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OVERVIEW OF THE CURRENT SITUATION RELATED TO THE IDENTIFICATION OF HAZARDOUS WASTE AND DEVELOPMENT OF A UNIFIED HAZARDOUS WASTE IDENTIFICATION GUIDE

OVERVIEW OF THE CURRENT SITUATION RELATED TO THE IDENTIFICATION OF HAZARDOUS WASTE

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Abbreviations used in the text

EU – European Union

OECD – Organisation for Economic Cooperation and Development

EPA – Environmental Protection Agency

EPD – Environmental Protection Department

SPS – State Plant Service

NPHC – National Public Health Centre

CD – Customs Department

LPPA – Lithuanian Plant Protection Association

MIA – Manufacturers and Importers Association

ELV – end-of-life vehicle

EEE – electrical and electronic equipment

WEEE – waste electrical and electronic equipment

TS – procurement technical specification

PPWIS – Unified Product, Packaging and Waste Record-Keeping Information System

RWMC – Regional Waste Management Centre

MoA – Ministry of Agriculture

BWCS – bulky waste collection site

CEN – European Committee for Standardisation

PET – polyethylene terephthalate

HDPE – high-density polyethylene

LDPE – low-density polyethylene

PP – polypropylene

PS – polystyrene

PCBs – polychlorinated biphenyls

PCTs – polychlorinated terphenyls

ECDC – European Centre for Disease Prevention and Control

REACH – Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) and establishing a European Chemicals Agency

CLP – Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures

1 Introduction

This 1st Interim Report has been drawn up under the Procurement Agreement No VPS-2021-59-ES of 25 August 2021 on the overview of the current situation related to the identification of hazardous waste and the development of a unified hazardous waste identification guide, entered by and between the Contractor and the Ministry of Environment of the Republic of Lithuania (the 'Customer') in the framework of the HAZ–IDENT project funded by the Norwegian Financial Mechanism Program for 2014–2021. The 1st Interim Report has been drawn up following the requirements in the Technical Specification for the Services (the 'TS').

The 1st Interim Report includes a preliminary draft overview of the current situation related to the identification of hazardous waste (the 'Overview'), drawn up following the objectives referred to in sub-items 2.2.1 to 2.2.9 of the TS:

'2.2.1. to analyse the legal context and regulatory framework of the identification and classification of hazardous waste, which applies in Lithuania, the EU, and other foreign countries referred to in sub-item 2.2.5; to propose improvements to national legislation to ensure proper and efficient hazardous waste identification and control thereof;

2.2.2. to identify the primary sources of hazardous waste generation and the extent of its generation in Lithuania in 2010–2020 (the year 2020 is included into the analysis only if official statistical data has been published); to identify representative groups of hazardous waste producers; to carry out analysis of hazardous waste generated in individual waste streams (municipal, industrial, packaging, medical, agricultural, construction, electrical and electronic equipment, end-of-life vehicles, sewerage sludge and contaminated soil, etc.), and to identify typical hazardous waste streams; to specify the leading hazardous waste treatment methods used in Lithuania; to analyse the amount of hazardous waste generated in Lithuania in 2010–2020 (the year 2020 is included into the analysis only if official statistical data has been published) in the total amount of waste generated and in individual waste streams, by assessing the amount of hazardous waste in kilograms per capita and per unit of GDP of Lithuania, and to compare the results with the data of the EU and other foreign countries referred to in sub-item 2.2.5; to assess the relevance of the official statistical data on the amount of hazardous waste generated in Lithuania in 2010–2020 (the year 2020 is included into the analysis only if official statistical data has been published, by comparing it with the amount of hazardous waste generated in other countries which are comparable to Lithuania in terms of economic structure and the economic development level);

2.2.3. to identify hazardous waste (including the codes of hazardous waste) that is usually misidentified and handled as non-hazardous waste in Lithuania (including the codes of non-hazardous waste);

2.2.4. to review the methods applied in Lithuania for the identification and classification of hazardous waste; to indicate the critical challenges encountered by authorities, hazardous waste producers and waste managers who are required to identify hazardous waste; to assess the competence and experience of the staff of the Environmental Protection Agency and the Environmental Protection Department under the Ministry of Environment in assessing whether hazardous waste has been appropriately identified and classified;

2.2.5. to review the methods applied by foreign countries (Norway, Latvia, Sweden, Germany, Poland, Ireland, the Netherlands, and Denmark) for the identification and classification of hazardous waste; to indicate the key strengths and weaknesses of the methods used; to produce recommendations on the possibility of using best practices available in these countries to develop the Guide;

2.2.6. to analyse permits for hazardous waste management applicable in the countries referred to in sub-item 2.2.5 of the Technical Specification by specifying the hazardous *waste management activities requiring a permit, the established conditions for hazardous waste management, and the requirements for the operator, etc.;*

2.2.7. to analyse the prevention and control measures applied by official authorities of the countries referred to in sub-item 2.2.5 of the Technical Specification to ensure that hazardous waste is not treated as non-hazardous waste and/or illegally disposed of in landfills of non-hazardous waste; to submit proposals on the application of similar measures in Lithuania;

2.2.8. to analyse the measures applied by official authorities of the countries referred to in sub-item 2.2.5 of the Technical Specification in dealing with the management of hazardous waste produced by orphan sites, insolvent enterprises, or enterprises under liquidation due to bankruptcy; to submit proposals on the application of similar measures in Lithuania;

2.2.9. to analyse and assess the scope of laboratory testing (identification) of hazardous waste carried out by Lithuanian economic entities and institutions in Lithuania and abroad; to identify issues encountered by waste holders and waste managers wishing or obliged to use the services of laboratory testing (identification) of waste; to submit proposals to address the identified problems.'

When drafting the Overview following the objectives referred to in sub-items 2.2.1 to 2.2.4 and 2.2.9 of the TS, the representative survey questionnaires on the identification of hazardous waste have been prepared; upon coordination of their contents with the Customer, the following respondents have been surveyed:

1. 30 active business entities generating hazardous waste from their activities, 30 active business entities engaged in the collection and transport of hazardous waste, and 20 active business entities engaged in the hazardous waste treatment;

2. two NGOs active in the field of environmental protection, and three licensed organisations of manufacturers and importers active in packaging waste management;

3. 13 representatives of municipal administrations and RWMCs responsible for organising the collection of hazardous waste from residents;

4. seven public and private scientific and research institutions generating hazardous waste from their activities or holding competence related to the identification of hazardous waste;

5. seven laboratories capable of analysing the chemical composition of waste;

6. the Environmental Protection Department (EPD), the Environmental Protection Agency (EPA), and three further public authorities (the State Plant Service (SPS), the National Public Health Centre (NPHC), the Customs Department (CD)) dealing with issues related to waste identification;

7. 1,000 Lithuanian residents. The survey was conducted by the market and public opinion research company 'Spinter research' (lith. *UAB Spinter tyrimai*); the report on the survey results is attached hereto as *Annex 1* in the form of a presentation (in Lithuanian).

To identify issues and provide generalised recommendations following the objectives referred to in sub-items 2.2.1 to 2.2.4 and 2.2.7 to 2.2.9 of the TS, three round table discussions were arranged for the groups of stakeholders listed above during the drafting stage of the Overview. On 22 November 2021, the round table discussion was held with representatives of public institutions, involving 24 participants from the Ministry of Environment, EPA, EPD, NPHC, CD, the Ministry of Agriculture (MoA), and the experts of UAB Ekokonsultacijos. On 23 November 2021, the round table discussion was held on the identification and classification of empty packaging of chemical substances or substance-containing mixtures generated in domestic or non-domestic environments, involving 37 participants from organisations of packaging manufacturers and importers, the Association of Municipalities of Lithuania and individual municipalities, Regional Waste

Management Centres (RWMCs), the Lithuanian Plant Protection Association (LPPA), representatives of public institutions, waste producers and waste managers, and the experts of UAB Ekokonsultacijos. On 24 November 2021, the round table discussion was held for the representatives of all stakeholders; 55 participants took part in the discussion, including 13 representatives of official authorities, seven experts, consultants and representatives of research bodies, six representatives of laboratories, 12 representatives of waste managers, 15 representatives of waste producers, and two representatives of the RWMC and municipality.

2 Overview of the current situation related to the identification of hazardous waste

2.1 Legal context of the identification and classification of hazardous waste

2.1.1 Legal context of the European Union

The harmonised classification of waste is applicable in the European Union according to the list of waste (the '**European List of Waste**' or '**LoW**', as defined by Article 7 of Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (the '**Waste Framework Directive**' or '**WFD**'), and approved by Commission Decision 2014/955/EU of 18 December 2014[1] (the '**Decision on the List of Waste**' replacing Commission Decision 2000/532/EC of 3 May 2000[2]). Properties for classification as hazardous waste are listed in Annex III to the WFD (replaced by Commission Regulation No 1357/2014 of 18 December 2014[3], the '**Regulation No 1357/2014**'). To give technical guidance on certain aspects of the Waste Framework Directive and the Decision on the List of Waste, as revised in 2014 and 2017, the European Commission published Notice No 2018/C 124/01 on technical guidance on the classification of waste (the '**EU Guidance**'), providing clarifications and guidance to national authorities, including local authorities, and businesses on the correct interpretation and application of the relevant EU legislation regarding the classification of waste, namely identification of hazardous properties, assessing if the waste has a hazardous property and, ultimately, classifying the waste as hazardous or non-hazardous.

More detailed information on the provisions of the WFD, the Decision, and the EU Guidance is given below (see point 2.1.1.1). However, as far as the EU legal framework for the identification and classification of hazardous waste is concerned, it is necessary to assess not only the content of the legislation and technical guidelines referred to above but also the provisions of other legislation on the identification of hazardous waste (see point 2.1.1.2), and on the regulation of chemicals (see point 2.1.1.3).

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[1] Commission Decision 2014/955/EU of 18 December 2014 amending Decision 2000/532/EC on the list of waste pursuant to Directive 2008/98/EC of the European Parliament and of the Council.

[2] Commission Decision 2000/532/EC of 3 May 2000 replacing Decision 94/3/EC establishing a list of waste pursuant to Article 1(a) of Council Directive 75/442/EEC on waste and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous waste (notified under document number C(2000) 1147).

[3] Commission Regulation (EU) No 1357/2014 of 18 December 2014 replacing Annex III to Directive 2008/98/EC of the European Parliament and of the Council on waste and repealing certain Directives.

2.1.1.1 Waste Framework Directive, Decision on the European List of Waste, EU Guidance

Waste Framework Directive

The WFD is the main piece of EU legislation on waste, the provisions of which must be transposed by all Member States. The scope of the Directive is determined by the definition of the term 'waste' in Article 3(1) and the exceptions provided for in Article 2[4]. It should be noted that deciding whether a substance or object can be considered 'waste' in the sense of the WFD is a weighty decision, and just as equally important, is the decision as to whether it should be classified as 'non-hazardous waste' or 'hazardous waste'.

In the WFD, hazardous waste is defined as a waste that displays one or more of the fifteen hazardous properties listed in Annex III to the WFD. The Directive also contains a definition of non-hazardous waste.

> ***<u>Waste Framework Directive</u>***
>
> ***Article 3. Definitions***
>
> *1. 'waste' means any substance or object which the holder discards or intends or is required to discard;*
>
> *2. 'hazardous waste' means waste which displays one or more of the hazardous properties listed in Annex III;*
>
> *2a. 'non-hazardous waste' means waste which is not covered by point 2;*

Article 7 of the WFD sets the basis for the European List of Waste. The Decision on the List of Waste was adopted in implementing Article 7(1). Article 7(2) and (3) of the WFD set out provisions for the cases when a Member State considers waste as hazardous, although it is listed in the LoW as non-hazardous and vice versa. Article 7(2) and (3) do not prescribe the competent authority or the relevant procedure for such decisions; this is a question left to the internal legal and administrative organisation of each Member State (it should be noted that economic operators or other private entities are not considered 'the Member States' and are not entitled to take a decision pursuant to Article 7(2) and 7(3) of the WFD).

> ***<u>Waste Framework Directive</u>***
>
> ***Article 7. List of Waste***
>
> *1. The Commission is empowered to adopt delegated acts in accordance with Article 38a in order to supplement this Directive by establishing, and reviewing in accordance with paragraphs 2 and 3 of this Article, a list of waste. The list of waste shall include hazardous waste and shall take into account the origin and composition of the waste and, where necessary, the limit values of concentration of hazardous substances. The list of waste shall be binding as regards determination of the waste which is to be considered as hazardous waste. The inclusion of a substance or object in the list shall not mean that it is waste in all circumstances. A substance or object shall be considered to be waste only where the definition in point (1) of Article 3 is met.*
>
> *2. A Member State may consider waste as hazardous waste where, even though it does not appear as such on the list of waste, it displays one or more of the properties listed in Annex III. The Member State shall notify the Commission of any such cases without delay and provide the Commission with all relevant information. In the light of notifications received, the list shall be reviewed in order to decide on its adaptation.*
>
> *3. Where a Member State has evidence to show that specific waste that appears on the list as hazardous waste does not display any of the properties listed in Annex III, it may consider that waste as non-hazardous waste. The Member State shall notify the Commission of any such cases without delay and shall provide the Commission with the necessary evidence. In the light of notifications received, the list shall be reviewed in order to decide on its adaptation.*

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[4] For the purpose of this Report, the scope of the WFD is not further analysed, and additional information can be found in the Guidance on the interpretation of key provisions of the WFD. (European Commission — Directorate-General Environment (2013): Guidance on the interpretation of key provisions of Directive 2008/98/EC on waste).

4. The reclassification of hazardous waste as non-hazardous waste may not be achieved by diluting or mixing the waste with the aim of lowering the initial concentrations of hazardous substances to a level below the thresholds for defining waste as hazardous.

6. Member States may consider waste as non-hazardous waste in accordance with the list of waste referred to in paragraph 1.

7. The Commission shall ensure that the list of waste and any review of this list adhere, as appropriate, to principles of clarity, comprehensibility and accessibility for users, particularly small and medium-sized enterprises (SMEs).

Annex III to the WFD lists properties of waste which render it hazardous (see Table 1). To take account of scientific progress, this Annex has been updated by Commission Regulation (EU) 1357/2014, applicable as of 1 June 2015, and by Council Regulation (EU) 2017/997, applicable as of 5 July 2018. EU regulations are directly applicable in the Member States without transposition to national legislation.

Table 1. Properties of waste which render it hazardous (according to Annex III of the WFD)

Hazardous Properties	
HP 1	Explosive
HP 2	Oxidising
HP 3	Flammable
HP 4	Irritant – skin irritation and eye damage
HP 5	Specific Target Organ Toxicity (STOT)/Aspiration Toxicity
HP 6	Acute Toxicity
HP 7	Carcinogenic
HP 8	Corrosive
HP 9	Infectious
HP 10	Toxic for reproduction
HP 11	Mutagenic
HP 12	Release of an acute toxic gas
HP 13	Sensitising
HP 14	Ecotoxic
HP 15	Waste capable of exhibiting a hazardous property listed above not directly displayed by the original waste

In addition to the above provisions directly related to the identification and classification of hazardous waste, the WFD also lays down specific conditions for the management of hazardous waste, including:

- the obligation to provide evidence for the tracking of the waste according to the system put by the relevant Member State (Article 17 of the WFD);
- the ban on the mixing of hazardous waste (Article 18 of the WFD);
- specific labelling and packaging obligations (Article 19 of the WFD);
- the provision that hazardous waste must only be treated in specially designated treatment facilities with a special permit as required under Articles 23 to 25 of the WFD.

According to the provisions of Article 20 of the WFD 'Hazardous waste produced by households', the above Articles 17, 18 and 19 do not apply to mixed waste produced by households only until it is accepted for collection, disposal or recovery by an establishment or an undertaking that has obtained a permit or has been registered.

Waste Framework Directive

Article 20. Hazardous waste produced by households

1. By 1 January 2025, Member States shall set up separate collection for hazardous waste fractions produced by households to ensure that they are treated in accordance with Articles 4 and 13 and do not contaminate other municipal waste streams.

2. Articles 17, 18, 19 and 35 shall not apply to mixed waste produced by households.

3. Articles 19 and 35 shall not apply to separate fractions of hazardous waste produced by households until they are accepted for collection, disposal or recovery by an establishment or an undertaking which has obtained a permit or has been registered in accordance with Article 23 or 26.

4. By 5 January 2020, the Commission shall draw up guidelines to assist and facilitate Member States in the separate collection of hazardous waste fractions produced by households.

Hazardous waste produced by households. As part of the implementation of Article 20(4) of the WFD, the Commission Notice 'Separate Collection of Household Hazardous Waste' (2020/C 375/01) was prepared and published in 2020, providing not only best practices for separate collection of household hazardous waste in the EU Member States but also information on the classification of such waste. The types of hazardous waste produced by households, analysed in the above-mentioned Commission Notice, are presented in *Fig. 1*.

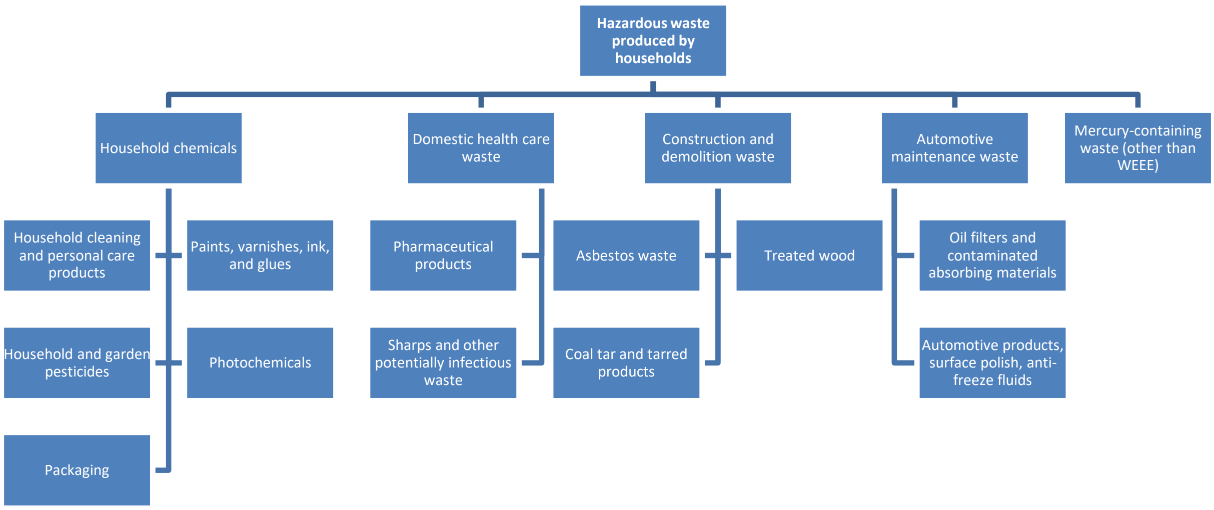


Fig. 1. Household hazardous waste, source: 'Separate Collection of Household Hazardous Waste'

The above-mentioned Commission Notice contains guidance on separate collection and classification of household hazardous waste (Table 2).

Table 2. Guidance on the classification of household hazardous waste (source: 'Separate Collection of Household Hazardous Waste')

Hazardous waste produced by households	Classification/LoW code	Characterization of waste
1. Household chemicals		
1.1. Household cleaning and personal care products	20 01 13* – solvents 20 01 14* – acids 20 01 29* – detergents containing hazardous substances	Many household cleaning products 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 or corrosive*, amongst other hazards.
1.2. Paints, varnishes, ink, and glues	20 01 27* – paint, inks, adhesives, and resins containing hazardous substances	Paints are mixtures of solvents, pigments, minerals, resins, surfactants, and other additives. A fraction of the product ends up in the sewers and surface waters following the cleaning of brushes and containers. Solvent-based paints emit volatile organic compounds to the air during their use and end-of-life use. Waste paints and solvents containing hazardous substances represent a substantial part of hazardous household waste.
1.3. Household and garden pesticides	20 01 19* – pesticides	Pesticides are substances that are contained as active substances in plant protection products and biocides. Even though household pesticides are explicitly formulated for non-professional/home use, they contain active ingredients that are *toxic to plants and animals other than their target*, especially for plants (herbicides), insects (insecticides) or fungi (fungicides). Some pesticides can be *persistent and bio-accumulative* and can be *toxic if ingested* and *irritating to eyes and skin*.
1.4. Photochemicals	20 01 17* – photochemicals	Liquid waste from the photographic process contains *hydro-quinine, sodium sulphite, silver, mercuric chloride, cadmium, ferrocyanide, acids and formaldehyde.* These are found in process bath wastes, colour developer wastes, bleach, fixer, and fixer wastes. **Germany and Denmark** require owners of photography shops to take back this waste from households free of charge. They are also responsible for its disposal.
1.5. Packaging	15 01 10* – packaging containing residues of or contaminated by hazardous substances	Packaging waste containing hazardous substances and mixtures (as listed above) is considered hazardous waste. It can be collected separately via the civic amenity site or periodic pick-ups for household hazardous waste. Further guidance on the classification of containers of hazardous substances and mixtures and when they are considered 'empty' can be found in the *Commission notice on technical guidance on the classification of waste*. Empty packaging from households is typically collected as part of separate collection schemes or mixed municipal waste.
2. Domestic health care waste		
2.1. Pharmaceutical products	20 01 31* – cytotoxic and cytostatic medicines 20 01 32* – medicines other than those mentioned in 20 01 31	Various pharmaceuticals such as analgesics, antibiotics, hormone replacement drugs, oral chemotherapy drugs and antidepressants are commonly found in households. According to some estimates, a considerable proportion of them become waste. At the same time, a number of them enter sewerage systems. Member States usually impose requirements on pharmacies or civic amenity sites to accept waste pharmaceutical products. Member States such as France and Spain have established Extended Producer Responsibility schemes for expired pharmaceutical products

Hazardous waste produced by households	Classification/LoW code	Characterization of waste
		to finance collection.
2.2. Sharps and other potentially infectious waste	20 03 01 – mixed municipal waste 20 03 99 – municipal wastes not otherwise specified	Infectious waste is waste containing viable micro-organisms or toxins that are known or reliably believed to cause disease in man or other living organisms. Specific national rules on collecting and treating such waste generally apply to waste generated in health care facilities, such as hospitals, laboratories, and veterinary clinics, but *not to health care waste generated at home, for which generally no separate collection schemes exist other than for used pharmaceuticals*. As a result of the COVID-19 pandemic, which was declared in March 2020, some Member States or their regions have specific collection arrangements for mixed waste from households with COVID-19 affected patients. In general, however, as stated in the guidance issued by the European Centre for Disease Prevention and Control (ECDC) and further reflected in guidance issued by the Commission services, such waste is collected together with the unsorted municipal waste fraction without further specific collection measures in place.
3. Construction and demolition waste		
3.1. Asbestos waste	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	‘Asbestos’ describes a group of naturally occurring mineral silicate fibres of the serpentine and amphibole series. Asbestos is a hazardous mineral with a fibrous structure, producing severe, potentially fatal, long term health effects, including cancer, when inhaled. It was widely used for insulation and other purposes in the past, owing to its resistance to fire and heat. Asbestos is a substance classified as a category 1 carcinogen. 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.
3.2. Treated timber	20 01 37* – wood containing hazardous substances	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. 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. However, disposal of the wood treated with them is still necessary.
3.3. Coal tar and tarred products	17 03 01* – bituminous mixtures containing coal tar 17 03 03* – coal tar and tarred products 20 01 37* – wood containing hazardous substances (see point 3.2)	Before being superseded by bitumen, coal tar was commonly used as a binder in road construction. Also, *wooden railway sleepers were treated with coal tar creosote, as a 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 considered hazardous because it contains significant amounts of *polycyclic aromatic hydrocarbons (PAHs)*, a group of carcinogenic compounds. Asphalt waste containing coal tar is considered hazardous waste when the level of coal tar is > 0.1%. The term ‘coal tar’ describes several complex substances derived from coal, which are classified as carcinogens of Category 1A in Annex VI to the CLP

Hazardous waste produced by households	Classification/LoW code	Characterization of waste
		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%. Used railway sleepers are known to have been reused in gardens to stabilise walls or ground and are dealt with in the section above on wood waste. Coal tar can also be found in products like *coal tarred board* or *roofing felt (bituminous coating),* which was used, e.g., as part of roofs at garden houses. Some may give rise to considerable amounts of hazardous waste when being repaired or replaced.
4. Automotive maintenance waste		
4.1. Oil filters and contaminated absorbing materials	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	Oil filters from cars can become part of household waste when Do-It-Yourself motorists service their cars. These activities may also generate other oil-impregnated waste, such as clothes and gloves.
4.2. Automotive products, surface polish, anti-freeze fluids	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	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. Like other liquids in the car, anti-freeze such as brake fluids or lubricating oil need to be changed periodically.
5. Mercury-containing waste (other than WEEE)	20 01 21* – fluorescent tubes and other mercury-containing waste 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	Mercury is highly toxic to humans and animals when inhaled or ingested. It is also toxic to aquatic organisms. Mercury-containing waste produced by households includes *old mercury batteries and mercury thermometers*. The total use of mercury in measuring devices in 2007 in the EU was estimated at between 7 and 17 tonnes. The main applications were sphygmomanometers, home barometers, fever thermometers and thermometers for laboratory and industrial applications. The placing on the market of mercury-containing measuring devices is now banned under REACH regulation (Annex XVII, entry 18a) and the mercury use for equipment sold to the public (such as fever thermometers and barometers) ceased in 2009. Mercury recovery units exist, for example, in **Germany, France, Austria, and Sweden**.

Commission Decision 2000/532/EC (Decision on the List of Waste)

As indicated above, the European List of Waste is established by the Commission Decision 2000/532/EC (Decision on the List of Waste). The European List of Waste is the key document for the classification of waste. A consolidated version of the LoW has existed since 2000. It has been revised by Commission Decision 2014/955/EU to adapt the LoW to scientific progress and align it with developments in chemicals legislation. As EU Decision, the LoW is binding in its entirety and addressed to the Member States and does not require transposition.

It is important to note that the Decision on the List of Waste contains the LoW and provides further provisions (rules) for the assessment of hazardous properties and the classification of waste. The structure of the Decision can be categorised into several parts that are described in more detail below:

— Definitions

— Rules on the assessment and classification

— Rules on the use of the LoW

— European List of Waste

First, the Decision on the List of Waste contains definitions and refers to Regulation (EC) No 1272/2008 to define hazardous substances (for details, see point 2.1.1.3).

Decision 2000/532/EC on the List of Waste

DEFINITIONS

For the purposes of this Annex, the following definitions shall apply:

1. 'hazardous substance' means a substance classified as hazardous as a consequence of fulfilling the criteria laid down in parts 2 to 5 of Annex I to Regulation (EC) No 1272/2008;

2. 'heavy metal' means any compound of antimony, arsenic, cadmium, chromium (VI), copper, lead, mercury, nickel, selenium, tellurium, thallium and tin, as well as these materials in metallic form, as far as these are classified as hazardous substances;

3. 'polychlorinated biphenyls and polychlorinated terphenyls' ('PCBs') means PCBs as defined in Article 2(a) of Council Directive 96/59/EC;

4. 'transition metals' means any of the following metals: any compound of scandium, vanadium, manganese, cobalt, copper, yttrium, niobium, hafnium, tungsten, titanium, chromium, iron, nickel, zinc, zirconium, molybdenum and tantalum, as well as these materials in metallic form, as far as these are classified as hazardous substances;

5. 'stabilisation' means processes which change the hazardousness of the constituents in the waste and transform hazardous waste into non-hazardous waste;

6. 'solidification' means processes which only change the physical state of the waste by using additives without changing the chemical properties of the waste;

7. 'partly stabilised wastes' means wastes containing, after the stabilisation process, hazardous constituents which have not been changed completely into non-hazardous constituents and could be released into the environment in the short, middle or long term.

The Decision on the List of Waste also sets out rules for the assessment and classification of waste. The Decision states that the criteria laid down in Annex III to Directive 2008/98/EC must be applied when assessing the hazardous properties of wastes. As regards the classification of waste as hazardous (assessment of its hazardous properties), reference is made to Regulation (EC) No 1272/2008 (for more details, see point 2.1.1.3). This part of the Decision clearly states that hazardous waste is marked with an asterisk (*) in the List of Waste.

It is important to note that there are three types of entries in the European List of Waste:

— 'Absolute hazardous entries': Waste which is assigned to absolute hazardous entries cannot be allocated to non-hazardous entries and is hazardous without any further assessment;

— 'Absolute non-hazardous entries': Waste which is assigned to absolute non-hazardous entries cannot be allocated to hazardous entries and is non-hazardous without any further assessment;

— 'Mirror entries', where waste from the same source might under the European List of Waste be allocated to a hazardous entry or to a non-hazardous entry depending on the specific case and on the composition of the waste.

The Decision on the List of Waste states that the assessment of hazardous properties of waste is necessary only where the waste corresponds to one of the mirror entries.

Decision 2000/532/EC on the List of Waste

ASSESSMENT AND CLASSIFICATION

1. Assessment of hazardous properties of waste

When assessing the hazardous properties of wastes, the criteria laid down in Annex III to Directive 2008/98/EC shall apply. For the hazardous properties HP 4, HP 6 and HP 8, cut-off values for individual substances as indicated in Annex III to Directive 2008/98/EC shall apply to the assessment. Where a substance is present in the waste below its cut-off value, it shall not be included in any calculation of a threshold. Where a hazardous property of a waste has been assessed by a test and by using the concentrations of hazardous substances as indicated in Annex III to Directive 2008/98/EC, the results of the test shall prevail.

2. Classification of waste as hazardous

Any waste marked with an asterisk (*) in the list of wastes shall be considered as hazardous waste pursuant to Directive 2008/98/EC, unless Article 20 of that Directive applies.

For those wastes for which hazardous and non-hazardous waste codes could be assigned, the following shall apply:

— An entry in the harmonised list of wastes marked as hazardous, having a specific or general reference to 'hazardous substances', is only appropriate to a waste when that waste contains relevant hazardous substances that cause the waste to display one or more of the hazardous properties HP 1 to HP 8 and/or HP 10 to HP 15 as listed in Annex III to Directive 2008/98/EC. The assessment of the hazardous property HP 9 'infectious' shall be made according to relevant legislation or reference documents in the Member States.

— A hazardous property can be assessed by using the concentration of substances in the waste as specified in Annex III to Directive 2008/98/EC or, unless otherwise specified in Regulation (EC) No 1272/2008, by performing a test in accordance with Regulation (EC) No 440/2008 or other internationally recognised test methods and guidelines, taking into account Article 7 of Regulation (EC) No 1272/2008 as regards animal and human testing.

