through other trash receptacles due to dimensions. Examples include:
- Furniture, carpets, mattresses, cardboard carpet rolls, windows, doors, tar paper, white and colored EPS insulation boards ("Kugerl" to see).
- In the case of large individual items (for example, couch) also over a cubic meter, but no apartment evacuations.

There are 17 Bring-in Civic Amenity sites total and 1.03 per 100,000 inhabitants.

Problematic materials from households are collected at more than 100 drop-off points in Vienna. Figure 26 below shows all of Vienna's available hazardous waste collection points. In addition to the 17 Civic amenity sites, problem substances can be handed in at a total of 93 mobile collection points for problem substances. The 93 mobile collection points are distributed over all 23 municipal districts of Vienna and are visited by collection vehicles once a quarter. In addition, there are 4 stationary drop-off points at Viennese markets, which are available from Mon-Fri from 4 p.m. to 6 p.m. and on Saturdays from 9 a.m. to 1 p.m.
Table 23 Locations of the 17 Viennese Civic Amenity Sites

<table>
<thead>
<tr>
<th>Locations of the Civic Amenity Sites in Vienna (Mistplätze):</th>
</tr>
</thead>
<tbody>
<tr>
<td>2, Zwischenbrücken: Dresdnerstr. 119;</td>
</tr>
<tr>
<td>3, Landstraße: Grasbergerg. 3;</td>
</tr>
<tr>
<td>10, Favoriten: Sonnleithnerg. 30;</td>
</tr>
<tr>
<td>11, Simmeringer: Johann-Petrak-Gasse 1;</td>
</tr>
<tr>
<td>12, Hetzendorf: Wundtg./Jägerhausg.;</td>
</tr>
<tr>
<td>14, Baumgarten: Wientalstraße 51;</td>
</tr>
<tr>
<td>16, Ottakring: Kendlerstr. 38b;</td>
</tr>
<tr>
<td>17, Hernals: Richthausenstr. 2-4;</td>
</tr>
<tr>
<td>19, Oberdöbling: Leidesdorfgasse bei 1;</td>
</tr>
<tr>
<td>19, Heiligenstadt: Grinzingerstr. 151;</td>
</tr>
<tr>
<td>21, Donaufeld: Fultonnesstr. 10</td>
</tr>
<tr>
<td>21, Stammersdorf: Nikolsburgergasse 12;</td>
</tr>
<tr>
<td>22, Kagran: Percosstr. 4 (auch sonntags 7 bis 18 Uhr geöffnet)</td>
</tr>
<tr>
<td>22, Stadlau: Mühlwasserstr. 2;</td>
</tr>
<tr>
<td>22, Breitenlee: Breitenleer Straße 268;</td>
</tr>
<tr>
<td>22, Breitenlee: Breitenleer Straße 268;</td>
</tr>
<tr>
<td>23, Liesing: Seybelgasse 2</td>
</tr>
<tr>
<td>23, Inzersdorf: Südrandstr. 2.</td>
</tr>
</tbody>
</table>

Figure 19 Location of the hazardous waste collection points and the mobile hazardous waste collection points
Stationary problematic material collection points

Opening hours Monday to Friday from 4 to 6 p.m., Saturday from 9 a.m. to 1 p.m:
- 2nd, Karmelitermarkt in the municipal building,
- 2nd, Wohlmutstraße/Ennsgasse (front garden market),
- 6th, Naschmarkt - Linke Wienzeile ggü. Alfred-Grünwald-Park,
- 12th, Meidlinger Markt ggü. Ignazgasse 12.

Opening hours Monday to Friday from 7 a.m. to 6 p.m., Saturday from 7 a.m. to 2 p.m:
- 21st, Floridsdorfer Markt ggü 9-14

With the collection system described above, the City of Vienna not only fulfills the legal requirements but even exceeds them many times over.

Mobile collection of problematic materials.

The mobile problem waste collection comes to your neighborhood every 3 months. At the 93 locations, problem materials in household quantities (between 1 and 5 liters, depending on the type of problem material) are collected free of charge.
Central collection point for problematic materials

The Central Problem Materials Collection Point at the site of the waste treatment plant (Rinterzelt) is a transfer point for the recyclable portions of the hazardous fractions from the collection of problem materials and for defined hazardous waste from commercial deliveries. More information on Rinterzelt and its operation is provided in the subchapter - Material recovery - Rinterzelt - Austria's largest waste treatment plant.

**Total annual collected quantities MA 48 for door-to-door collection and bring collection points and civic amenity sites:**

- **Paper** - 127,062 t, 73 kg/cap (paper: 122,117 t, cardboard: 4,945 t).
- **Glass** - 28,213 t, 16.2 kg/cap (glass packaging: 28,155 t, flat/multilayer glass: 58 t).
- **Plastic** - 9,934 t, 5.7 kg/cap.
- **Metal** - 12,360 t, 7.1 kg/cap.
- **Bio-waste** - 106,590 t, 61.2 kg/cap.

In terms of annual collected quantities, a distinction between door-to-door collection and bring collection points cannot be drawn since bins/containers from door-to-door collection and bins/containers from bring collection points are emptied by one collection car so no separate weighing of waste amounts collected is performed. More detailed information regarding the share of collected quantities via civic amenity sites are also not available) and this applies for all relevant waste streams).

**Extended Producer Responsibility scheme (EPR scheme) for packaging waste in Austria**

The EPR scheme covers the following packaging material: paper and cardboard, glass, metal, plastic, beverage cartonnes, biodegradable packaging (other composite materials, wood etc.).
In Austria, the revised Ordinance on the Prevention and Recovery of Packaging Waste and Specific Waste Products (Packaging Ordinance of 2014) that entered into force on 1 January 2015 [AT VVO 2014] requires all manufacturers, distributors and importers that place packaging or packaged goods on the Austrian market to take these packaging materials back free of charge and ensure their recovery or reuse. The revised Packaging Ordinance brings some major changes regarding overall packaging waste obligations and the collection and recovery of packaging (i.e. now several collection and recovery systems offering compliance services for household packaging, area-wide).

Consumer pays for collection and treatment of packaging waste in advance when buying a product (fee included in the sales price of a product).

**Deposit scheme for refillable plastic beverage containers in Austria**

The deposit scheme covers Refillable plastic beverage containers. The funding mechanism is regulated by the Ordinance on Taking Back and Deposit Payments for Refillable Plastic Beverage Containers (Federal Law Gazette No 513/1990 as amended by Federal Law Gazette II No 440/2001) that entered into force on 1 January 2002 establishes a compulsory deposit of € 0.29 for refillable plastic beverage containers at the national level.

### 2.2 Waste streams

In this chapter, the management in terms of collection and treatment practices of selected waste streams will be described for Austria and more specifically for the city of Vienna, where the exact data is available. Note that not all waste streams will be elaborated, the focus will be predominantly on municipal waste from households and other fractions that are classified as hazardous waste or have similar properties. The focus will be on hazardous household waste where the data can be found for this specific fraction.

#### 2.2.1 Municipal waste from households and similar establishments

The definition of "municipal waste" according to the Waste Management Act 2002, is that it is the waste from private households and other types of waste which, on account of their nature or composition, are similar to domestic waste. Municipal waste from households and similar establishments is primarily generated by households and public bodies, such as kindergartens or schools. This waste originates also from commercial and industrial enterprises, public administration, hospitals, markets, agriculture and tourist establishments.

The municipal waste from households and similar establishments is comprised of the following fractions - mixed municipal waste (residual waste), bulky waste, biogenic waste, hazardous household waste, waste electrical equipment, waste batteries and recoverables such as packaging, waste paper, waste glass, waste metals, waste plastics, waste textiles, etc. Some of the respective waste streams will be described in the following sub-chapters.
According to the data in the 400, the total generated volume for Austria (rounded off) is 4,160,159 t, i.e. 482 kg/inhabitant, and the total generated volume for Vienna is 885,464 t, i.e. 488 kg/inhabitant.

Of the roughly 4.2 million tonnes of municipal waste from households and similar establishments, 40% was supplied for treatment via public domestic-refuse collection as mixed municipal waste (residual waste) and bulky waste. Around 2.5 million tonnes, or 60% of the total volume, was obtained through a separate collection.
Of the approximately 1,450,400 tonnes of recoverable, packaging collected separately accounted for roughly 449,500 tonnes. This accounts for approximately 11% of the total volume of municipal waste from households and similar establishments.

The hazardous household waste amounts to 19,100 t (rounded off), or 100 kg/m³, and the total volume is 191,000 m³ (rounded off). Hazardous household waste and WEEE together make for 98,000 tonnes in 2015, which is a 2.1% or 2,000 t increase comparing to the year 2009.

**Treatment**

In 2015, around half of the approximately 4,160,000 tonnes of municipal waste from households and similar establishments were supplied for material recovery. More than 40% underwent thermal treatment, while less than 10% underwent mechanical-biological treatment.

| Table 24 Municipal waste from households and similar establishments in Vienna and the total for Austria in 2015 (t) |
|---|---|---|---|
| Mixed municipal waste | 523,545 | 59.13% | 1,431,593 | 34.41% |
| Bulky waste | 27,042 | 3.05% | 244,210 | 5.87% |
| Hazardous household waste and batteries | 1,454 | 0.16% | 19,138 | 0.46% |
| Waste electrical and electronic equipment | 12,105 | 1.37% | 78,871 | 1.90% |
| Paper, printed matter and Packaging | 123,046 | 13.90% | 659,810 | 15.86% |
| Glass packaging | 28,726 | 3.24% | 218,490 | 5.25% |
| Metal packaging | 3,020 | 0.34% | 28,844 | 0.69% |
| Bulky metals | 11,864 | 1.34% | 88,121 | 2.12% |
| Textiles | 4,023 | 0.45% | 29,406 | 0.71% |
| Plastic packaging | 6,810 | 0.77% | 154,701 | 3.72% |
| Bulky wood and packaging | 42,232 | 4.77% | 244,161 | 5.87% |
| Other recoverables | 2,778 | 0.31% | 26,898 | 0.65% |
| Biogenic waste | 98,819 | 11.16% | 935,917 | 22.50% |
| Total | 885,464 | 100.00% | 4,160,160 | 100.00% |

According to the data from the Federal Waste Management Plan 2017 from the table on the Recovery or disposal of municipal waste - Initial treatment stages in 2015 the treatment of hazardous household waste and WEEE separately is given for Austria 19,100 tonnes for HHW collected separately and 67,800 tonnes for WEEE collected separately, and in Vienna 1,500 tonnes for HHW collected separately and 10,400 tonnes for WEEE collected separately. For WEEE collected separately, there is also the amount that end up for thermal treatment of processed fractions – 2,600 tonnes in Vienna of the 15,200 tonnes total for Austria. WEEE from processing, from a separate collection, sorting residues are being landfilled – 500 tonnes in Vienna of the total of 3,300 tonnes for Austria.

**MIXED MUNICIPAL WASTE (RESIDUAL WASTE) FROM HOUSEHOLDS AND SIMILAR ESTABLISHMENTS**

"Mixed municipal waste" is waste that originates predominantly from private households or which, on account of its nature or composition, is similar to domestic waste. In the waste management legislation in the federal provinces, it is sometimes described as "domestic waste" or "residual waste". Mixed municipal waste does not include recoverables collected separately, biogenic municipal waste, bulky municipal waste, waste electronic equipment,
used batteries, hazardous household waste or street sweepings. Only mixed municipal waste from the municipal sector will be described in this section.

The composition of mixed municipal waste depends on a number of different factors. The key elements of mixed municipal waste are plastics and composite materials, organic fractions, paper and cardboard packaging.

In 2015, the volume of mixed municipal waste from households and similar establishments was approximately 1,431,600 tonnes. The amount of waste generated per head is 289 kg in Vienna and the total volume is 523,500 tonnes of the total 1,431,600 tonnes for Austria. The amount for Vienna is larger than in some other provinces and can be attributed to many causes, including provisions under provincial law, existing collection systems, the number of second homes, the level of tourism or the proportion of waste from commercial enterprises which is disposed of jointly.

Starting from a high level in 1991, the volume of mixed municipal waste generated from households and similar establishments decrease appreciably in the first instance as a result of the entry into force of the ordinances on the separate collection of packaging, biogenic waste and waste generated from construction. Over the last 10 years, the outright volume of waste generated has stagnated, even though population numbers have risen by 4.6 %.

Mixed municipal waste from households and similar establishments is predominantly disposed of in the collection system through public domestic refuse collection or private enterprises. The latter are instructed to effect collection by municipalities or waste management associations. The waste from agriculture, service companies, small business enterprises and public bodies which is similar to that generated by households is predominantly collected together via domestic refuse collection.

In 2015, 1,162,100 tonnes of mixed municipal waste were subjected to thermal treatment directly or the following processing in the initial treatment stage, while 255,600 tonnes underwent biological treatment. 13,900 tonnes of recoverables separated out from the municipal waste were recycled.

**BULKY WASTE FROM HOUSEHOLDS AND SIMILAR ESTABLISHMENTS**

Bulky waste from households and similar establishments includes waste that cannot be collected via customary waste containers on account of their size or shape and which cannot be assigned to any recoverables collection. Key elements of the bulky waste are furnishings, including furniture, mattresses and sanitary fittings, as well as wood and wood-based materials.

The volume of bulky waste from households and similar establishments generated in 2015 totalled approximately 244,200 tonnes total for Austria (28 kg/inhabitant), and 27,000 tonnes for the city of Vienna (15 kg/inhabitant).

The volume of bulky waste from households and similar establishments which has been generated since 1991 has an increasing trend which is related to the population increase, the rise in living standards and to a reduction in the useful life of consumer goods such as furniture.

Bulky waste is predominantly collected through the bring-it-yourself system at the collection points for recoverables, although there is also collection on demand or the street collection of bulky waste. A large part of the bulky waste is sorted and predominantly undergoes thermal or biological treatment following a grinding process. Scrap metals that are sorted from the bulky waste enter recycling establishments. Sorted untreated and treated waste wood is thermally recovered or recycled in the wood material industry.
SEPARATELY COLLECTED HAZARDOUS HOUSEHOLD WASTE

Hazardous household waste is hazardous waste that is normally generated and accumulated in private households. These hazardous household waste also include hazardous waste from all other waste producers which is comparable with domestic waste in terms of type and quantity. In both cases, this waste is classed as hazardous household waste as long as it remains in the possession of the initial waste producers.

In Austria, old stocks of plant treatment agents and pesticides, old paints and varnishes, medicinal products, asbestos cement, aerosol dispensers (aerosol cans), medical waste, liquid waste mineral oils (waste oils) and solid waste contaminated with grease and oil, among other things, are collected as hazardous household waste. Besides the listed, chemical residues, lyes, acids, solvents and mercury-containing waste are disposed of as hazardous household waste.

Waste electrical and electronic equipment and batteries will be described in their own separate sub-chapters.

In terms of quantities, the most important hazardous household waste types are old paints and varnishes, solvents, waste oils and oil mixtures, as well as asbestos cement and chemical residues. In 2015, the volume of hazardous household waste collected separately was approximately 19,140 tonnes total for the entire Austria (2.2 kg/inhabitant), while in the city of Vienna the volume was 1,460 tonnes (0.8 kg/inhabitant).

Given their hazardous properties and constituents, hazardous household waste must be collected separately from the other types of municipal waste. These substances are collected several times a year through stationary collection points for hazardous household waste in the municipalities or at mobile collection points. Sometimes, the hazardous household waste, including out-of-date medicines, waste oils or copier toners, are taken back free of charge by the specialist stores. Following presorting, hazardous household waste undergo physico-chemical treatment or are treated thermally, while utilising their energy content.

SEPARATELY COLLECTED RECOVERABLES FROM HOUSEHOLDS AND SIMILAR ESTABLISHMENTS

According to Article 2(4) of the Waste Management Act 2002, as amended, recoverables are "waste that is collected separately from other types of waste, or substances that are reclaimed from waste through treatment, in order to deliver such waste in a certifiable manner for admissible recovery."
A variety of recoverables are collected separately by the households or similar establishments, including rigid plastic, toys and CDs, in which connection the number of separated fractions varies across the federal provinces. The following fractions are recorded separately across Austria:

- Waste paper, paperboard and cardboard packaging – packaging and printed matter
- Waste glass (clear and coloured glass) – packaging
- Scrap metals – packaging
- Scrap metals – household scrap
- Waste textiles, including footwear
- Lightweight fraction – packaging
- Waste wood – packaging
- Bulky waste wood
- Other recoverables such as fats/frying oils, flat glass, end-of-life tyres, other plastics and others.

Approximately 1.45 million tonnes of recoverables from household collection were collected separately in 2015 in total for entire Austria (168 kg/inhabitant), with the share of 35% the volume of municipal waste from households and similar establishments, which corresponds to roughly one-third of the volume of municipal waste generated from households and similar establishments. For the city of Vienna a total of 222,500 tonnes of recoverables from household collection were collected (123 kg/inhabitant).

The recoverables from household collection are collected via the regionally differentiated collections of packaging in the collection or bring-it-yourself systems or via collection points for recoverables. In 2015, on average 77 % of the roughly 1.45 million tonnes of recoverables following the corresponding sorting was supplied for recycling, while roughly 23 % was supplied for thermal recovery.
### Table 25 Recoverables from household – Collection-volume by fractions (Excluding recoverables sorted from mechanical-biological treatment plants and mechanical treatment) – Federal Waste Management Plan 2017

<table>
<thead>
<tr>
<th>Fractions</th>
<th>Quantity (t)</th>
<th>Quantity (%)</th>
<th>Quantity (kg/inhabitant)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste paper, paperboard and cardboard packaging, packaging and printed matter</td>
<td>659,800</td>
<td>45.49%</td>
<td>76.5</td>
</tr>
<tr>
<td>Waste glass - packaging</td>
<td>218,500</td>
<td>15.06%</td>
<td>25.3</td>
</tr>
<tr>
<td>Scrap metals - packaging</td>
<td>28,900</td>
<td>1.99%</td>
<td>3.3</td>
</tr>
<tr>
<td>Scrap metals - scrap</td>
<td>88,100</td>
<td>6.07%</td>
<td>10.2</td>
</tr>
<tr>
<td>Waste textiles</td>
<td>29,400</td>
<td>2.03%</td>
<td>3.4</td>
</tr>
<tr>
<td>Waste plastics - packaging</td>
<td>154,700</td>
<td>10.67%</td>
<td>17.9</td>
</tr>
<tr>
<td>Waste wood - packaging and bulky wood</td>
<td>244,100</td>
<td>16.83%</td>
<td>28.3</td>
</tr>
<tr>
<td>Other recoverables</td>
<td>26,900</td>
<td>1.85%</td>
<td>3.1</td>
</tr>
<tr>
<td>Total recoverables (rounded off)</td>
<td>1,450,400</td>
<td>100.00%</td>
<td>168</td>
</tr>
</tbody>
</table>

The table above shows that the largest share is reserved for waste paper, paperboard and cardboard packaging.

### Used cooking oils and edible fats (SN 12302)

In addition, 1,104 tonnes of waste edible fats were collected from households and similar establishments in Lower Austria. In Vienna around 265 tonnes was collected.

Of the animal fats produced, almost three-quarters (73%) were shipped from Austria. 6% underwent thermal recovery, 17% was used in the production of biodiesel and 3% in the animal feed industry.

In 2003, the "WÖLI" - Used cooking oil collection introduced. The MA 48 offers this service of free edible oil collecting buckets (5 liters) for Viennese Households at the collection points for problematic substances. The full bucket can be taken to any collection point and will be exchanged for a clean one free of charge. There are larger ones for hotels and restaurants at the collection points on Civic Amenity Sites, cooking oil collecting bucket (GastroWÖLI). When you pick up an empty GastroWÖLI for the first time, a low nominal fee of 5 euros to be paid. The exchange of full for clean empty ones The container is again free of charge. Used deep-frying and frying fats, cooking oils from pickled dishes (e.g. Sardines) and spoiled edible fats. The separately collected used cooking oils and fats represent recyclable material, which is used, among other things, in biodiesel production for a fee. Without this collection, the large amount of collected collections would presumably be largely in the Vienna’s sewer network land, deposit there and thus cause high maintenance costs.

Figure 26 Free edible oil collecting buckets
The quantities collected have declined over the past 10 years (an average of 2% per year) as presented in the following Figure.

![Figure 27 Volume development "Used cooking oils and edible fats" - MA 48](image)

**Figure 27 Volume development "Used cooking oils and edible fats" - MA 48**

SEPARATELY COLLECTED BIOGENIC WASTE FROM HOUSEHOLDS AND SIMILAR ESTABLISHMENTS

The definition in accordance with the Ordinance on the separate collection of biogenic waste, Federal Law Gazette No 68/1992, as amended, is that biogenic waste has a high organic, biodegradable proportion and is therefore especially suitable for composting and fermentation. Biogenic waste collected separately can be subdivided as follows:

- Green waste from the garden and green areas, such as grass clippings, tree and shrub cuttings, flowers, foliage;
- Waste from the preparation of foodstuffs as well as leftovers.

The composition of the biogenic waste collected separately from households and similar establishments depends on the time of year, annual rainfall, the settlement structure, etc.

![Figure 28 Circular economy in Vienna – Closed loop of organics – source – Waste Management in Vienna Municipal Department 48](image)
In 2015, 935,900 tonnes of biogenic waste from households and similar establishments were collected separately in total in entire Austria (108 kg/inhabitant) with the share of 22 % of the volume of municipal waste from households. In Vienna 98,800 tonnes of biogenic waste from households and similar establishments were collected separately in total, where 86,800 t of biogenic waste is recorded separately with the help of organic waste collection bins, and 12,000 t of green waste is recorded by means of container collection and the collection point for recoverables or fed directly to a composting plant (54 kg/inhabitant).

The majority of biogenic waste from households is collected via the organic waste collection bin, which is mostly disposed of in the collection scheme. In contrast, green waste and shrub cuttings from household gardens are also taken to the existing collection points or direct to composting plants.

Biogenic waste which is collected separately is recovered in agricultural, municipal or commercial composting and biogas plants. The compost is subsequently utilised in agriculture, for fertilising public green spaces, such as parks, cemeteries, sports grounds, etc., dispensed to the population or used in horticulture and landscaping. The biogas originating in biogas plants is used to generate energy and heat. The digestate is used either for composting or is directly recovered for agricultural purposes. Non-recoverable residual materials, such as plastics, which are separated by screening during rough presorting or following the treatment process, are thermally recovered.

### 2.2.2 Other waste from residential areas

#### BIOGENIC WASTE FROM GREEN AREAS

This fraction relates to the biogenic waste which is generated in public and semi-public areas and is assigned to the following types of waste:
- municipal garden and park waste,
- cemetery waste,
- roadside greenery.

Municipal garden and park waste include plant residue from green spaces, parks and sports grounds. This includes grass clippings, foliage and tree and shrub cuttings. Cemetery waste is predominantly biogenic waste that arises as a result of the upkeep of graves and cemeteries. It comprises flowers, wreaths, soil, etc. Depending on the form of waste sorting at the cemetery, cemetery waste also includes certain shares of non-compostable impurities, including candle remains non-degradable parts of posies and wreaths, plastic ribbons, etc. The biogenic waste resulting from the maintenance of streets and car parks is designated as roadside greenery. This involves grass clippings, tree and shrub cuttings. Roadside greenery is often contaminated with littering waste and may be polluted with heavy metals.

In 2015, approximately 472,300 tonnes of biogenic waste from green areas accrued across Austria.

Municipal garden and park waste is mostly collected loose by the municipalities, sometimes shredded and recovered in green waste composting plants or jointly with biowaste. Tree and shrub cuttings serve as structural material in the composting process. Cemetery waste is collected using troughs which are often positioned in the cemetery area. Depending on the degree of contamination and the type of waste collected, cemetery waste is composted or undergoes treatment in mechanical-biological or thermal plants. Roadside greenery is collected by the road administrations responsible and then undergoes biological or thermal recovery.
A certain amount, but not a significant part of the municipal garden and park waste, along with the roadside greenery, remains at the place where it is generated and decomposes without being taken to treatment plants. This proportion is not included in the figure for the overall amount of waste generated.

The composts produced from biogenic waste from green areas are used to fertilise public green areas in sports grounds and parks, gardens and cemeteries, are utilised in agriculture or used in private gardens and landscaping.

CATERING WASTE

Catering waste is food scraps that originate from catering establishments, food wholesalers and commercial kitchens, such as those in hospitals, canteens and barracks. This involves plant and animal waste resulting from the sale and preparation of dishes as well as residues from the consumption of foodstuffs. Catering waste consists of foodstuffs past their expiry date, preparation leftovers, such as bones, peelings, pips, seeds or meat, and of leftovers that have not been consumed. Catering waste also includes, however, unspoilt foodstuffs which have exceeded their best before date or which sometimes have not exceeded their best before date. The composition of catering waste that is collected separately depends on the collection system, consumer behaviour exhibited by inhabitants, the geographical location of the place where it is generated and the time of the year.

In 2015, approximately 117,700 tonnes of catering waste was generated.

Catering waste is largely collected by commercial waste disposal firms. The receptacles are either changed or cleaned and disinfected on site. The waste from small catering establishments or from regions where no commercial collection of catering waste is available can be disposed of, in the event of a volume of, at maximum, 80 litres/week and upon the explicit consent of the competent municipal institution, via the municipal collection for biogenic waste.

The collection and treatment of catering waste is subject in any event to the provisions as per Regulation (EC) No 1069/2009 containing hygiene requirements for animal by-products not intended for human consumption.

Catering waste is largely recovered in biogas and composting plants. Only a small percentage is thermally recovered – 89% is fermented, 10% is composted and 1% is incinerated.

STREET-CLEANING RESIDUES

The waste which accumulates during street cleaning and the cleaning of squares and parks is designated as street-cleaning residues. This occasionally also includes the contents of public waste containers.

Street-cleaning residues consist of mineral fractions such as grit, dust or abraded material from the carriageway which is interspersed with biogenic components from roadside greenery, foliage and soils. Street-cleaning residues also include pollutants such as salt and de-icing products, abraded particles from tyres and brake linings, parts of the carriageway and road markings. Heavy metals from motor exhaust fumes and residues from engine leaks or accidents are also included to a limited extent. Furthermore, street-cleaning residues include carelessly discarded waste (littering), such as chewing gum, cigarette ends and packaging, as well as occasionally waste from public waste containers which are positioned on streets as well as in squares and parks.

The mineral portion is roughly two-thirds and the organic portion one-third of the street-cleaning residues. The composition of street-cleaning residues varies significantly according to the time of year and the place where the waste is generated. While an increased portion of grit is present in the street-cleaning residues during springtime, an increased amount of foreign matter, such as packaging, can be found in the street-cleaning residues during summer. Foliage accounts for an increased proportion of autumnal street-cleaning residues. The composition and level of heavy metal contamination also depend on the volume of traffic. Consequently, there are clear differences between urban and rural places where waste is generated.
In the region of 86,000 tonnes of street-cleaning residues were recorded in 2015.

Street-cleaning residues are largely collected separately, whereby around 70% of the sprinkled grit can be collected for processing. Two-thirds of the grit brushed in with a broom is available for reuse under optimal conditions and following corresponding preparation. A further portion is used as a recycled construction product.

Depending on the treatment method of the mixed municipal waste which is customary in a particular place, the contents of public waste paper bins and the non-recyclable portion of the street-cleaning residues either undergo mechanical-biological or thermal treatment. The remaining portion is deposited in the corresponding landfill class depending on the pollution level.

### 2.2.3 Packaging waste

Pursuant to the Packaging Ordinance 2014, Federal Law Gazette II No 184/2014, packaging material, packaging aids or pallets used for the containment, protection, handling, delivery and presentation of goods which are manufactured from various packaging materials constitute packaging.

Packaging materials include the following:

- paper, cardboard, paperboard and corrugated cardboard;
- glass;
- wood;
- ceramics;
- metals;
- textile fibres;
- plastics;
- laminated beverage cartonnes, other bonded materials;
- other packaging materials, in particular on a biological basis.

Approximately 1.3 million tonnes of packaging waste (collected separately and in mixed fractions, including residual waste or commercial waste) is being generated on an annual basis in the entire Austria.

Depending on the type of packaging material, the nature of the collection and the place where the waste is generated/collected, different forms of recycling and other recovery are available.

**Paper, paperboard and cardboard packaging** is collected in the near-household sector together with other paper products (e.g. magazines, newspapers, advertising materials and suchlike) in waste paper collection containers. The waste paper collected is used in the production of toilet paper, newspapers, printed matter and packaging from paper, cardboard, paperboard and corrugated cardboard. The paper, paperboard and cardboard used may pass through the production and recycling process on several occasions.

There are approximately 80,600 collection containers for clear and coloured glass for the separate collection of **used glass packaging** in Austria. The waste glass collected undergoes several sorting processes in the glassworks (manual sorting, magnetic separators, screens). At the same time, impurities/contaminants are also removed. The separate collection of clear and coloured glass is necessary since, during the production of clear glass, mingled coloured glass would result in discolourations. Following the sorting process, the waste glass, together with glass raw materials (quartz sand, lime, dolomite and soda), is melted down at approximately 1,600 °C and used in the production of new glass packaging.

**Metal packaging** which is collected separately is sorted in sorting plants or shredder operations and foreign matter and impurities are separated. 100% of the sorted metal packaging is recycled. Ferrous metals are used in steel
production as a high-quality raw material. Aluminium packaging is sorted out by manual sorting or by means of eddy current separators.

The wooden packages collected are sorted, crushed and treated and then processed into shavings. The shavings are used in the timber industry in the production of chipboard, in incineration plants for generating energy and as structural material in the composting of biogenic waste.

In Austria, a variety of models are available in the household sector for the separate collection of lightweight packaging (collective term for packaging from plastics, bonded materials, wood, textiles, ceramics and bio packaging). There will either be a joint collection of all lightweight packaging in the yellow sack (collection system) or in the yellow bin (bring-it-yourself system), or a systematic collection of plastic bottles (hollow body collection).

2.2.4 Waste electrical and electronic equipment

Waste electrical and electronic equipment (WEEE) includes the electrical and electronic equipment that is considered waste pursuant to Article 2 of the Waste Management Act 2002, including all their components, subassemblies and consumables which form part of the electrical and electronic equipment at the time of discarding. Waste electrical and electronic equipment arises in private households, business enterprises, industry, administrative institutions and other areas. Electrical and electronic equipment is characterised by a complex design and great diversity of the material. The constituents range, inter alia, from critical raw materials, such as precious metals, to substances with properties that pose a risk to health and/or to the environment, such as heavy metals or persistent organic pollutants.

In Austria in 2015, 186,644 tonnes of electrical and electronic equipment were placed on the market, such as large equipment, refrigerators and freezers, visual display unit (VDUs) including cathode-ray tube equipment, small electrical equipment and lamps.

Waste electrical and electronic equipment is collected in Austria through collection centres for recoverables or sometimes through municipal bulky waste collection, through stationary and mobile municipal problematic substance collection centres and by specialist retailers and disposal companies. As regards WEEE from private households, a free-of-charge take-back option exists.

In 2015, approximately 80,246 tonnes of WEEE in total was collected by registered collection points.

A certain portion of the (potential) volume of waste electrical equipment is not collected via registered collection points and due to the following reasons:

- Waste electrical equipment is supplied to the Austrian waste management industry via other collection channels as registered collection points. Waste electrical equipment with a high proportion of scrap iron (especially large appliances such as washing machines) is collected together with scrap iron at bulky waste collection points, for example. Sorting analyses and studies show that the average proportion of waste electrical equipment in mixed municipal waste is only around 1%.
- Equipment is frequently not handed over for collection immediately at the end of use, but is instead stored temporarily for extended periods.
- Working equipment (e.g. VDUs) are exported abroad and reused there.
- Waste electrical equipment is shipped illegally to neighbouring countries through organised collections directly from households. Some waste electrical equipment is extremely coveted due to its composition (high metal content) as it can still be resold for a profit.

The aim of treating WEEE is the reclamation of recyclable recoverables and the separation of components containing pollutants. To this end, WEEE undergoes specific processing in separate plants. The complex design of the
equipment, which is constructed using a variety of joining techniques, is often very laborious to disassemble into its individual components. Manual activities are therefore largely limited to the removal of components and assemblies for reuse or to remove any harmful substances. Materials are largely separated by means of automated crushing and sorting techniques.

In Austria, there are currently around 40 plants available for the initial treatment of waste electrical and electronic equipment. Large electrical equipment is treated in shredders. Harmful substances and/or component parts featuring a high pollutant content are separated out beforehand prior to crushing pursuant to the Waste Treatment Obligations Ordinance, Federal Law Gazette II No 363/2006, as amended. The separation into ferrous and non-ferrous metal and other residues meets current state-of-the-art requirements. For small electrical appliances and VDUs, there are treatment methods available based on prior manual disassembly and mechanical processing which ensure extensive recovery of the materials contained therein, such as metal, glass and plastics. Harmful substances (e.g. CFCs, VOCs and mercury switches) are also removed from refrigerators, freezers and air-conditioning appliances in special treatment plants prior to recovery of the metal, plastic and glass. Lamps are separated mechanically in encapsulated establishments with exhaust air collection and purification and separated out into different types of material.

The disposal of household waste electrical appliances is free of charge. They are taken to the Vienna waste disposal sites and the Rinterzelt. Small electrical appliances (edge length less than 50 centimeters) can also be disposed of at the problem material collection points. Old electrical appliances can also be handed in free of charge at larger stores with a sales area of more than 150 square meters when purchasing a new appliance.

In Vienna, more than 8,000 tonnes of waste electrical equipment are handed in to the Waste Management, Street Cleaning and Vehicle Fleet Department (MA 48) every year. This amount includes about 3,100 tonnes of iron, which would be enough to produce 310,000 bicycles. It also contains about 200 tonnes of aluminum, which would be enough to produce 20,000 aluminum rims for 5,000 cars. There are also about 300 tonnes of copper, which would be enough to produce about 22,000 kilometers of cable.

### 2.2.5 Waste batteries and accumulators

Waste batteries and accumulators include those batteries and accumulators which are regarded as waste within the meaning of Article 2 of the Waste Management Act 2002, as amended. Waste batteries and accumulators are found in private households, in the commercial sector, in administrative bodies and other service areas, as well as in industry and in the automotive sector. Depending on the area of application, a distinction is made between portable batteries, automotive batteries and industrial batteries.

Batteries and accumulators, or waste batteries and accumulators, have one or more voltaic cells which consist of electrodes and an electrolyte as well as a metal and/or plastic housing. Depending on the battery type, lead, iron, manganese, nickel, zinc, cadmium or also graphite account for a high percentage. Lithium or mercury are found in lower percentages. Plastic components may account for up to 10%. Potassium hydroxide, ammonium chloride or sulphuric acid, for example, and, in the case of lithium batteries, organic or inorganic electrolytes (e.g. propylene carbonate, thionyl chloride) are used as electrolytes.

The Waste Management, Street Cleaning and Vehicle Fleet Department in Vienna (MA 48) offers a practical pre-collection aid for the home, the battery collection box. The small, orange reusable box provides sufficient space for batteries, rechargeable batteries and button cells. It is available free of charge at Vienna's waste disposal sites and the numerous problem material collection points (Mistplatz). There, the collection box filled with old batteries will also be emptied by specialist staff and returned to you for further use. Batteries can also be handed in at retail outlets.
MA 48 collects two million batteries a year. Added to this are those quantities that are handed in directly to retailers. The substances, some of which are harmful, are disposed of or, if possible, recycled. In addition to harmful substances, batteries contain valuable materials such as zinc, manganese and nickel.

In 2015, 2,299 tonnes of waste portable batteries and 14,044 tonnes of used automotive batteries were collected. In the case of industrial batteries, no obligation to report the quantities collected exists as per the Batteries Ordinance, Federal Law Gazette II No 159/2008, as amended.

In Austria, waste portable batteries are only sorted in one plant. In one plant, waste batteries and accumulators are disassembled beforehand. The sorted portable batteries are shipped from Austria for further treatment. In one further plant, lead storage cells are opened up mechanically, plastic components and acid are separated and the lead-containing components moved directly to the associated secondary lead works for reclamation of the lead.

In Austria in 2015, the average recycling efficiencies, which were calculated in accordance with Regulation (EU) No 493/2012 as the mass of recovered output fractions to the mass of the attributable inputs into the recycling plants, as regards portable batteries and accumulators exceeded 80% each time in all three categories of portable batteries (lead-acid batteries, nickel-cadmium batteries, other batteries).
2.2.6 End-of-life vehicles

Within the meaning of the End-of-life Vehicle Ordinance (Federal Law Gazette II No 407/2002), end-of-life vehicles are used vehicles (passenger cars and vehicles used to carry goods with a permitted total weight not exceeding 3.5 tonnes, and three-wheel motor vehicles, with the exception of motor tricycles) which the owner wishes to dispose of, or has already disposed of, or whose disposal as waste is necessary because they pose a danger to the environment.

Vehicles that are no longer roadworthy or safe to operate, or where the costs of repair exceed the present value, shall generally be classified as end-of-life vehicles. (Untreated) end-of-life vehicles that have accrued constitute hazardous waste since these vehicles generally contain hazardous substances such as fuels (petrol, diesel), engine oils, oil filters, brake fluids and coolants, batteries, capacitors containing PCBs and similar.

End-of-life vehicles have a very heterogeneous, complex composition, comprising roughly 10,000 individual parts and around 40 different materials (approx. 50-60 % steel, approx. 10-12 % cast iron, 3-8 % non-ferrous metals (aluminum, copper), 10-20 % plastics, rubber and textiles, 2-3 % glass, 2-5 % fluids (engine oils, brake fluids, coolants, residual fuels, screen-wash, etc.) and 5-10 % other materials). Despite the great diversity of materials, various components may continue to be used as replacement parts or a significant portion of the materials supplied for recycling.

In 2015, according to Statistics Austria, around 4.75 million passenger cars were registered in Austria. Every year in Austria, approximately 250,000 passenger cars are taken off the road. Of these, only a portion are supplied for recovery in Austria while the majority of the vehicles taken off the road are shipped abroad as used vehicles.

In Austria, there are around 700 enterprises (motor vehicle dealers, workshops, waste disposal companies, recyclers, secondary raw materials dealers, shredder operators) that take on end-of-life vehicles free of charge. The collection points for end-of-life vehicles are published on the website of the Federal Ministry of Agriculture and Forestry, Environment and Water Management.
End-of-life vehicles are treated and recovered in approved enterprises in accordance with the state of the art. Minimum technical requirements concerning the storage and treatment of end-of-life vehicles can be found in Appendix 1 to the End-of-life Vehicle Ordinance.

Following acceptance of the end-of-life vehicles, these are drained (ecologically damaging fuels and liquids are removed). In workshops and approved recovery operations, saleable used parts (e.g. engines, gears, alternators, headlights, seats, control elements, axle components, body panels and similar) are removed and stored temporarily until sold. The pre-treated end-of-life vehicles are separated out in one of the six shredder plants across Austria into directly recoverable metal flows and shredder waste. The shredder waste then undergoes further treatment. The Directive on end-of-life vehicles stipulates the following recovery rates for EU Member States beginning 2015: 85 % for reuse and recycling and 95 % for recovery in total. In Austria in 2015, the rate for reuse and recycling was 86,9 %. The overall rate for reuse and recovery was 96,9 %. The total weight of the 47,926 end-of-life vehicles shredded in 2015 was in the region of 43,934 tonnes.

2.2.7 End-of-life tyres

End-of-life tyres are tyres that are generally no longer suitable or authorized for their original purpose. Reasons for disposal may include, for example, insufficient tread depth, embrittlement of the rubber compound or other damage to the body (carcass).

Tyres are made up of a mixture of substances comprising:

- natural rubber (approx. 24 %),
- synthetic rubber (approx. 21 %),
- soot and active fillers (approx. 26 %),
- steel wires (approx. 16 %),
- textile fabrics (approx. 3 %),
- oils and other ingredients (approx. 10 %).

The volume of end-of-life tyres in 2015 was in the region of 55,950 tonnes. Around 23,300 tonnes of end-of-life tyres were shipped to Austria in 2015, while approximately 20,500 tonnes were shipped from Austria.

Approx. 3,000 tonnes of end-of-life tyres underwent retreading. Following mechanical processing operations, approximately 25,400 tonnes underwent material recovery and 33,300 tonnes underwent thermal recovery in Austrian plants.

2.2.8 Construction and demolition waste

Materials that accumulate during construction and demolition activities in building construction, civil engineering, road and bridge building constitute construction and demolition waste. 90 % of this arises during the demolition, conversion and restoration of buildings. Only around 10 % of the waste accumulates during the construction of new buildings. In building construction, this waste primarily includes concrete, brick and other demolished masonry. This accounts for around 70 % to 90 % of the total quantity. The remainder predominantly comes from wood, metal and various site waste as well as hazardous waste in part (asbestos and hazardous waste will be elaborated in later sub-chapters separately).
In 2015, approximately 10 million tonnes of construction and demolition waste accrued. This averages out at around 1,160 kg per person. Depending on the economic situation facing building construction and civil engineering, in Austria, the volume varies year by year and cannot, therefore, be predicted precisely.

The waste is generally collected directly on site by waste disposal and demolition companies using several skips. Small quantities of building debris, for instance, may also be delivered to municipal collection points for recoverables. To ensure separate collection and high-quality recovery, the Recycled Construction Materials Ordinance, which entered into force in January 2016, Federal Law Gazette II No 181/2015, as amended, contains provisions in the following areas:

Obligations in the case of construction and demolition activities:
- Separation and treatment of waste which accumulates during construction and demolition activities,
- Manufacture and end-of-waste status of recycled building materials.

In 2015, in the region of 8.3 million tonnes of construction and demolition waste - hence the majority – were supplied to a recovery facility. In the course of structural measures, roughly 670,000 tonnes of construction and demolition waste were additionally used for technical fills. Approximately 640,000 tonnes of construction and demolition waste were deposited in landfills.
2.2.9 **Asbestos waste**

Asbestos occurs in nature as a fibre-forming mineral. Up to the end of the 1980’s, asbestos was used in many products on account of its resistance to heat and fire, its insulating properties and its chemical stability. Asbestos was used in the building industry, for example, as a sealing material, as air-placed asbestos, or in asbestos cement sheets, but was also used, inter alia, in electric storage heaters or in floor and wall coverings.

Where products containing asbestos are not used or treated properly, respirable fibres can be released which, when inhaled, may cause cancer. Therefore, the placement on the market of products containing asbestos is generally prohibited. Since around 2004, the asbestos products placed on the market prior to 1990 have increasingly accrued as waste.

Asbestos waste is hazardous waste that can be sent to landfill following appropriate pre-treatment. Under certain conditions, asbestos waste may be deposited at landfills for non-hazardous waste in specific sections.

From 2004 to 2015, the volume of asbestos cement (SN 31412) - the most common asbestos-containing waste - increased roughly fivefold in Austria (64,800 tonnes). The total amount of asbestos cement deposited in Austria for the year 2015 was 66,500 tonnes.

As for asbestos waste, asbestos dust the amounts in Austria in 2015 in terms of volume were 340 tonnes and 200 tonnes were deposited. The trend for this fraction was mostly similar in the past years with the exception of 2010 where the amounts rose up to 11,000 tonnes in volume and 12,200 tonnes of deposited due to a one-off renovation project.

In 2013, 2014 and 2015, the landfilling of asbestos waste exceeded the respective volume. The difference can be attributed to asbestos waste which was separated from other types of waste during sorting/processing.

2.2.10 **Waste oils and mineral oil-based waste (including specifically contaminated soils)**

This sub-chapter considers waste under the code number group (SNG) 54 "Waste from mineral oil and coal refining products" in ÖNORM S 2100 "List of Waste" (2005) and the waste under code number (SN) 31423 "Oil- contaminated soil".

Essentially, the types of waste under SNG 54 "Waste from mineral oil and coal refining products" involve liquid and solid hydrocarbons, mixtures/emulsions of hydrocarbons with aqueous liquids or solids which are contaminated with hydrocarbons. The majority of the types of waste under SNG 54 are basically classified as dangerous since they have properties that pose a risk to the environment, which may be detrimental to health or which are highly flammable. Some types of waste can be declassified if they demonstrably exhibit no hazardous properties. Some types of waste are solidified in the course of treatment.

In 2015, a volume of waste generated under SNG 54, including SN 31423 "Oil-contaminated soils", of around 2.21 million tonnes was recorded. With around 1.86 million tonnes, bitumen and asphalt (SN 54912). Furthermore, in 2015, approximately 115,000 tonnes of oil-contaminated soil or earth accumulated. In addition, even larger quantities of waste oils, oil separator contents and various types of emulsions/sludges contributed significantly to the volume of SNG 54.

With a quantity of 26 tonnes, the volume of waste containing PCBs/PCTs [polychlorinated biphenyls and polychlorinated terphenyls] in 2015 was similar to the volumes generated in previous years.

In 2015, approximately 22,900 tonnes of waste oils (SN 54102) were incinerated. Roughly 15,900 tonnes were shipped abroad for treatment. Hence, the entire primary quantity of around 34,000 tonnes and approximately 4,800 tonnes of secondary waste, which arises, for example, during the separation of waste emulsions, were treated.
large part of the bitumen/asphalt (SN 54912, approx. 1,835,000 tonnes) was recovered. Around 5 % of the waste under SNG 54 and oil-contaminated soils were deposited in landfills (in some cases following treatment). This primarily concerned bitumen and asphalt and around 65 % of the oil-contaminated soils and earths.

2.2.11 Medical waste

Waste from medical institutions as per ÖNORM S 2104 is subdivided into the following:

**Group 1 - Waste that is not hazardous inside or outside medical institutions**

This group includes non-hazardous waste such as municipal waste and similar waste, bulky waste, biogenic waste, street sweepings and recoverables (e.g. plastic, glass, paper, metal and cardboard packaging; X-ray films).

**Group 2 - Waste that may only pose a risk of infection or injury within medical institutions but does not need to be disposed of as hazardous waste**

Waste within this group is subdivided into:
- Waste with no risk of injury (SN 97104), such as wound dressings, plaster casts, nappies and disposable articles;
- Waste with a risk of injury (SN 97105), such as hypodermic needles, lancets and scalpels;
- Wet waste (SN 97104) includes, for example, disposables filled with sucked-off secretions which may leak during transport;
- Anatomical substances (SN 97103).

**Group 3 - Waste that is hazardous inside and outside medical institutions and therefore requires special treatment in both areas (SN 97101 gn)**

This group includes, for example, non-disinfected microbiological cultures and waste containing hazardous pathogens.

**Group 4 - Other waste which accrues in medical institutions**

Waste in this group includes waste derived from medicinal products, disinfectants, mercury and mercury-containing residues, photochemicals, laboratory waste and chemical residues, laboratory animals and bodies and body parts of animals, animal faeces, kitchen and canteen waste, and electrical and electronic devices.

The quantity of waste generated by medical institutions (excluding the municipal portion) amounted to approximately 40,641 tonnes in 2015, while the proportion of hazardous waste was around 2.9 %.

<table>
<thead>
<tr>
<th>Code numbers</th>
<th>Waste designation</th>
<th>Volume [t]</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>97101</td>
<td>Waste which may prove hazardous inside and outside medical institutions, e.g. waste containing hazardous pathogens as per ÖNORM S 2104 - hazardous</td>
<td>1,154</td>
<td>2.84%</td>
</tr>
<tr>
<td>97102</td>
<td>Disinfected waste, with the exception of hazardous waste</td>
<td>2,515</td>
<td>6.19%</td>
</tr>
<tr>
<td>97103</td>
<td>Anatomical substances</td>
<td>33</td>
<td>0.08%</td>
</tr>
<tr>
<td>97104</td>
<td>Waste that may only pose a risk of infection or injury within medical institutions, as per ÖNORM S 2104</td>
<td>36,095</td>
<td>88.81%</td>
</tr>
</tbody>
</table>
The treatment of waste from medical institutions is laid down by the Waste Treatment Obligations Ordinance, Federal Law Gazette II No 459/2004, as amended, or by ÖNORM S 2104 "Waste from medical institutions".

**Group 1:**
- Recoverables, including packaging material and separately collected fractions (paper and paperboard, glass, metal and plastics), as well as sorted parts of the bulky waste, are recycled.
- Biogenic waste is supplied for composting or to biogas plants.
- The non-recyclable portions of the plastic packaging and bulky waste are thermally recovered while utilising their energy content.
- Mixed municipal waste is either subjected to mechanical-biological pre-treatment followed by thermal recovery of the high-calorific fraction and depositing of the landfill fraction, or else it is incinerated directly.

**Group 2:**
- Waste with a risk of injury must be collected in containers that are sufficiently pierce-resistant and unbreakable, leak-proof, tightly sealed and opaque, and must be supplied for thermal treatment. The use of press containers should be refrained from to the extent possible. Containers which contain only non-infectious medical waste may be collected together with mixed municipal waste in accordance with provincial-law regulations, provided they are supplied for thermal treatment in a safe manner. Containers shall be permanently sealed prior to being handed over to an authorised waste collector or treatment plant, or prior to incorporating them in the mixed municipal waste collection.
- Waste with no risk of injury and wet waste must be collected in sufficiently tight drums, transport containers or suitable vehicles, transported and then treated thermally.
- Anatomical substances must undergo thermal treatment or be buried.

**Group 3:**
Non-disinfected microbiological cultures and waste containing hazardous pathogens must be disinfected prior to preparing the waste and supplied for thermal treatment.

**Group 4:**
- Waste derived from medicinal products is supplied for thermal treatment.
- Disinfectants, laboratory waste, chemical residues and photochemicals are incinerated or may undergo physico-chemical treatment. Where possible, fixing baths are supplied for recycling.
- Waste electrical and electronic equipment and, in some cases, mercury and mercury-containing residues are recycled where possible.
- The mercury and mercury-containing residues that cannot be recycled shall undergo physico-chemical treatment.
- Laboratory animals and bodies and body parts of animals are supplied for rendering or incinerated.
- Catering waste and sometimes animal faeces are recovered biologically.
Approx. 93% of the medical waste specified in Table 19 is thermally treated, and approx. 3% go directly to mechanical-biological treatment plants, whereas 4% are exported. 75% of the hazardous waste specified in Table 19 is thermally treated, and 25% is exported.

2.2.12 Hazardous waste

Hazardous waste is specified in Article 4 of the List of Waste Ordinance, Federal Law Gazette II No 570/2003. Hazardous waste occurs in all sectors of the economy but also as hazardous household waste in private households. The amounts of hazardous waste which are most relevant in terms of quantities originate from soil remediation and the metal and chemical industries.

In 2015, some 1,265,600 tonnes of hazardous waste were generated in Austria. This corresponds to roughly 2% of the total volume of waste in Austria.

Hazardous waste must either be treated in plants approved for this purpose in Austria or abroad or disposed of in underground landfill sites.

Pursuant to Article 16(1) of the Waste Management Act 2002, as amended, the depositing of hazardous waste on overground landfill sites is essentially prohibited. Pre-treated asbestos waste and waste containing tar may, however, also be deposited on landfill sites designed for non-hazardous waste in structurally separate compartments. In 2015, around 66,700 tonnes of asbestos waste were deposited in this way. Underground landfill sites are not currently operated in Austria. Around 16,200 tonnes of hazardous waste were taken abroad in order to dispose of it in underground landfill sites.

In 2015, around 16% of the hazardous waste in Austria underwent thermal recovery or was treated. Around 27% of the hazardous waste was treated in domestic physico-chemical plants.

Hazardous waste electrical and electronic equipment undergoes specific processing in separate plants before a recovery of materials contained therein, including metal, plastic or glass, can take place.

End-of-life vehicles are first drained. Saleable used parts are removed and reused. The pre-treated end-of-life vehicles are separated out in shredder plants into directly recoverable metal flows and shredder waste.

Lead storage cells are pre-treated mechanically and the components containing lead recycled at an Austrian secondary lead works. The sorted portable batteries are shipped abroad for recovery.

Around 27% of the hazardous waste was able to be recycled in 2015 either in Austria or abroad. 23% of the hazardous waste was pretreated in such a way that the waste no longer had any hazardous properties or was able to be declassified. For example, contaminated soils were largely treated in special treatment plants.

In the chart below, the proportions of the various methods for treating hazardous waste are presented.
2.3 Treatment of the communally collected waste in Vienna

In 2016, 1,189,605 tonnes of waste were collected by MA 48 (MA 48, 2017a).

The following chart shows the breakdown into material recycling, biological treatment, thermal treatment and landfilling (inert materials). Sorting residues generated in the course of a sorting process at MA 48 facilities are assigned to the subsequent treatment type (e.g., sorted waste materials are assigned to recycling, sorting residues similar to residual waste are assigned to thermal treatment).

The currently available treatment capacities for the collected municipal waste are sufficient. With the existing treatment facilities, the disposal security for municipal waste can be guaranteed.
2.3.1  **Material recovery - Rinterzelt - Austria's largest waste treatment plant**

Commercial, industrial and bulky waste can be handed in here. More than 280,000 tonnes of waste are sorted, processed or temporarily stored here every year. Next to the plant there is a Civic Amenity site (Mistplatz).

Opening hours: Monday to Friday from 7 a.m. to 4:30 p.m., Saturday from 7 a.m. to 2 p.m. The Central Problem Material Collection Point and the takeover of electrical and small electrical appliances are closed on Saturdays.

The Central Intermediate Problem Material Storage (Z-Prosa) was opened in 1991 at the Rinterzelt site. The problem materials collected by stationary and mobile problem material collection points are centrally re-sorted here, temporarily stored, processed and sent for proper and environmentally compatible disposal or recycling. The processing of waste electrical equipment is also one of the facility's tasks. As early as 1989, a plant was set up for the extraction of liquefied refrigerant gases in order to remove the environmentally harmful chlorofluorocarbons (CFCs) from the refrigerators and freezers delivered. This was followed in 1996 by the construction of a treatment facility for waste electrical and electronic equipment on what is known as Level 5 of the Rinterzelt; this was relocated to the Z-Prosa building in 2014 and has taken place there ever since.

In June 2001, a treatment and sorting plant for household and bulky waste - known as a splitting plant for short - was set up to recycle residual waste that had previously gone to landfill untreated. This separated high-calorific fractions and separated usable metals. The resulting high-calorific "light fraction" was delivered to Wien Energie's fluidized bed furnace 4 at the Simmeringer Haide plant and thermally recycled. The remaining heavy fraction with low calorific value was landfilled at the Rautenweg landfill site or, in order to achieve an optimal calorific value, partially mixed with the light fraction for incineration. In 2013, this step was outsourced directly to the Pfaffenau waste logistics center in Simmering, where it has been carried out ever since.

In 2007, a plastics sorting plant went into operation in the Rinterzelt. The existing 20-year-old sorting plant was thereby renewed from the ground up and incorporated into the overall plant concept. The plant was fed by separately collected plastic bottles and separated them according to color and material. A sorting purity of over 98% was achieved for four fractions (polyethylene terephthalate -PET in three colors (clear, blue, green) and "high density polyethylene" - HDPE). The main focus was on a high sorting depth or purity of PET beverage bottles in order to recycle them afterward ("Bottle-to-Bottle Recycling Plant in Mühlendorf"). In 2017, the operation of the plant was discontinued and it was dismantled. In 2016, the decision was made to demolish the Rinterzelt and redesign the site.