— Wastes containing polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF), DDT (1,1,1-trichloro-2,2-bis (4-chlorophenyl)ethane), chlordane, hexachlorocyclohexanes (including lindane), dieldrin, endrin, heptachlor, hexaclorobenzene, chlordecone, aldrine, pentachlorobenzene, mirex, toxaphene hexabromobiphenyl and/or PCB exceeding the concentration limits indicated in Annex IV to Regulation (EU) No 2019/1021 of the European Parliament and of the Council shall be classified as hazardous.

— The concentration limits defined in Annex III to Directive 2008/98/EC do not apply to pure metal alloys in their massive form (not contaminated with hazardous substances). Those waste alloys that are considered as hazardous waste are specifically enumerated in this list and marked with an asterisk (*).

— Where applicable the following notes included in Annex VI to Regulation (EC) No 1272/2008 may be taken into account when establishing the hazardous properties of wastes:

— 1.1.3.1. Notes relating to the identification, classification and labelling of substances: Notes B, D, F, J, L, M, P, Q, R, and U.

— 1.1.3.2. Notes relating to the classification and labelling of mixtures: Notes 1, 2, 3 and 5.

— After assessing the hazardous properties for a waste according to this method, an appropriate hazardous or non-hazardous entry from the list of wastes shall be assigned.

— All other entries in the harmonised list of wastes are considered non-hazardous.

The Decision on the List of Waste also clarifies the structure of the LoW and lays down detailed rules for the selection of an appropriate waste code. It is explained that the six-digit codes are used for the waste, and the sequence of waste code selection must be followed to identify the correct waste code.

Decision 2000/532/EC on the List of Waste

LIST OF WASTE

The different types of waste in the list are fully defined by the six-digit code for the waste and the respective two-digit and four-digit chapter headings. This implies that the following steps should be taken to identify a waste in the list:

— Identify the source generating the waste in Chapters 01 to 12 or 17 to 20 and identify the appropriate six-digit code of the waste (excluding codes ending with 99 of these chapters). Note that a specific production unit may need to classify its activities in several chapters. For instance, a car manufacturer may find its wastes listed in Chapters 12 (wastes from shaping and surface treatment of metals), 11 (inorganic wastes containing metals from metal treatment and the coating of metals) and 08 (wastes from the use of coatings), depending on the different process steps.

— If no appropriate waste code can be found in Chapters 01 to 12 or 17 to 20, the Chapters 13, 14 and 15 must be examined to identify the waste.

— If none of these waste codes apply, the waste must be identified according to Chapter 16.

— If the waste is not in Chapter 16 either, the 99 code (wastes not otherwise specified) must be used in the section of the list corresponding to the activity identified in step one.

Technical guidance on the classification of waste (EU Guidance)

As mentioned above, the European Commission published Notice No 2018/C 124/01 on technical guidance on the classification of waste (the '**EU Guidance**'), providing clarifications and guidance to national authorities, including local authorities, and businesses on the correct interpretation and application of the relevant EU legislation regarding the classification of waste, namely identification of hazardous properties, assessing if the waste has a hazardous property and, ultimately, classifying the waste as hazardous or non-hazardous.

The EU Guidance is structured in three chapters:

— Chapter 1 provides an overall background to waste classification and instructions on how to read the guidance.

— In Chapter 2, the relevant parts of EU waste legislation are briefly presented and their relevance for the definition and classification of hazardous waste is given.

— Chapter 3 presents the general steps of waste classification highlighting the basic concepts.

For detailed information reference is made to the respective annexes, where the specific aspects are described extensively:

— Annex 1 provides information on the List of Waste and on the selection of appropriate List of Waste entries.

— Annex 2 presents the various sources of information on hazardous substances and their classification.

— Annex 3 describes the principles for the assessment of the individual hazardous properties HP1 to HP 15 referred to in Annex III of the WFD.

— Annex 4 reviews basic concepts and refers to the available standards and methods regarding waste sampling and chemical analyses of waste.

Chapter 3 of Annex 1 to the EU Guidance presents additional information and specific examples providing guidance on characterisation approaches to be followed for the most problematic and complex waste, in particular packaging waste, waste from electrical and electronic equipment, and end-of-life vehicles (ELV).

2.1.1.2 Other EU legislation on waste classification

Regarding EU regulation on the identification and classification of hazardous waste, it is important to mention other legislation that is not directly linked to the establishment of rules on the identification of hazardous waste but lays down different rules on the classification of waste (depending on the scope). A brief overview of this legislation is given below.

Regulation (EC) No 1013/2006 of the European Parliament and of the Council of 14 June 2006 on shipments of waste

Regulation (EC) No 1013/2006 of the European Parliament and of the Council of 14 June 2006 on shipments of waste ('**Regulation No 1013/2006**') implements into EU law the provisions of the Basel Convention and OECD Decision C(2001)107. Regulation

No 1013/2006, which is directly applicable in all Member States, establishes the procedures, conditions, and requirements to be fulfilled during transboundary shipments of waste. According to Articles 34 and 36 of Regulation No 1013/2006, the export of waste for a disposal operation outside the EU/EFTA area is prohibited, as well as *the export of hazardous wastes* from the EU to any non-OECD Decision country.

There are two control procedures for the shipment of waste, namely:

- the general information requirements of Article 18, which is normally applicable to shipments for recovery of wastes listed in Annex III ('green' listed wastes) or IIIA, and
- the procedure of prior written notification and consent for any other type of shipment of wastes.

To determine whether the shipment of waste is not prohibited and/or to identify which of the above procedures should apply to the shipment of waste, proper classification of waste is first required. It is important to note that, in this case, waste is classified according to the lists contained in Annex III–IV to Regulation No 1013/2006 (the incorporated lists of international agreements). These lists provide for a classification approach different from the LoW.

However, classification according to the LoW is also relevant in the context of the provisions of Regulation No 1013/2006, for instance, as a criterion for whether the waste may be exported to certain non-EU non-OECD countries (Article 36(1)). The classification of waste following the entries listed in Annexes III–IV to the Regulation (e.g. Basel Convention and OECD codes) as well as the entries of the LoW (Part 2 of Annex V to the Regulation) is to be indicated in the relevant documents accompanying the shipment of waste.

Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste and Council Decision of 19 December 2002 establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC (2003/33/EC)

Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste (the '**Landfill Directive**') contains rules on the management, permit conditions, closure, and after-care of landfills. Council Decision 2003/33/EC of 19 December 2002 establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC (the '**Decision 2003/33/EC**') specifies waste acceptance criteria ('WAC') for acceptance of waste in the different classes of landfills as recognised by the Landfill Directive.

The classification of waste as hazardous according to LoW and Annex III to the WFD is important also for the purposes of the Landfill Directive and Decision 2003/33/EC since it is first necessary to determine whether or not waste is hazardous (hazardous waste should as a general rule be disposed of at landfills for hazardous waste, and non-hazardous waste should be disposed of at landfills for non-hazardous waste or inert waste). However, the classification of waste as hazardous or not, according to the principles of Annex III to the WFD and according to the LoW, must not be confused with the assessment of waste to determine compliance with the criteria for acceptance of waste as set out by Annex II to the Landfill Directive and as laid down in Decision 2003/33/EC.

Directive 2006/21/EC of the European Parliament and of the Council of 15 March 2006 on the management of waste from extractive industries and amending Directive 2004/35/EC.

Directive 2006/21/EC of the European Parliament and of the Council of 15 March 2006 on the management of waste from extractive industries and amending Directive 2004/35/EC (the '**Extractive Waste Directive**') sets up the framework for proper management of wastes resulting from extractive industries. Although it is excluded from the scope of the WFD, the hazardousness of wastes from the extractive industries should be classified in line with Annex III to the WFD and the LoW.

The Extractive Waste Directive aims at ensuring that waste from the extractive industries is managed in a way which prevents or reduce as far as possible any adverse effects on the environment and any resultant risks to human health. Although waste from extractive industries covered by the Extractive Waste Directive is explicitly excluded from the scope of the WFD (Article 2(2)(d) of the WFD), classification according to the LoW nevertheless is relevant: operators are under the Extractive Waste Directive to prepare a waste management plan, establishing the necessary measures to effectively manage relevant waste. In accordance with the waste management plan the hazardousness of the waste from the extractive industries should be classified in line with criteria of the LoW and Annex III to the WFD.

2.1.1.3 EU legislation on the classification and management of chemicals relating to the identification of hazardous waste

Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

Regulation (EC) 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (the '**REACH Regulation**') entered into force in 2007. The REACH Regulation is the general chemicals law at the EU level, applying to substances (in mixtures or articles). The purpose of REACH is to ensure a high level of protection of human health and the environment, including the promotion of alternative methods for the assessment of hazards of substances, as well as the free circulation of substances on the internal market while enhancing competitiveness and innovation. The REACH Regulation defines and operates a number of processes with the overarching aim of ensuring the safe use of chemicals:

- registration/notification of substances;
- improved communication of information in the supply chain by means of extended Safety Data Sheets (eSDS);
- evaluation of substances by public authorities of EU Member States to ascertain whether substances present a risk to human health or the environment;
- restriction of use and/or marketing of substances for which an unacceptable risk has been determined;
- authorisation is applicable to certain substances of very high concern (SVHC) which can only be placed on the market and used subject to the granting of a specific and time-limited authorisation, subject to certain conditions.

It is important to note that according to Article 2(2) of the REACH Regulation, waste (as defined by the WFD) is not considered a substance or a mixture or an article under the REACH Regulation; no direct obligations apply under the REACH Regulation for producers or holders of waste. However, for the classification of waste, information on substances collected from manufacturers and importers of substances at the moment of REACH registration, and in particular information on the classification of substances pursuant to Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures (the '**CLP Regulation**'), which is published on the ECHA website.

It should be noted that some test methods, or adaptations thereof, applied for the purpose of the REACH Regulation are indicated in Regulation (EC) 440/2008 (the '**Test Methods Regulation**'), may be applied in the framework of waste classification.

Regulation (EC) No 1272/2008 on classification, labelling and packaging (CLP) of substances and mixtures

The CLP Regulation adapts for the EU the UN international chemicals classification system (Globally Harmonised System — GHS). In this context, it sets out detailed criteria for assessing substances and determining their hazard classification. Similarly to the REACH Regulation, Article 1(3) of the CLP Regulation lays down that waste is not considered a substance, mixture, or article; consequently, obligations under the CLP Regulation do not apply to waste.

Although Annex III to the WFD is based on the CLP Regulation, as mentioned above, it does not contain a full 'one to one' transposition of the criteria as laid down in the CLP Regulation. In terms of the classification of waste, it should be noted that some of the HP criteria of Annex III to the WFD refer directly to the CLP Regulation hazard classes and categories and to hazard statements and associated criteria for classification. Many mirror entries of the LoW specifically refer to hazardous substances. The classification of substances is done according to the CLP Regulation, whereas the presence of hazardous substances contained in waste must be evaluated in line with Annex III to the WFD. Further, Table 3.1 of Part 3 of Annex VI to the CLP Regulation provides a set of official harmonised classifications of substances. Where such harmonised classification is available, it must be used in the classification of waste.

Regulation (EU) 2019/1021 on persistent organic pollutants (POPs)

Regulation (EU) 2019/1021 on persistent organic pollutants (the '**POP Regulation**'), inter alia, aims at protecting the environment and human health from certain specified substances that are transported across international boundaries far from their sources, persist in the environment, and can bioaccumulate in living organisms, by implementing relevant international agreements. The Regulation's scope is restricted to the substances listed in the Annexes of the Regulation.

Following Article 7 of the POP Regulation, wastes consisting of POPs, containing or contaminated with them above specific limit values (concentration limit referred to in Article 7(4)(a) — the so-called 'low POP-content limit value'), must be disposed of or recovered, without undue delay and following the provisions laid down in the POP Regulation in such a way as to ensure that the persistent organic pollutant content is destroyed or irreversibly transformed so that the remaining waste and releases do not exhibit the characteristics of persistent organic pollutants. Disposal or recovery operations that may lead to recovery, recycling, reclamation, or re-use of the POPs are prohibited.

The classification of the mirror entries under the LoW, as amended by Commission Decision 2014/955/EU, must take into consideration the existence of certain POPs. Waste containing certain POPs (as indicated in the Annex to the LoW (point 2, indent 3)), above the relevant thresholds of POPs Regulation, is considered hazardous without further consideration.

Note that:

- The presence of POPs listed in the Annexes of the POP Regulation other than those specifically mentioned in the Annex to the LoW (point 2, indent 3), even in concentrations exceeding the limit values established in Annex IV to the POP Regulation, does not automatically lead to the classification of waste as hazardous. Classification would depend on the hazard classification of the substance and must be assessed by applying the general rules of Annex III to the WFD applicable to HP1 to HP15.
- This impact on classification is irrespective and independent from all obligations set out for the producers and holders of POPs waste according to POP Regulation.

Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances

Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances (the '**Seveso III Directive**') has as main objective the prevention of major accidents which involve dangerous substances, and the limitation of their consequences for human health and the environment, with the goal of ensuring a high level of protection throughout the Union in a consistent and effective manner.

Operators handling dangerous substances above certain thresholds are obliged to take all necessary measures to prevent major accidents and limit their consequences. The requirements include providing information to the public likely to be affected by an accident, providing safety reports, establishing a safety management system and an internal emergency plan. The Member States must, amongst others, ensure that emergency plans are in place for the surrounding areas and that mitigation actions are planned.

The Seveso III Directive also applies to waste but waste landfill sites, including underground storage, are excluded from the scope of the Seveso III Directive. Note 5 to Annex I of the Seveso III Directive refers to the CLP Regulation and mentions waste explicitly.

Note 5 to Annex I of the Seveso III Directive:
In the case of dangerous substances which are not covered by Regulation (EC) No 1272/2008 (the CLP Regulation), including waste, but which nevertheless are present, or are likely to be present, in an establishment and which possess or are likely to possess, under the conditions found at the establishment, equivalent properties in terms of major-accident potential, these shall be provisionally assigned to the most analogous category or named dangerous substance falling within the scope of this Directive.

2.1.2 National legislation

The provisions of the WFD discussed above have been transposed to the Law on Waste Management of the Republic of Lithuania and implementing legislation, the main of which is the Waste Management Rules approved by Order No 217 of the Minister for Environment of 14 July 1999 (the '**Waste Management Rules**'). As mentioned above, EU regulations are directly applicable in the Member States; therefore, the Waste Management Rules only refer to the obligation to follow this legislative act when identifying hazardous waste. In Lithuania, as in the other EU Member States, there are other legal acts related in one way or another to the identification of waste. This section below provides detailed information about the legislative provisions in force in Lithuania.

2.1.2.1 Provisions of the Law on Waste Management and the Waste Management Rules on the identification and classification of hazardous waste

Law on Waste Management

Article 7^1 of the Law on Waste Management provides that the list of waste is approved by the Ministry of Environment. That Article also states that the obligation to identify waste in compliance with the list of waste applies to the waste holder, i.e. the waste producer or the person holding the waste. The list of waste is attached to the Waste Management Rules as Annex 1.

Law on Waste Management
Article 7^1. List of waste
1. In identifying waste, the waste holder must act in compliance with the list of waste.

2. The list of waste classifying waste by the source of generated waste shall be approved by the Ministry of Environment.

Article 2. Definitions:

*6. '**Waste**' means any substance or item which the holder discards or intends or is required to discard.*

*8. '**Waste producer**' means anyone whose activities produce waste (original waste producer) or anyone who carries out pre-processing, mixing or other operations resulting in a change in the nature or composition of this waste.*

*17. '**Waste holder**' means the waste producer or the person who is in possession of the waste.*

In addition, Article 13 of the Law on Waste Management establishes an obligation for holders of hazardous waste to identify and declare existing hazardous waste.

Law on Waste Management

Article 13. Identification and declaration of hazardous waste

The holder of hazardous waste must identify and declare the hazardous waste held in accordance with the procedure laid down by the Ministry of Environment.

The Ministry of Environment has not approved any separate procedure for the identification and declaration of hazardous waste; therefore, the identification of hazardous waste must be carried out in accordance with the provisions of the Waste Management Rules detailed below, in particular the provisions of Annex 1 thereof, and the declaration of hazardous waste is implemented in accordance with the Rules for the Accounting and Reporting of Waste Generation and Management approved by order of the Minister for Environment. Those Rules impose an obligation on all waste producers whose activities generate hazardous waste to record it under the provisions of the Rules.

In addition, it should be noted that, when transposing specific provisions of the WFD, the Law on Waste Management lays down special conditions for the management of hazardous waste, including:

- the ban on the mixing of hazardous waste (Article 14 of the Law on Waste Management);
- labelling and packaging obligations (Article 15 of the Law on Waste Management).

Waste Management Rules

As mentioned above, the list of waste is attached to the waste Management Rules as Annex 1; the Rules also contain a separate chapter on the identification and declaration requirements for hazardous waste.

Waste Management Rules

CHAPTER X. IDENTIFICATION AND DECLARATION OF HAZARDOUS WASTE

73. Waste marked with an asterisk (*) in the list of wastes provided in Annex 1 to the Rules is considered hazardous waste.

74. Enterprises generating hazardous waste must identify the generated hazardous waste, determine its composition, and declare the generated hazardous waste in their waste accounting records.

75. Enterprises must follow Annex 1, point 2 for the identification of hazardous waste.

76. If the waste cannot be identified by the methods referred to in point 75, laboratory tests must be carried out to determine the composition and properties of hazardous waste.

77. The reclassification of hazardous waste as non-hazardous waste may not be achieved by diluting or mixing the waste failing to comply with the requirements set out in points 78 and 79 and with the aim of lowering the initial concentrations of hazardous substances to a level below the thresholds for defining waste as hazardous.

It is important to note that the list of waste provided in Annex 1 to the Waste Management Rules (the '**List of waste**') differs from the European LoW, as it contains eight-character national codes for particular wastes. To determine a waste code within the list, the eight-character waste code is first to be identified. If none of the eight-digit waste codes is applicable, then the six-digit waste code is used.

The provisions of Commission Decision 2000/532/EC (the Decision on the List of Waste) are transposed into Annex 1 to the Waste Management Rules, which also maintains the structure of the Decision accordingly, i.e. Annex 1 to the Waste Management Rules contains, in addition to the List of waste, further provisions (rules) for the assessment of hazardous properties and the classification of waste, including:

— Rules on the assessment and classification;

— Rules on the use of the List of waste;

— List of waste.

The rules on the assessment and classification of waste are transferred from the Decision on the List of Waste into Chapter I 'Assessment and Classification' of Annex 1 to the Waste Management Rules.

As in the Decision on the List of Waste, Chapter I of Annex 1 to the Waste Management Rules states that any waste marked with an asterisk (*) in the List of waste is considered hazardous waste; only waste that can be assigned both hazardous and non-hazardous waste codes should be assessed for hazardous properties (i.e. where the source and type of waste generation correspond to a mirror waste code); reference is made to Regulation No 1272/2008 (the CLP Regulation).

It should be noted that point 2.1. of Annex 1 to the Waste Management Rules indicates that any waste marked with an asterisk (*) in the List of waste is considered hazardous waste under the Law on Waste Management of the Republic of Lithuania **unless Article 18[1] of the Law on Waste Management applies**[5], i.e. the aforementioned obligation to identify and declare hazardous waste outlined in Article 13 of the Waste Management Law does not apply.

Chapter I 'Assessment and Classification' of Annex 1 to the Waste Management Rules also refers to Regulation 1357/2014 with direct applicability (which, as stated above, replaced Annex III to the WFD, laying down criteria for determining when waste is to be identified as hazardous).

There is additional information provided in the context of the adaptation of the provisions of the Decision on the List of Waste to national law: Hazardous property HP 9 (infectious) is assessed under Order No V-706 of the Minister for Health of the Republic of Lithuania of 18 July 2013 approving the Lithuanian Hygiene Standard HN 66:2013 'Safety Requirements for the Management of Medical Waste', and other legal acts of the Republic of Lithuania.

CHAPTER I

ASSESSMENT AND CLASSIFICATION

1. For the assessment of hazardous properties of waste, the criteria set out in the Annex to Commission Regulation (EU) No 1357/2014 of 18 December 2014 replacing Annex III to Directive 2008/98/EC of the European Parliament and of the Council on waste and repealing certain Directives (OJ 2014 L 365, p. 89) ('Regulation No 1357/2014') shall apply. For the hazardous properties HP 4, HP 6 and HP 8, cut-off values for individual substances as indicated in Annex to of Regulation No 1357/2014 shall apply to the assessment. Where a substance is present in the waste below its cut-off value, it shall not, be included in any calculation of a threshold. Where a hazardous property of a waste has been assessed by a test and by using the

[5] Article 18[1]. Hazardous waste produced by households. 1. Requirements of Articles 7, 9, 13, 14, 15 and 17 of this Law shall not apply to mixed waste produced by households. 2. Requirements of Articles 7, 9, 15 and 17 of this Law shall not apply to hazardous waste produced by households until it is accepted by an undertaking engaged in the collection, disposal or recovery of waste which has obtained a permit and/or has been registered in the State Register of Waste Managers.

concentrations of hazardous substances as indicated in Annex to Regulation No 1357/2014, the results of the test shall prevail. *2. Classification of waste as hazardous:* *2.1. any waste marked with an asterisk (*) in the List of waste is considered as hazardous waste under the Law on Waste Management of the Republic of Lithuania, unless Article 18[1] of the Law on Waste Management applies;* *2.2. for those wastes for which hazardous and non-hazardous waste codes could be assigned, the following shall apply:* *2.2.1. an entry in the list of wastes marked as hazardous, having a specific or general reference to hazardous substances, is appropriate to a waste when that waste contains relevant hazardous substances that cause the waste to display one or more of the hazardous properties HP 1 to HP 8 and/or HP 10 to HP 15 as listed in Annex to Regulation No 1357/2014. Hazardous property HP 9 (infectious) is assessed under Order No V-706 of the Minister for Health of the Republic of Lithuania of 18 July 2013 approving the Lithuanian Hygiene Standard HN 66:2013 'Safety Requirements for the Management of Medical Waste', and other legal acts of the Republic of Lithuania;* *2.2.2. a hazardous property can be assessed by using the concentration of substances in the waste as specified in Annex to Regulation No 1357/2014 or, unless otherwise specified in Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 (OJ 2008 L 353, p. 1) ('Regulation No 1272/2008'), by performing a test in accordance with Commission Regulation (EC) No 440/2008 of 30 May 2008 laying down test methods pursuant to Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) or other internationally recognised test methods and guidelines, taking into account Article 7 of Regulation (EC) No 1272/2008 as regards animal and human testing;* *2.2.3. wastes containing polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF), DDT (1,1,1-trichloro-2,2- bis (4-chlorophenyl)ethane), chlordane, hexachlorocyclohexanes (including lindane), dieldrin, endrin, heptachlor, hexaclorobenzene, chlordecone, aldrine, pentachlorobenzene, mirex, toxaphene hexabromobiphenyl and/or PCB exceeding the concentration limits indicated in Annex IV to Regulation (EU) No 2019/1021 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants shall be classified as hazardous;* *2.2.4. the concentration limits defined in Annex to Regulation No 1357/2014 do not apply to pure metal alloys (not contaminated with hazardous substances). those waste alloys that are considered as hazardous waste are specifically enumerated in this list and marked with an asterisk (*);* *2.2.5. where applicable the following notes included in Annex VI to Regulation (EC) No 1272/2008 may be taken into account when establishing the hazardous properties of wastes:* *2.2.5.1. 1.1.3.1. notes relating to the identification, classification and labelling of substances: Notes B, D, F, J, L, M, P, Q, R, and U;* *2.2.5.2. 1.1.3.2. notes relating to the classification and labelling of mixtures: Notes 1, 2, 3 and 5;* *2.2.6. for the purposes of assessing the hazardous property HP14, waste shall be classified as hazardous when, after 48 hours of interaction, 50% of the response level of Daphnia magna is achieved at the concentration of waste 10% or less in the sample (reaching 48 h EC50 ≤ 10%) by testing according to standard LST EN ISO 6341 (Water quality — Determination of the inhibition of the mobility of Daphnia magna Straus (Cladocera, Crustacea) — Acute toxicity test). Waste samples shall be prepared in accordance with standard LST EN 14735 (Characterization of waste — Preparation of waste samples for ecotoxicity tests);* *2.2.7. failure to identify the composition of the waste and the absence of documents proving that the waste is not hazardous shall result in the classification of the waste as hazardous;* *2.3.all other entries in the harmonised list of wastes are considered non-hazardous.*

The list of waste (as mentioned above, the list of waste used in Lithuania is more extensive than the European List of Waste, as eight-digit waste codes are used in Lithuania to identify particular waste) is set out in Chapter II of Annex 1 to the Waste Management Rules. At the beginning of the chapter, information is provided from the Decision on the List of Waste concerning the structure of the list of waste and the rules for the use thereof.

CHAPTER II *LIST OF WASTE*

3. The different types of waste in the list are fully defined by the six-digit or eight-digit code for the waste and the respective two-digit and four-digit chapter headings. This implies that the following steps should be taken to identify a waste in the list:

3.1. identify the source generating the waste in Chapters 01 to 12 or 17 to 20 and identify the appropriate six-digit or eight-digit code of the waste (excluding codes ending with 99 of these chapters). It should be noted that a specific production unit may need to classify its activities in several chapters. For instance, a car manufacturer may find its wastes listed in Chapters 12 (wastes from shaping and surface treatment of metals), 11 (inorganic wastes containing metals from metal treatment and the coating of metals) and 08 (wastes from the use of coatings), depending on the different process steps;

3.2. if no appropriate waste code can be found in Chapters 01 to 12 or 17 to 20, the Chapters 13, 14 and 15 must be examined to identify the waste.

3.3. If none of these waste codes apply, the waste must be identified according to Chapter 16;

3.4. if the waste is not in Chapter 16 either, the 99 code (wastes not otherwise specified) must be used in the section of the list corresponding to the activity identified in step one.

4. To determine a waste code within the list, the eight-character waste code is first to be identified. If none of the eight-digit waste codes is applicable, then the six-digit waste code is used.

5. The List of waste contains a code type set up for each waste code (ANH = absolute non-hazardous, AH = absolute hazardous, MH = mirror hazardous, MNH = mirror non-hazardous). If the code type ANH is assigned to the waste code, it shall be considered non-hazardous, and no assessment of hazardousness is required. If the code type AH is assigned to the waste code, it shall be considered hazardous, and no assessment of hazardousness is required. If the code type MNH or MH is assigned to the waste code, the hazardousness of waste must be assessed. The assessment of the hazardousness of waste shall be carried out in accordance with Chapter I, point 2.2, based on the safety data sheet of the substance or mixture, the description of the waste generation process, the analysis of the waste composition or other available information.

2.1.2.2 EU Guidance

The EU Guidance is published on the website of the Ministry of Environment[6], and no national legislation contains any references to it. In Lithuania, there is no national guidance on the identification and classification of hazardous waste.

2.1.3 Legal framework for the identification and classification of hazardous waste. Summary

Virtually all the provisions of the WFD relating to the identification and classification of hazardous waste have been transposed into the Lithuanian national legal framework. It should be noted, however, that the existing legal framework is somewhat confusing, with specific legal provisions being unclear/redundant and/or contradictory, e.g.:

- As mentioned above, the Law on Waste Management contains a reference to the obligation to identify waste in Article 7[1] referring to the List of waste, in addition to the obligation for holders of hazardous waste to identify and declare existing hazardous waste in Article 13. In this way, the identification of hazardous waste may appear to be subject to identification procedures other than those relating to the list of waste.
- It is not entirely clear how the exemption referred to in point 2.1 of Annex 1 to the Waste Management Rules should apply, namely that any waste marked with an asterisk (*) in the List of waste is considered as hazardous waste under the Law on Waste Management of the Republic of Lithuania, **unless Article 18[1] of the Law on Waste Management applies**[7], i.e. the aforementioned obligation to

[6]https://am.lrv.lt/uploads/am/documents/files/atliekos/2018_C%20124_01%20%20Atliek%C5%B3%20klasifikavimo%20technin%C4%97s%20gair%C4%97s.pdf

[7] Article 18[1]. Hazardous waste produced by households 1. Requirements of Articles 7, 9, 13, 14, 15 and 17 of this Law shall not apply to mixed waste produced by households. 2. Requirements of Articles 7, 9, 15 and 17 of this Law shall not apply to hazardous waste produced by households until it is accepted by an undertaking engaged in the collection, disposal or recovery of waste which has obtained a permit and/or has been registered in the State Register of Waste Managers.

identify and declare hazardous waste outlined in Article 13 of the Waste Management Law does not apply.

— Point 2.2.7. of Annex 1 to the Waste Management Rules states: *failure to identify the composition of the waste and the absence of documents proving that the waste is not hazardous shall result in the classification of the waste as hazardous*, which implies that it allows waste to be classified as hazardous without its composition being determined; however, at the same time, point 74 of the Waste Management Rules imposes an obligation to determine the waste composition: *Enterprises generating hazardous waste* ***must identify the generated hazardous waste****,* ***determine its composition****, and declare the generated hazardous waste in their waste accounting records.*

It should be noted that in Lithuania, no authority is assigned functions related to the identification and classification of hazardous waste, which includes the provision of methodological assistance to economic entities. There is also a lack of clarity and procedures on how the correct identification of waste must be validated: It is not specified what information has to be provided, to which authority, in which cases the submission is compulsory, etc.

Improvement proposals for Lithuanian legislation on the identification and classification of hazardous waste are presented in Chapter 2.6.

2.2 Analysis of the generation and management of hazardous waste in Lithuania

2.2.1 Generation, sources, and volumes of hazardous waste

The analysis of hazardous waste generated in Lithuania, its quantities and sources has been carried out based on publicly available data and the statistical data additionally submitted by the EPA.

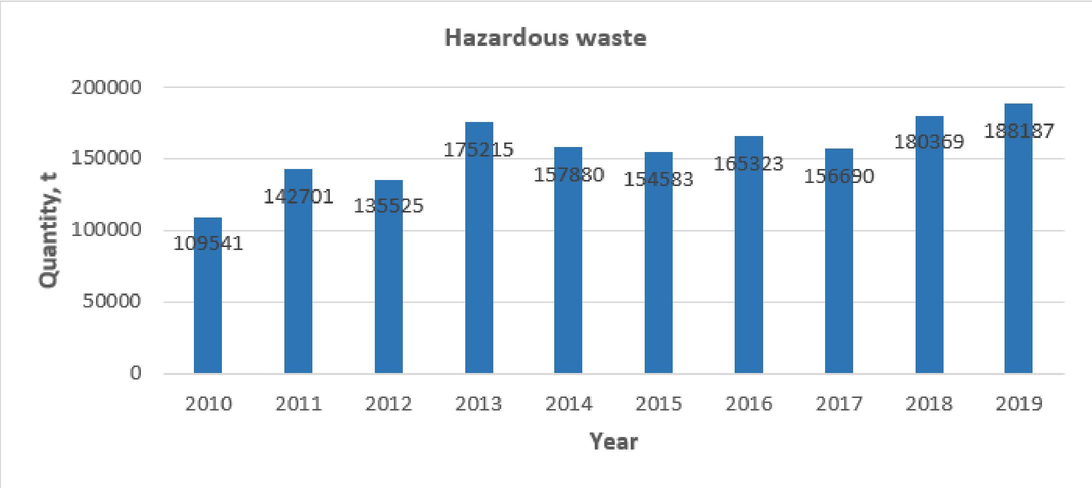
Considering the absence of official statistics on hazardous waste generated/collected in Lithuania in 2020, the Report analyses the statistical data published by the EPA on the quantities of hazardous waste collected (generated) in Lithuania from 2010 to 2019.

In Lithuania, as in the other EU Member States, sources of waste generation are divided according to the relevant sections listed in the statistical classification of economic activities (the 'sectors'), i.e.:

- A – Agriculture, forestry and fisheries;
- B – Mining and quarrying;
- C – Manufacturing;
- D – Electricity, gas, steam and air conditioning supply;
- E – Water supply, sewerage;
- E38 – Waste collection, treatment and disposal activities, materials recovery;
- F – Construction;
- G–U – Service sector;
- G46.77 – Wholesale of waste and scrap;
- EP–HH – Households.

The analysis of waste generated assesses which hazardous waste has been generated in a given sector.

To identify the changes in the generation of other hazardous waste, first, the total amount of hazardous waste generated in Lithuania from 2010 to 2019 has been assessed, which had landed in waste management facilities, except for the waste generated from the treatment of waste (the 'secondary waste').

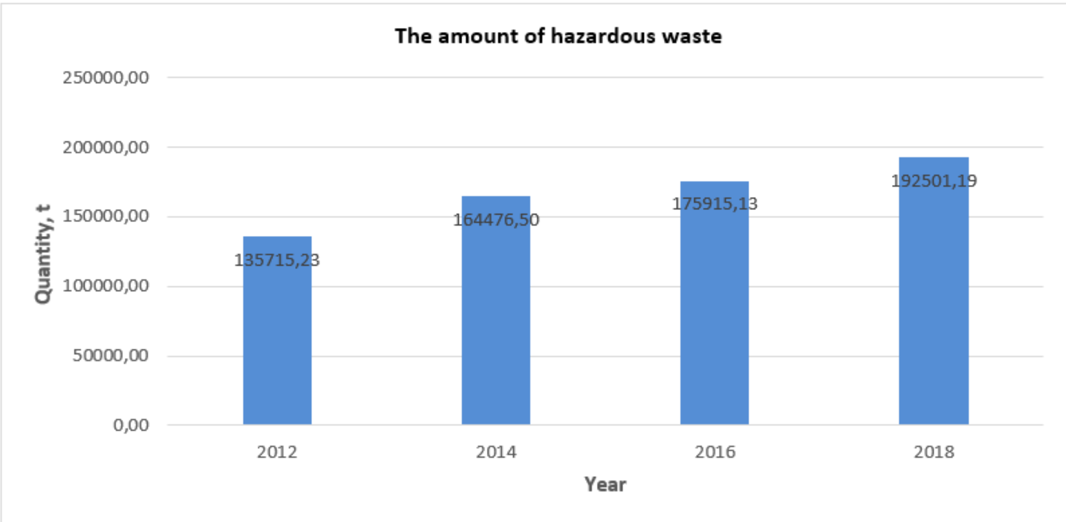


Source: EPA.

Fig. 2. The amount of hazardous waste collected (generated) in Lithuania from 2010 to 2019.

According to the data available in Fig. 2, the amount of hazardous waste generated increased by 72% between 2010 and 2019, i.e. from 109,541 tonnes in 2010 to 188,187 tonnes in 2019. The assessment of the amount of hazardous waste collected (generated) annually has resulted in extreme variations. Most hazardous waste was collected (generated) in 2013, 2018, and 2019.

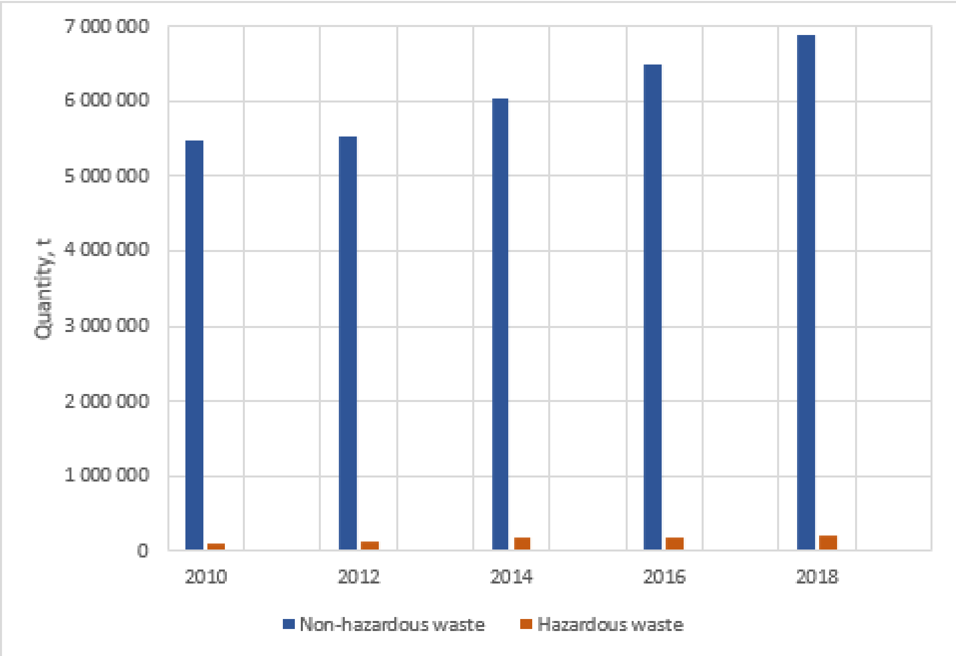
When assessing the total amount of hazardous waste collected (generated) in Lithuania in 2012, 2014, 2016 and 2018 that had entered waste management facilities, including the secondary waste, the annual increase in the amount of hazardous waste has been established. Comparing the amount of waste collected (generated) in 2012 and 2018, the amount of waste collected/generated in 2018 increased by 42%, i.e. the amount of hazardous waste increased from ~135,715 tonnes to ~192,501 tonnes.



Source: EPA.

Fig. 3. The amount of hazardous waste collected (generated) in Lithuania in 2012, 2014, 2016 and 2018, including the secondary waste.

The share of hazardous waste in total waste generation amounted to 1.92% in 2010 and increased to 2.8% in 2018. The share of non-hazardous waste increased by almost 26% over the same period.



Source: EPA.

Fig. 4. The amount of hazardous and non-hazardous waste collected (generated) in Lithuania from 2014 to 2018.

The table below shows the types of hazardous generated in Lithuania from 2010 to 2019.

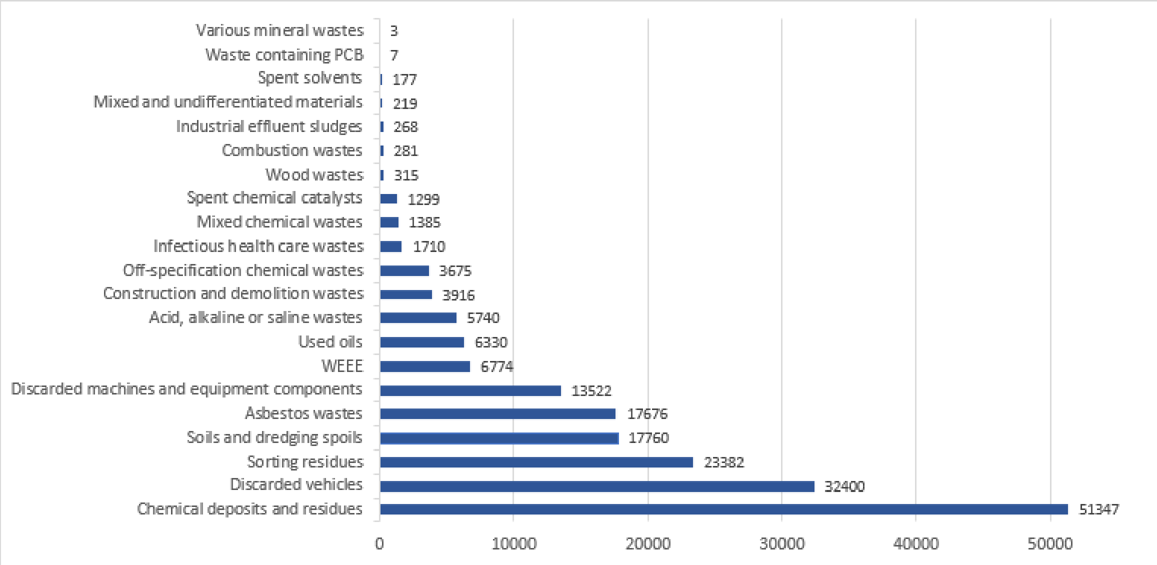
Table 3. The amount of hazardous waste generated (collected) in Lithuania from 2010 to 2019 by individual types of waste.

Types of hazardous waste	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Spent solvents, t/y	33	68	55	115	124	109	148	160	131	177
Acid, alkaline or saline wastes, t/y	**3,629**	**4,723**	**4,358**	**4,242**	**4,820**	**4,495**	**4,588**	**4,958**	**4,395**	**5,740**
Used oils, t/y	**3,972**	**4,001**	**3,328**	**3,379**	**4,372**	**5,219**	**4,802**	**5,281**	**5,873**	**6,330**
Spent chemical catalysts, t/y		14	28	870	1	426	447	346	121	1,299
Off-specification chemical wastes t/y	630	1,303	801	1,023	1,330	1,637	1,900	2,403	3,241	3,675
Mixed chemical wastes, t/y	847	343	383	628	516	543	742	1,579	1,116	1,385
Chemical deposits and residues, t/y	**45,548**	**46,311**	**34,650**	**45,208**	**44,407**	**44,108**	**43,495**	**29,821**	**40,818**	**51,347**
Industrial effluent sludges, t/y	120	176	151	111	97	91	163	638	37	268

Types of hazardous waste	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Infectious health care wastes, t/y	1,121	883	1,144	1,150	1,266	1,275	1,242	1,244	1,323	1,710
Glass wastes, t/y	244	99	112	0		2	0	13		
Wood wastes, t/y	15	361	668	1,495	480	183	155	188	273	315
Waste containing PCB, t/y	67	40	32	22	8	11	19	14	7	7
Discarded vehicles, t/y	**16,382**	**21,198**	**25,010**	**30,724**	**32,160**	**27,442**	**25,280**	**26,115**	**27,532**	**32,400**
Discarded EEE, t/y	**2,656**	**4,022**	**4,553**	**4,382**	**4,406**	**4,316**	**4,472**	**5,544**	**5,631**	**6,774**
Discarded machine and equipment components, t/y	**17,129**	**17,215**	**19,251**	**17,530**	**17,541**	**16,865**	**16,654**	**15,074**	**12,935**	**13,522**
Mixed and undifferentiated materials, t/y	44	65	46	67	64	67	57	104	102	219
Sorting residues, t/y	**10,794**	**17,846**	**15,455**	**15,203**	**15,526**	**16,166**	**14,929**	**20,921**	**21,336**	**23,382**
Construction and demolition wastes, t/y	73	604	522	612	217	2,125	1,819	2,204	2,507	3,916
Asbestos wastes, t/y	**4,528**	**5,045**	**16,166**	**14,167**	**18,179**	**11,122**	**9,947**	**14,253**	**14,568**	**17,676**
Waste of naturally occurring minerals, t/y		7	0							
Combustion wastes, t/y	210	80	368	944	1,300	534	479	301	459	281
Various mineral wastes, t/y	3	2	0	1	2	3	2	4	11	3
Soils and dredging spoils, t/y	**1,496**	**18,295**	**8,446**	**33,343**	**11,063**	**17,845**	**33,981**	**25,524**	**37,955**	**17,760**
Total, t/y	**109,541**	**142,701**	**135,525**	**175,215**	**157,880**	**154,583**	**165,323**	**156,690**	**180,369**	**188,187**

Source: *https://aaa.lrv.lt/lt/veiklos-sritys/atliekos/atlieku-apskaita/atlieku-apskaitos-duomenys/surinkta-pavojinguju-atlieku-pagal-atskiras-ju-rusis*.

The assessment of the information provided in Table 3 has shown that the distribution of waste by streams is similar each year; therefore, a graphical breakdown of the types of waste is provided based on the data for 2019.



Source: EPA.

Fig. 5. The amount of hazardous waste generated (collected) in Lithuania in 2019 by types of waste.

According to both Table 3 and Fig. 5, the prevailing types of hazardous waste produced in Lithuania are as follows:

- **Chemical deposits and residues**.

  The bulk of this type of waste consists of bilge oils from other navigation (waste code 13 04 03*), oily water from oil/water separators (waste code 13 05 07*), mixtures of wastes from grit chambers and oil/water separators (waste code 13 05 08*), and sludges from oil/water separators (waste code 13 05 02*). This waste is mainly generated in the services sector; the sectors of water collection, treatment, and supply; sewerage; remediation and other waste management services; and the service sector.

- **End-of-life vehicles (ELVs)**.

  ELVs are generated in all activity sectors. The majority of ELVs are produced by households.

- **Sorting residues**.

  The bulk of this type of waste consists of other wastes (including mixtures of materials) from mechanical treatment of waste containing dangerous substances (waste code 19 12 11*) and premixed wastes composed of at least one hazardous waste (waste code 19 02 04*). Sorting residues are generated in waste management plants.

- **Soils and dredging spoils.**

  This type of waste consists of oil spills (waste code 05 01 05*), inorganic fraction of soil and stones containing dangerous substances (waste code 17 05 03*), and dredging spoil containing dangerous substances (waste code 17 05 05*). Most of the waste comes from the manufacture of coke and refined petroleum products, the construction, and service sectors.

- **Waste containing asbestos**.

  The bulk of this type of waste is construction materials containing asbestos (waste code 17 06 05*) and insulation materials containing asbestos (17 06 01*). This waste is mainly generated in the construction sector and in households. Smaller quantities are produced in the agriculture, forestry and fisheries sector, and the service sector.

- **Discarded machines and equipment components**.

  This type of waste includes various batteries and accumulators, hazardous parts dismantled from ELVs (e.g. oil and fuel filters, airbags, components containing mercury), fluorescent tubes and other mercury-containing waste. Most lead batteries accounting for the vast majority of this type of waste are generated in households and the service sector.

- **Discarded EEE.**

  A comparison between 2010 and 2019 has shown an increase of 2.55 times in WEEE generation (from 2,656 tonnes in 2010 to 6,774 tonnes in 2019). The bulk of this waste comes from households and the service sector.

- **Used oils.**

  Most of the oil waste is generated in the service sector.

Waste of naturally occurring minerals was generated only once in the accounting periods (7 tonnes in 2011). Hazardous glass waste has not been generated at all since 2014 or has been present in quantities ranging from 2 t/y to 13 t/y. The amount of waste containing PCB is decreasing every year (from 67 tonnes in 2013 to 7 tonnes in 2019).

In assessing the hazardous waste generated by certain activities, the EPA's data on hazardous waste collected/generated in Lithuania in 2012, 2014, 2016, and 2018 have been analysed in individual sectors.

Agriculture, forestry and fisheries.

The assessment of hazardous waste generated in this sector has identified the *construction materials containing asbestos* (waste code 17 06 05*) as the most abundant waste generated (around 38.5%), based on the average of the 4-year data used for the analysis. About 18.2% of the total amount of hazardous waste generated is attributed to *used oils* (13 02 08* – other engine, gear and lubricating oils), about 16.5% – to *chemical deposits and residues* (13 05 07* - oily water from oil/water separators; 13 05 02* – sludges from oil/water separators; 13 04 03* – bilge oils from other navigation), and approximately 8% – to *ELVs. Discarded machines and equipment components* (waste codes: 16 01 21* (hazardous components other than those mentioned in 16 01 07 to 16 01 11 and 16 01 13 and 16 01 14); 16 06 01* (lead batteries); 16 01 07* (oil filters)) account for approximately 7.8%; *mixed chemical wastes* (15 01 10* – packaging containing residues of or contaminated by dangerous substances) account for about 6.3%; while other waste streams account for 1% or less of the total amount of hazardous waste generated in this sector. For more details, see Fig. 6.

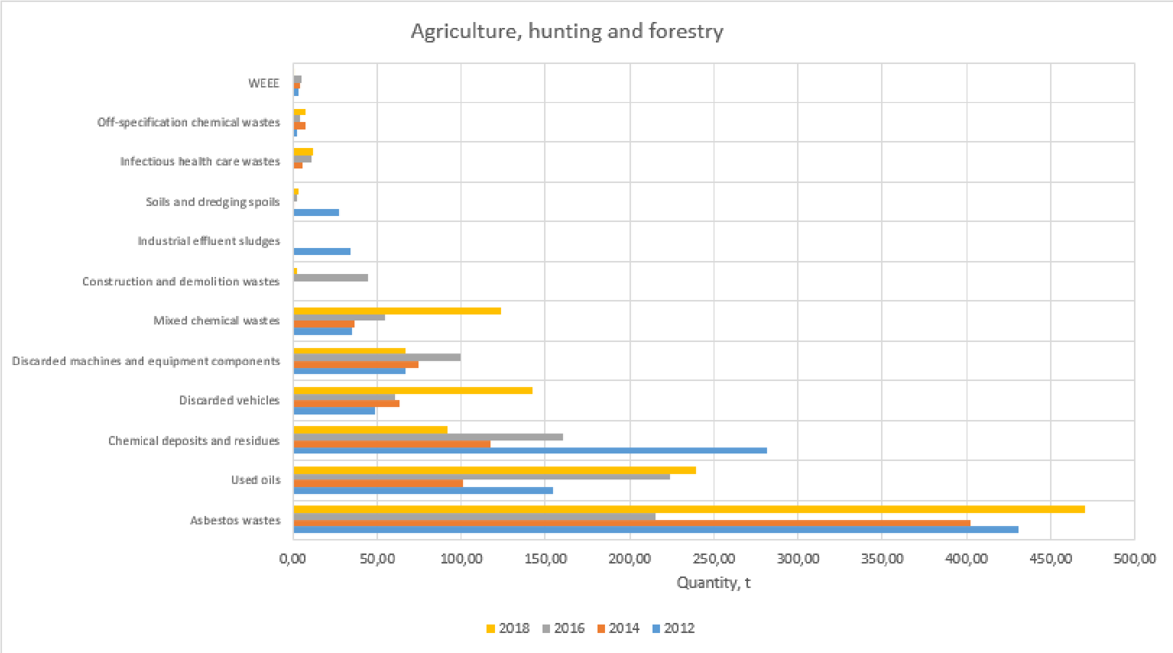


Fig. 6. Hazardous waste generated in the agriculture, forestry and fisheries sector.

Mining and quarrying

Based on the average of the 4-year data used for the analysis, the most abundant waste (around 32%) generated in the mining and quarrying sector consists of *chemical deposits and residues* (15 02 02* – absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances; 13 05 08* – mixtures of wastes from grit chambers and oil/water separators). About 22.4% of the total amount of hazardous waste generated is attributed to *used oils* (13 02 08* – other engine, gear and lubricating oils), about 17.2% – to *soils and dredging spoils* (17 05 03* – inorganic fraction of soil and stones containing dangerous substances), and approximately 6.6% –. to *industrial effluent sludges* (01 05 05* – oil-containing drilling muds and wastes). *Mixed chemical wastes* (15 01 10* – packaging containing residues of or contaminated by dangerous substances) account for about 5.2%. In comparison, other waste streams account for 5% or less of the total amount of hazardous waste generated in this sector. For more details, see Fig. 7.

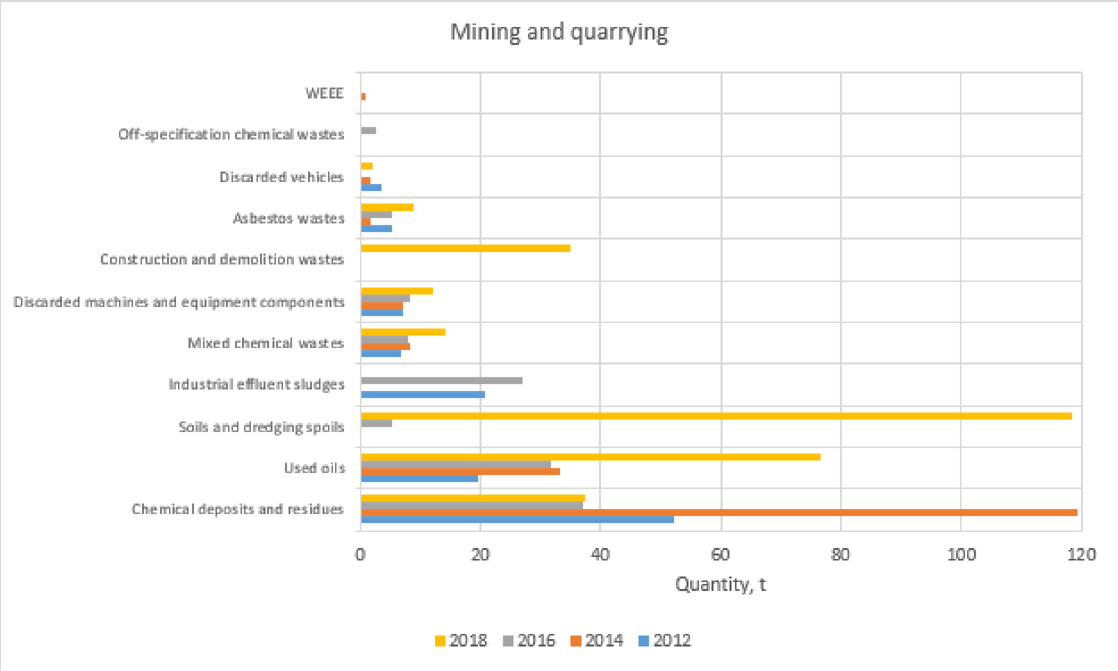


Fig. 7. Hazardous waste generated in the mining and quarrying sector.

Manufacturing

This sector includes all activities listed in Section C of the statistical classification of economic activities[8]. According to the EPA's data on hazardous waste collected/generated in Lithuania, and based on the average of the 4-year data used for the analysis, approximately 41% of the total hazardous waste generated in the manufacturing sector consists of *chemical deposits and residues* (13 05 02* – sludges from oil/water separators; 13 05 07* – oily water from oil/water separators; 15 02 02* – absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances; 13 05 08* – mixtures of wastes from grit chambers and oil/water separators); approximately 22.6% – of *soils and dredging spoils* (17 05 03* – inorganic fraction of soil and stones containing dangerous substances); approximately 13% – of *acid, alkaline or saline wastes* (11 01 05* – pickling acids; 11 01 07 * – pickling bases), approximately 8% – of *off-specification chemical wastes* (08 01 11* – waste paint and varnish containing organic solvents or other dangerous substances; 08 04 09* – waste adhesives and sealants containing organic solvents or other dangerous substances, etc.); and approximately 3.8% – of *used oils* (13 02 08* – other engine, gear and lubricating oils; 05 01 03* – tank bottom sludges; 12 01 09* – machining emulsions and solutions free of halogens). Other waste accounts for 1.9% or less of the total hazardous waste generated in this sector (see Fig. 8).

[8] Regulation (EC) No 1893/2006 of the European Parliament and of the Council of 20 December 2006 establishing the statistical classification of economic activities NACE Revision 2 and amending Council Regulation (EEC) No 3037/90 as well as certain EC Regulations on specific statistical domains (https://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/ks-ra-07-015).

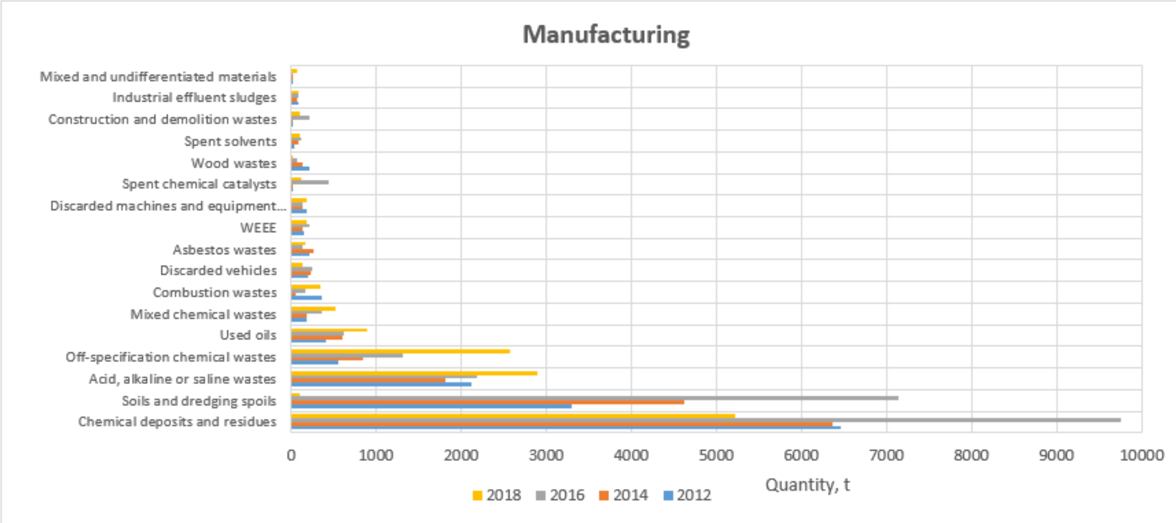


Fig. 8. Hazardous waste generated in the manufacturing sector.

Electricity, gas, steam, and air conditioning supply

After analysing the waste generated in this sector, it has been established that about 59.3% of the waste generated therein consists of *chemical deposits and residues* (13 05 07* – oily water from oil/water separators; 13 05 02* – sludges from oil/water separators; 13 07 01* – fuel oil and diesel); about 17.7% – of *combustion wastes* (10 01 14* – bottom ash, slag and boiler dust from co-incineration containing dangerous substances; 10 01 04* – oil fly ash and -boiler dust). *Used oils* (05 01 03* – tank bottom sludges; 13 03 10* – other insulating and heat transmission oils, etc.) account for about 6.5%; *construction and demolition wastes* (17 02 04* – glass, plastic and wood containing or contaminated with dangerous substances) account for about 5%; *discarded EEE* (16 02 13* – discarded equipment containing hazardous components other than those mentioned in 16 02 09 to 16 02 12, etc.) accounts for 2.7%. In contrast, other waste accounts for 2.5% or less of the total hazardous waste generated in this sector (see Fig. 9).

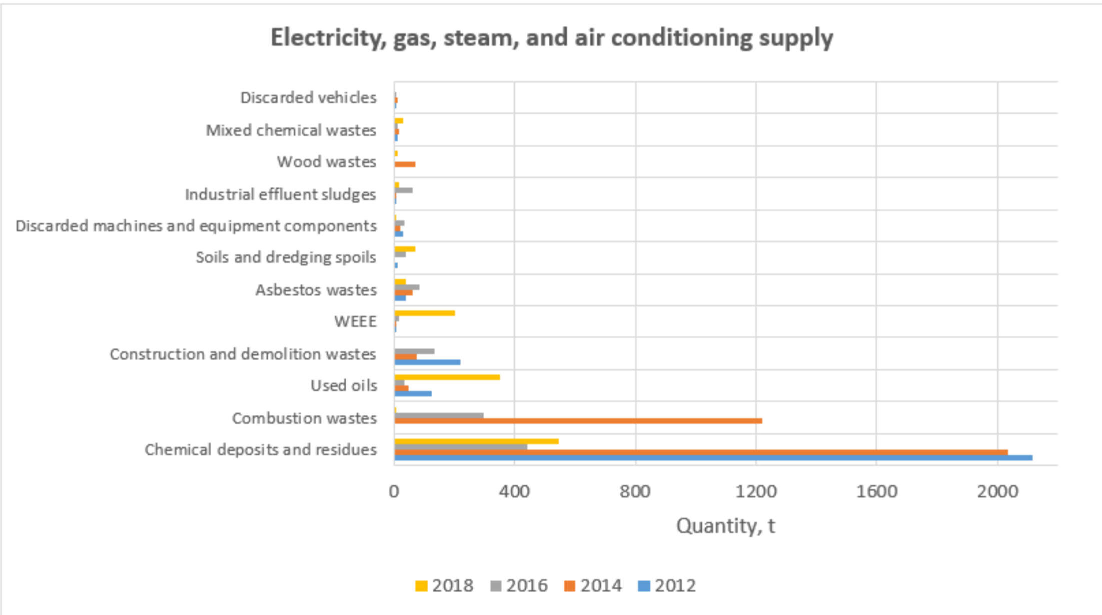
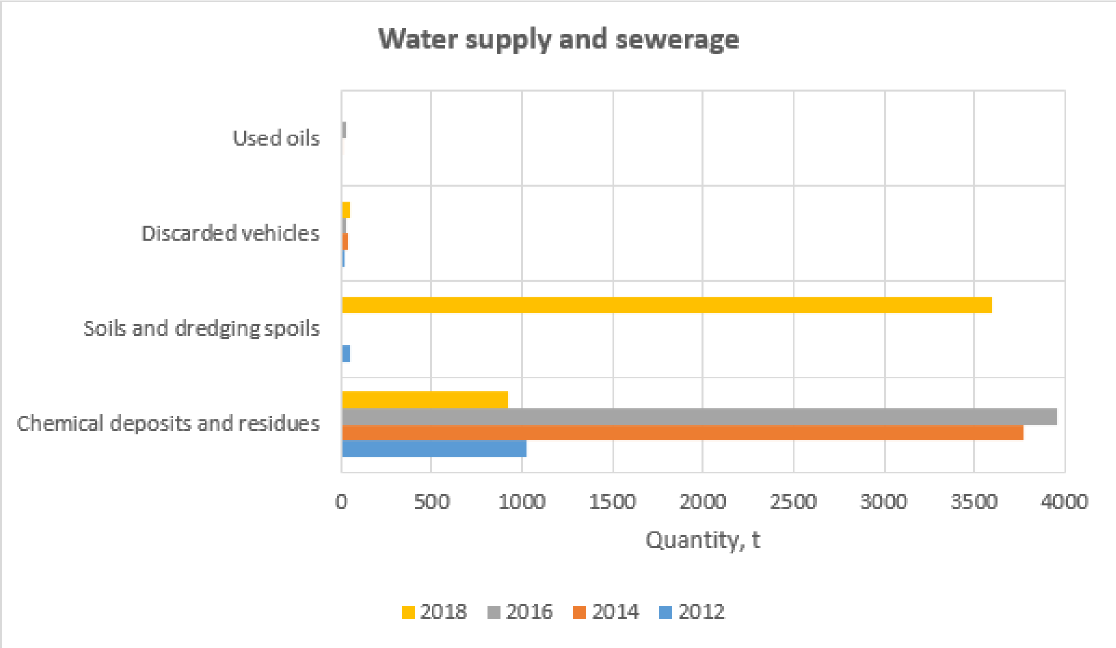


Fig. 9. Hazardous waste generated in the electricity, gas, steam, and air conditioning supply sector.