The Municipal Department 48 - Waste Management, Street Cleaning and Vehicle Fleet a new contemporary operating site, which is scheduled for completion in 2022.

**The following materials are recycled:** separately collected or subsequently sorted old materials, problematic/hazardous waste, and inert materials such as rubble or construction debris.

### Problematic/hazardous waste

The Central Problematic Materials Collection Point (Z-Prosa) serves as a storage and transfer point for problem materials and hazardous waste from commercial deliveries. After being collected at the waste disposal sites and the hazardous waste collection points, hazardous waste is delivered to Z-Prosa. Hazardous waste from commercial sources is delivered directly.

Recyclable materials arrive here as well as materials that require special treatment. The recyclable materials are:

- Cooking oils,
- lead accumulators,
- toner cartridges,

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- CDs and similar,
- XPS plates (no "Kugerl" to see), for example pink, green, blue, rarely white.

Items intended for special treatment are:
- Fluorescent lamps.
- Waste containing mercury.
- Batteries.
- Acids.
- Lyes and other chemicals.

At Z-Prosa, the materials are temporarily stored, re-sorted if necessary, packed into transportable quantities and passed on to authorized recycling and disposal companies. Every year, almost 1,000 tonnes of waste are accepted at Z-Prosa.

**Takeover of waste electrical and electronic equipment**

**Large electrical appliances**

Oil radiators during removal of heat transfer oil. Oil radiators are freed from heat transfer oil in the sintering tent, the metals are separated from electronic components and these components are recycled separately. The pollutants such as condensers and toners are removed from other large electrical appliances containing pollutants, which are mainly delivered by commercial enterprises, for example, large photocopiers before they are sent on to metal recycling companies.

**Small electrical appliances**

Broken cell phones. When recycling small electrical appliances, care must first be taken to manually remove components that contain harmful substances, such as toner cartridges in printers or fluorescent tubes in scanners, which can be easily released if damaged. After this pretreatment, the equipment is further processed by specialist companies and sent for metal and plastic separation. The recovered metals and plastics are returned to the production cycle sorted by type, for example for the manufacture of new housings.

**Recycling and disposal**

Every year, around 6,000 display screen units, 2,000 oil radiators, 2,600 refrigerators, 60,000 small electrical appliances, 3,000 large electrical appliances, 1,500 commercial electrical appliances and 280,000 gas discharge lamps arrive at the Rinterzelt. Some of these are freed of harmful substances or, after interim storage, handed over to authorized recycling and disposal companies.

**Logistics center for separately collected recyclables**

The logistics center is the hub for over 250,000 tonnes of waste annually. Onward transport is partly by truck, but also via the company's own rail connection. Some recyclable materials, such as cardboard packaging, have to be provided in the form of bales for storage and transport.

The bales produced are temporarily stored and transported to the recycling plants by rail or truck. Several storage options are available for interim storage of recyclable materials and residuals until they are transported away. Stored are:

- Metal and cans,
- White and stained glass,
- Wood waste,
- Bulky waste,
- Construction waste,
- Styrofoam,
- Compressed waste or waste transported loose in skips.

Treatment plant for incineration residues is elaborated in the following subchapters (Treatment of incineration residues and Landfilling)

**Tariffs for hazardous waste at Rinterzelt - 22., Percobraße 2**

*When delivering hazardous waste, company-completed hazardous waste consignment bills must be brought along.

**Table 27 Tariffs for hazardous waste (Source https://www.wien.gv.at/)**

<table>
<thead>
<tr>
<th>Waste type</th>
<th>Examples and remarks</th>
<th>Tariff for takeover (including 10 percent VAT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asbestos cement SN 31412</td>
<td>Fiber cement, eternite waste</td>
<td>264.50 Euro per ton</td>
</tr>
<tr>
<td>Refrigerators for private households SN 35205, SN 35206</td>
<td>For example, refrigerators, freezers, air conditioners</td>
<td>free of charge</td>
</tr>
<tr>
<td>Large and commercial refrigeration equipment</td>
<td>For example: refrigerated display cases, refrigerated beverage dispensers. The equipment must be unloaded by the deliverer in such a way that no damage to the refrigerant circuit can occur. No substances foreign to the equipment (foodstuffs etc)</td>
<td>440 Euro per ton</td>
</tr>
<tr>
<td>Screen equipment SN 35212</td>
<td>TV sets, computer monitors etc</td>
<td>free of charge</td>
</tr>
<tr>
<td>Fluorescent tubes SN 35339</td>
<td>Gas discharge lamps from the household sector. The fluorescent tubes are to be unpacked by the deliverer himself/herself.</td>
<td>free of charge</td>
</tr>
<tr>
<td>Illuminated signs SN 35339</td>
<td>Illuminated letters and special forms of gas discharge lamps from commercial use</td>
<td>1.700 Euro per ton</td>
</tr>
<tr>
<td>Lead-acid accumulators SN 35322</td>
<td>All types of lead/acid accumulators e.g. starter batteries and gel accumulators</td>
<td>free of charge</td>
</tr>
<tr>
<td>Device batteries SN 35338</td>
<td>Household and commercial batteries (according to the Battery Ordinance)</td>
<td>free of charge</td>
</tr>
<tr>
<td>Lithium batteries SN 35337</td>
<td>Batteries from household and commercial use (according to the Battery Ordinance)</td>
<td>free of charge</td>
</tr>
<tr>
<td>Industrial batteries nickel-cadmium SN 35323</td>
<td>Nickel accumulators filled with lye (for example nickel-cadmium, nickel-metal hydride)</td>
<td>4.180 Euro per ton</td>
</tr>
<tr>
<td>Industrial batteries lithium SN 35337</td>
<td>e.g. battery packs from defibrillators, lithium batteries prepared for industrial installation (soldering lugs present)</td>
<td>9.240 Euro per ton</td>
</tr>
<tr>
<td>Old medicines SN 53510</td>
<td></td>
<td>4,840 Euro per ton</td>
</tr>
<tr>
<td>Oil radiators SN 35201</td>
<td></td>
<td>free of charge</td>
</tr>
<tr>
<td>Printed circuit boards SN 35207</td>
<td></td>
<td>free of charge</td>
</tr>
<tr>
<td>Electrical appliances containing pollutants SN 35220, SN 35230</td>
<td>Pollutant-containing equipment from commercial use (stand-alone photocopiers, large medical equipment, printing machines, large cleaning machines, etc.)</td>
<td>819.14 Euro per ton</td>
</tr>
</tbody>
</table>
### 2.3.2 Biological treatment

#### Composting

In 2016, around 103,200 tonnes of biological material (organic waste garbage cans, tree/shrub cuttings, green cuttings) were transferred to the Lobau composting plant for composting. From this, around 41,000 tonnes of compost of the highest quality level A+ were obtained.

The Lobau composting plant has been in operation since 1991. It consists of an approximately 6.2 hectare paved and absolutely watertight rotting area. All leachate and rainwater is collected in a channel and pipe system. The water is collected in underground collection tanks made of water-impermeable reinforced concrete and then discharged via the sewer system.

At the Lobau composting plant, the entire chain of all steps in biowaste treatment takes place, starting with delivery, processing, composting, and finally fine screening of the finished compost.

27 waste collection vehicles start their organic waste collection routes at the composting plant. Organic waste from the organic waste garbage bins in Vienna’s green belt, from garden areas, from manure sites and from Vienna’s municipal gardens is brought here. Only plant materials from the garden, household and kitchen are collected. This includes, for example, tree and shrub cuttings, leaves, lawn cuttings, fallen fruit, wilted flowers, vegetable waste or plant-based food preparation residues.

#### Biogas production

With the opening of Biogas Wien in the fall of 2007, another high-tech plant went into operation next to MVA Pfaffenau in Simmering. The wide range of services offered by the Waste Management, Street Cleaning and Vehicle Fleet Department (MA 48) for the ecologically sound disposal of Vienna’s waste was thus further expanded in the sense of a closed-loop biocirculation economy. The plant recycles a total of 22,000 tonnes of kitchen waste per year.

Furthermore, the collected material (food waste, inner-city organic waste garbage bins, other collection) were subjected to anaerobic treatment at the Vienna biogas plant. This resulted in around 3 million m³ of biogas in 2016. After a cleaning step, the biogas is fed into the gas network.

<table>
<thead>
<tr>
<th>Waste type</th>
<th>Examples and remarks</th>
<th>Tariff for takeover (including 10 percent VAT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toner cartridge, ribbons SN 57127</td>
<td>Minimum price per delivery: 1 Euro</td>
<td>500 Euro per ton (minimum price per delivery: one Euro)</td>
</tr>
<tr>
<td>Gas cylinders SN 59804</td>
<td></td>
<td>88 Euro per piece</td>
</tr>
<tr>
<td>Electrical, commercial components SN 35201</td>
<td>for example large capacitors from commercial electrical equipment</td>
<td>555.65 Euro per ton</td>
</tr>
<tr>
<td>XPS insulation material SN 57108 specification code 77</td>
<td>for example Styrodur insulation boards, polystyrene, polystyrene foam (dangerously contaminated - chlorofluorocarbons foamed)</td>
<td>3.850 Euro per ton</td>
</tr>
<tr>
<td>Artificial mineral fibers (KMF) hazardous SN 31437.</td>
<td>Rock wool, glass wool et cetera as well as composite materials containing them. Delivery exclusively in tightly sealed transparent bags or big bags (no loose delivery)</td>
<td>2.200 Euro per ton</td>
</tr>
</tbody>
</table>
2.3.3 Thermal treatment

Around 65% of primary waste is thermally treated. This quantity is made up of so-called combustible mixed waste (residual waste from system collection, residual waste, bulky waste, street sweepings, sewage sludge, hospital waste, sorting residues, etc.).

Three thermal treatment plants are located in the city of Vienna for mixed municipal waste:

- Spittelau waste incineration plant - capacity 250,000 t/year
- Flotzersteig waste incineration plant - capacity 200,000 t/year
- Pfaffenau waste incineration plant - capacity 250,000 t/year

The Pfaffenau waste incineration plant (MVA) in Simmering was opened in September 2008 and is the newest of the three listed facilities. Since its commissioning, the Pfaffenau waste incineration plant has generated around 65 gigawatt hours of electricity and 410 gigawatt hours of district heating per year from 250,000 tonnes of Viennese waste. The amount of heat generated is equivalent to the annual consumption of around 50,000 Viennese households. The electricity produced can supply around 25,000 Viennese households.

The Landfill Ordinance has been in force in Vienna since January 1, 2009. This prohibits the disposal of untreated residual waste. The additional incineration capacity required is provided by the Pfaffenau waste incineration plant.

The plant not only complies with the limits of the strictest environmental legislation in the EU. The pollutants emitted are also two to ten times below the limits. A four-stage flue gas cleaning system ensures the lowest possible emission levels.

- Dust emissions are 90 percent below the permitted limit.
- Sulfur dioxide emissions are 95 percent below the limit.
- Thanks to a combined heat and power system, the efficiency of the plant is a high 76 percent.
- In addition, the energy required to operate the plant is generated in-house.

*Figure 34 MVA Pfaffenau and Biogas in Vienna*
2.3.4 Landfilling and Treatment of incineration residues

For the further treatment of incineration residues (ash, slag) from the waste incineration plants, a dedicated plant with a processing capacity of around 230,000 tonnes per year has been available on the site of the former Rinterzelt since 1990. Most recently, this plant was optimized in 2019 to increase the efficiency of separating ferrous metals and non-ferrous metals from the slag.

The incineration residues (slags) are divided into different grain sizes by screening and freed of metals. In the process, up to 18,000 tonnes of ferrous metals and up to 6,500 tonnes of non-ferrous metals are produced annually, which are recycled in the metal industry. By adding cement, sand and water, the processed incineration residues are mixed in a mixing plant to form an earth-moist ash-slag concrete. This mixture is placed at the Rautenweg landfill site using wheel loaders and road rollers.

This stabilized ash-slag concrete is used at the Rautenweg landfill site, among other things as a construction material for building the steep landfill slopes. Every year, up to 200,000 tonnes are thus installed at the landfill.

The neutralization sludges, the filter cakes (solids retained on the filter), and the fly ashes from the flue gas cleaning of the rotary kilns of the hazardous waste incineration plant are deposited underground outside Austria in former salt mining tunnels.

The following materials are delivered to the treatment plant for incineration residues:

- Slags from the Flötzersteig, Spittelau, Pfaffenu waste incineration plants.
- Slag from the two rotary kilns (Simmeringer Haide plant),
- Bed ash from the 4 fluidized bed furnaces (Simmeringer Haide plant),
- Fly ash from the waste incineration plants Flötzersteig, Spittelau, Pfaffenu,
- Fly ash from the 4 fluidized bed furnaces (Simmeringer Haide plant).

Landfilling of inert materials

A part of the landfilled inert waste consists of construction waste. However, a large part of the construction waste handed over to recyclers cannot be returned to the cycle, but must be landfilled.
The residues from the thermal treatment plants are landfilled either above or below ground, depending on their pollutant potential. For every 1,000 kilograms of waste incinerated, approx:

- 270 kilograms of slag,
- 27 kilograms of metal scrap from the slag,
- 28 kilograms of boiler and filter ash.
- 1 kilogram of neutralization sludge.

2.4 Examples of WM and HWM good practices

48-er Tandler

City of Vienna – Municipal Department 48 – Waste Management, Street Cleaning and Vehicle Fleet Vienna’s is active in reuse since 1989, when the city’s first reuse shop – the so called 48er-Basar was established. For the purpose of reuse and waste prevention the still usable goods were collected at the CASs (Mistplatz) of the city and sold in the 48er-Basar. The "48-Tandler-Box" is available for this on every CAS – Mistplatz. Following that practice the 48er-Tandler was opened in 2015 at a central location with a modern interior design coming from upcycled furniture aiming to attract all population groups.

The MA 48 campaigned diligently to inform Vienna’s citizens on the possibility of bringing their reusable goods to one of the recycling centres instead of disposing of them. Also, unclaimed goods from the city’s lost and found service as well as items from the city administration which are no longer being used are also turned over to the reuse shop. The 48-er Tandler provides both social and economic benefits, as all revenues are donated to charitable purposes and citizens have access to good-quality secondhand goods at affordable price.
Social projects are supported by handing in waste items in good condition on the CASs or shopping in the 48-shop. If necessary, various social institutions are also provided with donations in kind.

The 48er-Tandler is also an essential contribution of the City of Vienna to the qualitative and quantitative waste prevention. Reuse saves resources and significantly extends the life of these items. Things that are not needed are not necessarily proclaimed as waste, as they can still be of use to others.

The 48er Tandler is a second-hand market with added value aiming to Reuse and protect the environment

Several solutions used at the 48er Tandler are as follows:

- Old pallets have been transformed into room dividers, cloakrooms or mobile tables, books into stools, and bathtubs converted into sofas.
- Various upcycling companies can display their goods at the 48er Tandler and advertise their products.
- Private persons, can use the bulletin board to give away or sell items.
- School classes, clubs or senior groups use the premises outside of the opening times for information events to avoid waste.
- A wide range of information on waste prevention can be acquired in the shop, for example on reusable, repair services, avoidance of food waste, upcycling etc.:

![Figure 37 48-er Tandler shop (source - https://www.wien.gv.at/)](image)

The following product groups can be purchased (depending on availability):

- Clothing: shoes, various items of clothing for women, men and children
- Accessories: handbags, scarves, headgear
- Books: non-fiction, encyclopedias, novels, children's books and comics
- Electrical and electronic items: Electrical and electronic devices are only brought for sale after a safety check by the Dismantling and Recycling Center (DRZ). There is a one year warranty.
- Pictures: watercolors, prints, photographs with and without frames
- Tableware and housewares: complete service, individual parts, pots, decorative objects, planters
- Lamps: floor lamps, table lamps, chandeliers
- Poster furniture: sofa sets, armchairs
- Toys: soft toys, puzzles, games
- Sporting goods: exercise bikes, bicycles, roller skates, helmets
- Furniture: Small pieces of furniture from bedside tables to bar stools
- Music: records, CDs, DVDs
- Instruments: guitars, drums
- Electrical and electronic items
- 48 fan articles and games, for example the 48 collector's bag
- Vouchers from the 48er trader

The 48er Tandler is located at 5th, Siebenbrunnenfeldgasse 3, with opening times: Wednesday to Saturday (excluding public holidays) from 10 a.m. to 6 p.m.

![Figure 38 48er Tandler Box at the CAS (source -](https://48ertandler.wien.gv.at)

The 48er Tandler track record - Selling the attractive junk goods is estimated to save around 300 tons of waste each year. According to the European Circular Economy Stakeholder Platform, the following main results are achieved by the Tandler 48-er:

- In 2017, an average of 720 people visited the 48er-Tandler each day and 158,000 pieces were sold.
- Numerous visitors from other municipalities/cities from Austria and abroad have visited the 48er-Tandler.
- The homepage is updated weekly.
- According to current surveys, 81% of the participants are aware of the possibility to hand in goods for reuse at the recycling centres.
- Media response and customer feedback indicate the success of the 48er-Tandler. For example the Austrian television broadcasts the show erlesen from there.
- In 2017 the 48-er Tandler began organizing events to catch the attention of younger groups, e.g. through dance festivals or after work shopping. Events that aim to reach wider audiences are organized in the shop at least once a week.
The Dismantling and Recycling Center – Demontage und Recycling Zentrum DRZ

The Dismantling and Recycling Center is a recycling, reuse and upcycling company for old electrical devices. In Vienna, more than 8,000 tons of used electrical equipment are collected every year. Approx. 1,500 tons of this ends up in the Dismantling and Recycling Center every year. In the dismantling department of the Dismantling and Recycling Center, old electrical and electronic equipment that can no longer be reused is sorted and manually dismantled. In this way, different amounts of collected materials or fractions (e.g. ferrous metals, aluminum, copper, plastic ...) are obtained, which are then sent for recycling. Due to the fact that the devices are pretreated manually, the fractions can be separated as accurately as possible which results in higher recycling rates in the subsequent treatment step than with mechanical treatment.

Preparations for reutilization is performed in line with the EU Waste Directive 2008. The Dismantling and Recycling Center is certified EMAS-enterprise und specialized waste management company we constantly monitor and improve our daily processes and procedures to keep them at the state of the art.

The Dismantling and Recycling Center’s main partners are the City of Vienna and the Repair Network Vienna (Reparatur-Netzwerk Wien). The total throughput of more than 1,200 tons per year includes parts of the WEEE (small and large household appliances) collected at Vienna’s amenity sites, which is recycled here and fed into material recovery processes. Around 50% of old electrical devices accepted at the Dismantling and Recycling Center is put back into circulation as tested re-use devices. The Dismantling and Recycling Center specialists carry out all the steps that allow old devices to be safely reused. Part of this process are comprehensive safety, visual and functional tests, repairs and the subsequent cleaning of the devices. For environmental reasons, at Dismantling and Recycling Center refrigerators and tube screens are not dismantled, but only small and large electrical appliances (vacuum cleaners, kitchen appliances, computers, printers, washing machines, dishwashers ...).

The Dismantling and Recycling Center services include:
- Provision of collective containers
- individually coordinated collection logistics
- certified data erasure and/or destruction of data carriers (on request)
- Creation of disposal and recycling certificates
- Preparation for reuse of reuse-capable devices
There is also a Re-use shop in the Dismantling and Recycling Center where mainly used hi-fi equipment, computers and, to a lesser extent, household appliances in large numbers are being sold. Valuable vintage devices are always included. All devices are being sold with a 12-month warranty. Opening hours are Monday - Thursday: 9 a.m. - 4.30 p.m. and Friday: 9 a.m. - 2 p.m. There is also an online shop available.

In the store you can find: refurbished and tested IT and audio appliances, components and spare parts, excellent customer service and advisory. All reusable appliances undergo a standardized safety check, get thoroughly cleaned and comprehensively tested before being put up for sale.

In the trash design manufactory of the Dismantling and Recycling Center, great upcycling products are made from electrical and electronic scrap. Jewelry, furniture and accessories are handcrafted in Dismantling and Recycling Center workshop and sold at various markets and events, online and in the in-house shop in the Dismantling and Recycling Center.
3 Methods and tools applied to inform and involve citizens in WM and HWM

This chapter provides a brief overview of various tools and methods used, mostly via internet, in the City of Vienna to involve and engage citizens of all ages in waste management and HWM.

3.1 Federal Ministry Republic of Austria Climate Action, Environment, Energy, Mobility, Innovation and Technology website

The website contains, among other, numerous information in all aspects of waste management in Austria. For this purpose, several of the most interesting subjects that are provided at the website will briefly be presented.

- **Multilingual collection tips** – presented as short instruction leaflets for separate collection of waste fractions on several pages with pictograms and following explanations.

- **Info for schools** - Children can be taught about environmental protection and the proper use of our resources at an early age. This page contains information for schools, interesting facts about the topic "waste" and about the most important types of waste in terms of quantity. In order to make these subjects more interesting and accessible to children, fictional characters were created to tell the stories for different age groups (7-11 and from the age of 12).

  **Children from 7 to 11 years**

  Alfons Trennfix, the lively bat from Tyrol, has been giving children valuable tips and information about what is good for the environment for years. Packed into exciting adventure stories, Alfons and his friends show how to separate waste correctly, how to avoid it, why it is important to keep the landscape clean, and how to create a compost heap. Alfons has a hard time with the consumer ducks and tells them how important it is to buy high-quality and environmentally friendly school materials. But also by repairing and reusing (ReUse) products and objects, a lot can be done for the environment.

  published so far are:

  - Alfons Trennfix I on the subject of waste separation;
  - Alfons Trennfix II on the subject of compost/bio-waste;
  - Alfons Trennfix III on the subject of littering;
  - Alfons Trennfix IV on the topic of smart shopping for school;
  - Alfons Trennfix V on the topic of food;
  - Alfons Trennfix VI on the topic of ReUse and Repair.

  The garbage witch Rosalie knows her way around questions about the environment and waste. Interesting topics from the fields of environment and waste (for example, energy, air, plastics, end-of-life vehicles, etc.) are presented in a child-friendly way in the magazine "Rosalie Hexenpost" (Rosalie Witch's Post) and offer educators assistance in designing a teaching unit. Booklets can be downloaded from the website www.rosalie.st.

  The garbage witch Rosalie comes also into the school or into the kindergarten, supplies ideas and produces work documents and materials for a living instruction.

  **Children from 12 years and above**

  The information should help to better understand complex topics such as environmental impact, waste prevention, recycling, ecological treatment and sustainability.
Waste management is increasingly developing into a comprehensive circular economy. For example, glass, paper, metal and plastic can now be recycled at the end of their primary use phase and reprocessed into new products. Exciting life stories of these materials are presented in different working documents and are concerning the basic information on:

- Legislation in the waste sector,
- Glass,
- Plastics,
- Metal packaging,
- Paper.

### 3.2 Weniger mist website (less waste) - https://www.wenigermist.at/

The "naturally less waste" initiative promotes and supports pioneering and exemplary projects and activities that contribute to the conservation of valuable resources or to sustainable lifestyles and behavior. The "Naturally Less Waste" initiative is part of Vienna's "Model Environmental City".

The website provides easily accessible information to the citizens of Vienna and provides a variety of advices and guidance on subjects related to waste management. Besides a brief overview of waste management in Austria and Vienna and the overview of all projects related to waste management, the most important subjects concern the following:

- **Waste prevention**
  - conscious shopping,
  - repairing and used goods,
  - schools, operators and administration.

- **Less waste in everyday life**
  - Organic waste and compost,
  - Electronics and devices,
  - Free time and garden,
  - Celebrations,
  - Cosmetics,
  - Foodstuff,
  - Fashion,
  - Cleaning.

- **Waste separation and recycling**
  - Recycling,
  - Appropriate waste separation.

### 3.3 Waste championship 2020 (Mistmeisterschaft)

[https://www.wien.gv.at/umwelt/ma48/beratung/mistmeister/](https://www.wien.gv.at/umwelt/ma48/beratung/mistmeister/)

Every year, the waste consulting department of MA 48 organizes the waste championship for elementary schools.

In each school hour, 3 waste management games are to be mastered around the topics of waste avoidance and waste separation. In order to score as many points as possible and become "Waste Champion of the Year", the entire class was required to demonstrate not only knowledge but also skill and, above all, teamwork.
Small toy garbage cans

In addition to the classic competition form with points scoring, playful school lessons are also offered as part of the waste championship. Here, the focus is on a more leisurely pace and on learning basic waste management knowledge. Many classes used the play lesson as training and want to participate in the championship with points scoring in the following years.

3.4 Misttelefon 01 546 48

The Misttelefon was founded in the winter of 1987 as the Snow Phone. It was originally intended to be a one-stop-shop for snow removal only.

Today, the Misttelefon is the central service and information point for the population. The range of questions is wide, from opening hours to disposal problems to waste prevention issues. The service number is also the first point of contact for information on new campaigns and activities by the Waste Management, Street Cleaning and Vehicle Fleet Department (MA 48).

Every year, more than 70,000 Viennese use the service of the Misttelefon. The Misttelefon number can be found on all 20,000 wastebaskets and 450,000 waste containers.

Working hours - Monday to Saturday from 08h to 18h.

Exceptions: On public holidays the Misttelefon is not manned. On Good Friday, Christmas Eve (Dec. 24) and New Year’s Eve (Dec. 31), the Misttelefon telephone is available on weekdays from 8:00 to noon.
4 Benchmark analysis

Table 28 General information for three Partner Cities and Benchmark City

<table>
<thead>
<tr>
<th>City</th>
<th>Population (2020)</th>
<th>Area, km²</th>
<th>Density (inhabitant/km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yerevan</td>
<td>1,087,181</td>
<td>223</td>
<td>4,875</td>
</tr>
<tr>
<td>Warsaw</td>
<td>1,789,620</td>
<td>517</td>
<td>3,462</td>
</tr>
<tr>
<td>Tirana</td>
<td>502,734</td>
<td>42</td>
<td>11,970</td>
</tr>
<tr>
<td>Vienna</td>
<td>1,929,944</td>
<td>414</td>
<td>4,511</td>
</tr>
</tbody>
</table>

General waste information

Due to discrepancies in availability of data the following analysis does not give the exact and precise state of municipal solid and household hazardous waste. Data for collected quantities of MSW in Yerevan and Tirana are based on estimates provided by Municipal’s competent PUCs and companies dealing with waste collection. On the other hand, available data for Vienna are from 2015, but until present day population has increased by almost 90,000 inhabitants. When comparing data for Warsaw it should be noted that data on generated and separated collected hazardous waste do not refer to same year.

Table 29 General waste information

<table>
<thead>
<tr>
<th>City</th>
<th>Quantity of MSW</th>
<th>MSW collection rate</th>
<th>Quantity of HHW</th>
<th>Quantity of separated collected HHW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yerevan</td>
<td>400,000 t</td>
<td>100%</td>
<td>1,023 t</td>
<td>Lead batteries: 3,700 t in 2020 (2019) 4,691 t in 2019 (2018) 7,022 t in 2017</td>
</tr>
<tr>
<td></td>
<td>(369 g/person/year, 1 kg/person/day)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warsaw</td>
<td>778,164 t</td>
<td>100%</td>
<td>2,322 t</td>
<td>214,805 t</td>
</tr>
<tr>
<td></td>
<td>(435 kg/person/year, 1.19 kg/person/year)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tirana</td>
<td>492,890 t</td>
<td>87.9%</td>
<td>985,780 t</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>(469 kg/person/year)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

39 https://worldpopulationreview.com/world-cities/yerevan-population
40 https://worldpopulationreview.com/world-cities/warsaw-population
41 https://worldpopulationreview.com/world-cities/tirana-population
42 https://worldpopulationreview.com/world-cities/vienna-population
43 Estimation of Yerevan Municipality representatives for 2020
44 Based on estimation that the generated MSW in Yerevan city in 2018 was 310,000 tonnes/y and that the percentage of all hazardous waste (e.g. syringes and other sharp objects, medicine, paints and solvents, oils, pesticides) is 0.33% in Yerevan city, according to municipal waste composition determinate within the project “Waste Quantity and Composition Study (WQCS)”.
45 Calculated according to Table 13 Information on the amount of waste collected and handled in Warsaw in 2020
46 Source: Environmental Protection Programme for the City of Warsaw for 2021-2024. Note: Provided quantities include industrial and commercial waste and it is not possible to determine HHW quantities
47 Assuming that composition of municipal waste in Tirana is the same as for Albania, share of hazardous waste (not hospital) in 2016 was 0.2% (Table 9) while the total waste amount in Tirana was 492,890 tonnes (table 7)
Vienna – model city for benchmark analysis

<table>
<thead>
<tr>
<th>City</th>
<th>Mobile CAS</th>
<th>CAS</th>
<th>Other way of hazardous waste collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yerevan</td>
<td>0</td>
<td>0 (2 are planned)</td>
<td>n/a, HHW is collected by the private companies as provided in chapter 4.1.5. Quantity of collected and exported lead batteries was 3,700 tonnes in 2020. Because of huge quantity, very possible that lead batteries are collected not only from households, but from commerce and institutions as well, and not only from Yerevan but also from other cities. Note: Amount is not fully relevant because it is comprised of a larger share of MSW than HHW from Yerevan</td>
</tr>
<tr>
<td>Warsaw</td>
<td>40 locations (5 vehicles)</td>
<td>2 0.1 per 100,000 inhabitants</td>
<td>Expired medicines are collected at pharmacies; Mercury thermometers are collected at 170 pharmacies; WEEE is collected in weekly in every district by a non-profit organization; Used batteries are collected in over 650 educational institutions and some offices of the Districts and Offices of the Capital City of Warsaw</td>
</tr>
<tr>
<td>Tirana</td>
<td>0</td>
<td>0</td>
<td>n/a</td>
</tr>
<tr>
<td>Vienna</td>
<td>93 locations</td>
<td>17 0.91 per 100,000 inhabitants 0.88 per 100,000 inhabitants</td>
<td>HHW can either be brought back to the distributor (batteries, electronic waste) and to publicly situated collection points (4 around the city, located at big markets)</td>
</tr>
</tbody>
</table>

According to data presented in table above, it could be concluded that Vienna has the most developed infrastructure. Vienna covers less area (414 km² compared to Warsaw’s 517 km²) but has two times more mobile CAS location and nine times more stationary CAS.

Tirana and Yerevan currently have no such infrastructure capacities and are yet to be developed in the future.

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48 Federal Waste Management Plan 2017
49 Wiener Abfallwirtschaftsplan und Wiener Abfallvermeidungsprogramm 2019-2024 - Anhang 1 “Ist-Zustand der Wiener Abfallwirtschaft”, including commercial hazardous waste
50 Data on separately collected HW does not include WEEE
Vienna – model city for benchmark analysis

**Table 30 CAS and mobile CAS comparison**

<table>
<thead>
<tr>
<th>Waste type</th>
<th>CAS</th>
<th>Mobile CAS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vienna</td>
<td>Warsaw</td>
</tr>
<tr>
<td><strong>Cleaning and personal care products</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 01 13* solvents</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>20 01 14* acids</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>20 01 15* alkalines</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>20 01 29* detergents containing hazardous substances</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>16 05 04* gases in pressure containers (including halons) containing</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>hazardous substances</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Paints, varnishes, ink and glues</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 01 27* paint, inks, adhesives and resins containing hazardous substances</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Households, parks and garden pesticides</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 01 19* pesticides</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Photochemicals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 01 17* photochemicals</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Unused Pharmaceutical products, medicine</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 01 31* cytotoxic and cytostatic medicines,</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>20 01 32 medicines other than those mentioned in 20 01 31*.</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Asbestos waste</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 02 12* discarded equipment containing free asbestos,</td>
<td>✓</td>
<td>❌</td>
</tr>
<tr>
<td>(up to 1 m³)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 02 15* hazardous components removed from discarded equipment,</td>
<td>✓</td>
<td>❌</td>
</tr>
<tr>
<td>(up to 1 m³)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17 06 01* insulation materials containing asbestos,</td>
<td>✓</td>
<td>❌</td>
</tr>
<tr>
<td>(up to 1 m³)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Treated wood</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 01 37* wood containing hazardous substances,</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>17 02 04* glass, plastic and wood containing or contaminated with</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>hazardous substances</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Coal tar and tarred products</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17 03 01* bituminous mixtures containing coal tar,</td>
<td>✓</td>
<td>❌</td>
</tr>
<tr>
<td>17 03 03* coal tar and tarred products.</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Oil filters and contaminated absorbing materials</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 02 02* absorbents, filter materials (including oil filters not</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>otherwise specified), wiping cloths, protective clothing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>contaminated by hazardous substances</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 01 07* oil filters.</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

51 Quantity is limited to 1-5 litres
Vienna – model city for benchmark analysis

<table>
<thead>
<tr>
<th>Waste type</th>
<th>CAS Vienna</th>
<th>Warsaw</th>
<th>Mobile CAS Vienna</th>
<th>Warsaw</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Automotive products, surface polish, anti-freeze fluids</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 01 13* brake fluids,</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>16 01 14* anti-freeze fluids containing hazardous substances,</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>20 01 26* oil and fat other than those mentioned in 20 01 25,</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>16 01 03 end-of-life tires.</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Waste electrical and electronic equipment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 01 21* fluorescent tubes and other mercury-containing waste,</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>20 01 23* discarded equipment containing chlorofluorocarbons,</td>
<td>✓</td>
<td>✓</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>20 01 35* discarded electrical and electronic equipment other than those mentioned in 20 01 21* and 20 01 23* containing hazardous components[53].</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Batteries and accumulators</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 01 33* batteries and accumulators included in 16 06 01*, 16 06 02* or 16 06 03* and unsorted batteries and accumulators containing these batteries.</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Mercury-containing waste (other than WEEE)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>06 04 04* - waste containing mercury (e.g. thermometers).</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Edible oil and fat</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 01 25 edible oil and fat.</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Packaging</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 01 10* packaging containing residues of or contaminated by hazardous substances,</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>15 01 11* metallic packaging containing a hazardous solid porous matrix (for example asbestos), including empty pressure containers.</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

✓ accepted
✗ not accepted

According to table above, it could be concluded that the only difference between Vienna’s and Warsaw’s CAS facilities is asbestos waste which is not accepted in Warsaw.

**Effectiveness, efficiency, innovativeness of systems for HW management**

The system is organized in accordance with the provisions of the Law and EU directives, as already mentioned, the essential difference between Vienna and Warsaw is in the number and spatial coverage of cities with infrastructure, i.e. the number of mobile and stationary CAS, which directly affects the effectiveness of the system and less accessibility of the plant to citizens. In Warsaw, there are stationary CASs at two ends of the city, on different sides of the river.

The insufficient number of CASs is also indicated by the results of a survey conducted among the citizens of Warsaw, where 59% of the answers were:

1. More collection points;

---

52 discarded equipment containing chlorofluorocarbons usually refers to large WEEE (refrigerates, freezers etc) which are not expected because of their dimensions

53 Hazardous components from electrical and electronic equipment may include accumulators and batteries mentioned in 16 06 and marked as hazardous; mercury switches, glass from cathode ray tubes and other activated glass, etc.
2. More frequent garbage collection; more regularly, on time;
3. More educational campaigns and more information about waste collection points

An example of good practice according to the Separate Collection of Household Hazardous Waste (2020/C 375/01) is Luxembourg, which has one CAS per 35,000 inhabitants. On the other hand, Luxembourg is incomparably smaller in terms of population and area. Practice in Vienna shows that with a sufficiently educated population and awareness-raising campaigns, the HHW collection system is functioning satisfactorily. Warsaw should strive to increase the number CASs, given that the cities are comparable in area and population.

**Contributions of selected HW management practices to GDP growth**

For this part of the analysis the good practices of waste and hazardous waste management, mostly in Austria and Vienna, will be set as an example for the possible solutions to impact the GDP with innovative technologies and/or smart services, most notably by reuse and recycling, or even upcycling practices, in line with circular economy principles. It should be stated that not enough data nor relevant general publications could be found on this topic to actually calculate the contribution of these practices to the GDP of the subject countries and in that sense, certain logical assumptions and conclusions are made instead.
EXAMPLES OF PRACTICES IN AUSTRIA AND VIENNA:

Lead extraction from waste batteries and accumulators

In Austria, after being disassembled in one plant, waste batteries containing lead are further treated in one specific plant where lead storage cells are opened up mechanically, plastic components and acids are separated and the lead-containing components are moved directly to the associated secondary lead works for reclamation of the lead which can be later used for the production of lead and lead alloys, from recycled sources such as these. This is a prime example in obtaining a valuable resource from hazardous waste in the process of recycling, which results in positive impacts on both GDP and the environment.

ÖkoKauf Wien (Eco purchasing)

ÖkoKauf Wien is the city’s ecological and sustainable procurement programme. Since 1998, products have been bought and used in the most environmentally friendly way possible by the city council - from textiles to organic food, detergents, disinfectants, office supplies and furniture, to building materials. The most important criteria are: conservation of resources, ecological production, energy efficiency, reparable, avoidance of emissions as well as dangerous and toxic materials. Such a purchasing volume is a great opportunity to make a difference in the local and supralocal economy and in the market. ÖkoKauf Wien has been ensuring for 20 years that the purchase of products and services by the entire city council is directed in an ecological and sustainable direction. The extensive product knowledge that the ÖkoKauf team has acquired over time is promoted and passed on to private consumers.

Among its many goals an example can be taken for the cleaning products. In the city of Vienna every year many cleaning, disinfecting and detergents in the areas of health and care facilities, schools, kindergartens, administrative buildings, pensioners’ homes, are being used. For sustainable purchasing, ÖkoKauf Wien has specially developed a catalogue of criteria based on the balance of ecological, economic and social aspects. These include: reduction of resource consumption, avoidance of environmentally harmful substances, avoidance and reduction of waste, increasing the security of disposal of unavoidable waste, reduction of pollution in the workplace. There are also extensive criteria for the procurement of cosmetics, body cleansers and microfiber towels.

While this is not strictly related to waste and hazardous waste, part of the goals and practices implemented deal with waste, it is also a very good example of public policy and practice that positively impacts GDP and the environment.

Oeko Business Vienna

Oeko Business Wien is the City of Vienna’s environmental service package for Viennese companies. Established in 1998 by the City of Vienna - Environmental Protection, Oeko Business Wien supports companies in implementing environmentally relevant measures in their operations and helps to reduce operating costs, with the aim to generate clean profits for the environment and companies through ecological management, and to ensure high quality and financial advantages within the company through environmental protection.

From 1998 to 2019, the Oeko Business Vienna companies jointly achieved significant savings, besides 166.9 million euros in operating costs savings, achievements related to waste are: 127,370 tons less waste, 7,628 tons of hazardous waste not produced during this period.

This is also not strictly a WM or HWM oriented practice but some of the results, in the more than twenty-year period, show significant reduction in waste and hazardous waste generation as well as in terms of money saved. Oeko Business Wien is closely networked with comparable initiatives around the world and is committed to the transfer of knowledge to city and regional administrations at home and abroad, which could be one of the considerations for Partner Cities in the future steps of implementation of this and other similar practices.
The Dismantling and Recycling Centre – Demontage und Recycling Zentrum DRZ

The practice of this Centre is already presented in the Sub-chapter 2.4 Examples of WM and HWM good practices, and beside the obvious benefits of extending life to old electrical and electronic appliances and devices, through recycling, reuse and upcycling, and making them useful second-hand products, the most interesting is the trash design manufactory.

In the trash design manufactory of the Dismantling and Recycling Centre, various upcycling products are made from electrical and electronic scrap. Jewellery, furniture and accessories are handcrafted in Dismantling and Recycling Centre workshop and sold at various markets and events, online and in the in-house shop in the Dismantling and Recycling Centre.

This is a direct example of how some parts of waste streams, in this case WEEE, can become products and contribute to the GDP in a positive way, by generating extra income and job opportunities, while reducing the amounts of this waste type.

48-er Tandler

The 48er Tandler, also extensively elaborated in the Sub-chapter 2.4 Examples of WM and HWM good practices, is a second-hand market with added value aiming to reuse and protect the environment. Less waste approach is in line with the EU's Zero Waste Programme, the Federal Waste Management Plan and the Vienna Waste Management Plan. This names waste avoidance and preparation for reuse as the top strategic goals of Vienna’s environmental policy and defines the topic of reuse as an important focus. With the old goods market, the 48er Tandler, the goal of reuse is taken into account in a modern way.

The 48er Tandler Box is especially interesting variant and extension of the main 48er Tandler shop because it is attached to the CAS.

The obvious result of this manner of business is generating income, as well as providing job opportunities, while reducing the amount of various types of waste, including some hazardous waste.

IMPLEMENTATION POSSIBILITIES IN OTHER PARTNER CITIES

Considering that Partner Cities are in different stages of development when it comes to MWM and HWM practices and infrastructure, especially comparing to the selected model city Vienna, different new systems and practices can be considered worth developing.

Lead extraction from waste batteries and accumulators is given as a first example, but is perhaps the least transferable option, considering that it is an expensive technology and requires significant investments and long term planning.

Yerevan

Currently there are no recognized MWM and HWM practices, which are able to affect the national GDP similar to the ones in Vienna. As there are plans to construct three to four Civic Amenity Sites in Yerevan, it could be taken into consideration to implement trade solutions similar to 48er Tandler Box, if not rights from the start then as a long-term plan.

Warsaw

As Warsaw is an EU member state and adopted The Polish Roadmap “Transformation toward Circular Economy” in September 2019, and has already done significant work in awareness raising in these matters, it can be expected that the know-how of Vienna practices is more easily transferable in Warsaw’s waste management system.
Since Warsaw already has two operational Civic Amenity Sites as well as mobile CASs and has plans to expand this network but also announced plans to improve and re-profile the existing ones by implementing 5R option through new functions attached to the CAS, which is similar to the already implemented 48-er Tandler Box in Vienna, this is a great starting point to emulate this practice in the near future.

Tirana

Tirana has no recognized MWM and HWM practices, which are able to affect the national GDP similar to the ones in Vienna. As Tirana has laid down some plans in their strategic documents to construct recycling centres in the future, it can be planned to equip them with functions similar to the 48-er Tandler Box, considering that it is a communicable example with the citizens.

Democracy and decentralization in MWM and HWM

One of the key aspects in improving the effectiveness of waste management system and its infrastructure is efficient and easily accessible participatory mechanisms and tools, and also awareness raising actions for citizens using it.

Yerevan

Yerevan currently has no formally applied tools and methods for informing and involving citizens in hazardous waste management, and citizen’s awareness in these cities is considered low. Environmental protection NGOs somewhat contribute with their activities and campaigns, as described in chapter 5 – Methods and tool applied to inform and involve citizens in hazardous waste management.

Warsaw

The City of Warsaw is currently carrying out educational and information activities on waste hierarchy, proper segregation of municipal waste, and benefits resulting from the choice of selective collection

- In November 2019, the #SegregujNa5 search engine, which includes an ever-expanding database of user-submitted waste types, has been very popular and is considered successful and in 2020 about 3.5 million people used it. As a result of the search you citizens can find the answers as to which container you should throw certain waste into, e.g. glass, bio or mixed, as well as an additional hint. Good example is also on blisters and information that expired drugs should be turned over to a pharmacy. If the search does not include the item you are looking for, the user can submit a question to the City Hall in order to complete the search list.

- The city posts educational and informational materials in public spaces, print, online, and social media, from September/October 2019, available are also multilingual materials in English, Russian, Ukrainian. Now, the materials are available at https://warszawa19115.pl/-/materiały-do-pobrania. Educational materials about the waste management system were distributed to all districts, which is very important in terms of decentralization, and handed out during the Department's information campaigns or other related events.

- The city of Warsaw also conducted a campaign called "Ecopoukładani" with a purpose of the event to propagate environmentally friendly behaviors and to promote recycling among Warsaw citizens, during which a record-breaking collection of electro-waste was recorded. On 20 June 2020 an educational action called "Ecopoukładani" took place in 6 locations, during which about 17 tonnes of electro-waste was collected. For bringing the electro-waste the residents received plant cuttings - flowers, both annual and perennial – this was also a great example of incentivized approach.

- For the project called "Eco points in the whole city" 21,075 votes were cast by the inhabitants, the project involved the creation of an interactive map that allows you to find places where you can find, including:
  - battery containers,
  - electronic waste collection points,
  - hanger for unnecessary clothes and other places where clothes can be returned,
• Eateries,
• containers for plastic caps,
• boomerang bags - a place where you can leave or pick up bags,
• CAS and Mobile CAS.

**Tirana**

Tirana currently has no formally applied tools and methods for informing and involving citizens in hazardous waste management, and citizen's awareness in these cities is considered low. Albania however has included environmental related topics in curriculums of elementary and high schools, which is a good preparatory step in awareness raising for younger generations.

**Vienna**

- Federal Ministry Republic of Austria Climate Action, Environment, Energy, Mobility, Innovation and Technology launched a website containing, among other, numerous information in all aspects of waste management in Austria. The site contains multilingual collection tips – presented as short instruction leaflets for separate collection of waste fractions on several pages with pictograms and following explanations and also info for schools where children can be taught about environmental protection and the proper use of our resources at an early age. This page contains information for schools, interesting facts about the topic "waste" and about the most important types of waste in terms of quantity, where the topics are adjusted in accordance with the age of children.

- Weniger mist website (less waste) - [https://www.wenigermist.at/](https://www.wenigermist.at/)

  The website provides easily accessible information to the citizens of Vienna and provides a variety of advices and guidance on subjects related to waste management. Besides a brief overview of waste management in Austria and Vienna and the overview of all projects related to waste management, the most important subjects concern the following:

  - Waste prevention
    - conscious shopping,
    - repairing and used goods,
    - schools, operators and administration.
  - Less waste in everyday life
    - Organic waste and compost,
    - Electronics and devices,
    - Free time and garden,
    - Celebrations,
    - Cosmetics,
    - Foodstuff,
    - Fashion,
    - Cleaning.
  - Waste separation and recycling
    - Recycling.

  Appropriate waste separation

- Waste championship 2020 (Mistmeisterschaft).

Every year, the waste consulting department of MA 48 organizes the waste championship for elementary schools. In each school hour, 3 waste management games are to be mastered around the topics of waste avoidance and waste separation. In order to score as many points as possible and become "Waste Champion of
the Year”, the entire class was required to demonstrate not only knowledge but also skill and, above all, teamwork. In addition to the classic competition form with points scoring, playful school lessons are also offered as part of the waste championship.

- Misttelefon 01 546 48

The Misttelefon was founded in the winter of 1987 as the Snow Phone. It was originally intended to be a one-stop-shop for snow removal only.

Today, the Misttelefon is the central service and information point for the population. The range of questions is wide, from opening hours to disposal problems to waste prevention issues. The service number is also the first point of contact for information on new campaigns and activities by the Waste Management, Street Cleaning and Vehicle Fleet Department (MA 48).

Every year, more than 70,000 Viennese use the service of the Misttelefon. The Misttelefon number can be found on all 20,000 wastebaskets and 450,000 waste containers.

The above listed tools and actions for the two cities are comparable with each having its own specifics, but the it is obvious that both cities reasonably pay significant attention to educate and involve younger population. It can be concluded that they are currently on similar level, but Vienna has a longer tradition in using such tools, with Warsaw significantly improving in recent years.

Most of these tools should be used as a model and could be gradually incorporated in Tirana and Yerevan along with the development of necessary infrastructure in different stages of its development.

Also, according to Citizen survey which was conducted within this Action, average ocean of satisfaction with the waste management system in Warsaw is 4.1/5, while in Vienna it is 4.9/5. On the other hand, the results show significantly lower level of satisfaction, for Tirana 2.5/5 and for Yerevan 3/5.

**Legislation and Governance in MWM / HWM**

The starting point for the analysis of legislation is the status of the analysed countries towards the EU and compliance with European directives regarding waste management. The subchapters on legislation explain in detail the national laws and accompanying bylaws related to waste management in a broader sense, and in particular to the issue of hazardous waste. Poland and Austria, as Members of the European Union, have fully harmonized their national legislation with the EU, while Albania, as a candidate country, has also transposed the legislation, but the level of implementation is significantly lower than in the two EU countries and all targets are obsolete.

Armenia as a part of the Eastern Partnership, does not have obligation of legislation transposition, but as signatory state of many international conventions.
Vienna – model city for benchmark analysis

Governance

MWM/HWM are critical public policies and need to be designed and implemented in the light of good governance principles.

For this Study, the 12 Principles of the Strategy on Innovation and Good Governance at local level, endorsed by a decision of the Committee of Ministers of the Council of Europe in 2008, have been considered highly relevant. The principles are explained below, after which they are presented and analysed in a table format in relation to the three partner cities and the benchmark city. In case the principle is not relevant, i.e. the study authors do not have enough information to comment on them, a comment is provided accordingly.

1. Fair Conduct of Elections, Representation and Participation

Local elections are conducted freely and fairly, according to international standards and national legislation, and without any fraud. Citizens are at the centre of public activity and they are involved in clearly defined ways in public life at local level. All men and women can have a voice in decision-making, either directly or through legitimate intermediate bodies that represent their interests. Such broad participation is built on the freedoms of expression, assembly and association. All voices, including those of the less privileged and most vulnerable, are heard and taken into account in decision-making, including over the allocation of resources. There is always an honest attempt to mediate between various legitimate interests and to reach a broad consensus on what is in the best interest of the whole community and on how this can be achieved. Decisions are taken according to the will of the many, while the rights and legitimate interests of the few are respected.

2. Responsiveness

Objectives, rules, structures, and procedures are adapted to the legitimate expectations and needs of citizens. Public services are delivered, and requests and complaints are responded to within a reasonable timeframe.

3. Efficiency and Effectiveness

Results meet the agreed objectives. Best possible use is made of the resources available. Performance management systems make it possible to evaluate and enhance the efficiency and effectiveness of services. Audits are carried out at regular intervals to assess and improve performance.

4. Openness and Transparency

Decisions are taken and enforced in accordance with rules and regulations. There is public access to all information which is not classified for well-specified reasons as provided for by law (such as the protection of privacy or ensuring the fairness of procurement procedures). Information on decisions, implementation of policies and results is made available to the public in such a way as to enable it to effectively follow and contribute to the work of the local authority.

5. Rule of Law

The local authorities abide by the law and judicial decisions. Rules and regulations are adopted in accordance with procedures provided for by law and are enforced impartially.

6. Ethical conduct

The public good is placed before individual interests. There are effective measures to prevent and combat all forms of corruption. Conflicts of interest are declared in a timely manner and persons involved must abstain from taking part in relevant decisions.

7. Competence and Capacity
Vienna – model city for benchmark analysis

The professional skills of those who deliver governance are continuously maintained and strengthened in order to improve their output and impact. Public officials are motivated to continuously improve their performance. Practical methods and procedures are created and used in order to transform skills into capacity and to produce better results.

8. Innovation and Openness to Change

New and efficient solutions to problems are sought and advantage is taken of modern methods of service provision. There is readiness to pilot and experiment new programmes and to learn from the experience of others. A climate favourable to change is created in the interest of achieving better results.

9. Sustainability and Long-term Orientation

The needs of future generations are taken into account in current policies. The sustainability of the community is constantly taken into account. Decisions strive to internalise all costs and not to transfer problems and tensions, be they environmental, structural, financial, economic or social, to future generations. There is a broad and long-term perspective on the future of the local community along with a sense of what is needed for such development. There is an understanding of the historical, cultural and social complexities in which this perspective is grounded.

10. Sound Financial Management

Charges do not exceed the cost of services provided and do not reduce demand excessively, particularly in the case of important public services. Prudence is observed in financial management, including in the contracting and use of loans, in the estimation of resources, revenues and reserves, and in the use of exceptional revenue. Multi-annual budget plans are prepared, with consultation of the public. Risks are properly estimated and managed, including by the publication of consolidated accounts and, in the case of public-private partnerships, by sharing the risks realistically. The local authority takes part in arrangements for inter-municipal solidarity, fair sharing of burdens and benefits and reduction of risks (equalisation systems, inter-municipal co-operation, mutualisation of risks, etc.).

11. Human rights, Cultural Diversity and Social Cohesion

Within the local authority’s sphere of influence, human rights are respected, protected and implemented, and discrimination on any grounds is combated. Cultural diversity is treated as an asset, and continuous efforts are made to ensure that all have a stake in the local community, identify with it and do not feel excluded. Social cohesion and the integration of disadvantaged areas are promoted. Access to essential services is preserved, in particular for the most disadvantaged sections of the population.

12. Accountability

All decision-makers, collective and individual, take responsibility for their decisions. Decisions are reported on, explained and can be sanctioned. There are effective remedies against maladministration and against actions of local authorities, which infringe civil rights.
Table 31 Principles of good governance in three Partner Cities and Benchmark City with relation to municipal waste management – expert assessment of principles application

<table>
<thead>
<tr>
<th>PRINCIPLES OF GOOD GOVERNANCE</th>
<th>VIENNA</th>
<th>YEREVAN</th>
<th>WARSAW</th>
<th>TIRANA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principle 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fair Conduct of Elections,</td>
<td>Not relevant</td>
<td>Not relevant</td>
<td>Not relevant</td>
<td>Not relevant</td>
</tr>
<tr>
<td>Representation and Participation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Principle 2</td>
<td>✓</td>
<td>✗</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>Responsiveness</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Principle 3</td>
<td>✓</td>
<td>✗</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>Efficiency and Effectiveness</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Principle 4</td>
<td>✓</td>
<td>✗</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>Openness and Transparency</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Principle 5</td>
<td>✓</td>
<td>✗</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>Rule of Law</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Principle 6</td>
<td>Not enough information</td>
<td>Not enough information</td>
<td>Not enough information</td>
<td>Not enough information</td>
</tr>
<tr>
<td>Ethical conduct</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Principle 7</td>
<td>✓</td>
<td>✗</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>Competence and Capacity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Principle 8</td>
<td>✓</td>
<td>✗</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>Innovation and Openness to Change</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Principle 9</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Sustainability and Long-term Orientation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Principle 10</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Sound Financial Management</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Principle 11</td>
<td>Not enough information</td>
<td>Not enough information</td>
<td>Not enough information</td>
<td>Not enough information</td>
</tr>
<tr>
<td>Human rights, Cultural Diversity and Social Cohesion</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Principle 12</td>
<td>Not enough information, however largely linked to issues under Principle 4 Openness and Transparency</td>
<td>Not enough information, however largely linked to issues under Principle 4 Openness and Transparency</td>
<td>Not enough information, however largely linked to issues under Principle 4 Openness and Transparency</td>
<td>Not enough information, however largely linked to issues under Principle 4 Openness and Transparency</td>
</tr>
</tbody>
</table>
III

KEY INDICATORS OF HWM EFFECTIVENESS AND QUALITY
The purpose of indicators

The action “Capital Cities Collaborating on Common Challenges in Hazardous Waste Management - Yerevan, Warsaw, Tirana” combines a number of results which are expected to provide comprehensive, system-wide improvements to HWM governance and broadly defined institutional capacities in HWM, as presented by the overall objective: “To strengthen urban governance in hazardous waste management by cities-to-cities partnership based on peer learning, greater citizens’ participation and mainstreaming best practices, with focus on Yerevan.”