Water supply and sewerage

Chemical deposits and residues (71.4%) and *soils and dredging spoils* (26.9%) are the primary sources of waste generation in this sector. For more details, see Fig. 10.

Due to the comprehensive coverage of the data (0.3 t to 3,952 t), the information is presented in two graphs.



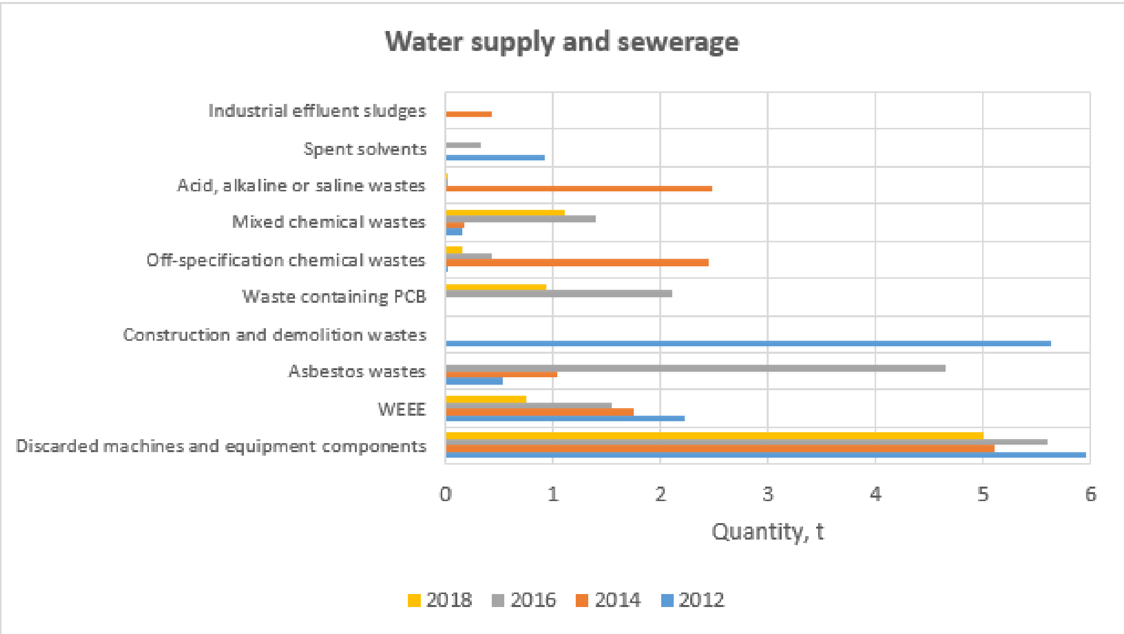


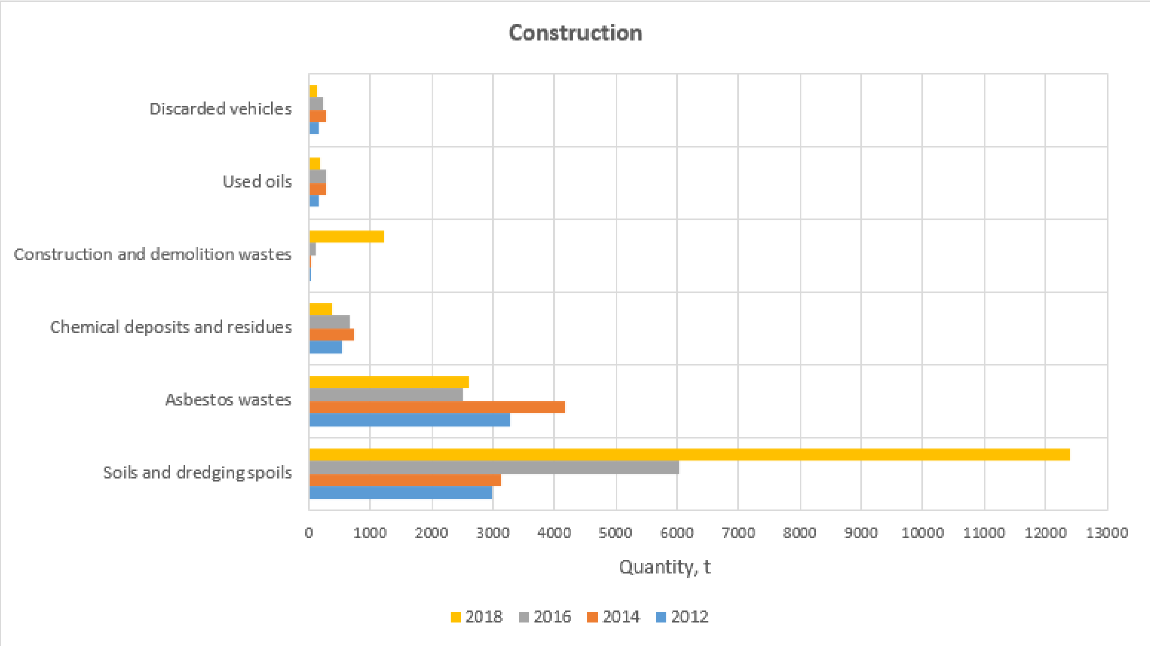
Fig. 10. Hazardous waste generated in the water supply and sewerage sector.

Construction

Based on the average of the 4-year data used for the analysis, the majority (around 56.3%) of waste generated in the construction sector accounts for *soils and dredging spoils* (17 05 03* – inorganic fraction of soil and stones containing dangerous substances). *Asbestos wastes* (17 06 05* – construction materials containing asbestos;

17 06 01* – insulation materials containing asbestos) account for about 28.9%; *chemical deposits and residues* (13 05 07* – oily water from oil/water separators; 13 05 02* – sludges from oil/water separators; 13 05 08* – mixtures of wastes from grit chambers and oil/water separators) account for about 5.3%; while other waste accounts for 2% or less of the total amount of hazardous waste generated in this sector (see Fig. 11).

Due to the comprehensive coverage of the data (0.8 t to 12,400 t), the information is presented in two graphs.



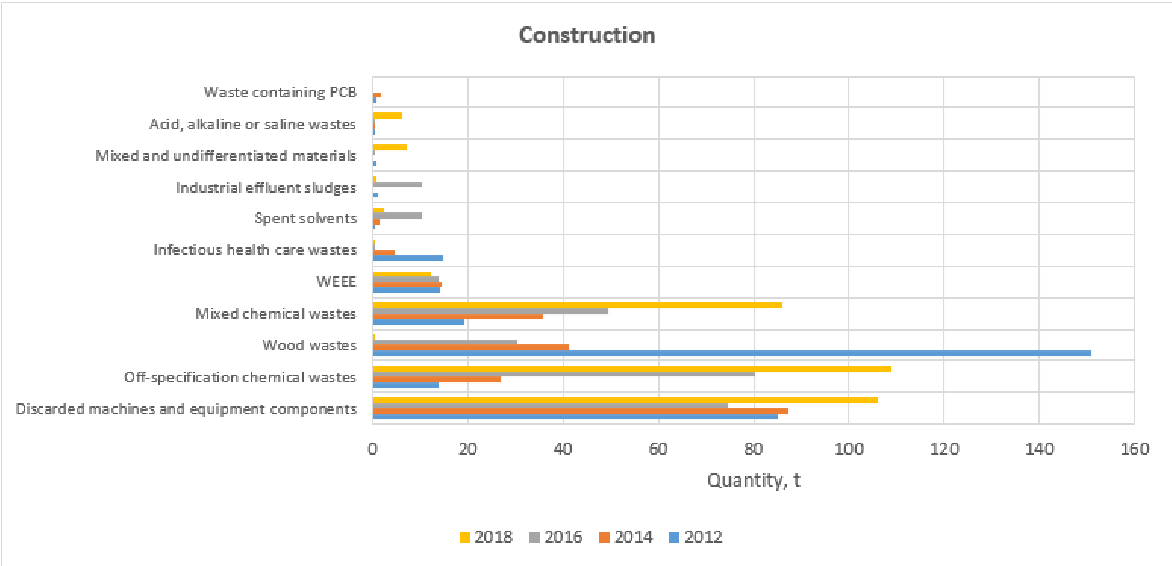
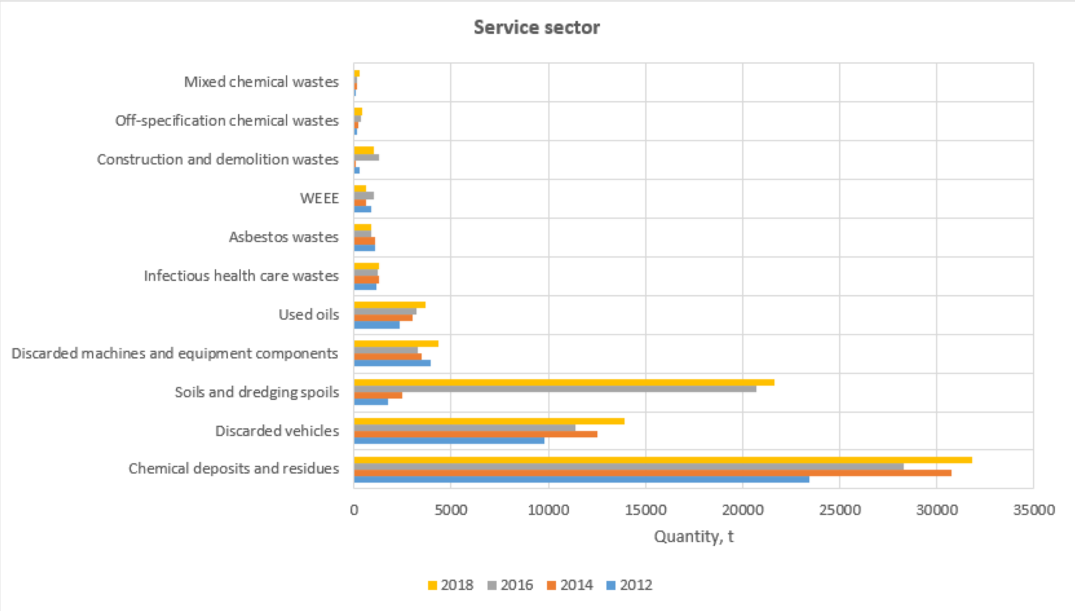


Fig. 11. Hazardous waste generated in the construction sector.

Service sector

About 45% of the total amount of hazardous waste generated in the service sector consists of *chemical deposits and residues* (13 04 03* – bilge oils from other navigation; 13 05 07* – oily water from oil/water separators; 13 05 08* – mixtures of wastes from grit chambers and oil/water separators, etc.); about 18.8% – of *ELVs*; and about 18.4% – of *soils and dredging spoils* (17 05 03* – soil and stones containing dangerous substances; 05 01 05* – oil spills). *Discarded machines and equipment components* (16 06 01* – lead batteries; 16 01 21* – hazardous components other than those mentioned in 16 01 07 to 16 01 11 and 16 01 13 and 16 01 14; 16 01 07* – oil filters, etc.) account for 5.9%; *used oils* accounts for approximately 4.8%; while other waste accounts for 1.9% or less of the total amount of hazardous waste generated in this sector (see Fig. 12).

Due to the comprehensive coverage of the data (1.3 t to almost 31,794 t), the information is presented in two graphs.



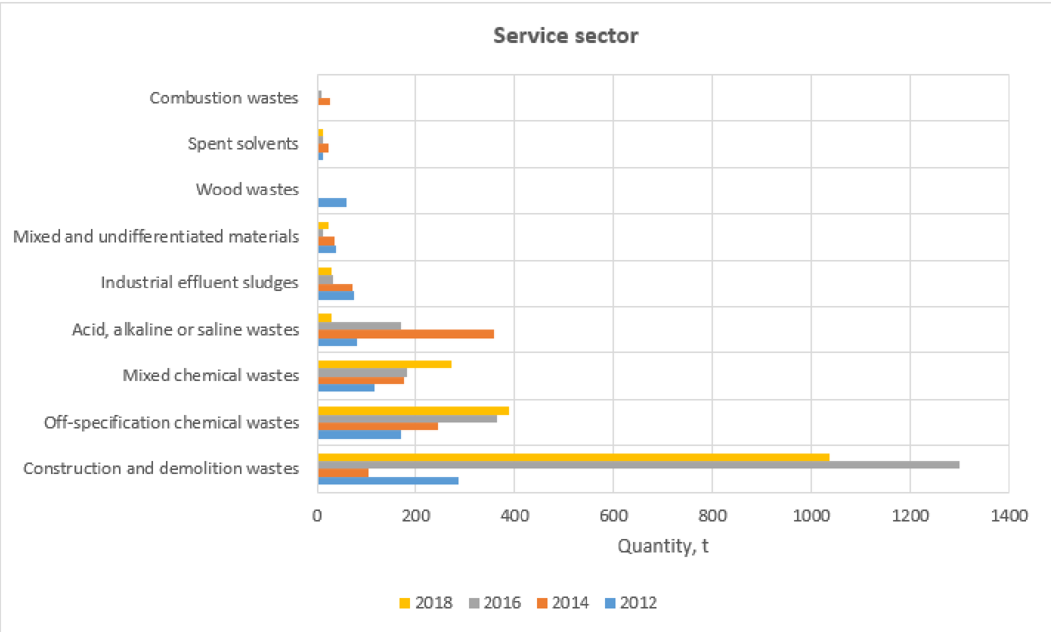


Fig. 12. Hazardous waste generated in the service sector.

Households.

ELVs account for the vast majority (around 36%) of hazardous waste produced by households; *discarded machines and equipment components* (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; 20 01 21* – fluorescent tubes and other mercury-containing waste, etc.) account for around 28.4%; *asbestos wastes* (17 06 05* – construction materials containing asbestos, etc.) account for around 25.4%; *discarded EEE* (20 01 35* – discarded electrical and electronic equipment other than those mentioned in 20 01 21 and 20 01 23 containing hazardous components; 20 01 23* – discarded equipment containing chlorofluorocarbons) account for about 9.6%; while other waste accounts for around 2% or less of the total amount of hazardous waste produced households (see Fig. 13).

It should be noted that ELVs and ELV components are municipal waste streams. Apart from these wastes, most household waste is asbestos, WEEE and off-specification chemical wastes.

Due to the comprehensive coverage of the data (0.85 t to almost 12,300 t), the information is presented in two graphs.

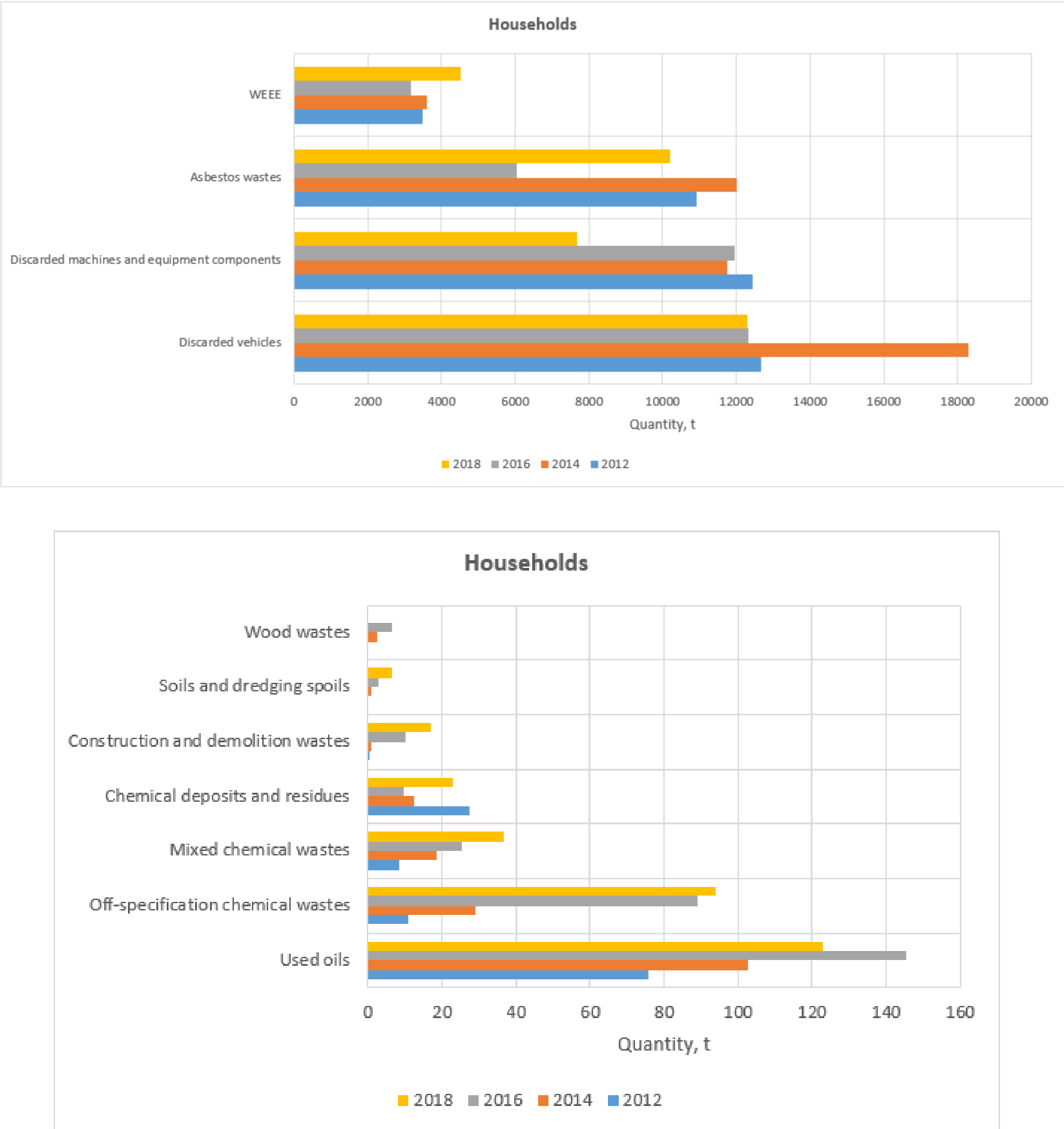


Fig. 13. Hazardous waste produced by households.

Generation of packaging waste

When assessing sources of hazardous packaging waste generation, packaging waste under the waste code 15 01 10* (packaging containing residues of or contaminated by dangerous substances) is mainly generated in the *manufacturing sector* (~55%), the *agriculture, forestry and fisheries sector* (~14%), and the *construction sector* (~11%). *Households* account for around 4% of total packaging waste under the waste code 15 01 10* collected in Lithuania from 2012 to 2018 (see Fig. 14).

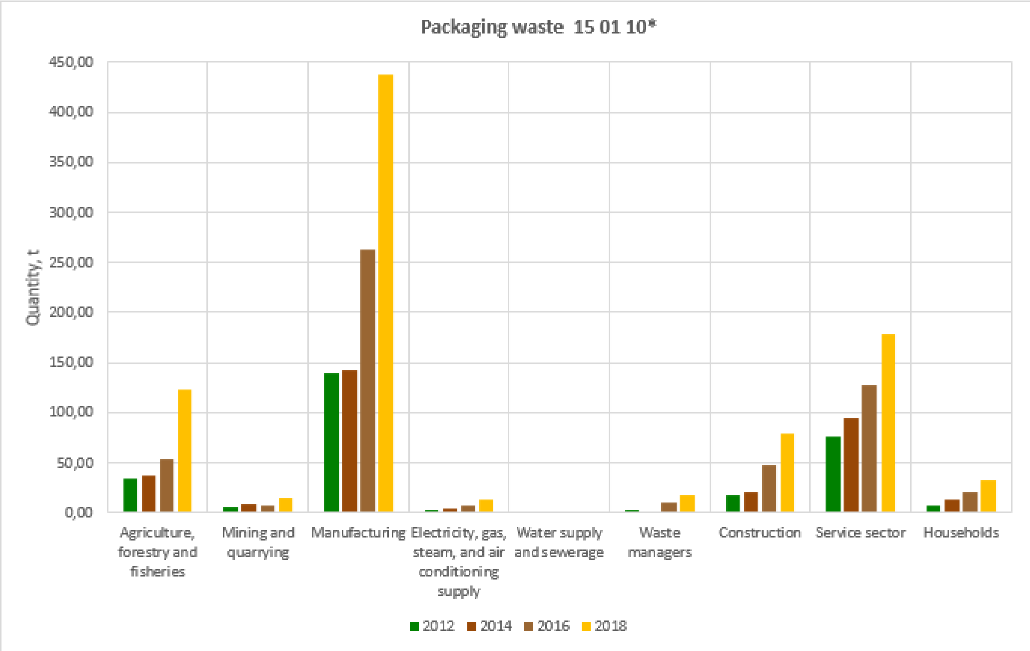


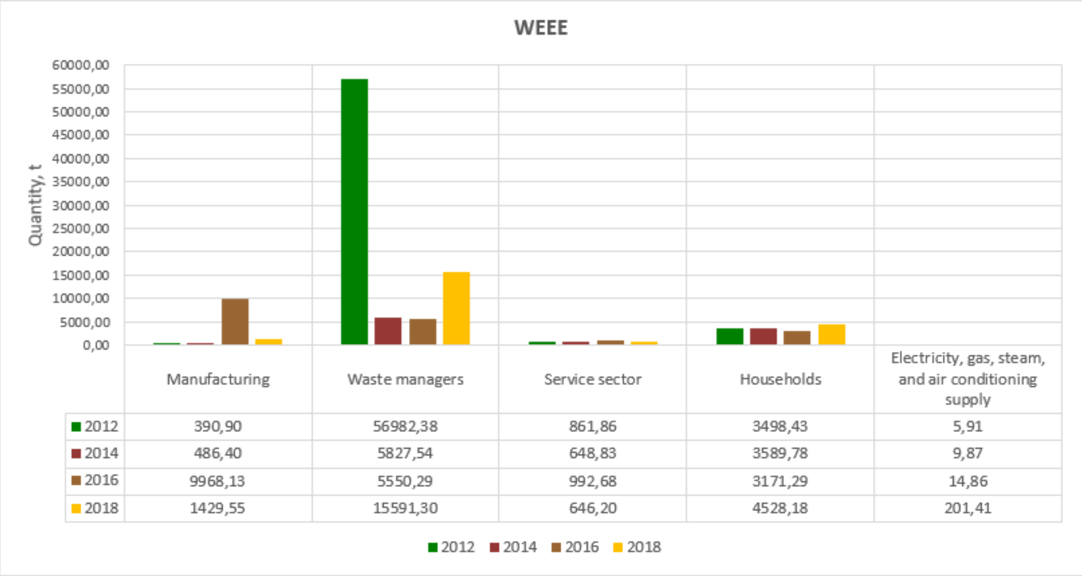
Fig. 14. Sources of generation of packaging waste under the waste code 15 01 10.*

Packaging waste under the waste code 15 01 11* (metallic packaging containing a dangerous solid porous matrix (e.g. asbestos), including empty pressure containers) is mainly generated in the *service sector* (~36%), *the manufacturing sector* (~23%), and by *households* (~17%), in terms of the total amount of packaging waste under the waste code 15 01 11* collected in Lithuania from 2012 to 2018 (see Fig. 15).

Fig. 15. Sources of generation of packaging waste under the waste code 15 01 11.*

When assessing the generation of hazardous WEEE, the highest levels of waste have originated in *households* and the *manufacturing sector*, excluding waste management companies (see Fig. 16).

Due to the comprehensive coverage of the data (0.2 t to 56,982 t), the information is presented in two graphs.



	Manufacturing	Waste managers	Service sector	Households	Electricity, gas, steam, and air conditioning supply
2012	390,90	56982,38	861,86	3498,43	5,91
2014	486,40	5827,54	648,83	3589,78	9,87
2016	9968,13	5550,29	992,68	3171,29	14,86
2018	1429,55	15591,30	646,20	4528,18	201,41

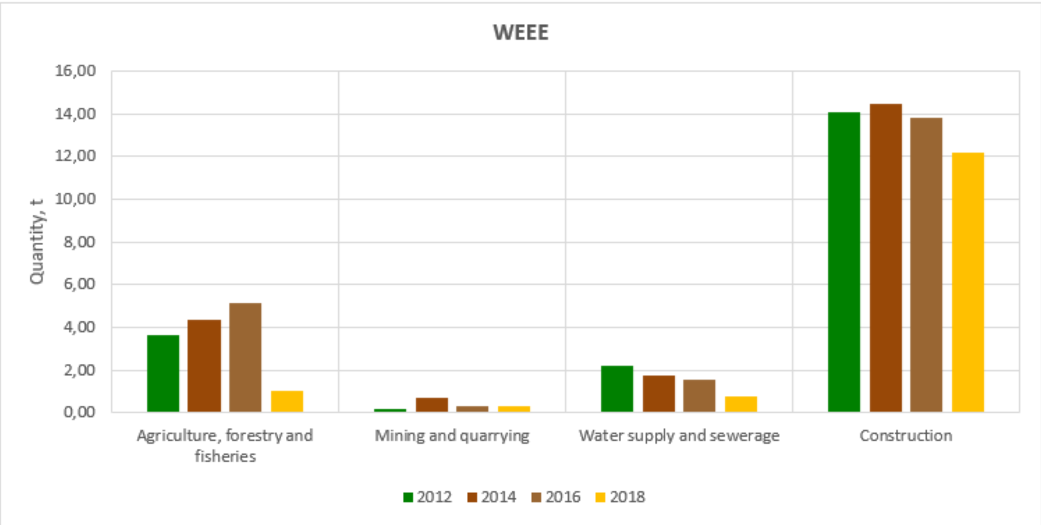


Fig. 16. Sources of generation of hazardous WEEE.

Generation of medical waste

When assessing the amount of hazardous medical waste (waste codes: 18 01 03*, 18 01 06*, 18 01 08*, 18 02 02*, 18 02 05*, 18 02 07*) generated in Lithuania from 2012 to 2018, it has been established that the majority (around 98%) of this hazardous waste originates in health care institutions (see Table 4), around 0.98% of the total

amount of this hazardous waste is generated in the agriculture, forestry and fisheries sector, around 1% of this waste comes from waste managers.
Sorting, collection, packaging, labelling, pre-treatment (decontamination) and temporary storage of medical waste from health care institutions is carried out following the requirements of HN 66:2013 'Safety Requirements for the Management of Medical Waste'.

Table 4. The amount of hazardous medical waste generated in Lithuania from 2012 to 2018 by the source.

Year	Amount of waste generated, in t								
	Agriculture, forestry and fisheries	Manufacturing	Electricity, gas, steam and air conditioning supply	Water supply, sewerage	Construction	Health care institutions	Households	Waste managers	Total
2012	0.000	0.199	0.028	0.003	14.659	1,128.676	0.000	20.168	1,163.733
2014	6.568	1.333	0.105	0.006	4.613	1,280.240;	0.000	15.012	1,307.877
2016	11.240	0.605	0.017	0.002	0.062	1,282.613;	0.127	13.908	1,308.574
2018	12.861	1.178	0.309	0.002	0.071	1,348.322;	0.042	1.702	1,364.488

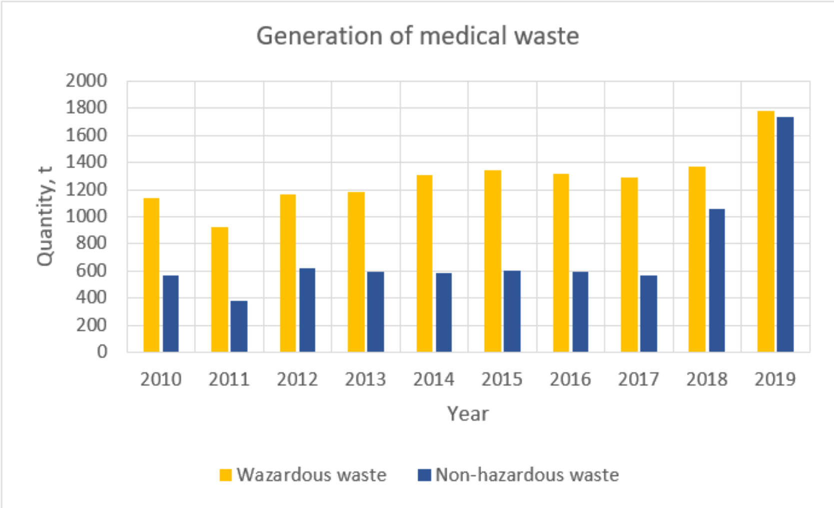


Fig. 17. Generation of hazardous and non-hazardous medical waste from 2010 to 2019

The estimation of the total generation of hazardous medical waste (waste codes: 18 01 03*, 18 01 06*, 18 01 08*, 18 02 02*, 18 02 05*, 18 02 07*) has shown an annual increase in the amount of such waste. From 2010 to 2019, the amount of hazardous medical waste increased by ~56.4%, i.e. 1,134.446 tonnes were generated in 2010, and 1,774.513 tonnes were generated in 2019. There is also a significant increase in non-hazardous medical waste (waste codes: 18 01 01, 18 01 02, 18 01 04, 18 01 07, 18 01 09, 18 02 01, 18 02 03, 18 02 06, 18 02 08). A comparison between 2010 and 2019 has shown an increase of three times in non-hazardous waste (from 560.73 t in 2010 to 1,731.846 t in 2019).

It should be noted that Annex to HN 66:2013 'Safety Requirements for the Management of Medical Waste' contains a list of groups of medical waste indicating which of the '18 01' waste codes available in the list of waste is to be attributed to particular waste generated in health care institutions. It can therefore be considered that HN 66:2013 provides health care institutions with the information on what medical waste is hazardous and non-hazardous and which waste code is to be assigned thereto.

For comparison, the ratio of hazardous and non-hazardous medical waste generated in other countries is presented below.