In general, this project will contribute to the Sustainable Development Goals, specifically to Goal 11 “Make cities and human settlements inclusive, safe, resilient and sustainable”, and to the corresponding target: by 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.

To monitor (and evaluate) progress in implementation from the perspective of achievement of Project objectives it is necessary to identify appropriate indicators. In addition, these indicators can be the basis for assessment by providing information on trends of waste management in all partners cities and can become benchmarking for comparisons between different cities in this project.

Therefore, a set of quantitative and qualitative Objectively Verifiable Indicators (OVI) are identified to monitor the achievements in terms of improved HW management systems, methods, approaches and solutions in the framework of the Action ‘Capital Cities Collaborating on Common Challenges in Hazardous Waste Management – Yerevan, Warsaw, Tirana’.

Here, the Consultant uses a widely accepted methodology for the identification of OVIs known as “RACER”. Namely, each identified indicator can be considered as Objectively Identifiable when it has the following attributes:

➢ Relevant: The indicator should have a strong correlation with the objective that the Project aims to achieve.
➢ Acceptable: The indicator must be easily understood and should be accepted by all stakeholders.
➢ Credible: The indicators must be accessible to non-experts, unambiguous and easy to interpret.
➢ Easy: It should be possible to collect the data with available resources, based on the principle of ‘proportionate analysis’ (appropriate scope and depth).
➢ Robust: The indicators should be sensitive enough to monitor changes; therefore it is important to select them according to the time lag between the action and the expected change that points to current progress towards long-term or future improvements. It is therefore important not to rely on i) old data; ii) indicators that, having been developed to compare countries or situations, are not suitable for monitoring changes; iii) variables influenced by long-term impacts; iv) variables that are deeply affected by uncontrolled short-term changes hiding the expected long-term changes.

The following sets of indicators are identified:

Set 1 – Key indicators on HWM systems – measuring how performance and operational capacity of HWM systems has mediated the volumes of HW collected, disposed and treated.
Set 2 – Key indicators on quality of partnership – determining to which extent partnership can generate added value, the transferability from one partner to the other of HWM solutions, expertise, practices; identification and piloting of common solutions; etc.
Set 3 – Key Indicators on quality of MWM/HWM Governance – focusing on institutional arrangements, transparency; interactions with citizens; etc.
Set 4 – Key indicators on democracy and decentralization – focusing on improved municipal services; improved participatory mechanisms; improved citizens’ awareness and satisfaction.
**Key indicators of HWM effectiveness and quality**

<table>
<thead>
<tr>
<th>Key indicator</th>
<th>Explanatory note</th>
<th>The baseline value (reference year in bracket)</th>
<th>Relevant sources of verification</th>
<th>Means of verification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Set 1: Key indicators on HWM systems</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantity of generated HW</td>
<td>This indicator expresses the amount of HW generated in a defined period (e.g., a year) at the territory of the partner city. Generally, the indicator covers HW from all economic sectors and households. It will show does any progress is achieved in preventing and reducing waste generation. Moreover, this indicator is directly related with the 2030 Agenda for Sustainable Development and will be used to measure progress for the achievement of Sustainable Development Goal (SDG) 12. Ensure sustainable consumption and production patterns and achievement of the corresponding target that is: 12.5 By 2030 substantially reduce waste generation through prevention, reduction, recycling and reuse.</td>
<td>Yerevan (2018)(^{54}): 1,023 tonnes of all HW</td>
<td>Yerevan City documentation</td>
<td>Engaged experts to allocate the days for collection of data; beneficiary staff to provide access to data and documents of waste companies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Warsaw (2018)(^{55}): 214, 805 tonnes of all HW</td>
<td>BDO waste database</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tirana (2016)(^{56}): 986 tonnes of HW (except hospital waste)</td>
<td>Tirana City documentation/National Environmental Agency</td>
<td></td>
</tr>
<tr>
<td>Amount of HW disposed on collection points for HW</td>
<td>Amount of HW disposed on collection points for HW illustrates the capacities of the city to collect HW separately.</td>
<td>Yerevan (2020): no separate collection of HW</td>
<td>Yerevan City documentation</td>
<td>Engaged experts to allocate the days for collection of data;</td>
</tr>
</tbody>
</table>

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\(^{54}\) Based on estimation that the generated MSW in Yerevan city in 2018 was 310,000 tonnes/y and that the percentage of all hazardous waste (e.g. syringes and other sharp objects, medicine, paints and solvents, oils, pesticides) is 0.33% in Yerevan city, according to municipal waste composition determinate within the project “Waste Quantity and Composition Study (WQCS)”.

\(^{55}\) Environmental Protection Program for the City of Warsaw for 2020-2024, page 71, Table 3.8.

\(^{56}\) Assuming that composition of municipal waste in Tirana is the same as for Albania, share of hazardous waste (not hospital) in 2016 was 0,2% (Table 9) while the total waste amount in Tirana was 492,890 tones (table 7)
### Key indicators of HWM effectiveness and quality

<table>
<thead>
<tr>
<th>Number of Civil Amenity Centers per inhabitant</th>
<th>Warsaw (2020): 2 CAC/1,789,620 inhabitants</th>
<th>Tirana (2020): no separate collection of HW</th>
<th>beneficiary staff to provide access to data and documents of waste companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>The number of Civil Amenity Centers per inhabitant that operate on the territory of the city illustrates the capacity of the collection system in the city. A larger figure referring to CAC means that disposal of waste that should not be disposed of in the household bins is improved.</td>
<td>Warsaw (2020): 2 CAC/1,789,620 inhabitants</td>
<td>Tirana City documentation/National Environmental Agency</td>
<td>Engaged experts to allocate the days for collection of data; beneficiary staff to provide access to data and documents</td>
</tr>
<tr>
<td>The number of incineration facilities illustrate capacities on the territory of the city to do adequate HW treatment.</td>
<td>Warsaw (2020): one facility exists; capacity after plant expansion 305,200 t/year</td>
<td>Tirana City documentation</td>
<td>Engaged experts to allocate the days for collection of data.</td>
</tr>
<tr>
<td>Warsaw (2020): one facility exists; capacity after plant expansion 305,200 t/year</td>
<td>Tirana City documentation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yerevan (2020): 0 CAC/1,087,181 inhabitants</td>
<td>Yerevan documentation</td>
<td>Tirana City documentation</td>
<td></td>
</tr>
<tr>
<td>Yerevan (2020): does not exist (there is one close to Yerevan, owned by private company)</td>
<td>Yerevan documentation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warsaw (2020): 2 CAC/1,789,620 inhabitants</td>
<td>Warsaw documentation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tirana (2020): 0 CAC/502,734</td>
<td>Tirana City documentation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tirana (2020): does not exist</td>
<td>Tirana City documentation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

57 https://worldpopulationreview.com/world-cities/yerevan-population
58 https://worldpopulationreview.com/world-cities/warsaw-population
59 https://worldpopulationreview.com/world-cities/tirana-population
### Key indicators of HWM effectiveness and quality

<table>
<thead>
<tr>
<th>System for collection of data on treatment of hazardous waste established</th>
<th>Due to the lack of data on the share of the HW which is adequately treated in the cities, the system for collection of data on treatment of hazardous waste needs to be established. Namely, chemical, physical and thermal processes might be used to detoxify HW to reduce solubility or mobility of contaminants into the environment. Moreover, data on adequate HW treatment is linked with SDG 6. Ensure availability and sustainable management of water and sanitation for all, through contribution to achievement of the following target: By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally Also, data on adequate HW treatment is linked with SDG 3. Ensure healthy lives and promote well-being for all at all ages and these data will be used to measure progress for the achievement of the corresponding target that is: 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.</th>
<th>Yerevan (2020): does not exist</th>
<th>Yerevan City documentation</th>
<th>Warsaw (2020): BDO waste database</th>
<th>BDO waste database</th>
<th>Tirana (2020): does not exist</th>
<th>Tirana City documentation/ National Environmental Agency</th>
<th>Engaged experts to allocate the days for collection of data; beneficiary staff to provide access to data and documents of waste companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of exported HW</td>
<td>This indicator expresses the amount of exported HW. With the construction of infrastructure for HW treatment, it could be expected that export of HW for treatment into authorized and registered facilities is decreased.</td>
<td>Yerevan (2020): 3700.0 tonnes</td>
<td>Yerevan City documentation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Engaged experts to allocate the days for collection of data; beneficiary staff to provide access to data and documents of waste companies</td>
</tr>
</tbody>
</table>
### Key indicators of HWM effectiveness and quality

<table>
<thead>
<tr>
<th>Set 2: Key indicators on quality of partnership</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of staff exchanges/internships</strong></td>
<td>The number of staff exchanges/internships between partner cities illustrates the improvement of partnership between partner cities. Staff exchanges/internships will enable the transfer of knowledge and experience and establishing business relationships.</td>
</tr>
<tr>
<td>Warsaw (2020): 0</td>
<td>Project documentation</td>
</tr>
<tr>
<td>Tirana (2020): 0</td>
<td>Project documentation</td>
</tr>
<tr>
<td>Yerevan (2020): 0</td>
<td>Project documentation</td>
</tr>
<tr>
<td><strong>Number of initiatives that are replicated from another partner city</strong></td>
<td>This indicator expresses the number of initiatives which are replicated into partner city and leading to improvement of his HW management using experience of another partner city.</td>
</tr>
<tr>
<td>Warsaw (2020): 0</td>
<td>Project documentation</td>
</tr>
<tr>
<td>Tirana (2020): 0</td>
<td>Project documentation</td>
</tr>
<tr>
<td>Yerevan (2020): 0</td>
<td>Project documentation</td>
</tr>
<tr>
<td><strong>Set 3: Key Indicators on quality of MWM/HWM Governance</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Database on MSW and HW collected, recycled, disposed in operation</strong></td>
<td>Quality, accessible, and timely data collection and reporting is essential for improved waste management. Therefore, this indicator refers to</td>
</tr>
<tr>
<td>Tirana (2020): 0</td>
<td>Project documentation</td>
</tr>
<tr>
<td>Yerevan (2020): 0</td>
<td>Project documentation</td>
</tr>
</tbody>
</table>

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60 Export is prohibited

61 There is no database on MSW collected, recycled, disposed, not in PUC, not in Municipality or the Ministries, not in the existing landfill, neither in Armenian Statistical Office. Database on MSW and HW generation, collection, treatment, and disposal has to be established as soon as possible.
### Key indicators of HWM effectiveness and quality

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficiency of MSW bill payments collection</td>
<td>database in operation</td>
<td>no database in operation</td>
<td>80%</td>
<td>Warsaw estimated lack of payments amounts to 17.67% (according to response received).</td>
</tr>
<tr>
<td>Number of new initiatives regarding HW taken by city administration</td>
<td>82.33%</td>
<td>92%</td>
<td>0</td>
<td>Engaged experts to allocate the days for collection of data; beneficiary staff to provide access to data and documents.</td>
</tr>
<tr>
<td>Number of investment project related to HWM which are completed within the framework of the Action</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Engaged experts to allocate the days for collection of data.</td>
</tr>
</tbody>
</table>

**Databases on MSW and HW that are maintenance by PUC or the city administration.** Relevant data that are collected, analysed and processing could be used for adequate decision making thus leading to improvement of the quality of MWM/HWM Governance.

**Warsaw (2020):**
- BDO waste database
- Engaged experts to allocate the days for collection of data; beneficiary staff to provide access to data and documents.

**Tirana (2020):**
- Tirana City documentation

**Yerevan city (2020):**
- Yerevan City documentation

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62 Baza Danych o Odadach

63 In Warsaw estimated lack of payments amounts to 17.67% (according to response received).
### Key indicators of HWM effectiveness and quality

<table>
<thead>
<tr>
<th>Citizen’s satisfaction with MWM/HWM system</th>
<th>This indicate represent the assessment of the quality of provided waste management services</th>
<th>Yerevan (2021): 3.0 out of 5.0</th>
<th>Citizens’ survey</th>
<th>Engaged experts to allocate the days for collection of data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warsaw: (2021): 4.1 out of 5.0</td>
<td>Warsaw: (2021): 4.1 out of 5.0</td>
<td>Citizens’ survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tirana (2021): 2.5 out of 5.0</td>
<td>Yerevan (2021): 64</td>
<td>Yerevan City documentation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Set 4: Key indicators on democracy and decentralization

<table>
<thead>
<tr>
<th>Number of entities that have a license to handle HW</th>
<th>The number of entities that have a license to handle HW (collection, transportation, storage, treatment, recycling, utilization, disposal and burial) illustrates the capacity and market for HW management. Also this figure indicates the improvement of participatory mechanisms in HW management.</th>
<th>Yerevan city (2020): 21</th>
<th>Yerevan city documentation</th>
<th>Engaged experts to allocate the days for collection of data; beneficiary staff to provide access to data and documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warsaw (2020): 17</td>
<td>Warsaw City documentation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tirana (2020): 0</td>
<td>Tirana City documentation</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of public events to promote innovation, R&amp;D and smart solutions on HWM</th>
<th>The number of innovation and R&amp;D and smart solution events illustrates a proactive approach of the city administration towards the improvement of public awareness.</th>
<th>Yerevan city (2020): 0</th>
<th>Project documentation</th>
<th>Engaged experts to allocate the days for collection of data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warsaw (2020): 0</td>
<td>Project documentation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tirana (2020): 0</td>
<td>Project documentation</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of grant calls for proposals awarded within Action</th>
<th>The number of grant calls for proposals awarded within the Action illustrates the ability of the local community to formulate new ideas and their</th>
<th>Yerevan city (2020): 0</th>
<th>Project documentation</th>
<th>Engaged experts to allocate the days for collection of data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warsaw (2020): 0</td>
<td>Project documentation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tirana (2020): 0</td>
<td>Project documentation</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

64 Citizen survey results performed within this Project

65 Although 16 permits for HW management have been issued in Albania, no one of the companies is located in Tirana.
## Key indicators of HWM effectiveness and quality

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
<th>Data</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of innovations and smart solutions for HWM implemented in the partner city</td>
<td>This indicator expresses the number of innovations and smart solutions for HWM implemented in the partner city which illustrates the strengthened capacities of the local community and the improved public awareness.</td>
<td>Yerevan city (2020): 0  Warsaw (2020): 0  Tirana (2020): 0</td>
<td>Engaged experts to allocate the days for collection of data</td>
</tr>
<tr>
<td>Number of industrial plants that start-up research-development-innovation process aiming to reduce the amount of generation of HW</td>
<td>The number of industrial plants that start-up research-development-innovation process aiming to reduce the amount of generation of HW illustrates the potential of the industry sector to apply cleaner production concept and to contribute to the circular economy</td>
<td>Yerevan city (2020): 0  Warsaw (2020): 0  Tirana (2020): 0</td>
<td>Engaged experts to allocate the days for collection of data</td>
</tr>
<tr>
<td>Number of obligations transfers to the lower levels of governance</td>
<td>The number of obligations transfers to the lower levels of governance illustrates the progress of decentralization (e.g. delegation of responsibility from national to local level or to the licensed entities).</td>
<td>Yerevan city (2020): 0  Warsaw (2020): 0  Tirana (2020): 0</td>
<td>Engaged experts to allocate the days for collection of data</td>
</tr>
</tbody>
</table>
IV
SURVEY REPORT - citizens’ awareness and satisfaction with HWM - Yerevan, Warsaw, Tirana
1 INTRODUCTION

As per the ToR of the Project "Capital Cities Collaborating on Common Challenges in Hazardous Waste Management - Yerevan, Warsaw, Tirana" one of the task within Component 0 was to conduct the Public Survey on quality delivery, equitable access to HWM and citizen’s awareness in Yerevan as the leader and its partners - Warsaw and Tirana.

As a Model city for benchmark analysis, the project team, on the recommendation of the Baseline Study contractor, Dvoper Ltd., selected Vienna (Austria, EU MS).

All activities performed to achieve the specified Result, as well all given recommendations for successful addressing of the public awareness on HWM were carried out, keeping in mind the following important aspects:

1. Diverse context of the three capitals with regard to level of adopted legislation, economic stability and ability for investments in HWM, existing HW infrastructure and management, education system and social aspects, as well as human and organizational resources to address the challenges of waste;
2. New trends and challenges reflected in the growth of urban population and economic wealth increase coupled with greater municipal waste and hazardous waste generation;
3. Global Climate Action and Sustainable development (EU and UN).

However, when it comes to public awareness - even though the Project cities (PCs) are at a different level of development and framed in largely different contexts/aspects, it is expected that mutual learning, lessons and experience exchange, and the development of joint and coordinated actions will generate significant results of improved knowledge among their populations. Awareness, strengthen by knowledge, can result in the change of citizens’ behaviours towards the separation of the household hazardous waste, and in general towards greater environmental consciousness and protection.

Prior to the Public Survey launch, the Questionnaire developed by the Contractor’s Team was submitted to the CA - Yerevan Municipality “IPIU Building up of Yerevan” Community Non-Commercial Organization (CNCO) for discussion, comments and approval.

After the official approval of the Questionnaire, the Survey was administered (April - June 2021) and collected data were aggregated, analysed and presented within the 1.3 Section Chapter 3. Applied sampling methodology and the questionnaire used for interviews are enclosed to this Baseline Study as Annex 1 and Annex 2. The Raw Dataset collected from survey are presented in the form of database and provided to the Contracting Authority in electronic format separately.

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66 C0 – “Preparation of a baseline study on hazardous waste management in the Cities of Yerevan, Warsaw, and Tirana”
67 Hereinafter referred to as the three Partner Cities – PCs
68 C0 Result 2 - Citizens’ awareness and satisfaction investigated by surveying samples of inhabitants in the three Partner Cities
69 Hereinafter Hazardous Waste Management - HWM
71 Hereinafter Contracting Authority - CA
2 BACKGROUND

2.1 Development of Survey Questionnaire

The Survey Questionnaire on quality delivery, equitable access to HWM and citizens’ awareness was developed in close cooperation with CA of each PC, during the Inception phase of the Baseline Study (February/March 2021).

Statistical samples of citizens in each PC and in the EU/EEA City (Vienna) were defined and selected as reference for the benchmark analysis, using the stratified random sampling methodology according to which the entire population is branched into multiple non-overlapping, homogeneous groups (strata) and randomly choose final members from the various strata.

Considering that the stratified random sampling is a more precise metric than simple random sampling, smaller samples served as a representative point of the whole population, thus resulting in higher time and cost-effectiveness of the survey (statistically non-representative). The minimum sample size for each PC was 80 returned/completed survey questionnaires.

The Questionnaire was focused on citizens’ awareness of HWM and their perceptions regarding the quality and accessibility of HWM services provided at municipal level, and formulated using non-specialized language meaning that specific technical terminology related to MWM/HWM was avoided, simplified and explained so that all participants across the strata were able to understand it.

Identical questions - in total 17 with specific closed type sub-questions, available in native language of each country - were used for all Cities thus generating comparable and agreeable data.

In order to fulfil the requirement about variations of the targeted groups, stratification was done according to age (from below 21 to above 61) and share of each age group was proportional with number of obtained answers. Targeted categories represented the population of the city centre and the periphery, different districts, different house units, education level, gender and other characteristics, that could reflects citizen’s awareness and knowledge of municipal hazardous waste.

Data analysis in relation to stratification may show whether older and/or less educated strata have less awareness, knowledge related to the concepts, management and consequences of inadequate treatment of hazardous waste. These findings may prove crucial for further actions in regard to usage of the awareness raising instruments for these specific target groups, i.e. possible thematic workshops, educational tools, etc.

Having in mind the complexity of the survey, especially in regard to COVID-19 restrictions, apart from CAs, cooperation with environmental NGOs in PCs was established to facilitate the surveying/interviewing process.

Survey was conducted in the period from April until June 2021, with the methods of collecting data as follows:

- online interviews (by phone or computer assisted phone interviews),
- live interviews in different parts of the city (which covered both housing types - houses (periphery) and flats (central city part)) and live interviews in supermarkets, markets, shopping malls, picnic areas and other places where the population of different demographic characteristics gathers (gender, age, educational level, income level).

This is a first survey of the public awareness on the HWM, conducted simultaneously in 4 targeted cities. Therefore it can be considered and further used as the baseline for measuring the success of future public awareness campaigns and related promotional activities on HWM in Yerevan, Warsaw, and Tirana.

2.1.1 Preparation of questions related to waste and its classification – important facts

The questions related to HWM have been developed in accordance with the general definition of waste, its classification, as well as the legal regulations that exist in the EU related waste and specifically household hazardous waste.
In the process of investigation of the citizen’s awareness, formulation of the questions is from vital importance. Apart from the fact that usage of the adequate vocabulary is mandatory, smart using of the proper definitions and facts can improve knowledge of the respondents, thus make them think about the types of waste they have at home.

For this reason, in this section we provide short overview of the most important facts and definitions of household waste, and their official sources. Any subsequent survey of the citizen’s awareness on HWM should include this information.

**Definition of the Waste as per Basel Convention**\(^{72}\): “Substances or objects, which are disposed of or are intended to be disposed of, or are required to be disposed of by the provisions of national law”.

Main Classification of Waste as non-hazardous or hazardous, per WFD\(^{73}\):

- **by its origin** (municipal or household waste and similar commercial, institutional and industrial waste, commercial and industrial).
- **by characteristics** (non-hazardous, inert and hazardous).

List of waste includes twenty groups that represent different waste origin and composition. In addition, classification criteria relating to the properties that may render waste hazardous are also regulated by WFD.

An overview of the types of hazardous waste generated in the household, by their source and index number, as provided in the List of Waste:

1. **Household chemicals and similar commercial, industrial and institutional chemicals**
   a) Cleaning and personal care products.
   b) Paints, varnishes, ink and glues.
   c) Households, parks and garden pesticides.
   d) Photochemicals.
2. **Domestic healthcare waste**
   a) Unused Pharmaceutical products, medicine,
3. **Construction and demolition waste from households, small commerce and institutions**
   a) Asbestos waste
   b) Treated wood,
   c) Coal tar and tarred products.
4. **Automotive maintenance waste**
   a) Oil filters and contaminated absorbing materials,
   b) Automotive products, surface polish, anti-freeze fluids.
5. **Waste electrical and electronic equipment,**
6. **Batteries and accumulators.**

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\(^{72}\) Basel Convention on the control of trans boundary movements of hazardous wastes and their disposal, an international treaty, adopted in 1989 and into force from 1992, by UNEP

\(^{73}\) EU Framework Directive on Waste, EU WFD - Article 3(2).
7. **Mercury containing waste** (other than WEEE) Household Mercury-containing waste includes thermostats, thermometers, sporting equipment, batteries, light bulbs (fluorescent bulbs, compact fluorescent light bulbs (CFLs), high intensity discharge (HID) lamps, ultraviolet lamps, neon lights), electronics (LCD screens). Dental amalgam is also a source mercury in waste.

Edible oil and fat edible oil and fat are not hazardous waste but they are included in this study because of improper treatment of this type of waste. Improper management of waste vegetable oil and animal fat includes pouring it down sewage system, onto soil, and disposing of it together with packaging via the residual waste bin, causing hazard impact to the environment, soil, air, surface and groundwater.

8. **Packaging**
3 SURVEY REPORTS – YEREVAN, TIRANA, WARSAW, VIENNA

3.1 Survey Report – Yerevan

Armenia, and more specifically the capital city of Yerevan (1.07 million inhabitants – 2019 estimate), is faced with negative consequences of decades-long unsustainable management of municipal waste and almost non-existent management of hazardous waste. HWM in Yerevan, as an integral part of MWM, must be fully (re)organised with the application of modern thinking, planning, knowledge and technology, and approximated to the best practices as implemented in the EU, to the extent feasible. Armenia has state laws that regulate waste and its disposal, but there is much more actions that need to be done in the future, in order to achieve the targets of the EU MS legal framework towards WM, especially HWM. It is fully recognized by Yerevan authorities that modernization in this field can be done in a ‘smart’ way by a fast-track transfer of effective solutions existing elsewhere and by learning from and with other cities faced with HWM as an important challenge in relation to the Sustainable Development Goals and the Global Climate Action.

Main findings of the survey on citizen’s awareness on waste management shows that the population of the Capital city is willing to participate in the process of implementation of the “Green policies”.

<table>
<thead>
<tr>
<th>Timeframe of the Survey</th>
<th>26 April 2021 – 2 June 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of people involved</td>
<td>100</td>
</tr>
<tr>
<td>Number of settlements involved</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Urban: 36 / Partially Urban 62 / Rural 2</td>
</tr>
<tr>
<td>Methodology</td>
<td>Quantitative field and online research</td>
</tr>
<tr>
<td></td>
<td>45 online interviews (by phone or computer assisted phone interviews)</td>
</tr>
<tr>
<td></td>
<td>55 live interviews in different parts of the city (which covered both housing types - houses (periphery) and flats (central city part)) ad live interviews in supermarkets, markets, shopping malls, picnic areas and other places where the population of different demographic characteristics gathers (gender, age, educational level, income level)</td>
</tr>
<tr>
<td>Sample</td>
<td>Adult citizens</td>
</tr>
<tr>
<td>Territory</td>
<td>Yerevan, Armenia</td>
</tr>
<tr>
<td>Questionnaire</td>
<td>Structured questionnaire, up to 30 minutes for answering</td>
</tr>
<tr>
<td>Number of questions</td>
<td>17</td>
</tr>
</tbody>
</table>

RESUME:

The Survey was conducted in the period of one and a half month, during COVID-19 pandemic, with 100 citizens involved.

Investigation covered 12 settlements, with the highest number of respondents in partially urban settlements 62%, followed by urban population with 36% share. Respondents living in rural parts of Yerevan such as Nubarashen were covered by 2%.

As of districts, most respondents are targeted in the Arabakir (where most of the type households are flats), followed by the district of Nork Nork (where most of the type households are houses). However, the data indicates that the sample of the surveyed population is 75% for apartments, while in houses as household type lives 25% of respondents.
The average age of the respondents is from 21 to 50 years old (79%), with average income (+more than average) 74% and at tertiary level of education 94%. With regards to the high percentage of respondents with tertiary level of education, the survey results may be excessively positive in terms of citizen’s awareness and behaviours. Data shows that 47% of respondents have between 4-5 members per household, while only 1% live alone.

The sample included almost an equal number of men and women: females 48%, males 52%.

A large percentage of respondents (91) is aware of problematic nature of hazardous types of waste in their houses, and ranked by percentage, answers are:

- No.1 - Detergents, cleaning agents and their packaging,
- No.2 - Batteries and accumulators (containing sulphuric acid, mercury, nickel, cadmium, lead, etc.),
- No. 3 - Waste from electrical and electronic equipment: household appliances like fridges, microwaves, etc.; TVs, cell phones, IT equipment; fluorescent, sodium, or LED lamps, etc. (containing mercury, lead, cadmium).

Last two types of HW on the scale were:

- Solvents, acids, bases, oxidizers and their packaging,
- Construction and demolition waste containing asbestos or other dangerous substances.

A large number of respondents were interested (82%) in answering the question “Do you think that the types of waste mentioned above are ‘problematic/hazardous waste’?”

The answers with highest percent per sample:

1. Dangerous for human health, animals and environment (soil, water),
2. Dangerous because they are not self-degraded, and consist of harmful substances and chemicals, heavy metals, acids, etc.,
3. No recycling in Armenia;
4. Long degradable period.

Below 10% are the responses related to CO₂ emissions, but there is no wordings on Climate Change and how environmental pollution is related to climate change.

Only 33% percent of respondents do recycling, while only 25% is familiar with locations in Yerevan where disposal of hazardous waste is possible. 75% of targeted population do not even know where the waste collection points are, and if they are placed at all in their district.

Answers on the question “What would motivate you the most to hand over HW separately from other waste?” represented in total % of the sample are:

- 96% - Easy availability of collection points where citizens can bring their hazardous waste,
- 90% - Cleaner and safer city thanks to hazardous waste being handled properly,
- 72% - Certain days dedicated to collection of hazardous waste by public utility company (for example, the first Saturday of each month).

93% of respondents are interested in the proper disposal of HW, and waste management, and consider actions on HWM as very important. Following this result, significant number are aware that HW has great negative impact on human health (92%), while 96% consider that improper disposal of HW also has large negative impact on environment.

In regard to the level of knowledge/awareness of the respondents about the negative impacts of HW to human health and the environment:

- 47% consider themselves with good knowledge, while 48% think that they have medium or low knowledge about the environment and
- 40% consider themselves with good knowledge, while 6% think that they have low knowledge about the negative impact on human health.

Based on given answers waste management service in Yerevan is evaluated as 3 out of 5.
94% of respondents answered on the question “What suggestions would you have regarding hazardous waste management in your Municipality?”, while 84% answered on question “What suggestions would you have regarding general municipal waste management in your Municipality?”

In total, five different aspects are with highest percent per sample:

1. Education on HWM (Preschool, Elementary, High Schools and Elderly), Public Awareness Campaigns;
2. Installation of more waste binbins for HW separation (for different types of HW), better control and better access to citizens covering the whole city area;
3. To build HWM Facilities (with associated HWM infrastructure) and to use examples of good practice from abroad;
4. Easy access to information on HWM and collection points (offline and online);
5. Organize HW events once per week for the citizens of all districts to handover their HHW.

Please check section 1.3.4 for Comparative Survey Analysis between Yerevan, Warsaw Tirana, and Vienna.

Below are the graphs with main figures and findings from the Survey:
<table>
<thead>
<tr>
<th>No.</th>
<th>No. of respondents</th>
<th>Municipality/District</th>
<th>Population</th>
<th>Type of housing unit</th>
<th>Type of settlement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>17</td>
<td>Arabkir</td>
<td>117,704</td>
<td>Flats</td>
<td>Urban</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
<td>Nor Nork</td>
<td>126,065</td>
<td>Houses</td>
<td>Partially Urban</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
<td>Kentron</td>
<td>125,453</td>
<td>Flats</td>
<td>Urban</td>
</tr>
<tr>
<td>4</td>
<td>9</td>
<td>Kanaker-Zeytun</td>
<td>73,886</td>
<td>Houses</td>
<td>Urban</td>
</tr>
<tr>
<td>5</td>
<td>9</td>
<td>Shengavit</td>
<td>135,535</td>
<td>Flats</td>
<td>Partially Urban</td>
</tr>
<tr>
<td>6</td>
<td>9</td>
<td>Erebuni</td>
<td>123,092</td>
<td>Houses</td>
<td>Partially Urban</td>
</tr>
<tr>
<td>7</td>
<td>9</td>
<td>Malatia-Sebastia</td>
<td>132,900</td>
<td>Houses</td>
<td>Partially Urban</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
<td>Achapnyak</td>
<td>108,282</td>
<td>Flats</td>
<td>Partially Urban</td>
</tr>
<tr>
<td>9</td>
<td>8</td>
<td>Avan</td>
<td>53,231</td>
<td>Houses</td>
<td>Partially Urban</td>
</tr>
<tr>
<td>10</td>
<td>5</td>
<td>Davtashen</td>
<td>42,380</td>
<td>Flats</td>
<td>Partially Urban</td>
</tr>
<tr>
<td>11</td>
<td>4</td>
<td>Nork-Marash</td>
<td>12,049</td>
<td>Houses</td>
<td>Partially Urban</td>
</tr>
<tr>
<td>12</td>
<td>2</td>
<td>Nubarashen</td>
<td>9,561</td>
<td>Flats</td>
<td>Rural (mostly)</td>
</tr>
</tbody>
</table>

**District sample in %**

<table>
<thead>
<tr>
<th>Municipality/District</th>
<th>District share in responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kanaker-Zeytun</td>
<td>9.0%</td>
</tr>
<tr>
<td>Shengavit</td>
<td>9.0%</td>
</tr>
<tr>
<td>Nubarashen</td>
<td>2.0%</td>
</tr>
<tr>
<td>Nork-Marash</td>
<td>4.0%</td>
</tr>
<tr>
<td>Malatia-Sebastia</td>
<td>9.0%</td>
</tr>
<tr>
<td>Nor Nork</td>
<td>10.0%</td>
</tr>
<tr>
<td>Kentron</td>
<td>10.0%</td>
</tr>
<tr>
<td>Erebuni</td>
<td>9.0%</td>
</tr>
<tr>
<td>Davtashen</td>
<td>5.0%</td>
</tr>
<tr>
<td>Arabkir</td>
<td>17.0%</td>
</tr>
<tr>
<td>Avan</td>
<td>8.0%</td>
</tr>
<tr>
<td>Achapnyak</td>
<td>8.0%</td>
</tr>
</tbody>
</table>
**Type of HW per household**

The types of hazardous waste in household:
- Waste tyres (car tyres): 17.0%
- Construction and demolition waste containing asbestos or other dangerous substances: 4.0%
- Pharmaceutical waste: 49.0%
- Detergents, cleaning agents and their packaging: 80.0%
- Solvents, acids, bases, oxidizers and their packaging: 5.0%
- Pesticides and their packaging: 9.0%
- Dyes, paint remnants, varnishes and their packaging: 13.0%
- Machine oil and its packaging: 15.0%
- Batteries and accumulators (containing sulphuric acid, mercury, nickel, cadmium, lead, etc.): 76.0%
- Waste from electrical and electronic equipment: household appliances like fridges, microwaves, etc., TVs, cell phones, IT equipment, fluorescent, sodium, or LED lamps, etc. (containing mercury, lead, cadmium): 61.0%

**Do you think that the types of waste mentioned above are ‘problematic/hazardous’?**

- Yes: 91%
- No: 3%
- I don’t know: 6%
In total 82% respondents answered.

The answers with highest percent per sample:

1. Dangerous for human health, animals and environment (soil, water),
2. Dangerous because they are not self-degraded, and consist of harmful substances and chemicals, heavy metals, acids, etc.
3. No recycling in Armenia;
4. Long degradable period.

The answers below 10% per sample:

1. Gas emissions - those waste appear together with the common trash, where they are burned, exporting poisonous gases – CO₂, or just don’t get degraded. In all cases, their emissions return to landfills, pastures, fields through air, soil, rain.

Some examples of specific answers:

1. "Thus is the official opinion of scientists."
2. "I’m aware of the battery dangers, it’s even written on their packaging."
3. "Recycling is extremely difficult or expensive, in some cases impossible."
4. "Where should mercury be thrown when the thermometer is damaged?"
5. "Recycling this waste is very difficult or impossible in many countries there is no practice of recycling such waste. Even if not recycled, they release substances dangerous to nature and the human body."
6. "It is obvious why. At least we were sending the tires to the border, collecting and handing the batteries over, and it is not yet known what awaits them but in the case of the other above-mentioned wastes, we remain confused."
In total 34% respondents answered.

The answers with highest percent per sample:

1. Separation of paper, plastic, glass, pharmaceutical waste;
2. We do not know what to do with batteries;
3. No, as there is no alternative, we mix HW with other trash or we don’t know where to dispose them.

Some examples of specific answers:

1. “I keep them until I find a lasting solution.”
2. “Batteries can be handed over to VTB bank branches (they have special containers), and a shop on the Mashtots street.”
3. “I’m not able to utilize the batteries, as they’re not recycled in Armenia.”
4. “I still keep pharmaceutics and batteries with me.”
5. “I keep the damaged LED bulbs and batteries in the house for the last 2-3 years. I handed over the packaging of the cleaners with plastic; I dumped the medicine with the garbage or in the sewer, though I know that it is not right.”

Are you familiar with locations in your city where disposal of hazardous waste is possible?

![Graph showing 75% Yes and 25% No]
What would motivate you the most to hand over HW separately from other waste?

- I am not interested in hazardous waste separation
- Cleaner and safer city thanks to hazardous waste being handled properly
- Adequate financial rewards (for example, receiving cash upon delivery or discounts on cost of utilities)
- Easy availability of collection points where citizens can bring their hazardous waste
- Certain days dedicated to collection of hazardous waste by public utility company (for example, the first Saturday of each month)

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>5%</td>
<td>31%</td>
<td>25%</td>
<td>18%</td>
<td>0%</td>
</tr>
<tr>
<td>14%</td>
<td>23%</td>
<td>25%</td>
<td>31%</td>
<td>0%</td>
</tr>
<tr>
<td>26%</td>
<td>25%</td>
<td>18%</td>
<td>14%</td>
<td>0%</td>
</tr>
<tr>
<td>47%</td>
<td>21%</td>
<td>16%</td>
<td>9%</td>
<td>3%</td>
</tr>
<tr>
<td>74%</td>
<td>25%</td>
<td>18%</td>
<td>14%</td>
<td>5%</td>
</tr>
</tbody>
</table>
In your opinion, what are the impacts of hazardous waste on human health and the environment?

- **Very large impact**
  - Impact on the environment: 34%
  - Impact on human health: 45%
  - Total: 65%

- **Large impact**
  - Impact on the environment: 29%
  - Impact on human health: 34%

- **Moderate impact**
  - Impact on the environment: 13%
  - Impact on human health: 2%

- **Small impact**
  - Impact on the environment: 1%
  - Impact on human health: 4%

- **No impact**
  - Impact on the environment: 3%
  - Impact on human health: 4%
How do you assess your knowledge/awareness about the negative impacts of HW to human health and the environment?

**Impact on human health**

- No impact: 45%
- Small impact: 4%
- Moderate impact: 4%
- Large impact: 13%
- Very large impact: 34%

**Impact on the environment**

- No impact: 65%
- Small impact: 3%
- Moderate impact: 1%
- Large impact: 29%
In general, how satisfied are you with waste management services in your Municipality?

- Very dissatisfied: 7%
- Dissatisfied: 23%
- Neither dissatisfied nor satisfied: 17%
- Satisfied: 37%
- Very satisfied: 16%
What suggestions would you have regarding hazardous waste management in your Municipality?

In total 94% respondents answered.

The answers with highest percent per sample:

1. Education on HWM (Preschool, Elementary, High Schools and Elderly), Public Awareness Campaigns;
2. Installation of more waste bins for HW separation (for different types of HW), better control and better access to citizens covering the whole city area;
3. To build HWM Facilities (with associated HWM infrastructure) and to use examples of good practice from abroad;
4. Easy access to information on HWM and collection points (offline and online);
5. Organize HW events once per week for the citizens of all districts to handover their HHW.

The answers below 10% per sample:

1. To organize monitoring services around the populated areas and buildings at least once in a month;
2. There should be a mechanism that motivates locals to bring their waste to recycling factories such as;
3. An installation of paid service of non-household waste collection;
4. Bins for Batteries;
5. Educate about the risk for human health;
6. Apply an adequate financial reward system to facilitate the process.

Some examples of specific answers:

1. “The society must be always taught, information banners and ads must be everywhere, many educational meetings with locals and they should be organized quite often. People are not aware of anything. Taking this chance, I want to inform you that some people open the bin, designed for glass, and throw ordinary trash in it. So, people are not aware. So far I’ve not met such an event, if I did not search for it by myself.”
2. “To map all those organizations who’re interested in this field and to cooperate with them, involving stakeholder NGOs.”
3. “To convince the business owners to start acting eco-friendly.”
4. “To transport the unused factories into recycling factories.”
5. “Carry out awareness-raising activities so that waste bins are not turned into garbage bins.”
6. “It is necessary to develop a program with the sponsorship of the state, cooperating with economic and scientific entities, taking into consideration the examples of experienced, developed countries. There is nothing unusual, you only need desire, optimism, financial resources and education.”
In total, 84 % respondents answered.

The answers with highest percent per sample:

1. More awareness-raising campaigns on how to sort, which types of plastic can be recycled in Armenia, where to throw our recyclable waste. Enlarge campaigns. Use social media, videos, commercials, share information and knowledge, educate people on how HW is dangerous for the society;
2. More bins, more collection points, more control;
3. Penalties for those who are not recycling;
4. To install hazardous waste bins next to waste sorting bins.

Some examples of specific answers:

1. „To upgrade the recycling factories thanks to business-state cooperation, that transform those factories into more eco-friendly ones, reducing their negative impact on the nature."
2. „To be more flexible and closer to the citizen."
3. „At the same time there should be motivating mechanisms – e.g. a local brings his/her waste, and eventually receives discounts by the local companies or municipality partners in return."
4. „To add more waste bins in Yerevan, awareness-raising, to fine, to fight against those who grab the waste from bins.”
5. „To monitor the process and define huge fines.”
6. „Rewarding mechanisms. Only social media campaigns are not efficient.”
7. „Form a group of specialists from different fields - chemists, biologists, ecologists, engineers, IT specialists, lawyers - to discuss the general issue from the point of view of waste management.”
8. „Develop a long-term strategy.”
9. „Such solutions that save time and help people to segregate, throw their waste.”
10. „There are many sorting bins in the city, which are placed in different parts of the city, but when people see green trash bins, they throw their garbage in it, thus not sorting it. It is worth organizing awareness courses for all citizens everywhere, explaining how dangerous waste is and how important it is to recycle it. Green trash bins can also be placed further away from residential buildings / neighbourhoods. But I think it is better to invest some symbolic money or encouragement in this sphere, so that the culture of recycling is finally formed in our country. The new generation, it seems to me, realizes the seriousness of this situation and the importance of sorting.”
11. „It is necessary to take into account the world experience, to give a boost to this case, because our country is obviously lame in the issue of waste sorting and recycling let them open a special organization that will process that waste.”
12. „I think if there is state support, an increase in the city budget, it will be possible to recycle garbage.”
3.2 Survey Report – Warsaw

<table>
<thead>
<tr>
<th>Timeframe of the Survey</th>
<th>18 May 2021 – 3 June 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of people involved</td>
<td>90</td>
</tr>
<tr>
<td>Number of settlements involved</td>
<td>18</td>
</tr>
<tr>
<td>Urban: 34 / Partially urban:56 / Rural: 0</td>
<td></td>
</tr>
</tbody>
</table>

- Methodology: Quantitative field and online research
- 90 live interviews in different parts of the city (which covered both housing types - houses (periphery) and flats (central city part)) ad live interviews in supermarkets, markets, shopping malls, picnic areas and other places where the population of different demographic characteristics gathers (gender, age, educational level, income level)

- Sample: Adult citizens
- Territory: Warsaw, Poland
- Questionnaire: Structured questionnaire, up to 30 minutes for answering
- Number of questions: 17

Poland has been a member of the European Union since 1 May 2004 under the Accession Treaty signed in Athens on 16 April 2003. As a member state, Poland has the power to influence EU decisions, to participate in the EU parliament and to use available funds\(^74\), among which are those for environment. The municipal waste management system in Poland has changed significantly in previous years as a result of adaptation to EU requirements, such as the scope of implementing the waste directive and the ambitious CE package from 2015.

In 2018, Poland generated 329 kg/y/inhabitant of municipal waste, well below the EU average (492 kg per capita). Reported data show that 34 % of municipal waste is recycled, which is much below the EU average of 46%. In principle, the updated National Waste Management Plan and the regional waste management plans prioritise separate collection and recycling. They provide for significant investment in selected waste collection sites, separate collection schemes, and conversion of mechanical-biological treatment facilities to sort separately collected waste and compost biodegradable waste. There are plans to invest in new waste-to-energy facilities or co-incineration. The City of Warsaw (1.76 million inhabitants in 2019) is quite advanced in dealing with HWM, and a source of experience and possible solutions yet several issues need attention, studies and investments. Currently the key challenges for Warsaw are studying of advanced incineration solutions, expansion of HW collection system, educating the population and promoting a greater engagement of the business sector.

RESUME:

The Survey was conducted in the period of less than a month, during COVID-19 pandemic, with 90 citizens involved.

Investigation covered 18 settlements, with the highest number of respondents in partially urban settlements 62.2%, while urban population has 37.7% share.

\(^74\) Environment for Europeans, https://ec.europa.eu/environment/efe/funding-and-life_en
As of districts, most respondents are targeted in Targówek (where most of the type households are houses), followed by the district of Praga Południe (where most of the type households are flats). The data indicates that the sample of the surveyed population is 84.5% for apartments, while in houses as household type lives 15.5% of respondents.

The average age of the respondents is from 20 to 50 years old (53.3%) and 50 to 61+ (38.8%), with average (+more than average) income 82.2% and at tertiary (44.4%) and secondary (46.6%) level of education. Data shows that 62.2% of respondents have between 2-3 members per household, 26.6% have between 4-5 members per household, while only 8.8% live alone.

The sample included almost equal number of men and women: females 47%, males 53%.

72.2% of respondents are aware of problematic nature of hazardous types of waste in their houses, yet 27.7% think that HW is not problematic. Per percentage and per type of waste, ranked answers are as listed:

- No.1 - Detergents, cleaning agents and their packaging,
- No. 2 - Waste from electrical and electronic equipment: household appliances like fridges, microwaves, etc.; TVs, cell phones, IT equipment; fluorescent, sodium, or LED lamps, etc. (containing mercury, lead, cadmium),
- No.3 - Batteries and accumulators (containing sulphuric acid, mercury, nickel, cadmium, lead, etc.),

Last two types of HW on the scale were:

- Solvents, acids, bases, oxidizers and their packaging,
- Construction and demolition waste containing asbestos or other dangerous substances.

61.1% of respondents were interested in answering the question “Do you think that the types of waste mentioned above are ‘problematic/hazardous waste’?"

The answer with highest percent per sample was mainly referred to opinion that HW Contain various chemicals that are hazardous to health and environment, considering HW as a dangerous and difficult for disposal;

Large number of citizens, 82.2% percent - do waste separation, while 83.3% of targeted population know the location of the waste collection points at their settlements.

Answers on the question “What would motivate you the most to hand over HW separately from other waste?” represented in total % of the sample are:

- 98.8% - Easy availability of collection points where citizens can bring their hazardous waste
- 97.7% - Cleaner and safer city thanks to hazardous waste being handled properly 90%
- 93.3% - Certain days dedicated to collection of hazardous waste by public utility company (for example, the first Saturday of each month)
- 91.1% - Adequate financial rewards (for example receiving cash upon delivery or discounts on cost of utilities)

67.7% of respondents are interested in the proper disposal of HW, and waste management, and consider actions on HWM as very important. 98.8% are aware that HW has great impact on human health (and) environment.

In regard to the level of knowledge/awareness of the respondents about the negative impacts of HW to human health and the environment:

- 98.8% consider themselves with good knowledge, while only 1.2% think that they have medium or low knowledge about the negative impact on the environment and on human health.

Based on given answers waste management service in Warsaw is evaluated as 4.1 out of 5.
65.5% of respondents answered on the question “What suggestions would you have regarding hazardous waste management in your Municipality?”, while 93.3% answered on question “What suggestions would you have regarding general municipal waste management in your Municipality?”

The answers with highest percent per sample refers mainly to:

1. More collection points;
2. More frequent garbage collection; more regularly, on time;
3. More educational campaigns and more information about waste collection points;
4. No suggestions or opinion;
1. Price reduction;

Please check section 1.3.4 for Comparative Survey Analysis between Yerevan, Warsaw, Tirana, and Vienna.

Below are the graphs with main figures and findings from the Survey:

<table>
<thead>
<tr>
<th>No.</th>
<th>No. of respondents</th>
<th>Municipality/District</th>
<th>Population</th>
<th>Type of housing unit</th>
<th>Type of the settlement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>17</td>
<td>Targówek</td>
<td>123,278</td>
<td>Houses</td>
<td>Partially Urban</td>
</tr>
<tr>
<td>2</td>
<td>17</td>
<td>Ursynów</td>
<td>145,938</td>
<td>Houses</td>
<td>Partially Urban</td>
</tr>
<tr>
<td>3</td>
<td>15</td>
<td>Praga Południe</td>
<td>178,665</td>
<td>Flats</td>
<td>Urban</td>
</tr>
<tr>
<td>4</td>
<td>15</td>
<td>Rembertów</td>
<td>23,280</td>
<td>Houses</td>
<td>Partially Urban</td>
</tr>
<tr>
<td>5</td>
<td>10</td>
<td>Żoliborz</td>
<td>48,342</td>
<td>Flats</td>
<td>Urban</td>
</tr>
<tr>
<td>6</td>
<td>4</td>
<td>Śródmieście</td>
<td>122,646</td>
<td>Flats</td>
<td>Urban</td>
</tr>
<tr>
<td>7</td>
<td>3</td>
<td>Wola</td>
<td>137,519</td>
<td>Houses</td>
<td>Urban</td>
</tr>
<tr>
<td>8</td>
<td>3</td>
<td>Bielany</td>
<td>132,683</td>
<td>Flats</td>
<td>Partially Urban</td>
</tr>
<tr>
<td>9</td>
<td>2</td>
<td>Mokotów</td>
<td>220,682</td>
<td>Flats</td>
<td>Urban</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
<td>Ursus</td>
<td>53,755</td>
<td>Flats</td>
<td>Partially Urban</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>Wawer</td>
<td>69,896</td>
<td>Houses</td>
<td>Partially Urban</td>
</tr>
<tr>
<td>12</td>
<td>1</td>
<td>Praga Północ</td>
<td>69,510</td>
<td>Flats</td>
<td>Partially Urban</td>
</tr>
<tr>
<td>13</td>
<td>0</td>
<td>Bemowo</td>
<td>115,873</td>
<td>Flats</td>
<td>Partially Urban</td>
</tr>
<tr>
<td>14</td>
<td>0</td>
<td>Białolęka</td>
<td>96,588</td>
<td>Houses</td>
<td>Partially Urban</td>
</tr>
<tr>
<td>15</td>
<td>0</td>
<td>Ochota</td>
<td>84,990</td>
<td>Flats</td>
<td>Urban</td>
</tr>
<tr>
<td>16</td>
<td>0</td>
<td>Włochy</td>
<td>38,075</td>
<td>Houses</td>
<td>Partially Urban</td>
</tr>
<tr>
<td>17</td>
<td>0</td>
<td>Wilanów</td>
<td>23,960</td>
<td>Houses</td>
<td>Rural (Agricultural fields)</td>
</tr>
<tr>
<td>18</td>
<td>0</td>
<td>Wesoła</td>
<td>22,811</td>
<td>Houses</td>
<td>Rural (Woods)</td>
</tr>
</tbody>
</table>
Which city district in Warsaw

- Mokotów: 16.67%
- Praga Południe: 16.67%
- Ursynów: 11.11%
- Wola: 11.11%
- Bielany: 4.44%
- Wilanów: 4.44%
- Śródmieście: 2.22%
- Żoliborz: 2.22%
- Ursus: 2.22%
- Praga Północ: 1.11%
- Wawer: 1.11%
- Ochota: 0.00%
- Białolęka: 0.00%
- Bemowo: 0.00%
- Praga Północ: 0.00%
- Ursus: 0.00%
- Wilanów: 0.00%
- Wola: 0.00%
- Bielany: 0.00%
- Wilanów: 0.00%
- Śródmieście: 0.00%
- Bielany: 0.00%
How many people is your household composed of?

Number of members in the household of the interviewed person:

- 8.89% only 1 member
- 34.44% to 2 members
- 27.78% to 3 members
- 26.67% 4 to 5 members
- 2.22% 6 or more members

Which type of housing unit do you live in?

Type of housing in Warsaw:

- 84.44% Flat
- 15.56% House

Age per sample:

Age:

- <21: 7.78%
- 21-30: 14.44%
- 31-40: 17.78%
- 41-50: 21.11%
- 51-60: 15.56%
- >61: 23.33%

Gender per sample:

Warsaw:

- Male: 53%
- Female: 47%

Education level per sample:

Education level:

- No education or incomplete primary: 44.44%
- Primary: 3.33%
- Secondary: 5.56%
- Tertiary: 46.67%

Income per sample:

Compared to incomes in the country:

- Below average: 61.11%
- Average: 17.78%
- More than average: 21.11%
Type of HW per household

The types of hazardous waste in household

- Waste tyres (car tyres): 15.56%
- Construction and demolition waste containing asbestos or other dangerous substances: 6.67%
- Pharmaceutical waste: 46.67%
- Detergents, cleaning agents and their packaging: 84.44%
- Solvents, acids, bases, oxidizers and their packaging: 5.56%
- Pesticides and their packaging: 20.00%
- Dyes, paint remnants, varnishes and their packaging: 22.22%
- Machine oil and its packaging: 30.00%
- Batteries and accumulators (containing sulphuric acid, mercury, nickel, cadmium, lead, etc.): 61.11%
- Waste from electrical and electronic equipment: household appliances like fridges, microwaves, etc.; TVs, cell phones, IT equipment; fluorescent, sodium, or LED...: 83.33%

Do you think that the types of waste mentioned above are 'problematic/hazardous waste'?

- Yes: 72.22%
- No: 21.11%
- I don't know: 6.67%
In total, 55% respondents answered.

The answers with highest percent per sample:

1. Contain various chemicals that are hazardous to health and environment;
2. HW is dangerous and difficult for disposal;

Some examples of specific answers:

1. “They should be disposed by producers (not by communal services).”
2. “People don’t know how to dispose chemical waste.”
3. “They are expensive to disposal.”
4. “They litter forest and other green area.”
5. “People should be disciplined and abide by the rules of waste separation.”
6. “It must be brought to designated place.”
7. “It poison rivers and air.”
8. “They are not degradable.”
9. “Everyone tries to clean earth (for example campaign "Clean up world") but animals die anyway due to ordinary waste, plastics etc.”
10. “They cause development of diseases - for example cancer, autoimmunological diseases, allergies, etc.”
11. “This waste should be separated and deposed separately because it dissolved slow.”
12. “Problem with utilization, harmful for environment.”
13. “It is hard to do their treatment.”

In the last 2-3 months how have you mainly disposed hazardous waste?
In total, 2% respondents answered. The answers:

1. “I take it to the appropriate point.”
2. “In containers for plastic waste.”

Are you familiar with locations in your city where disposal of hazardous waste is possible?

- Yes: 83.33%
- No: 16.67%
Certain days dedicated to collection of hazardous waste by public utility company (for example, the first Saturday of each month)

Easy availability of collection points where citizens can bring their hazardous waste

Adequate financial rewards (for example receiving cash upon delivery or discounts on cost of utilities)

Cleaner and safer city thanks to hazardous waste being handled properly

I am not interested in hazardous waste separation

<table>
<thead>
<tr>
<th>Certain days dedicated to collection of hazardous waste by public utility company (for example, the first Saturday of each month)</th>
<th>Easy availability of collection points where citizens can bring their hazardous waste</th>
<th>Adequate financial rewards (for example receiving cash upon delivery or discounts on cost of utilities)</th>
<th>Cleaner and safer city thanks to hazardous waste being handled properly</th>
<th>I am not interested in hazardous waste separation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>42.22%</td>
<td>64.44%</td>
<td>37.78%</td>
<td>58.89%</td>
</tr>
<tr>
<td>Agree</td>
<td>43.33%</td>
<td>28.89%</td>
<td>35.56%</td>
<td>32.22%</td>
</tr>
<tr>
<td>Neither agree nor disagree</td>
<td>7.78%</td>
<td>5.56%</td>
<td>17.78%</td>
<td>6.67%</td>
</tr>
<tr>
<td>Disagree</td>
<td>6.67%</td>
<td>0.00%</td>
<td>8.89%</td>
<td>2.22%</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>0.00%</td>
<td>1.11%</td>
<td>0.00%</td>
<td>0.00%</td>
</tr>
</tbody>
</table>
Impact of hazardous waste on human health and the environment

In your opinion, what are the impacts of hazardous waste on human health and the environment?