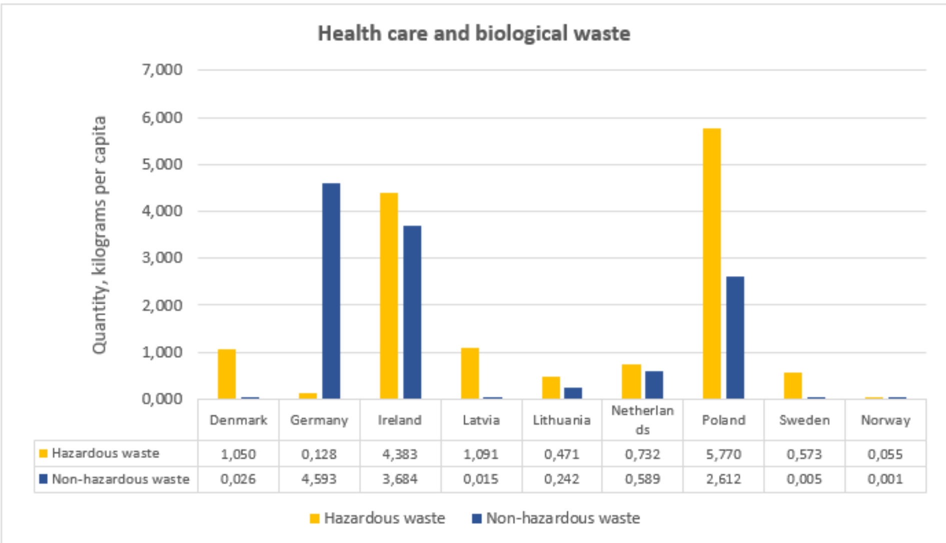


Fig. 18. Generation of hazardous and non-hazardous medical waste in 2018 in the countries concerned, in kg per capita (Source: Eurostat).

It should be noted that the Eurostat database does not provide information on all the waste under the '18 01' and '18 02' groups.

The comparison of the ratio presented in Fig. 18 of hazardous medical waste (waste codes: 18 01 03*, 18 02 02*) and non-hazardous medical waste (waste codes: 18 01 01, 18 01 02, 18 01 04, 18 02 01, 18 02 03) generated in other countries in 2019 has resulted in varying outcomes. Germany obviously generates significantly more non-hazardous medical waste. On the other hand, in other countries, including Lithuania, the reverse is true: more than 50% of the total amount of generated medical waste is hazardous (see Fig. 18). Based on the above, it can be concluded that the ratio of hazardous and non-hazardous medical waste generated in Lithuania is similar to that of other countries.

According to the information on medical waste management published on the EPA's webpage, hazardous medical waste generated in Lithuania is mainly treated, incinerated, and exported. Infected medical waste is first decontaminated. After decontamination, this medical waste becomes non-hazardous and is assigned the waste codes listed in Chapter 18. Under the applicable national legislation of Lithuania, it is prohibited to dispose of both infected and non-hazardous medical waste in a landfill.

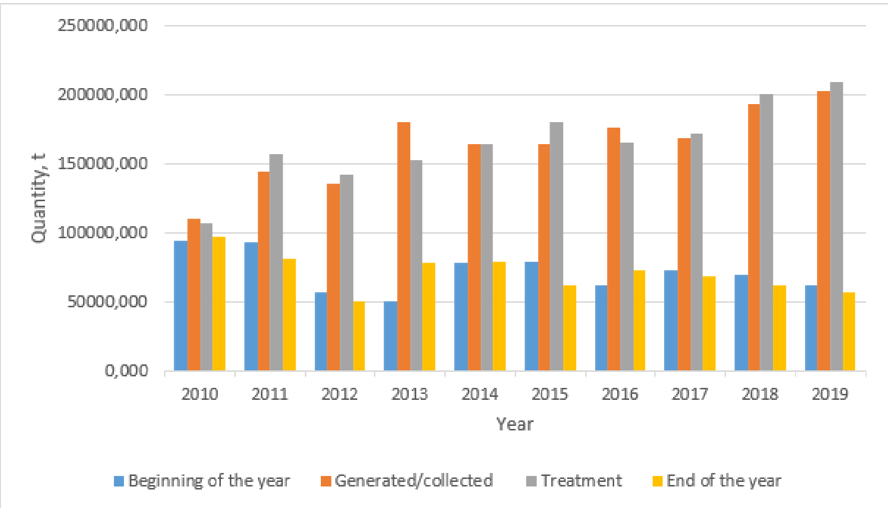
Summary and conclusions. Based on the information provided in this Chapter, it can be concluded that the amount of hazardous waste generated in Lithuania is increasing every year. The primary source of hazardous waste generation is the *service sector* (it is far more developed than the industry in Lithuania) and *households*.

In terms of waste codes, the amount of *ELVs, soil and stones containing dangerous substances, bilge oils from other navigation, construction materials containing asbestos, and lead batteries* are increasing annually. This is due to the purchase price of waste (for ELVs and lead batteries) and the activities developed in specific sectors (navigation, construction). Some waste, such as waste glass in small particles and glass powder containing heavy metals, has decreased and did not occur in 2018. The presence of such waste in Lithuania is likely to be low.

It is impossible to determine whether the waste has been appropriately identified based on statistical data. For this, more information on the identifiable waste is required, i.e. the precise source of generation, the composition, etc.

2.2.2 Hazardous waste management

According to the information published by the EPA, about 52% of the generated/collected waste was managed in Lithuania in 2010 (including the amount at the beginning of the year) and 79% in 2019. For more details, see Fig. 19.



Source: *https://aaa.lrv.lt/lt/veiklos-sritys/atliekos/atlieku-apskaita/atlieku-apskaitos-duomenys/suvestine-pagal-atlieku-kodus*.

Fig. 19. The amount of hazardous waste generated/collected and managed in Lithuania from 2010 to 2019.

In Lithuania, most of the hazardous waste managed (about 45%) is treated, i.e. the main components of the waste are disassembled, re-sorted, and separated. Around 29% of hazardous waste is recycled using any waste management operations numbered R2 to R9; around 16% of hazardous waste is exported; around 8% is landfilled, and around 8% of hazardous waste is incinerated using operation D10. The information on the quantities and types of waste managed in 2010–2019 is provided in Table 5 and Fig. 20.

Table 5. Hazardous waste managed in Lithuania from 2010 to 2019.

Year	**Managed**																**Total amount of the waste managed**
	Disposal				**Export (S4)**		**Incineration**				**Recycling (R2 to R9)**		**Other use (R10, R11)**		**Treatment (D8, D9, D14, R12, S5)**		
	In landfill (D1, D5)		**Using other operations (D2)**				**Use principally as a fuel or other means to generate energy (R1)**		**On land (D10)**								
	t/y	**(%)**	**t/y**	**(%)**	**t/y**	**(%)**	**t/y**	**(%)**	**t/y**	**(%)**	**t/y**	**(%)**	**t/y**	**(%)**	**t/y**	**(%)**	**t/y**
2010	4,522.745	4.232	0.000	0.000	17,667.410	16.532	0.195	0.000	1,479.950	1.385	42,850.829	40.096	0.000	0.000	40,349.995	37.756	97,149.608
2011	5,004.011	3.203	0	0.000	25,256.719	16.166	0	0.000	4,416.357	2.827	66,814.18	42.765	0	0.000	54,744.537	35.040	80,810.416
2012	15,448.972	10.896	182.82	0.129	21,261.791	14.996	0	0.000	1,018.152	0.718	44,864.375	31.643	0	0.000	59,004.726	41.617	50,229.628
2013	13,883.510	9.106	0.000	0.000	27,411.797	17.979	0.000	0.000	763.487	0.501	35,368.394	23.198	0.000	0.000	75,035.861	49.216	78,177.315
2014	18,168.355	11.092	176	0.107	27,906.952	17.037	0	0.000	19,33.137	1.180	35,181.123	21.478	0	0.000	80,436.801	49.106	79,009.201
2015	14,824.149	8.215	0.000	0.000	30,115.197	16.688	717.121	0.397	5,663.104	3.138	42,961.669	23.807	0.000	0.000	86,177.418	47.755	62,440.772
2016	10,441.664	6.332	0	0.000	27,046.101	16.401	4,023.685	2.440	617.276	0.374	46,095.818	27.953	0	0.000	76,677.571	46.499	73,041.107
2017	15,780.551	9.183	0	0.000	28,086.192	16.344	5,407.989	3.147	1,240.783	0.722	41,131.777	23.936	0	0.000	80,193.164	46.667	68,308.792
2018	18,677.2756	9.328	0	0.000	23,902.237	11.937	5,198.112	2.596	726.536	0.363	48,488.35339	24.217	0	0.000	103,235.8566	51.559	61,776.24792
2019	22,628.573	10.856	0	0.000	27,279.2633	13.087	6,048.826	2.902	1,416.413	0.680	58,072.60584	27.860	79.805	0.038	92,916.89639	44.577	56,121.08877

Source: *https://aaa.lrv.lt/lt/veiklos-sritys/atliekos/atlieku-apskaita/atlieku-apskaitos-duomenys/suvestine-pagal-atlieku-kodus*.

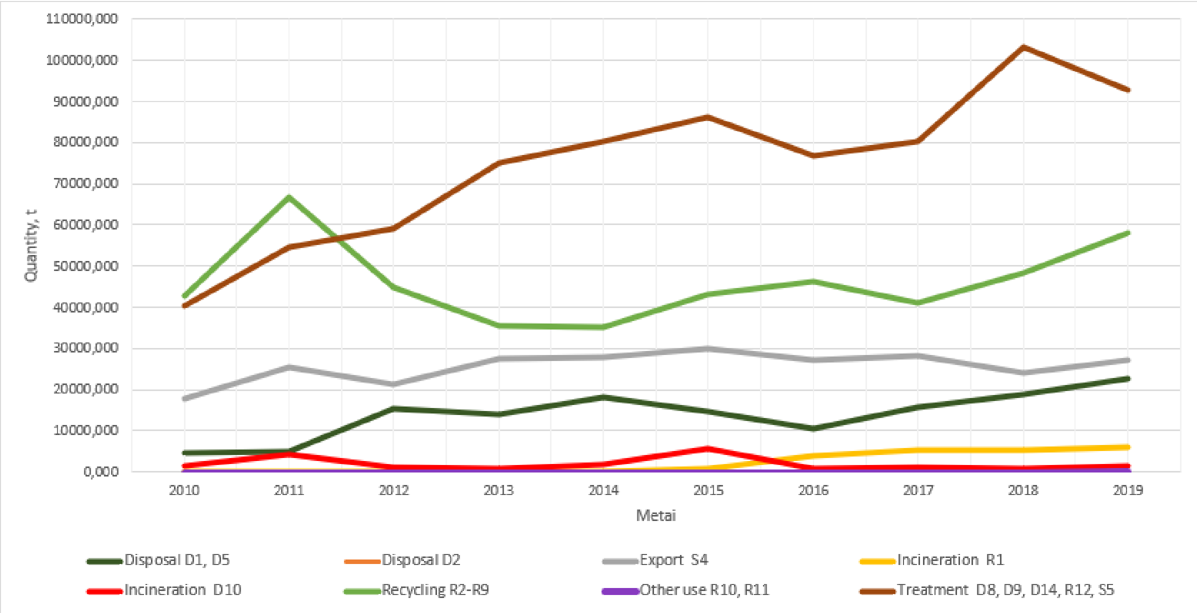


Fig. 20. Hazardous waste management operations used, and the quantities of hazardous waste managed in Lithuania from 2010 to 2019

Summary and conclusions. After assessing the hazardous waste management operations applied in Lithuania, it has been established that the hazardous waste management operations are partly in line with the principles of the waste management hierarchy, as about 29% of hazardous waste is recycled. However, a significant amount — about 8% — of the generated waste is landfilled. Statistics show that the amount of hazardous waste collected during the year is managed within the same year.

2.2.3 Comparison of hazardous waste generated in Lithuania with the other EU Member States

According to the Eurostat website, in 2018, 101.7 million tonnes of hazardous waste were generated in the European Union, representing 4.4% of the total waste collected. Compared to 2010, the EU generated more hazardous waste in 2018: hazardous waste increased by 11.9%, from 90.8 to 101.7 million tonnes. In 2018, the share of hazardous waste in total waste generation in all EU Member States was below 10.0%, except for Estonia and Bulgaria, 46.9% and 10.4%, respectively.

A substantial proportion of hazardous waste in Estonia is mainly due to energy production from oil shale. Of the countries shown in Fig. 21, Serbia recorded the largest share of hazardous waste (30.0%) due to intensive mining and quarrying, followed by Montenegro (27.8%), Turkey (15.3%), and Norway (11.6%).

Based on the data provided in Fig. 21, Lithuania ranks 18 out of 27 regarding the share of hazardous waste generated in the country and is ahead of Poland and Sweden. From this graph, it can be concluded that the generation of hazardous waste in the overall waste stream also depends on the developed industries and the amount of non-hazardous waste generated in the country. As Lithuania does not have a significant industry that influences hazardous waste generation (as in Estonia), this data is also reflected in the total amount of hazardous waste generated.

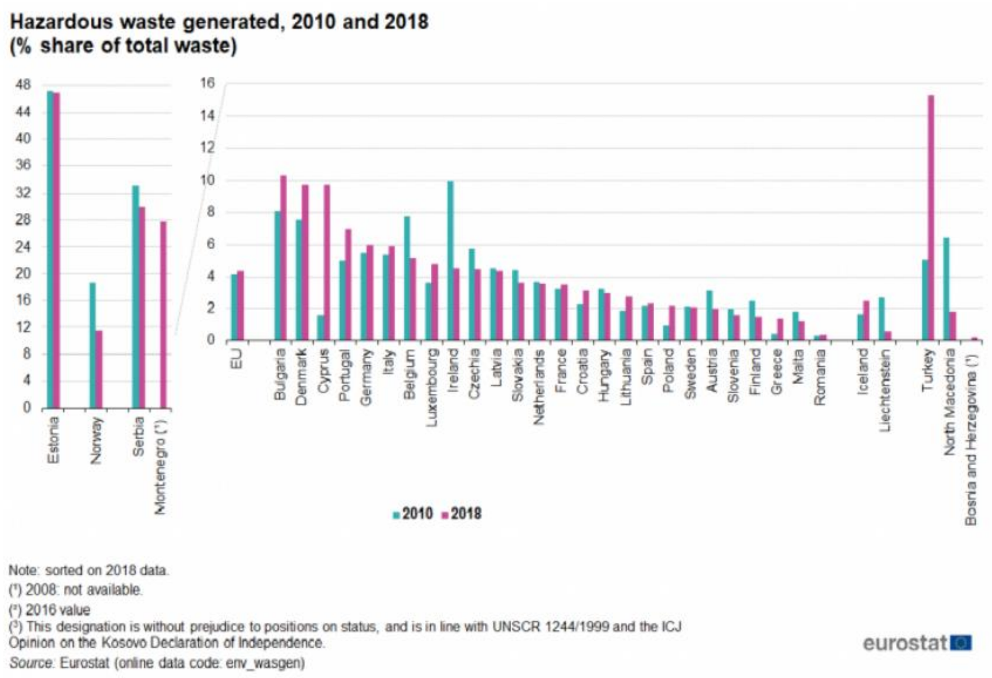


Fig. 21. Hazardous waste generated, 2010 and 2018 (% share of total waste).

Given that the report addresses the practice of identifying and classifying hazardous waste in eight countries, this Chapter also analyses in more detail Eurostat's publicly available data on the generation and management of hazardous waste in 2010, 2012, 2014, 2016, and 2018.

According to Eurostat, the most hazardous waste is generated per capita in Denmark (361 kg in 2018), Norway (308 kg in 2018), the Netherlands (299 kg in 2018), Germany (292 kg in 2018), and Sweden (283 kg in 2018) (see Fig. 22). The data shows that Lithuania is the eighth of the countries analysed by the generation of hazardous waste per capita (69 kg in 2018). Information provided in Fig. 22.

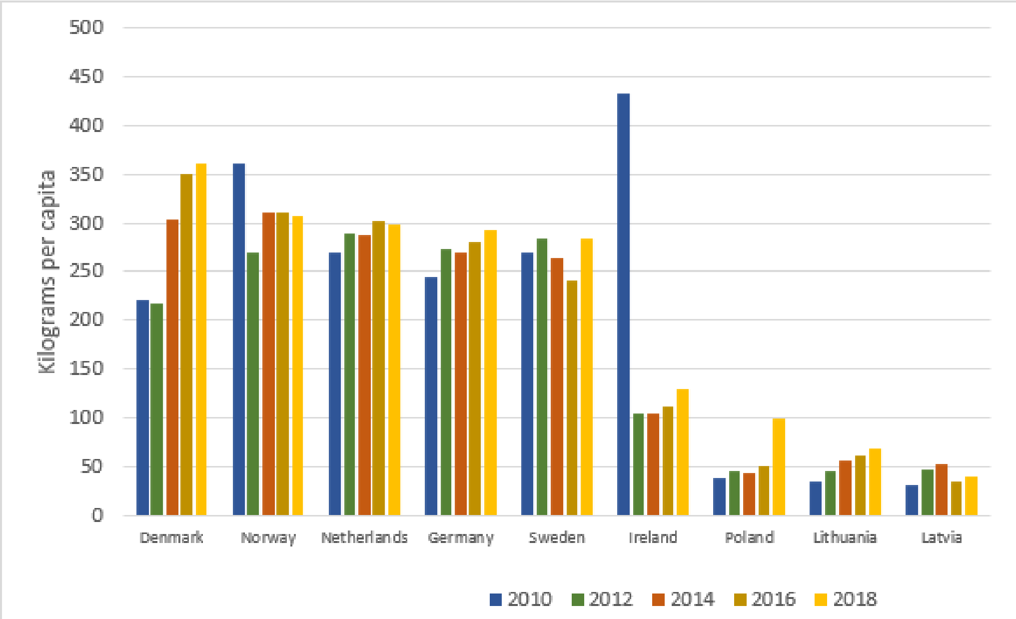


Fig. 22. Generation of hazardous waste in the countries concerned, in kg per capita (Source: Eurostat).

The comparison of the data provided in Fig. 21 and Fig. 22 has shown that both Poland and Sweden generate very high amounts of non-hazardous waste compared to the generation of hazardous waste; therefore, in Fig. 21, Lithuania ranks higher than Poland or Sweden in terms of the share of hazardous waste generated in total waste. However, according to the data on hazardous waste per capita, both Poland and Sweden are ahead of Lithuania.

Looking at the sources of waste generation, it has been established that:

In the **agriculture, forestry and fisheries sector**, the most hazardous waste is generated in Ireland (5 kg per capita in 2018), followed by Norway (4 kg per capita in 2018). Lithuania generated 1 kg per capita in 2018, like Denmark and Latvia. In Poland, Germany and the Netherlands, this waste amounts to less than 1 kg per capita (see Fig. 23).

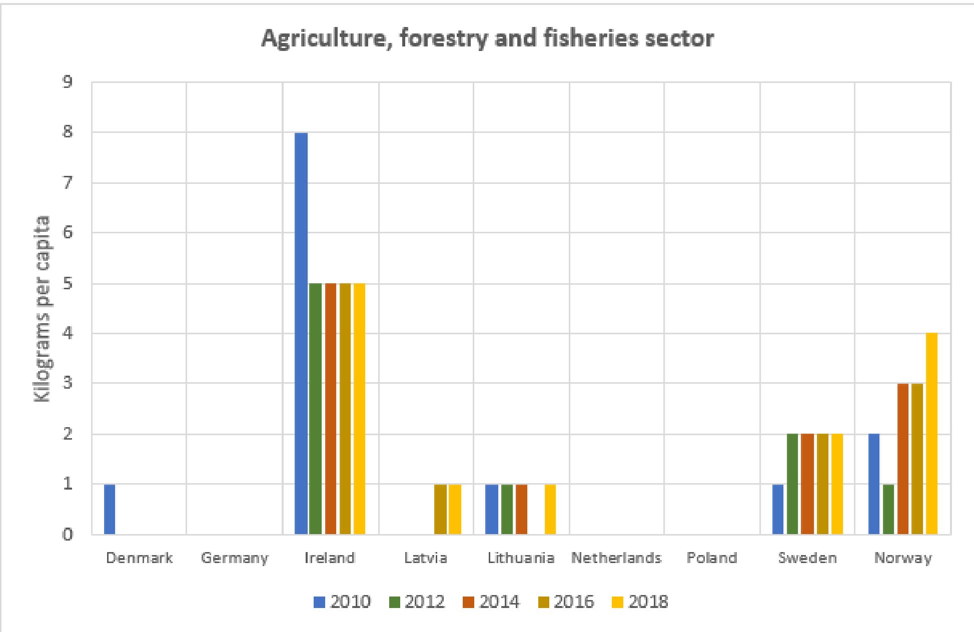


Fig. 23. Generation of hazardous waste in the agriculture, forestry and fisheries sector, in kg per capita (Source: Eurostat).

In the **manufacturing sector**, most hazardous waste is produced in Norway (128 kg per capita in 2018), Ireland (57 kg per capita), and Germany (55 kg per capita). In Lithuania, the manufacturing sector generated 5 kg per capita in 2018 and 8 kg per capita in 2016 (see Fig. 24). Lithuania is either last or second last compared to other countries under analysis. This difference is likely to be influenced by the less developed manufacturing sector of Lithuania. As Lithuania and Latvia demonstrate similar development levels in this sector, their amount of hazardous waste generated per capita is similar (Latvia generated 7 kg per capita in 2018 and 3 kg per capita in 2016).

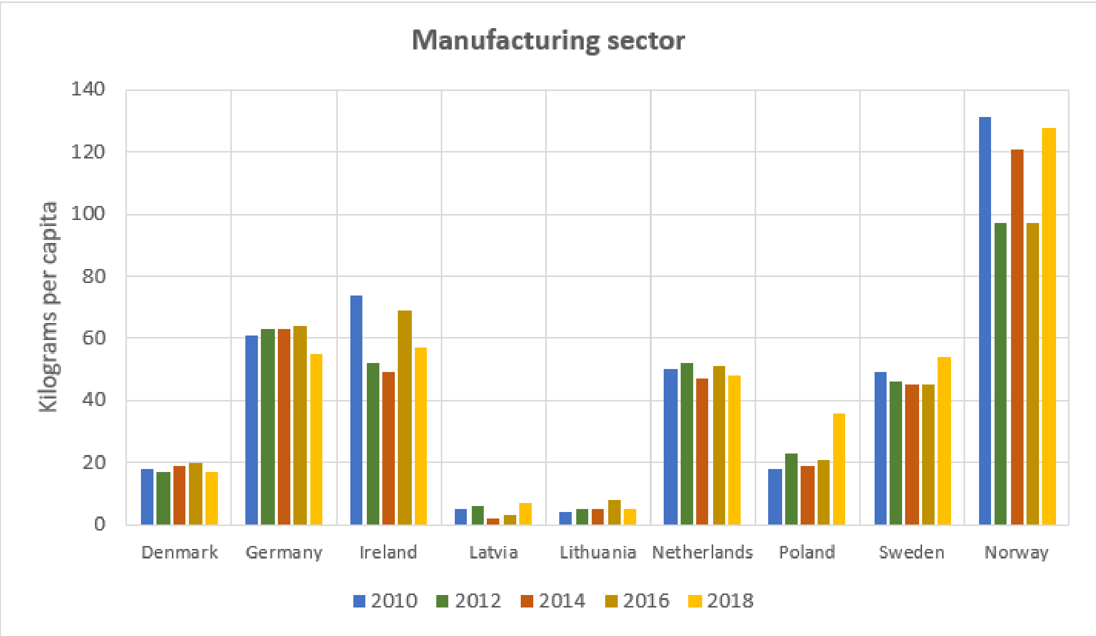


Fig. 24. Generation of hazardous waste in the manufacturing sector, in kg per capita (Source: Eurostat).

In the **electricity, gas, steam and air conditioning supply sector**, the most hazardous waste is generated in Sweden (36 kg per capita in 2018), followed by Germany (13 kg per capita in 2018). Lithuania generated 4 kg per capita in 2018. Denmark, the Netherlands, Poland, and Latvia produce similar or even lower hazardous waste levels in this sector. The least hazardous waste in this sector is generated by Ireland (1 kg per capita in 2018) (see Fig. 25). When comparing data on the amount of hazardous waste generated in this sector, it can be noted that Lithuania is the fifth out of nine countries concerned.

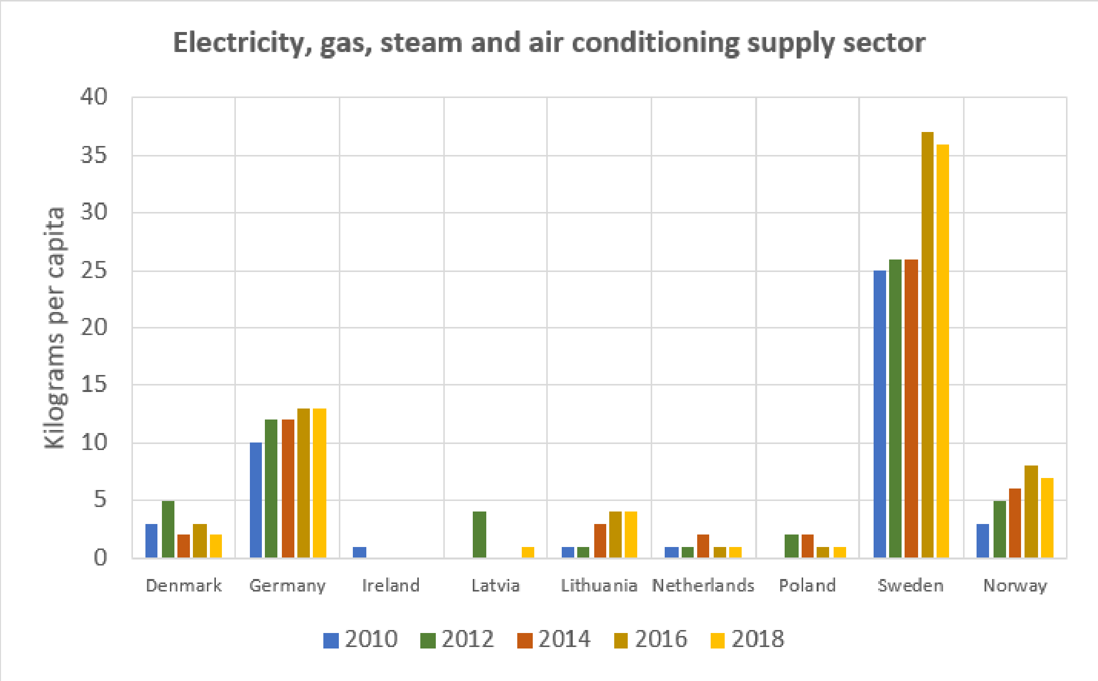


Fig. 25. Generation of hazardous waste in the electricity, gas, steam and air conditioning supply sector, in kg per capita (Source: Eurostat).

In the **water supply and sewerage sector**, the most hazardous waste is generated in Germany (81 kg per capita in 2018), Sweden (45 kg per capita in the same year), and Denmark (30 kg per capita). In 2018, Lithuania generated 11 kg of hazardous waste per capita, and Latvia generated 9 kg per capita (see Fig. 26). The waste generated in this sector is related to the treatment of water and sewerage, i.e. the higher the amount of sewerage that is contaminated with hazardous substances, the higher the amount of sewerage sludge and similar waste that is contaminated with hazardous substances.

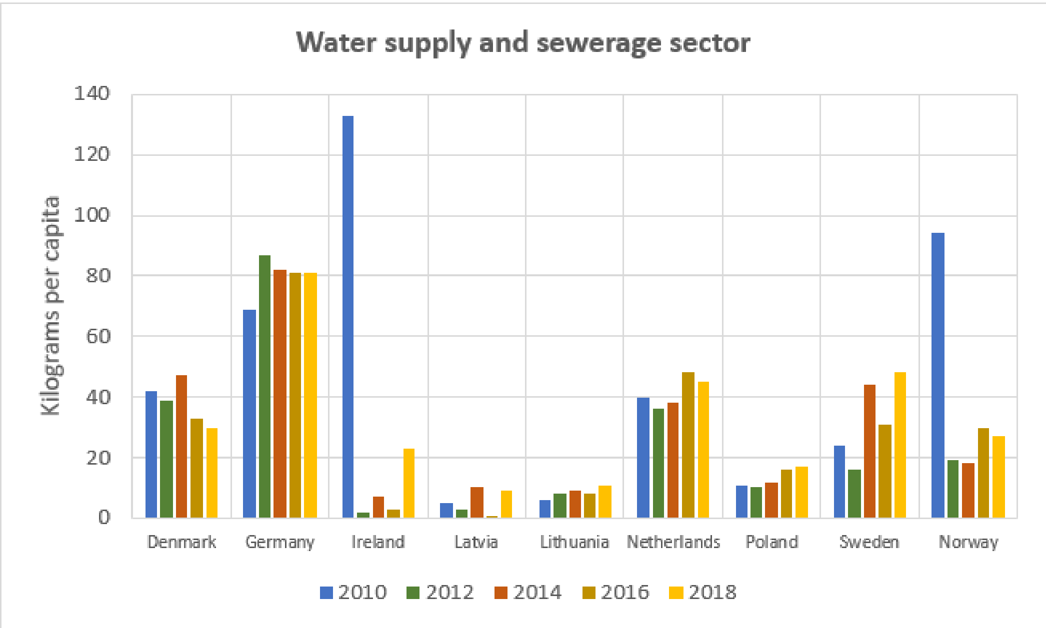


Fig. 26. Generation of hazardous waste in the water supply and sewerage sector, in kg per capita (Source: Eurostat).

In the **construction sector**, the most hazardous waste is produced in Denmark (269 kg per capita in 2018), the Netherlands (153 kg per capita in the same year), and Germany (110 kg per capita). This sector generated 5 kg per capita in Lithuania in 2018 (see Fig. 27). Such various levels of hazardous waste generation depend on the fact that some countries (e.g. Denmark and Germany) impose strict supervision of construction waste (identification of hazardous waste) at the source. For example, in Denmark, the extent of hazardous waste generation is assessed before renovation. In Denmark, the possibility of generation of waste containing PCBs is assessed for buildings constructed or renovated between 1950 and 1977, and, where necessary, mapping is carried out.