- **Very large impact**: 38.89% on human health, 40.00% on the environment
- **Large impact**: 20.00% on human health, 16.67% on the environment
- **Moderate impact**: 0.00% on human health, 0.00% on the environment
- **Small impact**: 0.00% on human health, 1.11% on the environment
- **No impact**: 0.00% on human health, 0.00% on the environment

**Impact on human health**

- 1. No impact: 0.00%
- 2. Small impact: 38.89%
- 3. Moderate impact: 20.00%
- 4. Large impact: 0.00%
- 5. Very large impact: 1.11%

**Impact on the environment**

- 1. No impact: 50.00%
- 2. Small impact: 0.00%
- 3. Moderate impact: 33.33%
- 4. Large impact: 16.67%
- 5. Very large impact: 0.00%
How do you assess your knowledge/awareness about the negative impacts of HW to human health and the environment?

**Impact on human health**

- 0.00%
- 1.11%
- 18.89%
- 31.11%
- 48.89%

- 1. No knowledge / awareness
- 2. Limited knowledge / awareness
- 3. Medium knowledge / awareness
- 4. Good knowledge / awareness
- 5. Very good knowledge / awareness

**Impact on the environment**

- 0.00%
- 1.11%
- 21.11%
- 33.33%
- 44.44%

- 1. No knowledge / awareness
- 2. Limited knowledge / awareness
- 3. Medium knowledge / awareness
- 4. Good knowledge / awareness
- 5. Very good knowledge / awareness
In general, how satisfied are you with waste management services in your Municipality?

Average grade: 4.1

- 58.89% Very satisfied
- 26.67% Dissatisfied
- 8.89% Neither dissatisfied nor satisfied
- 4.44% Satisfied
- 1.11% Very dissatisfied
What suggestions would you have regarding hazardous waste management in your Municipality?

In total 59 % respondents answered.

The answers with highest percent per sample:

1. More collection points;
2. More frequent garbage collection; more regularly, on time;
3. More educational campaigns and more information about waste collection points
4. No suggestions.

Some examples of specific answers:

1. “Pick up points should be near large shopping centres’.”
2. “Better education, distribution of leaflets to boxes with such waste.”
3. “Certainty of the date of export/pick up.”
4. “The possibility of ordering export.”
5. “To send a card with information about the collection of such garbage once a month.”
6. “Monthly export.”
7. “Better marking of place.”
8. “Permanent solution.”
9. “Better access to collection points.”
10. “City has the problem with this waste.”
11. “Fines for those who don’t separate waste.”
In total 84 % respondents answered.

The answers with highest percent per sample:

1. Provide more information on collection and education on importance of proper HW disposal;
2. Increase the number of collection points and pick up the waste more frequently;
3. Price reduction;
4. No suggestions.

Some examples of specific answers:

1. “We have very high prices, much higher than in other countries.”
2. “Information on staircase.”
3. “Better securing of storage sites.”
4. “We have too few places to donate such things.”
5. “Containers at points of sale of this kind of products.”
6. “There are too few such places. People don’t segregate rubbish.”
7. “Information on when and where is a place for garbage collection.”
8. “Increase information and educate the public on this subject.”
10. “Information about place and date and place of garbage pickup.”
11. “More incinerators for normal garbage.”
12. “Clearer information about garbage pickups.”
13. “Increases the number of such places and keep the public well informed about such places.”
15. “To organize better.”
16. “Fines for those who don’t separate waste.”
17. “Improve quality of waste management
18. “More collection points.”
19. “More educational campaigns on HW.”
3.3 Survey Report – Tirana

<table>
<thead>
<tr>
<th>Timeframe of the Survey</th>
<th>18 May 2021 – 2 June 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of people involved</td>
<td>86</td>
</tr>
<tr>
<td>Number of settlements involved</td>
<td>11</td>
</tr>
<tr>
<td>Urban: 85 / Partially urban:1 / Rural:0</td>
<td></td>
</tr>
<tr>
<td>Methodology</td>
<td>Quantitative field and online research</td>
</tr>
<tr>
<td></td>
<td>36 online interviews (by phone or computer assisted phone interviews)</td>
</tr>
<tr>
<td></td>
<td>50 live interviews in different parts of the city (which covered both housing types - houses (periphery) and flats (central city part)) ad live interviews in supermarkets, markets, shopping malls, picnic areas and other places where the population of different demographic characteristics gathers (gender, age, educational level, income level)</td>
</tr>
<tr>
<td>Sample</td>
<td>Adult citizens</td>
</tr>
<tr>
<td>Territory</td>
<td>Tirana, Albania</td>
</tr>
<tr>
<td>Questionnaire</td>
<td>Structured questionnaire, up to 30 minutes for answering</td>
</tr>
<tr>
<td>Number of questions</td>
<td>17</td>
</tr>
</tbody>
</table>

Waste management in Albania is generally at a low level. The collection of municipal solid waste (MSW) is provided in most cities and towns but rarely in rural areas. In 2017, total waste generation was 442 kg/y/per capita, out of which some 385 kg/y/per capita represented solid municipal waste. While legislation on hazardous waste is in place, no information on hazardous waste management is available: expert studies estimate that hazardous waste may constitute some 3 to 5% of the total industrial waste – however data on quantity and types of industrial waste are not collected, and not relevant to household waste. This reflects on the HW management in Tirana (0.89 million inhabitants in 2019), that is currently not in a satisfactory situation.

Albania is striving to align its legislation with EU requirements. The last 4 subsequent EC Progress Reports om Albania have pointed out that only a modest progress has been made by the county with regard to the integrated waste management.

As in case of Tirana, survey data indicates that citizens are aware of importance of waste management, especially HW, and that they are willing to participate in further change of the behaviour, meaning that they are willing to recycle and to adapt themselves to new, greener actions of the municipal administration in HWM.

RESUME:

The Survey was conducted in the period of less than a month, during COVID-19 pandemic, with 86 citizens involved.

Investigation covered 11 settlements, with the highest number of respondents in urban settlements 98.8%, while partially urban population has only 1.1% share.

As of districts, most respondents are targeted in Tirana 2 - Bulevardi Bajram Curri, Bulevardi Zhan D’Ark, Qyteti Studenti, Sauku, Zona 1 (where most of the type households are flats), followed by the district of Tirana 6 - Kombinati, Yzerishti (where most of the type households are houses). The data indicates that the sample of the surveyed population is 58,1% for apartments, while in houses as household type lives 41.8% of respondents.

The average age of the respondents is from <20 to 40 years old (67.44%), with average (+more than average) income 87.2% and at tertiary (75.5%) and secondary (24.4%) level of education. Again, as the economic and
educational status of most respondents is high, the survey results might be overly optimistic from the perspective of the ‘average’ population, Data shows that 52.3% of respondents have between 4-5 members per household, while only 2.3% live alone.

The sample included 70% of females and 30% of males.

A large percentage of respondents (82.5%) are aware of problematic nature of hazardous types of waste in their houses, and ranked by percentage, answers are:

- No.1 - Detergents, cleaning agents and their packaging,
- No. 2 - Waste from electrical and electronic equipment: household appliances like fridges, microwaves, etc.; TVs, cell phones, IT equipment; fluorescent, sodium, or LED lamps, etc. (containing mercury, lead, cadmium),
- No.3 - Batteries and accumulators (containing sulphuric acid, mercury, nickel, cadmium, lead, etc.).

Last two types of HW on the scale were:
- Waste tyres (car tyres),
- Construction and demolition waste containing asbestos or other dangerous substances.

81.3% of respondents were interested in answering the question “Do you think that the types of waste mentioned above are ‘problematic/hazardous waste’?"

The answer with highest percent per sample was mainly that HW is dangerous for health and environment. Only 19.7% percent of respondents do recycling, while 24.4% are familiar with locations in Tirana where disposal of hazardous waste is possible. 75.5% of targeted population do not even know where the waste collection points are, and if they are placed at all in their district.

Answers on the question “What would motivate you the most to hand over HW separately from other waste?” represented in total percentage of the sample are:

- 97.6% - Cleaner and safer city thanks to hazardous waste being handled properly,
- 96.5% - Certain days dedicated to collection of hazardous waste by public utility company (for example, the first Saturday of each month),
- While 93% is share for answers: Easy availability of collection points where citizens can bring their hazardous waste and Adequate financial rewards (for example receiving cash upon delivery or discounts on cost of utilities).

84.8% of respondents are interested in the proper disposal of HW, and waste management, and consider actions on HWM as very important. Following this result, 100% are aware that HW has great negative impact on human health (and) environment.

In regard to the level of knowledge/awareness of the respondents about the negative impacts of HW to human health and the environment:

- 98.8% consider themselves with good knowledge, while only 1.2% think that they have medium or low knowledge about the negative impact on the environment and on human health.

Based on given answers waste management service in Tirana is evaluated as 2.5 out of 5.

95.3% of respondents answered on the question “What suggestions would you have regarding hazardous waste management in your Municipality?”, while 94.1% answered on question “What suggestions would you have regarding general municipal waste management in your Municipality?”

The answers with highest percent per sample refers mainly to increcent of number of separation containers and collection points, that should be, in citizens opinion accessible to everyone. Citizens of Tirana also thinks that those who do not respect the rules in HW separation and recycling should be legally penalized with appropriate fines. In addition, they consider that landfills must be located far away from populated area, while municipality should inform people by media on certain days for HW collection/disposal.

Please check section 1.3.4 for Comparative Survey Analysis between Yerevan, Tirana, Warsaw and Vienna.
Below are the graphs with main figures and findings from the Survey:

<table>
<thead>
<tr>
<th>No. of respondents</th>
<th>Municipality /District</th>
<th>Population</th>
<th>Type of housing unit</th>
<th>Type of the settlement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20</td>
<td>Tirana 2 - Bulevardi Bajram Curri, Bulevardi Zhan D’Ark, Qyteti Studenti, Sauku, Zona 1</td>
<td>Flats</td>
<td>Urban</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
<td>Tirana 6 - Kombinati, Yzerishti</td>
<td>Houses</td>
<td>Partially Urban</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
<td>Tirana 1 - Ali Demi</td>
<td>Houses</td>
<td>Urban</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
<td>Tirana 5 - Blloku, Selita, Tirana e Re</td>
<td>Houses</td>
<td>Urban</td>
</tr>
<tr>
<td>5</td>
<td>7</td>
<td>Tirana 7 - 21 Dhjetori, Ish-Fusha e Aviacionit</td>
<td>Flats</td>
<td>Urban</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>Tirana 9 - Lagja e Trenit, Brraka, Don Bosko (part)</td>
<td>Flats</td>
<td>Urban</td>
</tr>
<tr>
<td>7</td>
<td>5</td>
<td>Tirana 10 - Central Tirana</td>
<td>Flats</td>
<td>Urban</td>
</tr>
<tr>
<td>8</td>
<td>5</td>
<td>Tirana 3 - Brryli, Xhamiliiku</td>
<td>Flats</td>
<td>Urban</td>
</tr>
<tr>
<td>9</td>
<td>4</td>
<td>Tirana 4 - Kinostudio, Babrru, Allias</td>
<td>Houses</td>
<td>Urban</td>
</tr>
<tr>
<td>10</td>
<td>4</td>
<td>Tirana 11 - Lapraka, Instituti, Don Bosko (part)</td>
<td>Houses</td>
<td>Urban</td>
</tr>
<tr>
<td>11</td>
<td>3</td>
<td>Tirana 8 - Selvia, Medreseja e Tiranës</td>
<td>Flats</td>
<td>Urban</td>
</tr>
</tbody>
</table>
Which city district in Tirana

- Tirana 11 - Lapraka, Institut, Don Bosko (part) 4.7%
- Tirana 10 - Central Tirana 5.8%
- Tirana 9 - Lagia e Trenit, Braka, Don Bosko (part) 7.0%
- Tirana 8 - Selita, Medreseja e Tiraniës 3.5%
- Tirana 7 - Dëshmita, Ish-Fusha e Aviacionit 8.1%
- Tirana 6 - Kombinati, Zberishti 14.0%
- Tirana 5 - Bilokë, Selita, Tirana e Re 11.6%
- Tirana 4 - Kinostudio, Babru, Allias 4.7%
- Tirana 3 - Brryli, Xhamliku 5.8%
- Tirana 2 - Bulevardi Bajram Curri, Bulevardi Zhan D’Ark, Qyteti Studenti, Sauku, Zona 1 23.3%
- Tirana 1 - Ali Demi 11.6%
How many people is your household composed of?

Age per sample

Which type of housing unit do you live in?

Education level per sample

Gender per sample

Income per sample

compared to incomes in the country
Do you think that the types of waste mentioned above are ‘problematic/hazardous waste’?
In total, 81.3% respondents answered.

The answers with highest percent per sample:

1. Dangerous for health and environment.

The answers below 10% per sample:

1. “Because they contain non-absorbable substances in nature and a bad management of this waste will cause serious problems in flora and fauna as well as in the health of the humans throw water, air and land.”

Some examples of specific answers:

1. “I think the waste above mention has a high risk not only in the environment but also in the human health since we are dealing with chemical substances that are not “environmentally friendly”. Areas like Elbasan, known as one of the most problematic cities in Albania, are examples that we have problems with waste management.”
2. “Because in difference by other waste, hazardous waste have toxic content and can bring serious problem in the health. They resist for a long time in the environment, and they can cause different illness.”
3. “Waste containing heavy metals penetrates through water into the ground, passing to plans and then to humans thus entering to the food chain. Detergents, that contain phosphorous, pollute the environment through wastewater, leading to the phenomenon “Eutrophication” which, if not treated in time, leads to the disruption of the food network.”
4. “Some waste gets through the water and damages the creatures in the sea.”
5. “Bad management leads to pollution of environment.”
6. “They are dangerous for our health, the health of the children, for our pets.”
In total, 47.6% respondents answered. The answers with highest percent per sample:

1. There is no separate bins for HW. HW is disposed together with other waste.
2. “It depends on the district where you live. If you have or not the possibility to separate the waste.”

Some examples of specific answers:

1. “We try to categorize the waste in my family, and those called hazardous waste, we take in greater importance and we throw them separately.”
2. “We put the hazardous waste in specific place. But because I have a house but not everyone has this possibility. In this specific place my little brother cannot asses.”
3. “Here, most of the waste gathering cans are not separated.”
4. “Mostly separate because it can cause a major problem if they are joined together.”
5. “I returned the old washing machine to the distributor when I bought a new one. I separate the plastic waste in the dedicated container. I am unclear where to store batteries.”
6. “Electrical waste.”

Are you familiar with locations in your city where disposal of hazardous waste is possible?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>24.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>75.6%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Certain days dedicated to collection of hazardous waste by public utility company (for example, the first Saturday of each month)

Easy availability of collection points where citizens can bring their hazardous waste

Adequate financial rewards (for example receiving cash upon delivery or discounts on cost of utilities)

Cleaner and safer city thanks to hazardous waste being handled properly

I am not interested in hazardous waste separation

What would motivate you the most to hand over HW separately from other waste?

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certain days dedicated to collection of hazardous waste by public utility company (for example, the first Saturday of each month)</td>
<td>51.16%</td>
<td>61.63%</td>
<td>48.84%</td>
<td>66.28%</td>
</tr>
<tr>
<td>Easy availability of collection points where citizens can bring their hazardous waste</td>
<td>33.72%</td>
<td>27.91%</td>
<td>37.21%</td>
<td>29.07%</td>
</tr>
<tr>
<td>Adequate financial rewards (for example receiving cash upon delivery or discounts on cost of utilities)</td>
<td>11.63%</td>
<td>4.65%</td>
<td>6.98%</td>
<td>2.33%</td>
</tr>
<tr>
<td>Cleaner and safer city thanks to hazardous waste being handled properly</td>
<td>2.33%</td>
<td>2.33%</td>
<td>5.81%</td>
<td>1.16%</td>
</tr>
<tr>
<td>I am not interested in hazardous waste separation</td>
<td>1.16%</td>
<td>3.49%</td>
<td>1.16%</td>
<td>1.16%</td>
</tr>
</tbody>
</table>
Impact of hazardous waste on human health and the environment

In your opinion, what are the impacts of hazardous waste on human health and the environment?

5. Very large impact
- Impact on the environment: 67.4%
- Impact on human health: 73.3%

4. Large impact
- Impact on the environment: 31.4%
- Impact on human health: 25.6%

3. Moderate impact
- Impact on the environment: 1.2%
- Impact on human health: 1.2%

2. Small impact
- Impact on the environment: 0.0%
- Impact on human health: 0.0%

1. No impact
- Impact on the environment: 0.0%
- Impact on human health: 0.0%

Impact on human health
- 1. No impact: 68%
- 2. Small impact: 0%
- 3. Moderate impact: 1%
- 4. Large impact: 11%
- 5. Very large impact: 1%

Impact on the environment
- 1. No impact: 0%
- 2. Small impact: 0%
- 3. Moderate impact: 0%
- 4. Large impact: 26%
- 5. Very large impact: 73%
How do you assess your knowledge/awareness about the negative impacts of HW to human health and the environment?

**Impact on human health**

- 1. No knowledge / awareness: 11.6%
- 2. Limited knowledge / awareness: 0.0%
- 3. Medium knowledge / awareness: 19.77%
- 4. Good knowledge / awareness: 38.37%
- 5. Very good knowledge/ awareness: 40.70%

**Impact on the environment**

- 1. No knowledge / awareness: 11.6%
- 2. Limited knowledge / awareness: 11.6%
- 3. Medium knowledge / awareness: 19.77%
- 4. Good knowledge / awareness: 37.21%
- 5. Very good knowledge/ awareness: 40.70%
In general, how satisfied are you with waste management services in your Municipality?

Average grade: 2.5

- 1. Very dissatisfied: 17.44%
- 2. Dissatisfied: 17.44%
- 3. Neither dissatisfied nor satisfied: 17.44%
- 4. Satisfied: 46.51%
- 5. Very satisfied: 0.00%
In total, 95.3% respondents answered.

The answers with highest percent per sample:

1. More waste separation containers and collection points, accessible to everyone.

The answers below 10% per sample:

1. “I suggest having a system to separate the waste in different containers and also to have the action of the law for those who do not respect the rules.”
2. “Inform the people by media “certain days for hazardous waste,”
3. “HW collection should be done in special places, away from the inhabited area.”

Some examples of specific answers:

1. I suggest that this hazardous waste must be managed far away from popular areas.
2. they must be careful in the transmission process to have a schedule not during the day, when all the people are around on the road,
3. The waste should be taken every day from municipality and not collected in the containers for some days. Each family should collect in the area every day and municipality should collect them in order to not having unpleasant smell especially now in the summer,
4. I think the waste must be recycled and be turned to energy,
5. “First, I think it is necessary to have separated containers for the waste. (This policy is done some years ago but only in some area of Tirana near the centre) Secondly, I think it is necessary to inform the habitant about the hazardous waste and their impact in the health. It is important to explain what can anyone do to improve this situation. (One of the ways is through the administrators).”
6. “Community awareness. Municipality need to implement specific environmental protection policy for manufacturing companies, and individuals, tax and tariffs because they cause the pollution.”
7. “Need to have specialized companies in the collection of the waste.”
8. “Municipality need to inform the population about the negative effects of waste on the environment and health, and also the possibility of separation at the source.”
9. “I would rather have the people be aware of the threat these kinds of waste have for the species health and environment degradation by education programs or by media coverage, rather than the infrastructure of waste management geographical locations. Here in Albania at least I think this would be more efficient.”
10. “I have no information how the waste management is performed in my city. But I have a suggestion, municipality must apply taxes and tariffs depending in the activity of companies and manufactures.”
11. “It should be handled because I see hazardous waste everywhere, even in the city centre.”
12. “In the Municipality of Tirana, some years ago, started the implementation of a project to separate the waste in different containers but the people did not respect.”
13. “There must be special and well-protected places. Waste containers should be separate. I separate the waste but they are collected from the same machine to transport them to the Landfill.”
What suggestions would you have regarding general municipal waste management in your Municipality?

In total, 94.1% respondents answered.

The answers with highest percent per sample:

1. Containers must be separated for different waste and covered;
2. Cleaning/removal schedules must be correct and careful, and much more often, set a date once per week;
3. Landfill must be far away from populated areas.

Some examples of specific answers:

1. The use in efficient way of the taxes collected from inhabitants, 2- the efficient way to gather the waste not during the day that can cause traffic jam in the street, 3- the cleaner and the maintenance are concentrated only in the centre or the populated areas of Tirana, it is needed a better distribution. 4- the law to punish individuals who are not respecting the rules for environmental protection.
2. “In the Lake area needs to have more containers.”
3. “In Astir area, more containers needed.”
4. “The collection points should be more visible, so the resident should be informed about the place of collection of this hazardous waste. They are not going to throw them in wrong places.”
5. “I think the municipality need to work hard in the education of separation of the waste from the very beginning at elementary school. We are not aware about the problems arising in health from the bad waste management.”
6. Necessary infrastructure associated with incentive policies to make people aware.
7. In Albania it is important to invest in the process of recycle and finding alternative ways to manage the waste. Most of the waste are burn, causing even greater problems in the environment.
8. Information & infrastructure.
9. Separated containers for different waste. Municipality can tax all the individuals that not respect the law.
10. “Tirana Municipality is the biggest municipality and collect a huge amount of waste. I recommend to: - Design different programs in order to inform people about the negative effect of waste and waste management (separation of waste, collection, recycle) - public campaign - to pay the people who separate the waste. This happens in Germany.”
11. “We need more containers in Tirana with a small distance from each other. We need to have different containers in order to separate the waste. It is important to do the waste disposal very often to reduce the problems rising from air. We need to improve the infrastructure for the transportation of waste from district to collection points.”
12. “The waste must be managed in rural areas.”
13. “Management under strong legal responsibility.”
14. “In general, I am satisfied with the worked done by municipality.”
16. “Should be better organized.”
### 3.4 Survey Report – Vienna

<table>
<thead>
<tr>
<th>Timeframe of the Survey</th>
<th>3 May 2021 – 27 May 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of people involved</td>
<td>80</td>
</tr>
<tr>
<td>Number of settlements involved</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Urban: 46 / Partially urban: 33 / Rural: 0</td>
</tr>
<tr>
<td>Methodology</td>
<td>Quantitative field and online research</td>
</tr>
<tr>
<td></td>
<td>80 online interviews (by phone or computer assisted phone interviews)</td>
</tr>
<tr>
<td>Sample</td>
<td>Adult citizens</td>
</tr>
<tr>
<td>Territory</td>
<td>Vienna, Austria</td>
</tr>
<tr>
<td>Questionnaire</td>
<td>Structured questionnaire, up to 30 minutes for answering</td>
</tr>
<tr>
<td>Number of questions</td>
<td>17</td>
</tr>
</tbody>
</table>

Austria was one of the founding members of the European Free Trade Area (EFTA), and the state accession to the European Union marked the completion of the process of Austria’s integration efforts which had started long before the submission of Austria’s application for EC membership by then Minister of Foreign Affairs, Alois Mock, on 17 July 1989.

The total population of the city of Vienna is 1,867,582 inhabitants, at the area of 41,487 ha (City of Vienna, MA 23, 2017), with an average population density of 4,502 inhabitants /km². 40% of the population live in multi-family houses, 60% in (semi)detached houses. The average household size is 2.06 persons. The GDP in 2017 amounted to 47,700 €/capita.

The Formal waste sector is publicly owned and operated and there is no “Informal” waste sector in the city of Vienna. Every day, up to 265 waste collection vehicles of MA 48 are on the road to collect the waste. The municipal solid waste management services are financed through household fees as well as through Extended Producer Responsibility.

All the residual waste of the city of Vienna is treated in Vienna, no waste is exported for treatment. Recyclable materials are partly exported to recycling facilities in other counties of Austria.

Vienna was targeted by the project team as the benchmark point and example of good practice, at all levels of HWM.

RESUME:

The Survey was conducted in the period of less than a month, during COVID-19 pandemic, with 80 citizens involved, interviewed online due to the strong pandemic restrictions.

Investigation covered 23 settlements, with the highest number of respondents in partially urban settlements 57.4%, while urban population has 42.5% share.

As of districts, most respondents are targeted in Josefstadt (where most of the type households are flats), followed by the district of Favoriten (where most of the type households are houses). The data indicates that the sample of the surveyed population is 85% for apartments, while in houses as household type lives 15% of respondents.

The average age of the respondents is from 31 to 40 years old (76.25%), with average (+more than average) income 82.5% and at tertiary (43.75%) and secondary (50%) level of education. Data shows that 41.25% of
respondents have between 2-3 members per household, 25% have between 4-5 members per household, while 13.7% live alone.

The sample included almost equal number of men and women: females 55%, males 45%.

100% of respondents is aware of problematic nature of hazardous types of waste in their houses. Per percentage and per type of waste, ranked answers are as listed:

- No.1 - Batteries and accumulators (containing sulphuric acid, mercury, nickel, cadmium, lead, etc.).
- No. 2 - Waste from electrical and electronic equipment: household appliances like fridges, microwaves, etc.; TVs, cell phones, IT equipment; fluorescent, sodium, or LED lamps, etc. (containing mercury, lead, cadmium).
- No.3 - Detergents, cleaning agents and their packaging.

Last two types of HW on the scale were:

- Dyes, paint remnants, varnishes and their packaging.
- Construction and demolition waste containing asbestos or other dangerous substances.

0% of respondents were interested in answering the question “Do you think that the types of waste mentioned above are ‘problematic/hazardous waste’?”

100% percent - does waste separation, and 100% of targeted population knows the location of the waste collection points at their settlements.

Answers on the question “What would motivate you the most to hand over HW separately from other waste?” represented in total % of the sample are:

100% - Easy availability of collection points where citizens can bring their hazardous waste
100% - Cleaner and safer city thanks to hazardous waste being handled properly 90%
97.5% - Certain days dedicated to collection of hazardous waste by public utility company (for example, the first Saturday of each month)
98.8% - Adequate financial rewards (for example receiving cash upon delivery or discounts on cost of utilities)

100% of respondents is interested in the proper disposal of HW, and waste management, and consider actions on HWM as very important. 100% is aware that HW has great impact on human health (and) environment.

In regard to the level of knowledge/awareness of the respondents about the negative impacts of HW to human health and the environment:

88.8% consider themselves with good knowledge, while only 11.3% think that they have medium knowledge about the negative impact on the human health.

- 90% consider themselves with good knowledge, while only 10% think that they have medium or low knowledge about the negative impact on the environment and on human health.

Based on given answers waste management service in Warsaw is evaluated as 4.9 out of 5.