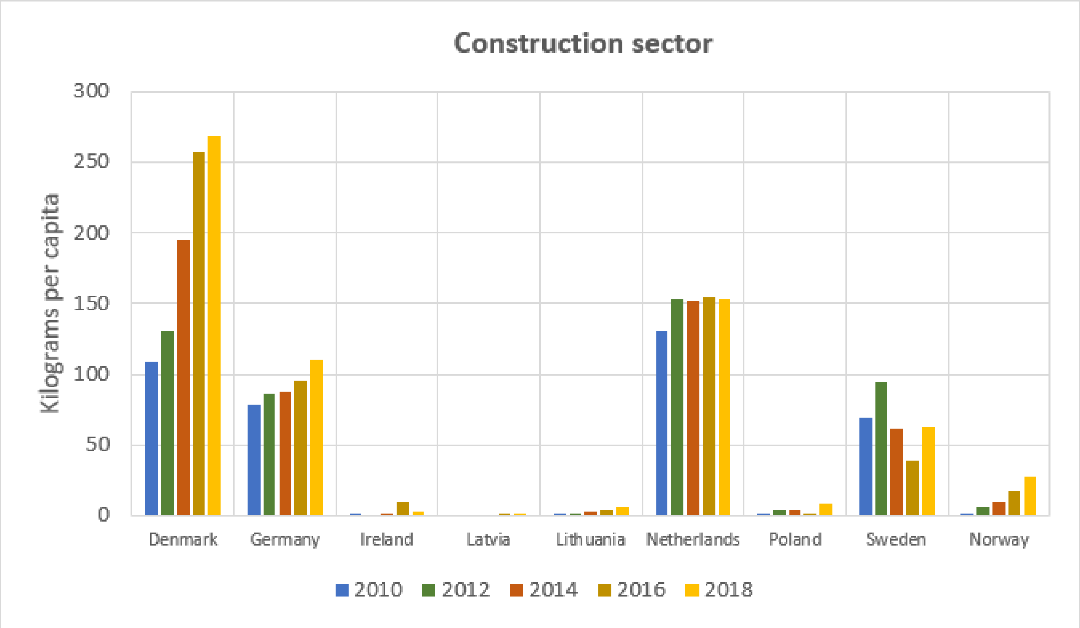


Fig. 27. Generation of hazardous waste in the construction sector, in kg per capita (Source: Eurostat).

An additional assessment has been made of the differences between the shares of generation of hazardous and non-hazardous waste in the total stream of construction waste generated in each country analysed (see Fig. 28). Eurostat data for 2019 has been used for the analysis.

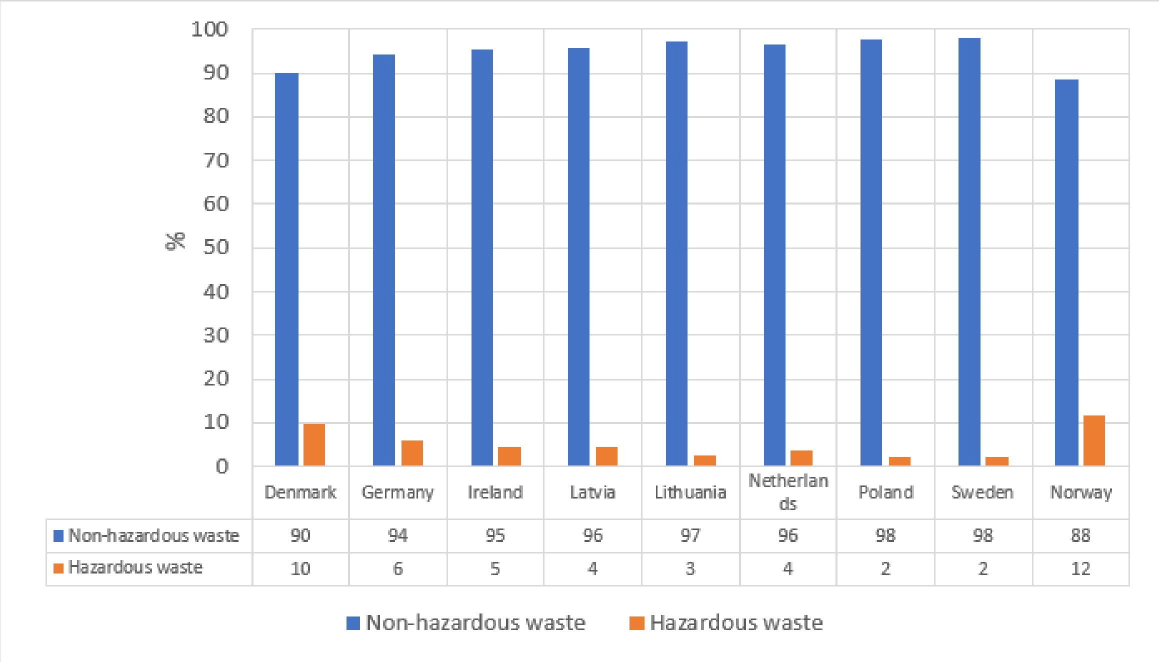


Fig. 28. Generation of hazardous and non-hazardous waste in 2019, the share of total construction waste (Source: Eurostat).

Based on the data presented in Fig. 28, higher levels of hazardous waste have been identified and originate in countries with strict controls on generated waste (e.g. Denmark, Germany). In other countries (Lithuania, Poland, and Sweden), the shares of hazardous and non-hazardous waste generation are similar. This shows that controls have an impact on the increase in hazardous waste.

In the **service sector**, most hazardous waste is produced in Sweden (35 kg per capita in 2018) and Norway (29 kg per capita in 2018). Similarly, Lithuania generated 29 kg per capita in 2018 (although it was 15 kg per capita in 2012). Latvia generates the least waste in this sector (6 kg per capita in 2018 (see Fig. 29). The amount of hazardous waste generated in this sector differs in Lithuania compared to other countries under analysis, but it is not as significant as, for example, Latvia.

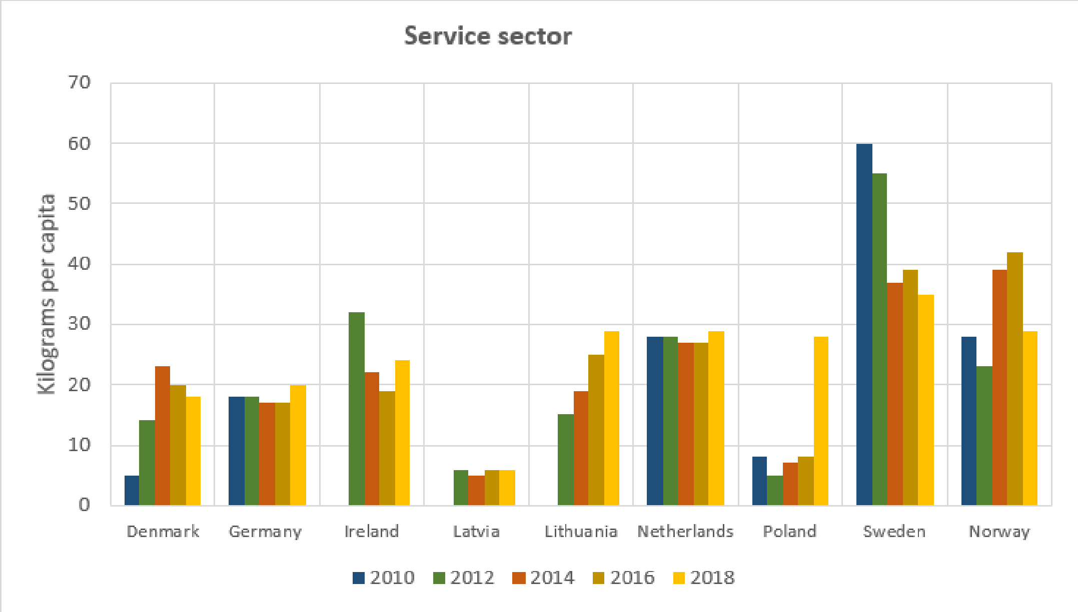


Fig. 29. Generation of hazardous waste in the service sector, in kg per capita (Source: Eurostat).

Health care and biological wastes. The Eurostat database treats waste under codes 18 01 03* (wastes whose collection and disposal is subject to specific requirements in order to prevent infection) and 18 02 02* (wastes whose collection and disposal is subject to special requirements in order to prevent infection) as health care and biological wastes. The analysis of data on the generation of this infected medical waste has shown that most of the waste is generated in Ireland (from 4 kg per capita in 2010 to 8 kg per capita in 2016); in Poland, this amounts to 1 kg per capita in 2010 and 8 kg per capita in 2018. In Lithuania, as in Germany and Norway, the amount generated is under 1 kg/g per capita (see Fig. 30). Based on this information, it can be noted that the generation of medical waste varies from one country to another and depends mainly on the number of services provided in health care institutions and the medical devices used (bandages, swabs, bandages, etc.).

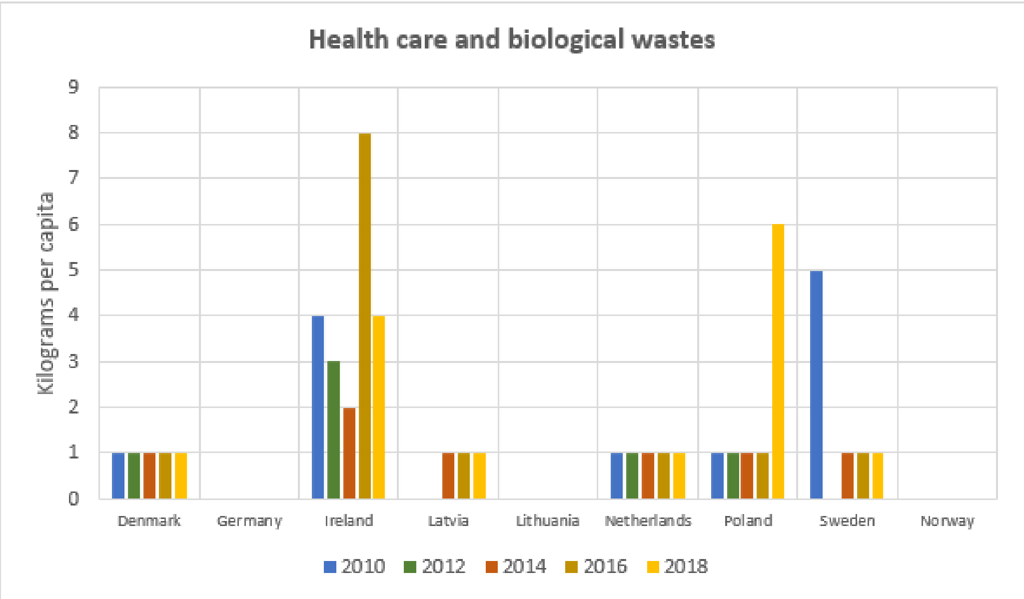


Fig. 30. Generation of hazardous medical waste, in kg per capita (Source: Eurostat).

The analysis of hazardous waste generated in the **waste management sector** in the countries concerned has shown that the highest amount of hazardous waste per capita is reported in Germany (80 kg in 2018), Sweden (51 kg in 2018), the Netherlands, and Denmark. Ireland accounted for the largest share of hazardous waste in 2010 (334 kg), but it has decreased significantly in the following years. According to the data for 2018, Norway holds the fifth position (21 kg), and Ireland is the sixth out of the nine countries analysed. Lithuania is the second last. In 2018, the waste management sector in Lithuania accounted for 10 kg of hazardous waste per capita (see Fig. 31).

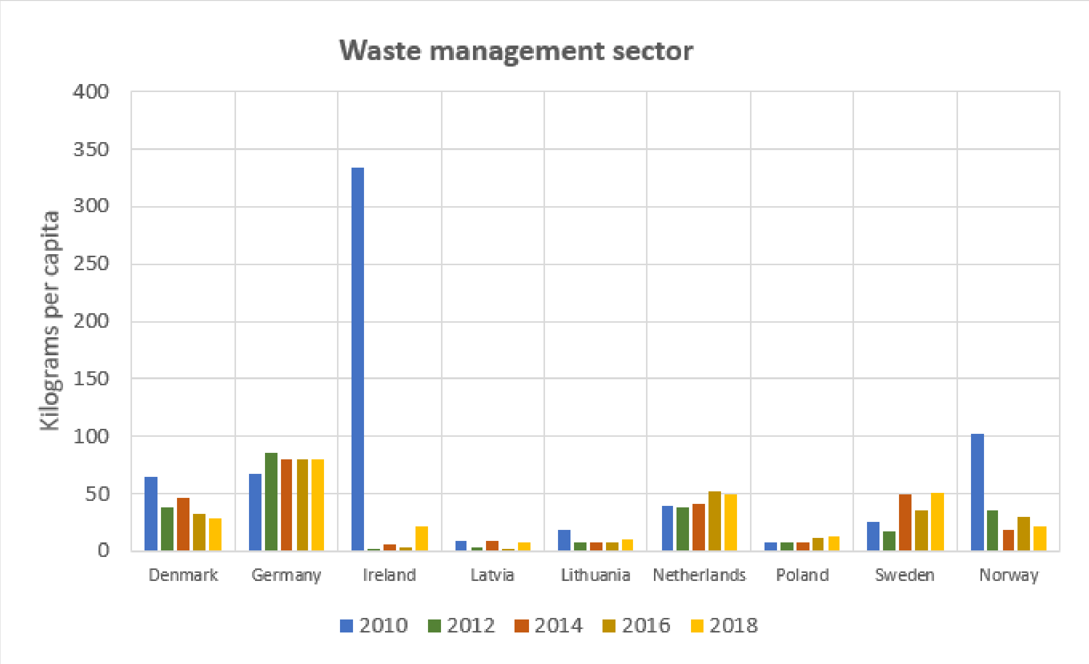


Fig. 31. Generation of hazardous waste in the waste management sector, in kg per capita (Source: Eurostat).

The analysis of the amounts of hazardous waste produced by households (per capita) has shown that most of the hazardous waste is generated in Norway (56 kg per capita in 2018), followed by Sweden (42 kg per capita in 2018). The least hazardous waste per capita is produced by German households (7 kg per capita in 2018). Lithuania holds the seventh position out of the nine countries analysed (12 kg per capita in 2018). For more details, see Fig. 32.

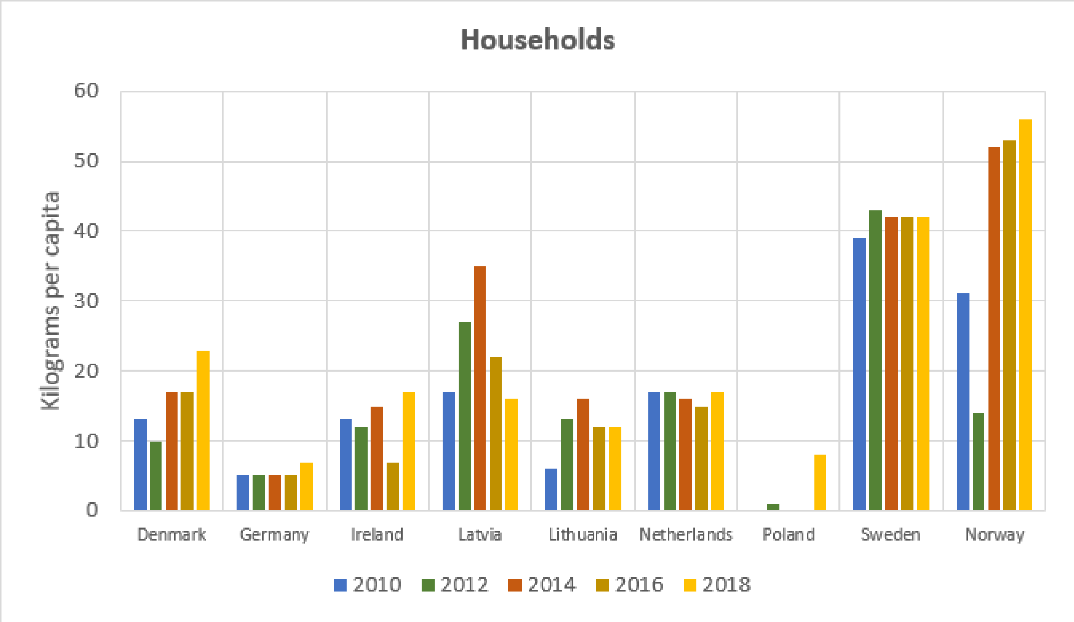


Fig. 32. Hazardous waste produced by households, in kg per capita (Source: Eurostat).

Summary and conclusions. The analysis of the above information suggests that the sources of hazardous waste generation in the countries concerned depend on the development level within the relevant sector of economic activity in those countries. In countries such as Lithuania, Latvia and Denmark, the primary sources of hazardous waste generation are *service and construction sectors* and *households*. The amount of hazardous waste generated by the *construction sector* in Denmark is also influenced by the national requirements for identifying hazardous waste that may be generated before demolition or repair. In Poland, Germany, the Netherlands, and Ireland, the key sources of hazardous waste generation are the *manufacturing, construction, and service sectors*.

Comparison of the amount of hazardous waste generated in Lithuania with other countries that are close to Lithuania in terms of economic structure and level of economic development.

To assess the relevance of the officially available statistical data on the amount of hazardous waste generated in Lithuania for 2010–2019, a comparison of the amount of hazardous waste generated in Lithuania has been made with other countries that are close to Lithuania in terms of economic structure and level of economic development, as well as with neighbouring countries, i.e. Latvia, Estonia, Poland, the Czech Republic, Cyprus, and Slovenia.

The Eurostat data on the amounts of hazardous waste produced in Latvia, Estonia, Poland, the Czech Republic, Cyprus, Slovenia, and Lithuania in 2018 by type is presented in Table 6 below.

Table 6. Comparison of the amount of hazardous waste generated in Lithuania in 2018 with other countries that are close to Lithuania in terms of economic structure and level of economic development.

Waste categories	Waste content in kg per capita						
	Czech Republic	Estonia	Cyprus	Latvia	Poland	Slovenia	Lithuania
Secondary waste	22	28	4	5	4	4	12
Spent solvents	1	0	0	0	0	8	0
Acid, alkaline or saline wastes	10	3	0	1	2	2	2
Used oils	9	3	6	3	5	3	2*
Chemical wastes	30	1,080	6	3	28	13	16
Industrial effluent sludges	12	21	1	8	2	3	**0**
Sludges and liquid wastes from waste treatment	7	12	0	0	0	1	0
Health care and biological wastes	5	1	1	1	6	1	0**
Discarded equipment (excluding discarded vehicles, batteries and accumulators waste)	4	5	1	4	9	3	3
Discarded vehicles	16	41	11	7	11	5	10
Batteries and accumulators waste	1	3	5	4	1	5	4
Mixed and undifferentiated materials	0	0	0	1	5	0	0
Sorting residues	1	6	0	5	2	2	8
Mineral waste from construction and demolition	18	9	0	0	7	0	1
Various mineral wastes	4	0	223	2	4	5	5
Combustion wastes	6	7,003	0	0	6	9	0
Soils	20	35	0	1	10	1	14
Waste from waste treatment and stabilised waste	14	10	3	0	2	1	4
Waste excluding major mineral wastes	117	8,186	35	38	79	57	49

Source: Eurostat

Note: * Since Eurostat provides data by rounding it up to an integer number, the amount of used oils generated in Lithuania seems to be the smallest among the countries analysed. The assessment of the unrounded data has shown the following results: In Latvia, 2.84 kg of used oils are generated per capita, in Estonia – 2.85 kg per capita, in Lithuania – 2.09 kg per capita, i.e. the amount of used oils generated per capita in the Baltic States is similar.

** The assessment of the unrounded amounts of health care and biological wastes per capita has shown the following results: Estonia produces 0.51 kg per capita, Latvia produces 1.09 kg per capita, Slovenia produces 0.56 kg per capita, and Lithuania produces 0.47 kg per person, i.e. there is no significant difference between health care and biological wastes per capita in Estonia, Slovenia, and Lithuania.

The analysis of 18 categories of waste has revealed the most significant difference in the amount of industrial effluent sludges produced in Lithuania. Compared to other countries, Lithuania generates the least of this waste. This is also confirmed by the annual amounts of sewerage sludge generated in each country analysed (see Table 7).

Table 7. Generation of industrial effluent sludges, sludges, and liquid wastes from waste treatment in the countries concerned, in t/year (Source: Eurostat).

Countries	2010		2012		2014		2016		2018	
	Industrial effluent sludges	Sludges and liquid wastes from waste treatment	Industrial effluent sludges	Sludges and liquid wastes from waste treatment	Industrial effluent sludges	Sludges and liquid wastes from waste treatment	Industrial effluent sludges	Sludges and liquid wastes from waste treatment	Industrial effluent sludges	Sludges and liquid wastes from waste treatment
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Czech Republic	122,619	36,552	102,313	149,729	114,843	38,881	128,017	39,600	130,732	73,090
Estonia	49,470	15,387	14,780	20,001	21,662	13,787	20,418	13,934	27,101	16,418
Cyprus	10	283	0	0	424	214	104	222	1,115	188
Latvia	15,833	0	5,619	6,282	10,500	18,216	12,831	314	14,861	582
Poland	84,315	3,535	99,831	9,465	109,326	17,754	88,878	18,313	81,081	17,957
Slovenia	4,490	394	3,835	9,884	4,824	6,266	4,687	1,165	5,421	2,873
Lithuania	**120**	**111**	**829**	**77**	**98**	**62**	**162**	**96**	**37**	**95**

According to the information provided in Table 6, compared to other countries, less used oils, construction waste and health care and biological wastes are generated per capita. The data differ significantly when comparing the amounts of this waste per capita in Lithuania with those of the Czech Republic or Poland. However, when comparing data on waste generated in Lithuania with that of Latvia, Estonia and Slovenia, the outcome is similar. Therefore, it cannot be argued that used oils, construction waste, health care, and biological wastes are not adequately identified in Lithuania. However, the identification of these wastes should be considered.

Summary and conclusions. Having assessed the above information, it has been established that when comparing the amounts of hazardous waste generated in Lithuania with other countries that are close to Lithuania in terms of economic structure and level of economic development, the most significant difference is observed with regard to sewerage sludge. These amounts are likely to have been influenced by the industries prevailing in Lithuania, i.e. there are not many industrial enterprises that would generate sewerage sludge contaminated with hazardous substances, or otherwise, sludges are incorrectly identified. Other types of waste generated do not differ significantly. However, additional attention should be paid to the identification of used oils, construction waste, and health care and biological wastes.

2.3 Current situation of the identification of hazardous waste in Lithuania

This Chapter provides information based on the data obtained during the stakeholders' survey on the current situation of the identification and classification of hazardous waste in Lithuania, namely the methods of the identification and classification of hazardous waste used in practice by waste producers, waste managers, and responsible authorities, the waste testing conducted in Lithuania, misleading identification of waste streams, etc. At the end of the Chapter, the summary of the current situation of the identification of hazardous waste in Lithuania is presented.

2.3.1 Methods of the identification and classification of hazardous waste used in Lithuania

2.3.1.1 Identification and classification of hazardous waste at source

Based on the EPA's list of 30 enterprises generating the most hazardous waste in Lithuania, those 30 enterprises have been surveyed as hazardous waste producers. Some enterprises involved in selling second-hand motor vehicle parts have indicated that they outsource the waste accounting tasks to consultancy firms and do not directly perform any identification or classification of hazardous waste. Not all enterprises have responded to the questionnaire. Nine out of 30 enterprises surveyed completed the questionnaire. The results of the survey are summarised in Table 8

Table 8. Results of the survey of waste producers.

Sources used for the classification and identification of waste	Issues			Suggestions
	in waste classification	in waste testing	other	
Usually use: • Waste Management Rules; • Safety data sheets of the substance/mixture from which the hazardous waste originates; • Expert support (consultancy firms, waste managers). ***Sometimes use:*** • Inside support from colleagues within the enterprise. ***Rarely use:*** • The waste is tested in a laboratory; • EU Guidance.	It is not clear how to classify: • packaging waste containing hazardous substances, aerosol dispensers, etc.; • furniture (painted wooden and storage furniture). Some waste managers classify these items as bulky waste under the code 20 03 07, while others classify them as wood containing hazardous substances (20 01 37*); • other wood wastes; • sludge from production plants.	• There are no laboratories in Lithuania that can test waste. • Once the waste code has been identified by the laboratory, the waste managers do not want to receive the waste under this code, thus suggest using a different code.	• It is difficult to identify the hazardous properties of waste because it is necessary to know not only the composition of the main product but also the hazardous properties of the composite materials. • Doubts sometimes arise as to the classification under a specific waste code. • Training on the classification and identification of hazardous waste is lacking.	• There should be clear information identified on the product and its packaging, e.g. 'to be disposed of as hazardous waste', 'after use, the packaging to be disposed of as hazardous waste'. • The specific parameters to be analysed need to be defined, and their cut-off values specified for the purpose of classifying waste as hazardous. • Training on the classification and identification of hazardous waste is needed.

The survey suggests that waste producers usually consult waste managers for the classification and identification of waste. They also follow the Waste Management Rules and safety data sheets of substances/mixtures. None of the respondents has mentioned addressing the responsible authorities (EPA, EPD).

Many respondents have indicated that information on the identification and classification of hazardous waste is difficult to understand. Furthermore, some waste producers have trouble finding this information.

The waste producers are not too familiar with the EU Guidance either: merely one waste producer has indicated to have been using the EU Guidance, while some of the respondents have first heard of the EU Guidance when responding to the questionnaire. This shows that enterprises lack information on the methodological materials available.

Waste producers also encounter varying identifications of the same waste, i.e. some waste managers accept the same waste as non-hazardous, while others accept it as hazardous waste. The survey shows that waste producers rely on waste managers; therefore, they often assign a waste code depending on the acceptable code for the waste manager.

Waste producers have received numerous suggestions regarding training on the classification and identification of hazardous waste.

In summary, the survey suggests that it is difficult for waste producers to classify and identify waste. In particular, enterprises lack training; the clarification on usage of the current training material on waste classification and simplified explanations of when to treat waste as hazardous or non-hazardous for particular waste streams (e.g. packaging, wood wastes, etc.).

The waste generated in health care institutions constitutes a specific waste stream. The regulations applicable to the identification and classification of waste generated in health care institutions are laid down in the Lithuanian Hygiene Standard HN 66:2013 'Safety Requirements for the Management of Medical Waste'; according to the NPHC specialists, there are no issues related to the classification of medical waste as hazardous (infected); however, there is still uncertainty about classifying pharmaceutical waste as hazardous or non-hazardous, and classifying waste generated in dental practices, in particular mercury-containing waste.

Another specific waste stream is plant protection products and their packaging. Control of plant protection products is exercised by the State Plant Service under the Ministry of Agriculture (**SPS**). During the survey, the SPS specialists indicated that any waste related to off-specification plant protection products must, in all cases, be identified as hazardous; therefore, there is no need for a separate guide. The proper identification and classification of the related waste — packaging waste of plant protection products — is controlled by the EPD; however, in this case, there is a need for a separate identification guide.

The **Lithuanian Plant Protection Association** (LPPA) is conducting a pilot project on the proper handling of plant protection products (PPP) packaging based on good practices established by the European Crop Protection Association 'CropLife Europe', and the international organisation CropLife International. The project aims to assess the practices employed by farmers in the handling of the PPP packaging. In cooperation with the licensed waste manager, the rinsing quality of the supplied PPP packaging is assessed. Farmers are legally obliged to apply triple or integrated rinsing of the PPP packaging to implement the principles of sustainable use of pesticides. In addition to visual inspection, random samples are taken. Based on multi residues tests carried out by a Greek accredited laboratory, the limit of 0.1% w/w applicable for the most toxic substances has not been exceeded in any samples. According to the farmers involved in the project, the proper rinsing of the PPP packaging is adaptable in practice, and HDPE packaging suitable for recycling can be collected in the sector. The clarity in the legal framework is therefore crucial when hazardous waste becomes non-hazardous or secondary raw material. Under Article 8a(2) of the WFD, waste holders are encouraged to assume their responsibility for delivering their waste into the separate collection systems in place. Rationally organised waste management should be based on circular economy principles to make HDPE raw material. CropLife Europe is also developing methodological guidance for the industry on applying HP14 to properly rinsed packaging of plant protection products.

Although the results of the LPPA's project show that properly rinsed pesticide packaging does not have hazardous properties, it is established practice in Lithuania that such packaging should be considered hazardous waste. According to the LPPA, the PPP packaging that has been adequately rinsed and does not exhibit hazard properties is classified as non-hazardous waste in other countries, such as Greece, Romania, Latvia, Slovenia, Cyprus, Sweden, Germany, Austria, France, Ireland, and Belgium. **As a result, it is considered that the classification of the empty PPP packaging should also be included in the Guide under development.**

2.3.1.2 Identification of hazardous waste through environmental regulation of the activities of economic entities

In Lithuania, the EPA is responsible for the environmental regulation of economic activities in issuing IPPC permits and pollution permits and carrying out other related procedures.

During the survey, the EPA specialists stated that, following the EPA Regulations, the EPA specialists provide advice on the identification of hazardous waste to the extent it concerns the applications for and issuance/replacement of IPPC permits and pollution permits. This advice is provided by the specialists from the Integrated Pollution Prevention and Environmental Impact Assessment Division and the Waste Prevention Division of the Pollution Prevention Department. The issues related to hazardous waste accounting are clarified by the specialists from the Waste Licensing Division of the EPA.

The EPA specialists indicated that when examining the applications to issue/replace IPPC permits and pollution permits, they verify the proper identification of hazardous waste by: the description of the process of the economic activity for which the IPPC/pollution permit is issued/replaced/revised; the safety data sheets and/or other documents of substances/mixtures used in the process, which can result in waste generation; the laboratory testing data on the waste composition provided by the economic entity. The EPA specialists indicated that they use the information provided in the EU Guidance to verify the correct identification of hazardous waste. The following waste streams are identified as raising the most issues for economic entities and the EPA specialists: **WEEE, painted, varnished, impregnated wood waste, sleeper waste, medical waste, waste that may contain mercury, and ash waste.**

2.3.1.3 Identification of hazardous waste through environmental control of the activities of economic entities

In Lithuania, the EPD exercises the State environmental control of the activities of economic entities.

The survey of the EPD specialists has shown that although most of the respondents had indicated that the proper identification of hazardous waste is verified during the inspections, the most common method of the identification is the visual inspection, followed by the identification of waste by safety data sheets of the substances and mixtures from which the waste originates. The survey has also shown that the EU Guidance is rarely used for the environmental control of the activities of economic entities (in the case of the EPD). The following waste streams have been listed as requiring different guides and/or supporting information for the identification as being hazardous/non-hazardous: **WEEE, ELVs, and wood waste**.

In the case of transboundary movements of waste, where the waste comes from third countries, it is the task of the specialists of the Customs Department to verify the proper identification of waste (to assess whether appropriate procedures are in place for transboundary movements under Regulation No 1013/2006, see Chapter 2.1.1.2 for more details). During the survey, the specialists of the Customs Department have informed that they first carry out a document check, i.e. based on the documents available, assess the shipped waste and, in case of any doubts, contact the EPD by sending photographs of the waste shipped. The specialists of the Customs Department have identified the following waste stream as requiring a separate guide for the identification of hazardous waste: **ELVs (complete/incomplete ELVs, and other ELV waste, i.e. shipments of ELV parts)**.