Please check section 1.3.4 for Comparative Survey Analysis between Yerevan, Tirana, Warsaw and Vienna.
Below are the graphs with main figures and findings from the Survey:

<table>
<thead>
<tr>
<th>No.</th>
<th>No. of respondents</th>
<th>Municipality/District</th>
<th>Population</th>
<th>Type of housing unit</th>
<th>Type of the settlement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9</td>
<td>Josefstadt</td>
<td>25,068</td>
<td>Flats</td>
<td>Urban</td>
</tr>
<tr>
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<td>8</td>
<td>Mariahilf</td>
<td>31,621</td>
<td>Flats</td>
<td>Urban</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
<td>Neubau</td>
<td>32,027</td>
<td>Flats</td>
<td>Urban</td>
</tr>
<tr>
<td>4</td>
<td>7</td>
<td>Favoriten</td>
<td>194,820</td>
<td>Houses</td>
<td>Partially Urban (Agricultural parts)</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td>Landstraße</td>
<td>89,834</td>
<td>Flats</td>
<td>Urban</td>
</tr>
<tr>
<td>6</td>
<td>4</td>
<td>Leopoldstadt</td>
<td>103,233</td>
<td>Flats</td>
<td>Partially Urban</td>
</tr>
<tr>
<td>7</td>
<td>4</td>
<td>Alsergrund</td>
<td>43,342</td>
<td>Flats</td>
<td>Urban</td>
</tr>
<tr>
<td>8</td>
<td>4</td>
<td>Simmering</td>
<td>97,333</td>
<td>Houses</td>
<td>Partially Urban (Agricultural parts)</td>
</tr>
<tr>
<td>9</td>
<td>4</td>
<td>Ottakring</td>
<td>102,580</td>
<td>Houses</td>
<td>Partially Urban</td>
</tr>
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<td>10</td>
<td>4</td>
<td>Liesing</td>
<td>98,385</td>
<td>Houses</td>
<td>Urban</td>
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<tr>
<td>11</td>
<td>4</td>
<td>Floridsdorf</td>
<td>155,998</td>
<td>Flats</td>
<td>Partially Urban</td>
</tr>
<tr>
<td>12</td>
<td>3</td>
<td>Donaustadt</td>
<td>180,245</td>
<td>Flats</td>
<td>Partially Urban</td>
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<tr>
<td>13</td>
<td>3</td>
<td>Meidling</td>
<td>94,179</td>
<td>Houses</td>
<td>Partially Urban</td>
</tr>
<tr>
<td>14</td>
<td>2</td>
<td>Margareten</td>
<td>54,940</td>
<td>Flats</td>
<td>Urban</td>
</tr>
<tr>
<td>15</td>
<td>2</td>
<td>Penzing</td>
<td>91,578</td>
<td>Houses</td>
<td>Urban (City + Woods )</td>
</tr>
<tr>
<td>16</td>
<td>2</td>
<td>Währing</td>
<td>50,285</td>
<td>Houses</td>
<td>Partially Urban</td>
</tr>
<tr>
<td>17</td>
<td>2</td>
<td>Brigittenau</td>
<td>85,796</td>
<td>Flats</td>
<td>Urban</td>
</tr>
<tr>
<td>18</td>
<td>2</td>
<td>Rudolfsheim-Fünfhaus</td>
<td>78,388</td>
<td>Flats</td>
<td>Urban</td>
</tr>
<tr>
<td>19</td>
<td>1</td>
<td>Hernals</td>
<td>56,342</td>
<td>Houses</td>
<td>Partially Urban</td>
</tr>
<tr>
<td>20</td>
<td>1</td>
<td>Döbling</td>
<td>71,596</td>
<td>Houses</td>
<td>Partially Urban</td>
</tr>
<tr>
<td>21</td>
<td>0</td>
<td>Innere Stadt</td>
<td>16,409</td>
<td>Flats</td>
<td>Urban</td>
</tr>
<tr>
<td>22</td>
<td>0</td>
<td>Wieden</td>
<td>32,745</td>
<td>Flats</td>
<td>Urban</td>
</tr>
<tr>
<td>23</td>
<td>0</td>
<td>Hietzing</td>
<td>53,829</td>
<td>Flats</td>
<td>Partially Urban (City + Woods )</td>
</tr>
</tbody>
</table>
How many people is your household composed of?

Number of members in the household of the interviewed person:
- Only 1 member: 14%
- 2 members: 41%
- 3 members: 19%
- 4 to 5 members: 25%
- 6 or more than 6 members: 1%

Which type of housing unit do you live in?

Type of housing in Vienna:
- Flat: 85%
- House: 15%

Age per sample:

- <21: 12.66%
- 21-30: 32.91%
- 31-40: 44.30%
- 41-50: 10.13%
- 51-60: 0.00%
- >61: 0.00%

Gender per sample:

- Male: 45%
- Female: 55%

Education level per sample:

- No education or incomplete primary: 50.00%
- Primary: 43.75%
- Secondary: 2.50%
- Tertiary: 3.75%

Income per sample:

Compared to incomes in the country:
- Below average: 22.50%
- Average: 17.50%
- More than average: 60.00%
The types of hazardous waste in household

- Waste tyres (car tyres): 0.00%
- Construction and demolition waste containing asbestos or other dangerous substances: 7.50%
- Pharmaceutical waste: 71.25%
- Detergents, cleaning agents and their packaging: 83.75%
- Solvents, acids, bases, oxidizers and their packaging: 0.00%
- Pesticides and their packaging: 11.25%
- Dyes, paint remnants, varnishes and their packaging: 2.59%
- Machine oil and its packaging: 7.52%
- Batteries and accumulators (containing sulphuric acid, mercury, nickel, cadmium, lead, etc.): 97.50%
- Waste from electrical and electronic equipment: household appliances like fridges, microwaves, etc.; TVs, cell phones, IT equipment; fluorescent, sodium, or LED lamps, etc. (containing mercury, lead, cadmium): 95.00%

Do you think that the types of waste mentioned above are ‘problematic/hazardous waste’?

Main way of hazardous waste disposal in Vienna

- 100%
In total 0% respondents answered.

In the last 2-3 months how have you mainly disposed hazardous waste?

- Separated: 100.00%
- Mixed with other waste: 0.00%
- Other: 0.00%

In total 0% respondents answered.

Are you familiar with locations in your city where disposal of hazardous waste is possible?

- Yes: 100.00%
- No: 0.00%
Certain days dedicated to collection of hazardous waste by public utility company (for example, the first Saturday of each month)

Easy availability of collection points where citizens can bring their hazardous waste

Adequate financial rewards (for example receiving cash upon delivery or discounts on cost of utilities)

Cleaner and safer city thanks to hazardous waste being handled properly

I am not interested in hazardous waste separation

What would motivate you the most to hand over hazardous waste separately from other waste?

<table>
<thead>
<tr>
<th>What would motivate you the most to hand over hazardous waste separately from other waste?</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certain days dedicated to collection of hazardous waste by public utility company (for example, the first Saturday of each month)</td>
<td>53.75%</td>
<td>62.50%</td>
<td>31.25%</td>
<td>42.50%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Easy availability of collection points where citizens can bring their hazardous waste</td>
<td>36.25%</td>
<td>35.00%</td>
<td>56.25%</td>
<td>47.50%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Adequate financial rewards (for example receiving cash upon delivery or discounts on cost of utilities)</td>
<td>7.50%</td>
<td>2.50%</td>
<td>11.25%</td>
<td>10.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Cleaner and safer city thanks to hazardous waste being handled properly</td>
<td>0.00%</td>
<td>0.00%</td>
<td>1.25%</td>
<td>0.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>I am not interested in hazardous waste separation</td>
<td>2.50%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>100.00%</td>
</tr>
</tbody>
</table>
Impact of hazardous waste on human health and the environment

In your opinion, what are the impacts of hazardous waste on human health and the environment?

- **Very large impact**: 48.75% (Series 2), 63.75% (Series 1)
- **Large impact**: 33.75% (Series 2), 48.75% (Series 1)
- **Moderate impact**: 2.50% (Series 2), 3.92% (Series 1)
- **Small impact**: 0.00% (Series 2), 0.00% (Series 1)
- **No impact**: 0.00% (Series 2), 0.00% (Series 1)

Impact on human health:

- 63.75%: No impact
- 33.75%: Moderate impact
- 3.92%: Small impact
- 0.00%: Very large impact
- 0.00%: Large impact

Impact on the environment:

- 48.75%: No impact
- 48.73%: Moderate impact
- 2.50%: Small impact
- 0.00%: Very large impact
- 0.00%: Large impact

Series: 1, 2
How do you assess your knowledge/awareness about the negative impacts of HW to human health and the environment?

**Impact on human health**

- 54% No knowledge / awareness
- 46% Good knowledge / awareness

**Impact on the environment**

- 56% No knowledge / awareness
- 44% Good knowledge / awareness
In general, how satisfied are you with waste management services in your Municipality?

Average grade: 4.9

What suggestions would you have regarding hazardous waste management in your Municipality?

In total, 0% respondents answered.

What suggestions would you have regarding general municipal waste management in your Municipality?

In total, 0% respondents answered.
3.5 Comparative analysis of surveys

Citizen’s awareness and satisfaction towards municipal waste management was investigated in all targeted cities, as per project ToR, by surveying samples of inhabitants of Yerevan, Warsaw, Tirana, and Vienna, in the period from April until June 2021, using the same Questionnaire.

It is important to underline that the Survey was conducted during the COVID-19 pandemic which began in March 2020 and lasted over a year. State health measures and lockdowns that were undertaken in targeted cities may influenced respondents at some level, mainly on answering the questions related to their motivation towards recycling and municipal services of waste management.

Comparative Analysis of the survey data shows that targeted populations are mainly settled in urban and partially urban areas:

1. Tirana is the city with 98% targeted urban population from the city centre;
2. Yerevan sample consist of 62% urban population, 36% of partially urban (periphery) and 2% of rural;
3. Vienna with 58.7% of urban population and 41.2 of partially urban population, and
4. Warsaw 37.7% of urban and 62.2% of partially urban.

Aggregated data on General Questions are enclosed within the graph below, and are as follows:

- Biggest percentage of respondents sample is from Yerevan;
- Most of the respondents from all four cities are living in a flat as the type of household;
- Average number of respondents in all four cities in one household is between 4 to 5, Tirana is with largest sample share (52%), while Vienna has the biggest percent of respondents (41.25%) with 2-3 members per household, and biggest sample of those who live alone (13.7%)
- Sample per Gender shows that largest percent of female respondents is from Tirana (70%), while male respondents in highest percent are from Yerevan (52%)
- Average age per aggregated data from all four cities is 30-50, while the biggest percent of youngest population is targeted in Tirana and Yerevan, while most respondents between 50-61 years old are targeted in Warsaw;
- Tertiary level of education is higher in %, while the biggest percent of sample with tertiary level of education is targeted in Yerevan (94%), while the lowest percent per sample of secondary level of education is targeted in Tirana (24.4%) and
- Respondents from all four cities are with average income, compared to incomes in their countries.
Considering the type of hazardous waste per household, targeted population from all four cities has same percentage of produced hazardous waste per type:
<table>
<thead>
<tr>
<th>YEREVAN</th>
<th>WARSAW</th>
<th>TIRANA</th>
<th>VIENNA</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.1 - Detergents, cleaning agents and their packaging</td>
<td>No.1 - Detergents, cleaning agents and their packaging</td>
<td>No.1 - Detergents, cleaning agents and their packaging</td>
<td>No.1 - Batteries and accumulators (containing sulphuric acid, mercury, nickel, cadmium, lead, etc.)</td>
</tr>
<tr>
<td>No.2 - Batteries and accumulators (containing sulphuric acid, mercury, nickel, cadmium, lead, etc.)</td>
<td>No. 2 - Waste from electrical and electronic equipment: household appliances like fridges, microwaves, etc.; TVs, cell phones, IT equipment; fluorescent, sodium, or LED lamps, etc. (containing mercury, lead, cadmium)</td>
<td>No. 2 - Waste from electrical and electronic equipment: household appliances like fridges, microwaves, etc.; TVs, cell phones, IT equipment; fluorescent, sodium, or LED lamps, etc. (containing mercury, lead, cadmium)</td>
<td>No. 2 - Waste from electrical and electronic equipment: household appliances like fridges, microwaves, etc.; TVs, cell phones, IT equipment; fluorescent, sodium, or LED lamps, etc. (containing mercury, lead, cadmium)</td>
</tr>
<tr>
<td>No. 3 - Waste from electrical and electronic equipment: household appliances like fridges, microwaves, etc.; TVs, cell phones, IT equipment; fluorescent, sodium, or LED lamps, etc. (containing mercury, lead, cadmium)</td>
<td>No.3 - Batteries and accumulators (containing sulphuric acid, mercury, nickel, cadmium, lead, etc.)</td>
<td>No.3 - Batteries and accumulators (containing sulphuric acid, mercury, nickel, cadmium, lead, etc.)</td>
<td>No.3 - Detergents, cleaning agents and their packaging</td>
</tr>
</tbody>
</table>
Type of waste that were listed as the last two from the scale, are:

<table>
<thead>
<tr>
<th></th>
<th>YEREVAN</th>
<th>WARSAW</th>
<th>TIRANA</th>
<th>VIENNA</th>
</tr>
</thead>
</table>
| Last two on the scale:| * Solvents, acids, bases, oxidizers and their packaging  
|                      | * Construction and demolition waste containing asbestos or other dangerous substances | * Solvents, acids, bases, oxidizers and their packaging  
|                      |                                                | * Construction and demolition waste containing asbestos or other dangerous substances  
|                      |                                                | * Dyes, paint remnants, varnishes and their packaging  
|                      |                                                | * Construction and demolition waste containing asbestos or other dangerous substances  
|                      |                                                | * Construction and demolition waste containing asbestos or other dangerous substances  
|                      |                                                |                                                |                                                |
In general, respondents from all three cities consider HW as a dangerous and problematic.

Most common answers on the question “Why?” listed below:

**Yerevan:**
- a. Dangerous for human health, animals and environment (soil, water)
- b. Dangerous because they are not self-degraded, and consist of harmful substances and chemicals, heavy metals, acids, etc.
- c. No recycling in Armenia;
- d. Long degradable period.

**Warsaw:** HW is dangerous for health and environment, and difficult for disposal.

**Tirana:** HW is dangerous for health and environment.

**Vienna:** No answers.

As visually presented within the Graph below, only respondents from Vienna answered in total sample of 100% that the HW is disposed properly, while Warsaw is at the second place with 75% of respondents that are recycling.

Most of the respondents from Yerevan and Tirana specified two problems for proper HW disposal:

1. Small number of collections points for HW and/or for large number of settlements no collection point at all;
2. Problem with access to the collection points.

Data for all four cities shows that all respondents are in high percent motivated to do HW separation. The only discrepancy exists in Warsaw where 67.7% of respondents answered that they were not interested in HW separation, compared to numbers in Vienna (100%), Yerevan (93%), and Tirana (84.8%).

Most of suggestion for improvement of the municipal services on HWM are:

- More awareness-raising campaigns on how to sort, which types of plastic can be recycled, where to dispose HW. Enlarge campaigns. Use social media, videos, commercials, share information and knowledge, education of citizens on how HW is dangerous for the society;
- More bins, more collection points and easy access to it, more control;
- Fines for those who are not recycling;
- More frequent garbage collection; more regularly, on time;
- Price reduction (for Vienna and Warsaw).

Percentage of the respondents per targeted PCs corresponds with development of the HWM infrastructure: Vienna 100%, Warsaw 83.3 %, Yerevan 75%, and Tirana 75% per targeted population. Vienna has the higher grade on quality of municipal services for HW management, while Tirana has the lowest grade.

Knowledge on the negative impact on the human health and environment is high in all four municipalities.
Are you familiar with locations in your city where disposal of hazardous waste is possible?

<table>
<thead>
<tr>
<th>Location</th>
<th>Yes (%)</th>
<th>No (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yerevan</td>
<td>75.0</td>
<td>25.0</td>
</tr>
<tr>
<td>Warsaw</td>
<td>83.3</td>
<td>16.7</td>
</tr>
<tr>
<td>Tirana</td>
<td>75.6</td>
<td>24.4</td>
</tr>
<tr>
<td>Vienna</td>
<td>100.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Satisfaction with waste management services in the Municipality

<table>
<thead>
<tr>
<th>Location</th>
<th>Mean Score per Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yerevan</td>
<td>3.0</td>
</tr>
<tr>
<td>Warsaw</td>
<td>4.1</td>
</tr>
<tr>
<td>Tirana</td>
<td>2.5</td>
</tr>
<tr>
<td>Vienna</td>
<td>4.9</td>
</tr>
</tbody>
</table>
# LITERATURE

**#ECO pokładani all you need to know about Civic Amenity Sites**

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Bolesław Maksymowicz, Ośrodek Badawczo-Rozwojowy Ekologii Miast OBREM w Łodzi, Przepisy Unii Europejskiej W Zakresie Odpadów Niebezpiecznych I Specjalnych I Ich Implementacja Do Prawa Krajowego, Transgraniczny Obrót Odpadami

Capital factsheet – Vienna/Austria Assessment of separate collection schemes in the 28 capitals of the EU

Capital factsheet – Warsaw/Poland Assessment of separate collection schemes in the 28 capitals of the EU

Commission Notice Separate Collection of Household Hazardous Waste (2020/C 375/01)

Dubois Maarten, Sims Edward, Moerman Tim, Watson David, Bauer Bjorn, Bel Jean-Benoît, Mehlhart Georg, Guidance for separate collection of municipal waste, April 2020

Federal Waste Management Plan 2017

Integrated Waste Management National Plan 2020-2035 (Albania)

Lista Marszałka Województwa Mazowieckiego prowadzona na podstawie art. 38b ustawy z dnia 14 grudnia 2012 r. o odpadach (Dz. U. z 2020 r. poz. 797, z późn. zm.) Stan na 12 marca 2021 r

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The new Polish Act on Waste of 2012, Karolina Karpus, http://dx.doi.org/10.12775/PYEL.2013.003

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Wiener Abfallwirtschaftsplan und Wiener Abfallvermeidungs-programm (Planungsperiode 2019-2024) im Rahmen der Strategischen Umweltprüfung 2017/2018

Wojewódzki Plan Gospodarki Odpadami dla województwa mazowieckiego na lata 2016 - 2021 z uwzględnieniem lat 2022 – 2027, Warszawa, listopad 2015

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https://lekaro.pl/oferta/pszok/
https://segregujna5.um.warszawa.pl/
https://warszawa19115.pl/wszystko-o-odpadach
https://www.mazovia.pl/urzad-marszalkowski/informacje-ogolne/
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https://www.wien.gv.at/
https://www.wien.gv.at/umwelt/ma48/
ANNEXES

Annex 1. Citizens survey on quality of delivery and equitable access to hazardous/municipal waste management - Methodology of survey implementation

1. Methods of surveying

The survey is administered using a standard (fixed) set of questions, including multiple answer questions and Likert-scale answer questions. The approved questionnaire must be used and adapted to local language. Surveyors should be introduced to the questionnaire and this methodology before collecting responses.

2. Methods of collecting responses

This survey is to be administered in two ways:

A/ Physical surveying in the cities – Yerevan, Warsaw and Tirana – in person (minimum 50%) or by phone; in Vienna – by phone. Surveys by phone can be made using VOIP or other IT-based tools. Physical surveying will be mainly conducted by Dvoper Ltd. although it can be also conducted by the Partner Cities is considered useful.

B/ Online surveying – The survey can be made available using webpages of the Partner Cities or other communication channels with the general population.

3. Methods for maximising representation of responses

A/ Physical survey delivery should be administered in ways which provide stratified samples of city populations:

- Responses must be collected from at least three different city districts (city centre, densely populated dwelling areas (mostly with multi-apartment buildings), sparsely populated dwelling areas (mostly with single houses). The at least three chosen districts should be different in terms of socio-economic characteristics (average property prices, incomes, etc.).

- Responses must belong to all age groups of population indicated in question 14.

- Responses must belong to both genders in the balance of 50%-50% with a maximum deviation of 5 percentage points.

Basic randomising should be applied: interview every N-th person passing but N-th+1 if the N-th person is of the same gender as the previous one; change the street type where responses are collected (e.g. from a main district street to a secondary-importance street) at least N-times; call every N-th telephone number from a public phone listing and split among 2-3 mobile phone networks.

B/ Online survey – It is expected that the online survey will attract more responses from younger to mid-age population, better educated and more affluent. If responses show significant skewness in terms of socio-
economic characteristics of responses, some of the over-represented categories of responses will be downsized by random elimination of some (e.g. withdrawal of every forth, third or second response randomly).

4. **Methods to achieve the minimum number of responses**

**A/ Physical survey** delivery should be planned to obtain 100 responses per each city (4 cities) accounting for the need to eliminate potentially incomplete or otherwise erroneous questionnaires, and eventually obtaining at least 80 valid responses per each city.

**B/ Online survey** should be discontinued after 500 responses are collected or 400 valid responses are collected.

5. **Other issues**

The responses, after collection in any applicable form (paper or electronic), if not obtained directly via online survey engines, will be entered into an online survey engine to build an input database for data checks and analytics.
CITIZENS SURVEY

ON QUALITY OF DELIVERY AND EQUITABLE ACCESS TO HAZARDOUS/MUNICIPAL WASTE MANAGEMENT

Questionnaire

Introduction:

This survey is dedicated to assessing citizens’ knowledge, attitudes and behaviours, and their level of satisfaction with the management of household waste in the city, including problematic (hazardous) waste.

Note: Question 15 is divided into four sub-questions and each of them refers to districts/municipalities of each Partner City and EU/EEA (Benchmark) city. Final version of the questionnaire will be translated to the official languages and this question will only apply to the city where the survey is conducted.

1. How many people is your household composed of?
   - □ 1
   - □ 2
   - □ 3
   - □ 4-5
   - □ 6 or more than 6

2. Which type of housing unit do you live in?
   - Flat
   - House

3. Does your household produce these types of waste? (multiple answers possible)
   - □ Waste from electrical and electronic equipment: household appliances like fridges, microwaves, etc.; TVs, cell phones, IT equipment; fluorescent, sodium, or LED lamps, etc. (containing mercury, lead, cadmium)
   - □ Batteries and accumulators (containing sulphuric acid, mercury, nickel, cadmium, lead, etc.)
   - □ Machine oil and its packaging
   - □ Dyes, paint remnants, varnishes and their packaging
   - □ Pesticides and their packaging
   - □ Solvents, acids, bases, oxidizers and their packaging
   - □ Detergents, cleaning agents and their packaging
   - □ Pharmaceutical waste
   - □ Construction and demolition waste containing asbestos or other dangerous substances
   - □ Waste tyres (car tyres)

4. Do you think that the types of waste mentioned above are ‘problematic/hazardous waste’?
   - □ Yes
   - □ No
   - □ I don’t know
If yes, please specify why______________________________________________

5. In the last 2-3 months how have you mainly disposed hazardous waste? (consider answers to question 3)

☐ Separated ☐ Mixed with other waste ☐ Other. Please specify:_____________________

6. Are you familiar with locations in your city where disposal of hazardous waste is possible? (for example: containers or collection points for used batteries or waste electrical and electronic equipment)

☐ Yes ☐ No

7. What would motivate you the most to hand over hazardous waste separately from other waste?

<table>
<thead>
<tr>
<th>Motivations</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neither agree nor disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certain days dedicated to collection of hazardous waste by public utility company (for example, the first Saturday of each month)</td>
<td>☐ 1</td>
<td>☐ 2</td>
<td>☐ 3</td>
<td>☐ 4</td>
<td>☐ 5</td>
</tr>
<tr>
<td>Easy availability of collection points where citizens can bring their hazardous waste</td>
<td>☐ 1</td>
<td>☐ 2</td>
<td>☐ 3</td>
<td>☐ 4</td>
<td>☐ 5</td>
</tr>
<tr>
<td>Adequate financial rewards (for example receiving cash upon delivery or discounts on cost of utilities)</td>
<td>☐ 1</td>
<td>☐ 2</td>
<td>☐ 3</td>
<td>☐ 4</td>
<td>☐ 5</td>
</tr>
<tr>
<td>Cleaner and safer city thanks to hazardous waste being handled properly</td>
<td>☐ 1</td>
<td>☐ 2</td>
<td>☐ 3</td>
<td>☐ 4</td>
<td>☐ 5</td>
</tr>
<tr>
<td>I am not interested in hazardous waste separation</td>
<td>☐ 1</td>
<td>☐ 2</td>
<td>☐ 3</td>
<td>☐ 4</td>
<td>☐ 5</td>
</tr>
<tr>
<td>Other.</td>
<td>Please specify</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. In your opinion, what are the impacts of hazardous waste on human health and the environment?

<table>
<thead>
<tr>
<th>Impact</th>
<th>No impact</th>
<th>Small impact</th>
<th>Moderate impact</th>
<th>Large impact</th>
<th>Very large impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact on human health</td>
<td>☐ 1</td>
<td>☐ 2</td>
<td>☐ 3</td>
<td>☐ 4</td>
<td>☐ 5</td>
</tr>
<tr>
<td>Impact on the environment</td>
<td>☐ 1</td>
<td>☐ 2</td>
<td>☐ 3</td>
<td>☐ 4</td>
<td>☐ 5</td>
</tr>
</tbody>
</table>

9. How do you assess your knowledge/awareness about the negative impacts of hazardous waste to human health and the environment?

<table>
<thead>
<tr>
<th>Impact</th>
<th>No knowledge / awareness</th>
<th>Limited knowledge / awareness</th>
<th>Medium knowledge / awareness</th>
<th>Good knowledge / awareness</th>
<th>Very good knowledge / awareness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact on human health</td>
<td>☐ 1</td>
<td>☐ 2</td>
<td>☐ 3</td>
<td>☐ 4</td>
<td>☐ 5</td>
</tr>
<tr>
<td>Impact on the environment</td>
<td>☐ 1</td>
<td>☐ 2</td>
<td>☐ 3</td>
<td>☐ 4</td>
<td>☐ 5</td>
</tr>
</tbody>
</table>

10. In general, how satisfied are you with waste management services in your Municipality?

<table>
<thead>
<tr>
<th>Satisfaction</th>
<th>Very dissatisfied</th>
<th>Dissatisfied</th>
<th>Neither dissatisfied nor satisfied</th>
<th>Satisfied</th>
<th>Very satisfied</th>
</tr>
</thead>
</table>
11. What suggestions would you have regarding **hazardous waste management** in your Municipality?

Please specify_______________________________________________________________

12. What suggestions would you have regarding **general municipal waste management** in your Municipality?

Please specify_______________________________________________________________

13. **Gender:**

□ Male □ Female

14. **Age:**

□ <21 □ 21-30 □ 31-40 □ 41-50 □ 51-60 □ >61

15a. **Please specify which city district you live in Yerevan.**

□ Achapnyak □ Avan □ Arabkir □ Davtashen □ Erebuni □ Kentron □ Nor Nork
□ Malatia-Sebastia □ Nork-Marash □ Nubarashen □ Shengavit □ Kanaker-Zeytun

15b. **Please specify which city district you live in Tirana.**

□ Tirana 1 - Ali Demi □ Tirana 2 - Bulevardi Bajram Curri, Bulevardi Zhan D’Ark, Qyteti Studenti, Sauku, Zona 1
□ Tirana 3 - Brryli, Xhamlliku □ Tirana 4 - Kinostudio, Babru, Allias □ Tirana 5 - Biloiku, Selita, Tirana e Re □ Tirana 6 - Kombinat, Yzberisht □ Tirana 7 - 21 Dhjetori, Ish-Fusha e Avijacionit □ Tirana 8 - Selvia, Medreseja e Tiranës □ Tirana 9 - Lagja e Trenit, Brraka, Don Bosko (part) □ Tirana 10 - Central Tirana □ Tirana 11 - Lapraka, Instituti, Don Bosko (part)

15c. **Please specify which city district you live in Warsaw.**

□ Mokotów □ Praga Południe □ Ursynów □ Wola □ Bielany □ Targówek □ Śródmieście □ Bemowo □ Białołęka □ Ochota □ Wawer □ Praga □ Północ □ Ursus □ Żoliborz □ Włochy □ Wilanów □ Rembertów □ Wesoła

15d. **Please specify which city district you live in Vienna.**

□ Innere Stadt □ Leopoldstadt □ Landstraße □ Wieden □ Margareten □ Mariahilf □ Neubau □ Josefstadt □ Alsergrund □ Favoriten □ Simmering □ Meidling □ Hietzing □ Penzing □ Rudolfsheim-Fünfhaus □ Ottakring □ Hernals □ Währing □ Döbling □ Brigittenau □ Floridsdorf □ Donaustadt □ Liesing

16. **Please provide your education level:**

□ No education or incomplete primary □ Primary □ Secondary □ Tertiary

17. In your opinion, compared to incomes in the country, your family income is:

□ Below average □ Average □ More than average

Thank you!