2.3.1.4 Identification and classification of hazardous waste during the collection/transport and treatment thereof

Waste collectors/carriers must collect waste from waste producers and deliver it to waste managers licensed to manage such waste. Following the requirements of the legislation currently in force, namely the obligation to transport waste within the territory of Lithuania only with the accompanying PPWIS document containing, inter alia, the waste code, neither carriers nor collectors can change the waste code transferred to them, as they are not entitled to fill in the accompanying PPWIS document. Depending on the circumstances, the accompanying document is filled in either by the consignor (the waste producer) or by the consignee (the waste treatment facility); therefore, even if the carrier or collector finds that the waste transferred to them has been incorrectly identified, it is not possible to change the waste code. Apparently, for this reason, most of the waste collectors/carriers who have participated in the survey have indicated that they do not verify the proper identification of the waste transferred to them, as they trust the information provided by the consignor to be accurate.

Another relevant context is where the waste is collected and transported by the same waste processing facility. According to the representatives of the enterprises participating in the survey, the verification of the proper identification of waste is carried out in all cases[9]; the most common verification method is a visual inspection and assigning the waste code from the list of waste (without testing). In the case of waste generated from waste management, where the waste can be hazardous or non-hazardous (i.e. where there is a mirror waste code in the list of waste), the waste is usually sent to laboratories for testing.

Some respondents have indicated that there are cases where waste is classified as hazardous without testing due to a lack of information on the composition of waste. The main problems are as follows: there are no clear criteria for determining the hazardous properties of waste; it is not clear which testing is to be carried out to identify whether the waste is hazardous or not; there are no accredited laboratories in Lithuania specialising in the identification of waste; neither the EPA nor EPD specialists provide any tangible support.

The waste managers participating in the survey have identified the following waste streams as requiring separate identification guides: **WEEE, packaging (plastic, wood, metal, paper); filtering materials (filters, catalysts, used carbon); wiping cloths (wipes, protective clothing, textile that have been in contact with dangerous substances); aqueous waste (washing liquids, emulsions, water used in manufacturing processes); waste paint (waste from removal of paint, water-based paints used with other dangerous substances); waste adhesives (liquid water-based adhesives, hardened adhesives); wood waste (painted wood, glued wood); off specification articles (manufacturing rejects, off specification products or substances); sewerage sludge (sludge from the manufacturing process); ash and slag (ash or slag from boiler houses); grinding sludge (grinding waste after manufacturing processes); rubber waste (rubber parts of machinery or equipment that have been in contact with dangerous substances); mixed construction waste (paint residues, residues of used dangerous substances); contaminated soil (soil from contaminated production sites, soil near potential sources of pollution); medicines.**

2.3.1.5 Identification and management of hazardous waste produced by households

Following the survey of the representatives of municipalities and RWMCs on the identification of hazardous waste produced by households, it has been established that, according to the representatives of municipalities and RWMCs, the most relevant hazardous waste streams produced by households are as follows:

- Waste paints, varnishes, solvents, thinners, and adhesive residues;
- Waste packaging from various dangerous substances, preparations, and empty aerosol dispensers;
- Asbestos (slate) wastes;
- Waste from vehicles and their maintenance (lubricants, oils, liquids, filters, cleaning, polishing agents, etc.) (see Fig. 33).

All respondents to the survey identified these waste streams. Half of the respondents believe that waste from household chemicals and cleaning residues is also one of the most common

[9] It should be noted that due to the established legal framework and the functioning of the PPWIS system, once waste has been accepted, it is not possible to change the waste code in the accompanying PPWIS document.

hazardous waste produced by households. In contrast, one-third of the respondents have indicated household and garden pesticides, insecticides, herbicide residues, old medicines and waste from medical devices (syringes, needles, thermometers, etc.), and mercury-containing waste (fluorescent tubes, batteries and accumulators) as the most common hazardous waste produced by households. However, none of the respondents has identified photochemicals and the wood waste treated with preservatives as hazardous waste produced by households (see Fig. 33).

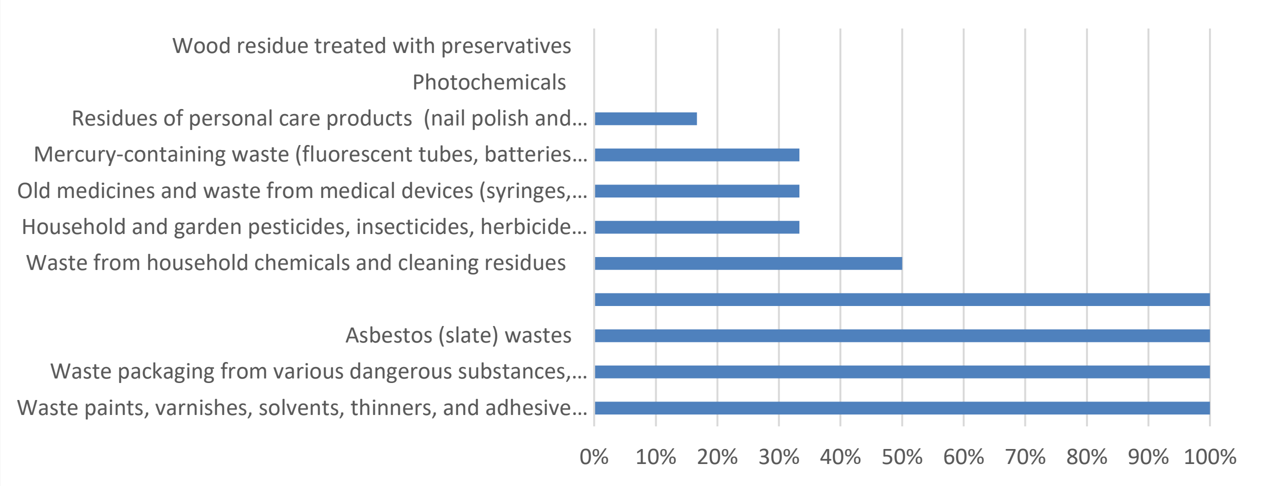


Fig. 33. The most common hazardous waste produced by households, according to representatives of municipalities and RWMCs; Source: the summarised data of the survey, 2021.

All the municipalities participating in the survey have a system of separate collection of hazardous waste produced by households: this waste is received at the BWCS or collected regularly from the residents; some municipalities co-operate with hazardous waste managers such as company UAB Toksika and organise a separate collection of hazardous waste produced by households. Systems complementing municipal waste management systems are in place for producer responsibility for waste streams (for taxable products (waste portable batteries and accumulators); WEEE).

The identification and classification of hazardous waste produced by households are relatively straightforward for municipalities, but the main uncertainty is the classification and handling of empty packaging containing dangerous substances:

'There is a need for legal regulation or instructions from packaging organisations on whether packaging waste containing dangerous substances may be dumped in packaging waste containers. Should this packaging waste be rinsed?'

'We would like to have a clear guide for identifying waste, including clarifying why and by what properties it should be classified as hazardous. Should all packages bearing the hazard labels be treated as hazardous waste? In what cases should empty packages not bearing the hazard labels be treated as hazardous (e.g. nail varnish bottles, adhesives, etc.)? Residents often draw attention to the hazard labels and, in the absence of those, people may dispose of waste into mixed municipal waste, which is prohibited.'

'It is not clear which packaging waste can be dumped in sorting containers; it is not clear which waste can be classified as hazardous waste (e.g. varnished, painted articles).'

'We get enquiries from farmers about why empty fertilizer bags are regarded as packaging contaminated with dangerous substances, although the fertilizer itself is dispersed directly into the soil. Why are empty plastic containers that used to contain dangerous substances such as chemicals considered hazardous waste? Are empty aerosol dispensers hazardous waste?'

Municipalities have also shared their experience of the requirements for sorting empty packaging of waste chemicals or mixtures:

- *'We recommend that residents bring such packaging to bulky waste collection sites (BWCS).*
- *We accept this waste at BWCS and hand them over to waste managers (as plastic or metal packaging contaminated with dangerous substances).*
- *Household waste with one or more hazardous properties and meeting the definition of hazardous waste (packaging contaminated with dangerous substances, etc.) is requested to be delivered to BWCS or for collection at designated sites where hazardous waste is collected. <u>It is not prohibited to dump such packaging waste into packaging waste containers; however, this packaging must be completely empty (free of liquids), while rinsing this packaging waste is purely indicative</u>.*
- *It is specified that packages containing dangerous substances are to be delivered to BWCS or directly to relevant waste managers; <u>if the packaging is empty and marked with PET, HDPE, LDPE, PP, PS labels, it is to be dumped into sorting containers.</u> Nail varnish bottles, aerosol dispensers, oil containers, EEE, batteries and accumulators must be delivered to BWCS.*
- *Regarding rinsing: this requirement has been emphasized to the residents, but we have received angry comments; therefore, we are glad if this waste is at least dumped into the appropriate containers or delivered to BWCS.*
- *Packaging containing hazardous waste delivered to BWCS must be watertight.'*

According to the results of the survey of the RWMC representatives, upon accepting the packaging waste of dangerous substances, the rule applies that empty packaging is recorded by the packaging material (plastic, glass, metal, etc.) as non-hazardous packaging waste. In contrast, aerosol dispensers are recorded as hazardous packaging waste. In the past, waste managers have been reluctant to accept certain types of household hazardous waste, such as waste oils, paints, varnishes, etc., contained in the original packaging of a specific capacity. There have been no problems with this issue lately.

A survey of ***non-governmental organisations and three licensed organisations of manufacturers and importers active in packaging waste management*** (the 'Organisations') also revealed that organisations do not always have a unanimous position and that the opinions of Organisations and municipalities/RWMCs on the classification of empty packaging waste do not always overlap.

Summing up the results of the survey of the Organisations, municipalities and RWMCs, it was found that the classification of empty household packaging containing dangerous substances or mixtures is relevant because there is no conclusive indication as to whether such waste can be dumped in packaging waste containers or should be handled together with other household hazardous waste collected through BWCSs or other collection facilities.

Both during the municipal survey and the round table discussion on the classification of empty packaging, the opinion of municipal representatives was expressed that waste sorting could be facilitated by the voluntary introduction of a **pictogram labelling system** that is quite successful in the Scandinavian countries. The public body 'We Do' (lith. *VšĮ Mes Darom*), in cooperation with the Office of the Nordic Council of Ministers and the Ministry of Environment of Lithuania, is implementing the project to initiate the implementation of the pictogram labelling system in Lithuania[10]. Denmark and Sweden, where the pictogram labelling system was introduced earlier, have more than 90 pictograms, which have grown over 4 to 5 years. Countries implementing the pictogram labelling system, such as Finland, start with the 20 most commonly pictograms; in Lithuania, 30 pictograms have been selected

[10] https://www.mesdarom.lt/project/atlieku-zenklinimo-sistema/.

so far, including one for hazardous waste; however, the number may increase as needed in the future. According to the idea of the project, packaging containing substances with hazardous properties should be marked with the same hazardous waste pictogram. In this case, residents would be informed that all packaging (whether containing content or empty) with a hazardous waste pictogram should be handled as domestic hazardous waste, which is not entirely correct and does not comply with the practice of classifying empty packaging in foreign countries (see Chapter 2.4.4 for details). In the case of pictograms for the labelling of waste, explicit instruction must be given to the manufacturers whose packaging should be labelled with such pictograms, and confusion should be added in cases where the packaging with its contents is to be classified as hazardous waste and empty as non-hazardous waste. The question remains whether this would make it easier for the public to identify waste from empty packaging by correctly classifying it as hazardous or non-hazardous.

However, hazardous waste pictograms could clarify the population on how to properly sort other hazardous waste produced by households (see Fig. 34).

Fig. 34. 13 pictograms for hazardous waste labelling used in Sweden

During the preparation of the Overview, the **survey of Lithuanian residents** was carried out – a study on the generation and sorting of hazardous waste in households. The survey was conducted by the market and public opinion research company 'Spinter research' (lith. *UAB Spinter tyrimai*); the report on the survey results is attached hereto as Annex 1 in the form of a presentation (in Lithuanian). The survey was conducted between October and November 2021, including 1,015 respondents across the country.

The results of the residents' survey have shown that:

- as many as 91% of respondents know what domestic hazardous waste is and how to distinguish it from non-hazardous waste. Of these, 38% know for sure, and 53% are partially aware of the topic;
- the majority of or most common household chemicals and cleaning agent residues (62%) and, to a lesser extent, waste of old medicines and medical devices (40%) are generated;
- hazardous waste produced in households is sorted by 86% of survey participants. All such waste is sorted by 39%, while only a part of it is sorted by 47% of the surveyed respondents;
- almost half (48%) of domestic hazardous waste sorters bring it to fuel stations/stores and other collection sites. Another frequently mentioned collection facility is a bulky waste collection site (42%);
- unsorted hazardous waste is usually dumped in a container together with mixed waste (30%). The most common reason for non-sorting is the absence of such waste (29%);

- individuals who have sufficient information on the sorting of hazardous waste usually refer to TV programmes (25%) and the internet (25%) as information sources. Those who have negatively assessed the adequacy of the information generally indicated as a reason that such information does not reach them (23%) or is difficult to understand or complicated to provide (14%);
- most survey participants have indicated (80%) that the proper management of domestic hazardous waste would be encouraged by a higher level of information on the correct sorting of such waste.

2.3.2 Misleading identification and management of waste

As mentioned in Chapter 2.3.1, to determine which hazardous waste is most frequently identified incorrectly in Lithuania, questions about the hazardous waste streams identified incorrectly were raised in questionnaires during the stakeholders' survey.

As indicated above, representatives of the EPA, the EPD, the NPHC, the Customs Department, and the SPS have been interviewed during the survey of **official authorities**. It is important to note that these authorities perform distinct functions in the identification and classification of hazardous waste. The information obtained during the survey on a potentially erroneous identification of waste streams differs accordingly.

In particular, representatives of the **EPA**, the body performing the environmental regulatory function in Lithuania, have been interviewed.

During the survey, representatives of that authority indicated that waste **resulting from the dismantling of ELVs is often incorrectly identified. Often, operators avoid indicating hazardous waste generation when submitting authorisation documents or do not identify all hazardous waste streams.** The EPA specialists also noted that the aim of minimising hazardous waste in the authorisation process is also reflected in the authorisation of other activities.

The primary function of another surveyed institution (the **EPD**) is to carry out State control of environmental protection of activities of economic entities. Representatives of that authority noted that, in most cases, **the hazardous waste of ELVs referred to above and WEEE and treated wood waste** are incorrectly identified.

Another public authority whose representatives have been interviewed is the **NPHC**, whose remit is to control the specific waste stream from health care institutions.

The regulations applicable to the identification and classification of waste generated in health care institutions are laid down in the Lithuanian Hygiene Standard HN 66:2013 'Safety Requirements for the Management of Medical Waste'; according to the NPHC specialists, there are no issues related to the classification of medical waste as hazardous (infected); however, some **pharmaceutical waste** may still be misidentified (as hazardous or non-hazardous waste) due to unclear requirements.

Another specific waste stream is plant protection products and their packaging. The activities of the producers of this waste stream are supervised by the **SPS** when controlling the use of plant protection products. **According to the SPS representatives**, all waste plant protection products, etc., which are no longer usable, are identified as hazardous, which is the case.

30 Lithuanian enterprises engaged in various activities (transportation, road maintenance, clothing cleaning, purchase of automotive parts, manufacture, etc.) have been surveyed **as waste producers**. According to the results of the survey of waste producers, the key issues were identified and, accordingly, a higher risk of misclassifying waste arises to assess the hazardous properties of the following waste:

- **wood waste;**
- **waste packaging of dangerous substances;**

- **sewerage sludge.**

Summing up the above information and the information in Chapter 2.3.1 may lead to the conclusion that, in general, according to the survey participants, waste streams that have been identified as the most problematic (for summary information on the most relevant waste streams due to identification issues and the risk of misidentification, see Table 9 in Chapter 2.3.4).

2.3.3 Overview of laboratory tests for hazardous waste identification

To analyse and assess the scope of laboratory testing (identification) of hazardous waste carried out by Lithuanian economic entities and institutions in Lithuania and abroad; identify issues encountered by waste holders and waste managers wishing or obliged to use the services of laboratory testing (identification) of waste; and submit proposals to address the identified problems, relevant questions have been included in the stakeholder survey questionnaires.

As indicated above (see Chapter2.3.1), the identification of waste using studies on the composition or hazardous properties of waste is not the most popular method of identifying hazardous waste in Lithuania. Visual or documentary assessment methods are used more frequently; therefore, the scope of the laboratory tests carried out could not be determined during surveys.

However, the survey results helped to identify another problem: **there are no laboratories in Lithuania accredited for waste testing** according to the standards set out in the table below. Therefore, where there is a need to determine the composition of the waste, operators (mainly waste managers, whose need to identify the waste accurately arises in cross-border shipments of waste) are forced to apply to foreign laboratories for testing. There have been legal disputes in Lithuania. Proper waste identification was the subject of a dispute or a particularly critical issue (public authorities EPD, EPA indicated such cases). The parties also applied to foreign laboratories for testing.

Table 8. Available methods for testing the composition of waste

Number of the relevant standard	Title
CEN/TS 16660:2015	Characterization of waste. Leaching behaviour test. Determination of the reducing character and the reducing capacity
EN 15863:2015	Characterization of waste. Leaching behaviour test for basic characterization. Dynamic monolithic leaching test with periodic leachant renewal, under fixed conditions
EN 14997:2015	Characterization of waste. Leaching behaviour test. Influence of pH on leaching with continuous pH control
EN 14429:2015	Characterization of waste. Leaching behaviour test. Influence of pH on leaching with initial acid/base addition
EN 14429:2015	Characterization of waste. Leaching behaviour test. Influence of pH on leaching with initial acid/base addition
EN 14997:2015	Characterization of waste. Leaching behaviour test. Influence of pH on leaching with continuous pH control
CEN/TS 15364:2006	Characterization of waste. Leaching behaviour test. Acid and base neutralization capacity test
CEN/TS 14405:2004	Characterization of waste. Leaching behaviour tests. Up-flow percolation test (under specified conditions)

Number of the relevant standard	Title
LST EN 12457-1:2002	Characterization of waste. Leaching. Compliance test for leaching of granular waste materials and sludges. Part 1: One stage batch test at a liquid to solid ratio of 2 l/kg for materials with high solid content and with particle size below 4 mm (without or with size reduction)
LST EN 12457-2:2002	Characterization of waste. Leaching. Compliance test for leaching of granular waste materials and sludges. Part 2: One stage batch test at a liquid to solid ratio of 10 l/kg for materials with particle size below 4 mm (without or with size reduction)
LST EN 12457-3:2002	Characterization of waste. Leaching. Compliance test for leaching of granular waste materials and sludges. Part 3: Two stage batch test at a liquid to solid ratio of 2 l/kg and 8 l/kg for materials with a high solid content and with a particle size below 4 mm (without or with size reduction)
LST EN 12457-4:2002	Characterisation of waste. Leaching. Compliance test for leaching of granular waste materials and sludges. Part 4: One stage batch test at a liquid to solid ratio of 10 l/kg for materials with particle size below 10 mm (without or with size reduction)
LST EN 16377:2013	Characterization of waste. Determination of brominated flame retardants (BFR) in solid waste
LST EN 16192:2011	Characterization of waste. Analysis of eluates
LST EN 15216:2007	Characterization of waste. Determination of total dissolved solids (TDS) in water and eluates
LST EN 13137:2001	Characterization of waste. Determination of total organic carbon (TOC) in waste, sludges and sediments
LST EN 13656:2002	Characterization of waste. Microwave assisted digestion with hydrofluoric (HF), nitric (HNO_3), and hydrochloric (HCl) acid mixture for subsequent determination of elements
LST EN 13657:2002	Characterization of waste. Digestion for subsequent determination of aqua regia soluble portion of elements
LST EN 14039:2004	Characterization of waste. Determination of hydrocarbon content in the range of C10 to C40 by gas chromatography
LST EN 14346:2006	Characterization of waste. Calculation of dry matter by determination of dry residue or water content
LST EN 14582:2007	Characterization of waste. Halogen and sulfur content. Oxygen combustion in closed systems and determination methods
LST EN 15192:2006	Characterisation of waste and soil. Determination of chromium (VI) in solid material by alkaline digestion and ion chromatography with spectrophotometric detection
LST EN 15308:2008	Characterization of waste. Determination of selected polychlorinated biphenyls (PCB) in solid waste by using capillary gas chromatography with electron capture or mass spectrometric detection
LST EN 15527:2008	Characterization of waste. Determination of polycyclic aromatic hydrocarbons (PAH) in waste using gas chromatography mass spectrometry (GC/MS)

Number of the relevant standard	Title
LST EN 16424:2014	Characterization of waste. Screening methods for the element composition by portable X-ray fluorescence instruments
LST EN 15309:2007	Characterisation of waste and soil. Determination of elemental composition by X-ray fluorescence

It is not always necessary to determine the composition of the waste when assessing the hazardous nature of the waste. Certain hazardous properties may be determined by testing. For example, following the provisions of the Waste Management Rules, the hazardous property HP14 (ecotoxicity) is assessed by testing following standard LST EN ISO 6341 (Water quality. Determination of the inhibition of the mobility of Daphnia magna Straus (Cladocera, Crustacea) — Acute toxicity test). At the same time, waste samples are prepared in accordance with standard LST EN 14735 (Characterization of waste. Preparation of waste samples for ecotoxicity tests). Surveys have revealed that only **one private laboratory in Lithuania is accredited for ecotoxicity testing**. However, according to the laboratory representatives, the number of applicants for such testing is limited (**up to 100 tests per year**).

Another important fact that emerged during the surveys is the lack in Lithuania of laboratories specialising specifically in waste research (such as in foreign countries such as Germany, the Czech Republic) capable not only of carrying out studies but also of providing methodological assistance on the identification of hazardous waste, i.e. of identifying which studies are needed, or all of them are necessary (this is an essential aspect in assessing the cost of some studies) and of interpreting the test results.

Such services are also not provided by the EPA laboratory, which does not have accreditation for waste research based on publicly available information.

Additional requests were made to waste producers and managers to assess the scope of research (identification) of hazardous waste carried out by Lithuanian economic entities in foreign laboratories. The additional survey has found that:

- waste managers are more likely to carry out analyses of hazardous waste than to determine the hazardous nature of the waste, but rather its suitability for a particular type of treatment (e.g. about 20 waste tests per year carried out by the operator of a hazardous waste landfill for compliance with the criteria for the acceptance of waste at hazardous waste landfills, about 20 for water content in used oils, etc.), as well as tests where waste is shipped for treatment to other countries under pre-notification procedures (the purpose of these tests is to determine whether the composition of the waste meets the requirements laid down by the consignee);
- Of **the waste producers** surveyed, only one company has reported having carried out tests on the composition of the waste to identify its hazardous properties (**15 tests on the varying composition of waste** have been carried out);
- The survey of waste managers has shown that the aggregate **volume of waste tests carried out by the surveyed companies to identify the hazardous nature of waste may reach up to 50 waste composition tests per year**.
- Waste collectors and waste managers have also reported that although representatives of Lithuanian and foreign laboratories are also contracted for sampling, **testing of the composition of waste is carried out in foreign laboratories** (e.g. the Czech Republic, Germany).

2.3.4 Identification of hazardous waste in Lithuania. Summary

According to the results of the surveys carried out, the following problems could be identified when considering the practical situation in Lithuania regarding the identification and classification of hazardous waste:

- The majority of respondents to the survey indicated as the main problem is that there is no single institution in Lithuania is responsible for methodological management and consulting (mandatory under the provisions of the Law on Public Administration and the Law on State Control of Environmental Protection) on the identification and classification of hazardous waste. In particular, the EPA consults only concerning the IPPC and pollution permit issues and does not provide advice concerning the identification of hazardous waste. Therefore, it is not clear where to address questions concerning the identification of hazardous waste. The questions do not relate to the receipt/modification/renewal of IPPC and/or pollution authorisations/amendment/renewal.
- Most respondents identified requirements for hazardous waste identification as complex and challenging to understand.
- Only a few survey respondents, including EPD specialists, are aware of EU Guidance.
- The most common methods of identifying waste in Lithuania are a visual evaluation which does not provide complete information about the composition of waste and, accordingly, about its hazardous nature, to determine whether the waste is assigned the correct waste code; second, by popularity, a documentary assessment based on the data in the safety data sheet of the product from which it originates.
- In Lithuania, there is lack of specialised training.

The table below (Table 9) summarises the information collected during surveys on waste streams identified as most relevant, i.e. waste that is potentially misidentified and for which there is a need for a separate guide/supporting information for identification. It should be noted that, as indicated above (see Chapter 2.3.1), in almost all cases, the survey participants identified the same waste streams as both potentially erroneously identified and as requiring a separate guide; the table below summarises the information.

Table 9. Most relevant hazardous waste streams require a more detailed guide (based on the survey results)

	EPD	EPA	CD[11]	NPHC	Waste managers	Waste producers
WEEE	+	+			+	
ELVs	+		+		+	
Pharmaceutical waste (medicines)				+	+	
Dental waste				+		
Wood waste (impregnated, painted)	+	+			+	+
Ash and slag waste		+			+	
Waste containing mercury		+				
Filtering materials (filters, catalysts, used carbon); wiping cloths (wipes, protective clothing, textile that					+	+

[11] Customs Department

	EPD	EPA	CD[11]	NPHC	Waste managers	Waste producers
have been in contact with dangerous substances)						
Aqueous waste (washing liquids, emulsions, water used in manufacturing processes)					+	
Waste paint (waste from the removal of paint, water-based paints used with other dangerous substances)					+	
Waste adhesives (liquid water-based adhesives, hardened adhesives)					+	
Off specification articles (manufacturing rejects, off-specification products or substances)					+	
Sewerage sludge (sludge from the manufacturing process); ash and slag (ash or slag from boiler houses)					+	+
Grinding sludge (grinding waste after manufacturing processes)					+	
Rubber waste (rubber parts of machinery or equipment that have been in contact with dangerous substances)					+	
Mixed construction waste (paint residues, residues of used dangerous substances); contaminated soil (soil from contaminated production sites, soil near potential sources of pollution)					+	
Packaging waste						+

2.4 Methods of the identification and classification of hazardous waste used in foreign countries

As the use of guides for the identification and classification of hazardous waste is directly related to the legal framework in force in those countries, this Chapter contains information on requirements established in foreign countries and methods used for the identification and classification of hazardous waste.

2.4.1 Nordic countries: Sweden, Denmark, Norway

Sweden

To prepare information on hazardous waste management in Sweden, publicly available information on the internet from the Swedish Ministry of Environment, the Environmental Protection Agency, and other Swedish authorities.

The following documents are used for the identification and classification of hazardous waste in Sweden:

a) Waste Order

Under Order No 2020:614 of the Minister for the Environment of Sweden on waste of 25 June 2020, it is established that the waste holder classifies the waste as hazardous waste if:

1. the waste has one or more hazardous properties following Annex III to Directive 2008/98/EC after assessment of the hazardous substances contained therein;
2. Wastes containing polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF), DDT (1,1,1-trichloro-2,2-bis (4-chlorophenyl)ethane), chlordane, hexachlorocyclohexanes (including lindane), dieldrin, endrin, heptachlor, hexaclorobenzene, chlordecone, aldrine, pentachlorobenzene, mirex, toxaphene hexabromobiphenyl and/or PCB exceeding the limits set in Annex IV to Regulation (EU) No 2019/1021 shall be classified as hazardous.

Classification of waste shall also consider classification and labelling following the notes to Annex VI to Regulation (EC) No 1272/2008 and the LoW set out in the Annex to Commission Decision 2014/955/EU of 18 December 2014.

b) EU Guidance, and the Classification of hazardous waste 2016: Amendments to the European Regulation on Waste Classification — what do they mean and what are the consequences?

The document 'Classification of hazardous waste 2016: Amendments to the European Regulation on Waste Classification — what do they mean and what are the consequences?' has been jointly drafted by the Nordic countries (Finland, Denmark, Sweden) and financed by the Nordic Council.

c) Manual on the Classification of Waste by the Environmental Protection Agency of Sweden

In addition, the Environmental Protection Agency of Sweden drew up the Manual on the Classification of Waste[12] on 18-02-2021, explaining how the classification of waste is to be carried out following the points in Chapter 2 of the Waste Order (2020:614). That Manual contains only references to the EU regulations (Regulation No 1357/2014, Regulation No 2017/997, Regulation No 2019/1021) without providing any detailed explanation or examples of how the classification of waste is to be carried out. The Manual refers to the EU Guidance for more advice on waste codes, assessment of hazardous properties, etc.

The website of the Environmental Protection Agency of Sweden contains a column on the classification and coding of waste[13], which provides brief explanations (steps) on how the classification of waste is to be carried out and how to assign the waste code to the correct waste.

As the most severe classifications, waste produced under uncontrolled conditions, such as contaminated soil, ash, sludge, and filter content, is identified. In such cases, the undertaking may need to take samples and analyse the waste to determine its contents and concentrations.

According to the information published by the municipal enterprise MIVA, the following household aerosols are regarded as hazardous waste:

[12] https://www.naturvardsverket.se/globalassets/vagledning/avfall-och-kretslopp/farligt-avfall/klassificering-och-kodning/210530_vgl_2_kap_avfallsforordningen_om_avfallsklassificering.pdf.

[13] https://www.naturvardsverket.se/vagledning-och-stod/avfall-farligt-avfall/klassificering-och-kodning/.

- pesticides, such as mosquito sprays and insect sprays;
- mounting foams, such as Casco, Tremco, Soudafoam, Bostik, and Byggmax;
- other aerosols include lubricating oils, paints, waterproofing preparations, car care preparations, and hair spray.

Empty containers of body care products and hair mousse/spraying* (sorted as metal packaging at a recycling station).

* The spray dispenser is considered empty when nothing comes out upon pushing the spray button. If the spray dispenser is empty, it can be sorted as metal packaging at the recycling station.

In the light of the above, we can say that the classification of waste in Sweden is based on regulations of the European Union.

Denmark

To prepare information on hazardous waste management in Denmark, publicly available information on the internet from the Ministry of Environment, the Environmental Protection Agency of Denmark, and other Danish authorities.

The following documents are used for the identification and classification of hazardous waste in Denmark:

a) Waste Order

According to Order No 2159 of the Minister for the Environment of Denmark on waste of 12 September 2020, hazardous waste is defined as waste that is listed in the list of waste available in Annex 2, labelled as hazardous waste, and that has one or more of the hazardous properties listed in Annex 3 thereto. Waste with the properties listed in Annex 3 is also considered hazardous waste.

Upon assessing the information in Annex 3 to the Waste Order, waste is considered hazardous if it has one or more properties HP 1 to HP 15.

Hazardous properties are assessed by determining the concentration of substances in waste as specified in:

- Annex to Regulation No 1357/2014;
- Regulation 2017/997 amending Annex III to Directive 2008/98/EC of the European Parliament and of the Council as regards hazardous property HP 14 'Ecotoxic';

or

- unless otherwise provided for in Regulation No 1272/2008 on classification, labelling and packaging of substances and mixtures, by testing under Regulation No 440/2008, determining experimental methods following Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH);

or

- other relevant test methods and guidelines of the European Committee for Standardisation (CEN) or other internationally recognised test methods and guidelines are used following Article 7 on experiments on animals and humans of Regulation No 1272/2008.

If hazardous properties of waste have been assessed during the test using the concentrations of hazardous substances set out in Annex 3 to the Waste Order, the testing results prevail.

Limit values for individual materials are used to assess the hazardous properties HP 4, HP 6, and HP 8. If the amount of the substance in the waste is below the limit value, it is not considered in the calculation of the limit concentration.

The following comments listed in Annex VI to Regulation No 1272/2008 concerning the classification, labelling, and packaging of substances and mixtures may also be considered when determining the hazardous properties of waste:

1) Notes relating to the identification, classification and labelling of substances: Notes B, D, F, J, L, M, P, Q, R, and U.
2) Notes relating to classification and labelling of mixtures: Notes 1, 2, 3 and 5.

Wastes containing polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF), DDT (1,1,1-trichloro-2,2-bis (4-chlorophenyl)ethane), chlordane, hexachlorocyclohexanes (including lindane), dieldrin, endrin, heptachlor, hexaclorobenzene, chlordecone, aldrine, pentachlorobenzene, mirex, toxaphene hexabromobiphenyl or PCB exceeding the concentration limits established in Annex IV to Regulation 2019/1021 on persistent organic pollutants shall be classified as hazardous.

The concentration limits in Annex 3 to the Waste Order do not apply to pure metal alloys in their hard form (free from contaminants). Metal alloys considered hazardous waste are listed in Annex 2 to the Waste Order and marked in bold.

b) Guidelines on the Classification of Hazardous Waste by the Environmental Protection Agency of Denmark

In 2017, the Environmental Protection Agency of Denmark issued new Guidelines on the Classification of Hazardous Waste (the 'Manual')[14] that replaced the Guidelines on Hazardous Waste.

The Environmental Protection Agency of Denmark regularly updates the Guidelines on the Classification of Hazardous Waste. In addition to this Manual, the FAQ page has been created on the website of the Environmental Protection Agency of Denmark and is constantly extended. An Excel tool has also been developed that can be used to determine the classifications and hazard characteristics of individual materials in waste (see https://mst.dk/affald-jord/affald/affaldsfraktioner/farligt-affald/vejledning-i-klassificering-af-farligt-affald/).

The Manual describes the classification of hazardous waste in six steps. It is not always necessary to go through all six steps. However, the fewer steps are overcome, the less awareness is given of the nature of the waste associated with its hazardous properties.

The Manual provides that waste may be classified as hazardous immediately in the following cases:

- If the waste is in its original packaging that bears a hazard pictogram, the waste is hazardous, with a few exceptions, for example:

> Labelling with the hazard pictogram 'Gas cylinder' (GHS04) does not necessarily mean that the waste is hazardous, as 'Gas cylinder' is not in itself a hazardous property (it depends on the contents).
>
> Similarly, the hazard pictogram for corrosion (GHS05) may also be assigned as a result of the property 'May be corrosive to metals' (H290), which is not in itself a hazardous property (however, substances with metal-corrosive properties will usually also have skin-corrosive and/or irritant or eye-damaging properties, which will trigger the same hazard pictogram, or GHS07 ('Exclamation mark')).
>
> A given product may be labelled because it contains a hazardous substance in a concentration exceeding a specific concentration limit set for that substance. In contrast, the product is only classified as hazardous waste if the substance in question

[14] https://mst.dk/media/93596/vejledning-i-klassificering-af-farligt-affald_april-2017.pdf.

exceeds the generic concentration limit for the property possessed by the hazardous substance.

There are two main reasons why hazardous products and mixtures do not always become hazardous waste when discarded:

1) Some products change properties during use, for example, two-component adhesives that harden, losing their hazardous properties, or solvent-based paints where the hazardous solvents evaporate as the paint dries — whether on a board or in the cans if left open long enough.

2) There are degree differences in how hazardous products and mixtures on the one hand and hazardous waste on the other are classified, which obviously impacts the outcome. The differences here fall into three main groups:

• Certain hazardous properties are not applicable at all for the classification of hazardous waste. This is the case for gas under pressure; the properties that may be corrosive to metals corrosive and toxic to reproduction (Lact. + H362), while others are not considered due to exceptionally low hazard category codes (Expl. 1.5 and 1.6, and Org. Perox. G and Self-act. G). Products and mixtures classified as hazardous only because of these properties will not become hazardous waste when discarded. The properties that are not applicable for hazardous waste classification are listed in Annex 3.8 of the Manual[15].

• When the generic concentration limits for skin and eye irritant properties in category 2 are higher than 20%, such waste is classified as hazardous. For products and mixtures, the concentration limit is 10%. Therefore, many soaps and detergents are classified as hazardous products (and consequently labelled with 'Exclamation marks') without necessarily becoming hazardous waste when discarded. This depends on whether the concentrations of the skin and/or eye irritants also reach the 20% concentration limit.

The labelling rules also mean that not all properties need to be labelled, with some hazard pictograms 'overriding' others. It is therefore not possible to obtain a complete overview of all the hazardous properties of the waste via the hazard pictograms.

It should also be borne in mind that the absence of hazard pictograms cannot conversely be used to establish that the waste is not hazardous.

Examples of hazardous products that do not need to be labelled but become hazardous waste: Substances, mixtures and articles with hazard class and category codes and hazard statement 'Flam. Gas2, H221' do not have to be labelled with a hazard pictogram; however, this waste may become hazardous by virtue of the properties listed in Annex 3 to the Waste Order.

Similarly, the lowest ranked hazard class and category codes and the environmental hazard codes (Aquatic Chronic 3, H412 and Aquatic Chronic 4, H413) do not trigger hazard labelling either.

In addition, there are HPs to which no hazard pictograms are attached (e.g. HP 9 'Infectious', HP 12 'Release of an acute toxic gas', and HP 15 'Waste capable of exhibiting a hazardous property listed above not directly displayed by the original waste').

Although the classification of a substance bearing hazard pictograms on its original packaging as hazardous waste is limited, if any, this is an indication that the waste is hazardous, with the above exceptions.

[15] https://mst.dk/media/93596/vejledning-i-klassificering-af-farligt-affald_april-2017.pdf.

- If the waste is liquid and has a flash point < 60 °C, the waste is hazardous (for waste oils, diesel, and light fuel oils < 55 °C and for gas < 20 °C).

The procedure for the classification of hazardous waste outlined in the Manual is based on a six-step guide:

1 Waste code
- Is the waste marked in bold in the list of waste? If yes – HAZARDOUS
- Mirror entry (not marked in bold?) – **Step 2**

2 Substance
- Are there hazardous substances detected in the waste? If yes – **Step 3**
- No hazardous substances – **Step 6**

3 POP
- One or more of the 15 POPs conc.> conc. limits? If yes – HAZARDOUS
- None of the 15 POPs conc. > conc. limits – **Step 4**

4 Class
- Identify the hazard class, category, and hazard statement codes
- Hazardous substances conc.> conc. limits? If yes – HAZARDOUS, if no – **Step 5**
- If (only) physical properties – **Step 6** (if HP 14 – Point 3.16)

5 Sum
- Sum of the hazardous substances > conc. limits? If yes – HAZARDOUS
- If no – **Step 6**

6 Other
- Check for HP1 'Explosive', HP 2 'Oxidizing', H3 'Flammable', or HP 9 'Infectious', HP 12 'Release of an acute toxic gas', or HP 15 'Waste capable of exhibiting a hazardous property listed above not directly displayed by the original waste'
  If yes – HAZARDOUS

A detailed description of the six steps (as defined by the guide used in the Manual) for determining whether waste is hazardous or non-hazardous is provided below.

Step 1. Waste code. The waste code is assigned following the list of waste. If a waste code is a mirror entry, proceed to Step 2.

An example of a mirror entry in the LoW, where the same waste can be both hazardous and non-hazardous: 02 01 08* agrochemical waste containing hazardous substances, agrochemical waste other than those mentioned in 02 01 08.

Step 2. Substance. Identify the substance(s) in the waste that possess properties that could make it hazardous and determine their concentration.

The rules for classifying hazardous waste do not specify which substances are to be considered and there are no objective criteria for how the information is to be obtained, including whether it is to be obtained by sampling and analysis. It is therefore left to a case-by-case assessment. The following considerations can be followed:

- if there is a safety data sheet available for the substance generating the waste, this can be an obvious starting point for identifying any hazardous substances;
- if the waste is packed in original packaging, labelling and information on the packaging will be useful to determine its hazardous properties;
- in the case of production waste, knowledge of raw material consumption and production process could contribute to the identification of relevant substances;

- in the case of contaminated soils, the history of land use (pollution history) may give indications of the substances (and their degradation products) that are relevant;
- for construction waste, the history (dates of construction and renovation) will be key information for assessing which substances and materials may be present.

When and if hazardous substances are identified in the waste, their concentration is determined by calculation, as well as by sampling and analysis.

Once the hazardous substances have been identified and their concentration(s) has been determined, proceed to **Step 3**.

If no substances with properties that could make the waste hazardous can be identified, this may be an indication that the waste is not hazardous. However, remember to check for all the HPs, including HP 9 'Infectious', HP 12 'Release of an acute toxic gas, and HP 15 'Waste capable of exhibiting a hazardous property listed above not directly displayed by the original waste'. Therefore proceed to **Step 6** in any case.

Step 3. POP. The presence and quantity of POPs is assessed.

If one or more substances belong to POP substances exceed the concentration limits of the relevant POP substances, then the waste is hazardous.

Step 4. Class. The hazard class, category and hazard statement codes of the substances are identified.

The classification of the identified substance or mixture that may render the waste hazardous is analysed in accordance with the ECHA database (see echa.europa.eu/information-on-chemicals/cl-inventory-database) or Regulation No 1272/2008.

If harmonised classifications of the substance(s) that may render the waste hazardous exist, make a note of the following information:

• the combination of the hazard class, category, and hazard statement (H-codes) associated with the classification (the two leftmost columns of the REACH list);

• any additional hazard statement codes that may be included in the label requirements and will appear in the 4th column as appropriate (the EUH always indicates something, but note only the relevant codes that are EUH001, 019, 029, 031, 032 and 044, and that apply for the assessment of the hazard properties HP 12 and HP 15);

• the note(s) associated with the classification (capital letters and/or figures). For substances, only notes B, D, F, J, L, M, P, Q, R and U and for mixtures only notes 1, 2, 3 and 5 are relevant. If applicable, they are listed in column 7 (far right) of the REACH list.

EC number

The EC number is the official, unique number of a substance in the EU. It can be the European Inventory of Existing Commercial Chemical Substances (EINECS), European List of Notified Chemical Substances (ELINCS), or no-longer polymer (NLP) list:

• The EINECS number is a unique combination of numbers for chemical substances listed in the European list of marketed chemical substances. EINECS is an abbreviation for European Inventory of Existing Commercial Chemical Substances and is characterised by the first three digits running from 200 to 399. The EINECS number is visible on the packaging of the hazardous substance.

• The ELINCS number is a unique combination of numbers for notified substances in the European list of chemical substances and is characterised by the first three digits running from 400 to 499. It is less likely that only notified substances are found in waste.

• NLP number: NLP is an abbreviation for 'No Longer Polymers', and NLP numbers are found in the official EU list of NLPs that was drawn up in the context of the 1992 change in the definition of polymers, whereby a number of substances previously considered as polymers with their own set of rules were no longer to be considered as polymers. NLP numbers are characterised by the first three digits starting with 500.

Index number:

The index number, which is used for sorting the list of classified substances, consists of the atomic number of the most characteristic chemical element (or, for organic substances, the most characteristic organic group) in the molecule as the first three digits.

In other words, you can search for all the substances classified for a given element. This can be helpful if you only know the element and are unsure about the compounds it is part of and whether it can therefore make the waste hazardous. Based on the history or knowledge of the production process etc. of a given waste, it will be possible to assess whether it contains one or more of the classified substances.

CAS numbers:

CAS number stands for 'Chemical Abstracts Service Number' that is assigned by the American Chemical Society at the rate substances and compounds are referred to in the scientific literature (i.e. independently of whether they are marketed or not). Note that only CAS numbers for anhydrous forms are included in the harmonised list. Hydrate forms have separate CAS numbers and if searched, they will not appear in the ECHA database. It is therefore recommended to use the EC number for searching, if available.

Step 5. Sum. Summation of concentrations of dangerous substances

It should be noted that summation is only required for substances harmful to health (first digit of the H-code is 3), and far from for all properties. Thus, only the concentrations of acutely toxic substances and substances which corrode or irritate must be summed (and, as a single exception, also substances which are toxic if inhaled), whereas the concentrations of various carcinogenic (Carc.), toxic for reproduction (Repr.), mutagenic (Muta.) or specific target organ toxicity (STOT) substances must not be summed.

Note also that only concentrations of substances with exactly the same combinations of hazard class and category codes and hazard statement codes may be summed. However, exceptions apply within certain combinations under HP 4 and HP 8 (see the Annex 3 to the Manual).

Step 6. Other. **The waste is assessed for having one or more physical hazardous properties: HP1 'Explosive', HP 2 'Oxidizing', H3 'Flammable', or HP 9 'Infectious', HP 12 'Release of an acute toxic gas', or HP 15 'Waste capable of exhibiting a hazardous property listed above not directly displayed by the original waste'. If yes, the waste is classified as hazardous waste.**

For wastes containing only substances that can give them the hazardous properties HP 1–3, HP 9, HP 12, and HP 15, there are, with few exceptions, no concentration limits to rely on when assessing whether the substances occur in such concentrations as to classify the waste as hazardous.

In such cases, it must be assessed based on specific knowledge of the waste whether it is hazardous or not. In the absence of such knowledge, waste testing may be necessary, e.g. to determine its flash point and explosivity.

Example of oxidising substance with harmful properties: Hydrogen peroxide is assigned a specific concentration limit for flammability of 50%

In addition, the substance is also classified as Acute Tox. 4, H332, Acute Tox. 4, H302 and Skin Corr. 1A, H314, for which generic concentration limits are set at: 22.5%, 25%, and 1% accordingly.

Waste containing hydrogen peroxide will thus be hazardous already at a concentration > 1%, and not only at the 50% level, where the waste the waste is oxidised.

For HP 12, the British calculation model is used to calculate limit concentrations. The British Environment Protection Agency has applied a theoretical calculation of concentration limits, where many of the substances with properties EUH029, EUH031 and EUH032 may produce the wastes containing these substances, which may in turn lead to the generation of acute toxic gases. Such waste must be classified as having HP 12 properties. The concentration limits are also given in Annex 3.7 to the Manual.

Example: Calcium hypochlorite, which is classified under the additional hazard code EUH031, in contact with acids liberates toxic gas.

The substance is one of the HP 12 substances for which the British Environmental Protection Agency has calculated concentration limits, and Annex 3.7 of the Manual states that the calculated concentration limit at which the presence of calcium hypochlorite in waste could trigger release of toxic gas when in contact with acid is 0.6%.

Wastes containing calcium hypochlorite in concentrations > 0.6% are thus classified as hazardous under HP 12. In addition, this waste will additionally be classified as hazardous under HP 8 (corrosive) at a concentration > 5%, and hazardous under HP 6 (acutely toxic) at a concentration > 25%.

The HP 15 requires an assessment of whether substances have the H205, EUH001, EUH019 and EUH044 properties.

It should be noted that all six steps need to be completed to properly classify waste.

c) <u>EU Guidance</u>

The EU Guidance is also applied to classify hazardous waste.

In addition, the examples and exceptional information on waste classification contained in the Manual may be used in the development of the Guide.

Packaging

In principle, there are no special rules for the classification of packaging that has contained dangerous substances and mixtures, apart from packaging that has contained pesticides (where there may be special rules under the Biocides Regulation, such as packaging that has contained pesticides must always be handled as hazardous waste if it is labelled with GHS06 (‘Skull and crossbones’)).

The Danish Environmental Protection Agency recommends that empty packaging bearing the GHS06 label should always be classified as hazardous waste, even when emptied. The same applies to emptied packaging labelled with GHS08 as it may contain dangerous substances with the same low concentration limits (0.1%).

For packaging labelled with GHS07 (‘Exclamation mark’), the generic concentration limits for the ingredients are 10% and above, and therefore there is insignificant risk that an empty packaging retains the hazardous property. This means that, for example, empty rinsed packages of a number of detergents, which are otherwise labelled with GHS07, can be in principle considered as non-hazardous.

The hazardous nature of all other packaging is determined by the residues contained therein.

Form of substances contained in waste

Often, the different forms in which the substances are found will determine their hazardousness. For example, copper in metallic form is not classified as dangerous at all, while a number of copper compounds are classified as hazardous. As regards waste, in many cases the problem arises because the form of the substance is unknown. Waste classification is therefore usually based on a conservative approach if all substances occur in their most hazardous form. This means, for example, that all lead (detected in the waste) occurs as a lead compound with a concentration limit of 0.3%.

The manual contains examples of identifying the meta compounds. The molar mass of each constituent element is determined in accordance with the formulation of the substance concerned. The distribution of the elements by weight (percentage by mass) is then calculated. Where the concentration of the substance compound is known, the concentration of the individual elements is calculated.

Hazard class and category code combinations

Annex 3.8 to the Manual contains a table showing combinations of hazard class and category codes not applicable for classification of hazardous waste.

Annex 3.1 to the Manual provides the interface between hazard pictograms and hazard statement codes, etc.

Annex 3.4 to the Manual systematically lists all H Codes with generic concentration limits in ascending order (i.e. with those having the lowest concentration limit — and therefore being the most hazardous — at the top). This shows that substances with e.g. hazard class and category code Acute Tox. 1 and hazard statement code H330, where the concentration limit is 0.1%, are much more likely to render the waste hazardous than substances with e.g. hazard class and category code Acute Tox.4 and hazard statement code H312, where the concentration limit is 55%.

M-factors are not applicable for the classification of hazardous waste. However, when classifying products and mixtures under Regulation No 1272/2008, for substances falling under category 1 of acute or chronic aquatic toxicity, specific concentration limits are not set, but instead a multiplication factor — the 'M-factor' — is used to determine the concentration of the substances concerned.

M-factors, like specific concentration limits, can explain why substances or products classified as hazardous are not necessarily classified as hazardous waste when discarded.

Classification of hydrocarbons

If the total hydrocarbon content is < 1,000 mg/kg, the waste is not classified as hazardous.

Lubricating oils should only be classified as carcinogenic if they contain > 3% of dimethyl sulfoxide (DMSO) extract.

Jet and diesel engine fuel and fuel oil (gas oil) in the range from C9 to C20 are classified as Carc. 2, H351, and thus make the waste hazardous only when these hydrocarbons are present in concentrations of 1% (10,000 mg/kg TS), while many of the other hydrocarbons are classified as Carc. 1B, H350, and the concentration limit is therefore 0.1% (1,000 mg/kg TS). Some oils are non-carcinogenic if benzene content is < 0.1%.

Annex 3.9 to the Manual contains concentration limits for some hydrocarbons when a substance is to be classified as hazardous.

The Guide will also consider the information and examples provided in the Manual.

Norway

Although Norway is not a member of the European Union, it complies with the EU legislation and recommendations under international agreements and treaties.

Norway has developed strong trade in waste with Sweden, Denmark, and other EU countries, as one of the strategic goals of Norway is to use 80% of waste generated through recycling and energy recovery[16].

General information on the classification and identification of waste[17]

Wastes to be identified by the code of the European LoW marked with an asterisk are classified as hazardous waste unless otherwise decided by the Norwegian Environment Agency or an authority authorised by the Ministry of Climate and Environment.

Waste that can be identified by different waste codes, at least one of which is marked with an asterisk and one of which is not, is only classified as hazardous waste if:

a. it contains relevant hazardous substances that cause the waste to display one or more of the hazardous properties HP1 to HP15, having a specific (e.g. 'asbestos') or general reference ('hazardous substances') in the list of waste;

b. it contains polychlorinated dibenzo-β-dioxins and dibenzofurans (PCDD/PCDF), DDT (1,1,1-trichloro-2,2-bis (4-chlorophenyl)ethane), chlordane, hexachlorocyclohexanes (including lindane), dieldrin, endrin, heptachlor, hexaclorobenzene, chlordecone, aldrine, pentachlorobenzene, mirex, toxaphene, hexabromobiphenyl, PCB, decabromodiphenyl ether, and/or hexabromosyclododecane with the concentration exceeding or equal to the concentration limits established in Annex 2 to the Waste Regulations.

Waste consisting of pure metal alloys in their solid form which are not contaminated by hazardous substances are nevertheless only be classified as hazardous waste if the alloys are explicitly mentioned in the list of waste and marked with an asterisk.

The criteria for classifying waste as hazardous, i.e. methods for determining hazardous properties (from HP 1 to HP 15), are included in Annex 2 to Chapter 11 of the Waste Regulations.

In accordance with the provisions of the Waste Regulations, the waste producer is responsible for the identification and classification of hazardous waste.

If the waste producer can document that the waste to be classified as hazardous does not have the hazardous properties specified in the CLP Regulation, the Norwegian Environmental Agency or an authority authorised by the Ministry of Climate and Environment may decide that the waste is not considered hazardous.

Municipalities must ensure separate collection of hazardous waste produced by households and enterprises generating smaller quantities of hazardous waste (up to 1,000 kg) per year. Enterprises that generate more than 1 kg of hazardous waste per year must deliver this

[16] The Norwegian Government's strategy for green competitiveness (2017): https://www.regjeringen.no/en/dokumenter/bedre-vekst-lavere-utslipp--regjeringens-strategi-for-gronn-konkurransekraft-engelsk/id2575420/.

[17] Waste Regulations, https://lovdata.no/dokument/SF/forskrift/2004-06-01-930/KAPITTEL_12#KAPITTEL_12.

waste for management at least once per year. Enterprises may, if authorised, recycle hazardous waste generated in their operations[18].

When delivering domestic hazardous waste to municipal sites, sites or mobile sites, residents must, as far as possible, provide information about the content and properties of the waste. A person delivering hazardous waste must ensure that this information is clearly indicated on the packaging.

Enterprises delivering hazardous waste to the waste manager must also provide sufficient information on the origin, content, and characteristics of the waste to ensure safe further waste management. Where waste is transferred to a waste manager authorised for the management of hazardous waste, the delivering enterprise must complete a declaration according to the template approved by the Norwegian Environmental Agency. The serial number of the declaration must be clearly indicated on the packaging. The label must be resistant to physical impact and climate exposure. The information contained in the declaration must ensure the traceability of the waste from its generation to its final disposal and managed in an e-system.

2.4.2 Western European countries: Germany, Ireland, Netherlands, and Belgium

Germany

In Germany, the basic legislation on the identification and classification of hazardous waste is the Federal Ordinance on the List of Waste[19].

This legislation implements in German federal law the Commission Decision 2000/532/EC on the list of waste, and certain requirements of the WFD. The structure of the Federal Ordinance on the List of Waste is broadly consistent with the wording and structure of the Decision on the List of Waste, i.e. it contains not only the list of waste itself but also additional provisions (rules) on the assessment of hazardous properties and classification of waste:

- Definitions;
- Rules on the assessment and classification;
- Rules on the use of the list of waste;
- European List of Waste.

Another important piece of legislation on the identification and classification of hazardous waste is the Federal Inspection Ordinance that entered into force on 1 February 2007; it describes the conditions for implementing the requirements of Articles 49 and 50 of the Federal Law on Waste Management as regards the registration and inspection obligations for waste management. At the heart of this legislation is not only the obligation to account for the generation, management and movement of waste, but also, in cases where the transfer of certain hazardous waste is planned, the requirement to get the approval by the competent authority for the identification of waste and the preferred method of disposal thereof (see Chapter 2.5 for details).

Additional information on the implementation of the requirements for the identification and classification of hazardous waste in Germany can be found in documents prepared by the

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[18] Annex on the Hazardous Waste Management to Norway's Waste Plan 2020–2025, including the Waste Prevention Programme (2021): https://www.miljodirektoratet.no/publikasjoner/2021/mars-2021/avfallsplan-2020-2025-vedlegg-farlig-avfall/.

[19] *Verordnung des Bundesministers für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft über ein Abfallverzeichnis (Abfallverzeichnisverordnung)*.

Federal/State Working Group on Waste (LAGA). The LAGA is a working body of the Conference of Environment Ministers of the German federal states, founded on 2 July 1963 with the aim of ensuring that waste legislation in the Federal Republic of Germany is enforced as uniformly as possible.

The LAGA promotes the sharing of experience and information between the Federal Government and the state governments and liaises with associations and interest groups to discuss cross-state issues of waste legislation and develop common solutions. It develops proposals and makes suggestions for the further development of legal provisions and for the protection of the interests of the federal states in international organisations. The LAGA publishes the necessary guidance for the enforcement of the Law on Waste by means of information notices and guidelines.

The key document published by the LAGA in the area of the classification and identification of hazardous waste is 'LAGA PN 98 Principles for taking samples from solid and compact waste, as well as deposited materials. Guidelines for the procedure of physical, chemical, and biological testing in connection with the recovery/disposal of waste'. This document is legally binding in Germany since 2001, and regularly updated considering legislative changes. The document provides summarised information on waste testing, from sampling to the determination of the composition. In view of the enormous size of the document, the LAGA has issued an accompanying document, a practical guide to PN 98, which provides information on the choice of testing strategies for the purpose of carrying out waste testing, taking into account the frequently asked questions.

The LAGA has also developed separate Guidelines for the procedure of physical and chemical testing of wastes, contaminated soils, and substances from contaminated sites (LAGA EW 98), which provide practical information on this type of waste testing necessary to determine the hazardous properties of waste and select the appropriate management method, considering the determined concentrations of certain substances.

Ireland

In Ireland, the provisions of the WFD on the identification and classification of hazardous waste have been transposed into the Waste Management Act[20]. The Act states that waste is to be regarded as hazardous where it has one or more of the hazardous properties listed in the Second Schedule to the Act, containing the properties of waste which render it hazardous, as listed in Annex III to the WFD.

The list of waste and the instruction for using the list are set out in the national guidelines on waste classification drawn up by the Irish Environmental Protection Agency. In the introduction of the document, there are references to the EU legislation and EU Guidance, followed by the European LoW, and the description of the stepwise identification of waste, using the five steps method:

- Waste composition details;
- Assign hazard statements and associated hazardous properties;
- Does the waste display the any of the hazardous properties HP1 to HP15?
    - Assessment of hazardous properties with concentration limits;
    - Assessment of hazardous properties without concentration limits;
- Assessment of persistent organic pollutants;
- List of Waste entry.

Additionally, a waste assessment template is provided in the guidelines, which mirrors the sequence of the above steps, and guides through the assessment process.

20 https://revisedacts.lawreform.ie/eli/1996/act/10/revised/en/html.

As the content of the guidelines is broadly consistent with the content of the EU Guidance (in a summarized form), no further information is provided herein on the guidelines developed by the Irish Environmental Protection Agency.

Classification of household hazardous waste in Ireland. In 2017, the Irish Environmental Protection Agency issued the Guidance for the Management of Household Hazardous Waste at Civic Amenity Sites, containing recommendations on the identification and classification of household hazardous waste[21]. An in-depth description of household hazardous waste and recommendations on the classification thereof is provided in *Annex 2* to the Report.

The Netherlands

In the Netherlands, the updated provisions of the WFD have been transposed into national legal framework by the Regulation No IENM/BSK-2015/86520 of the State Secretary for Infrastructure and the Environment of 30 April 2015 amending the former Regulation on the European List of Waste[22].

The Regulation on the European List of Waste contains a definition of the 'list of waste' specifying that the list of waste is the Annex to Commission Decision 2000/532/EC of 3 May 2000 replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous waste. Accordingly, it is stated that the assessment of waste is also carried out in accordance with the Decision.

In addition, Article 5 of the Regulation on the European List of Waste contains some specific national requirements for the identification of waste, namely:

- Asphalt products are in any case considered to be hazardous waste if they contain more than 75 mg/kg of a total sum of PAHs as listed in Annex A, Table 2, of the Soil Quality Regulation;
- Specific requirements for the sampling of waste are laid down:
  - used oils are sampled according to NEN-EN-ISO 3170:2004 Petroleum liquids — Manual sampling,
  - oil from electrical equipment is sampled according to NEN-EN-IEC 60567:2012 Oil-filled electrical equipment — Sampling of gases and analysis of free and dissolved gases — Guidance,
  - bitumen and tar products are sampled according to NEN 3940:1982 Bitumen and tar products — Sampling,
  - asbestos in waste and recycling granulate are sampled according to draft NEN 5897+C2:2017 Investigation and sampling of asbestos in waste materials and demolition waste,
  - other waste is sampled according to NVN 5860:1999 Waste — Sampling of waste.

In the Netherlands, a national Guide on the List of Waste[23] is available, detailing the instructions for using the LoW, describing the stages of the waste assessment, and giving practical examples in each case. The Guide also contains practical information for the classification of typical waste streams (construction waste, wood waste, WEEE, etc.).

[21] https://www.epa.ie/publications/monitoring--assessment/waste/hazardous-waste/guidance-for-the-management-of-household-hazardous-waste-at-civic-amenity-sites.php.

[22] https://zoek.officielebekendmakingen.nl/stcrt-2015-12342.html.

[23] https://www.afvalcirculair.nl/onderwerpen/afvalregelgeving/eural/.

In addition, a calculator spreadsheet to assess the hazardous properties of waste has been developed as a practical aid (including a disclaimer that the assessment results are provisional)[24].

Belgium (Flemish Region)

Belgium's example is reviewed separately since the Manual on Waste Classification[25] published by the Flemish authorities in Belgium is one of the documents that served as a basis for the EU Guidance. In addition, this Manual is one of the most detailed national waste classification guides, **also containing numerous practical examples**.

The Manual begins with the instructions for use and roadmap of the European LoW, including practical examples explaining the selection process of proper sections and sub-sections of the European LoW. If, upon completion of all the relevant steps, it is determined that the waste is to be assigned one of the mirror codes, the identification of hazardous waste must be carried out, details of which are given in Chapter 7 of the Manual. This chapter describes the steps required for the identification of waste (what substances to look for in the waste composition, how to interpret the testing results) using practical examples, such as the identification of volatile ash, ash, construction waste containing tar, etc. Chapter 8 of the Manual provides practical and helpful information on the identification of waste, broken down by the sections of the LoW; and the subsequent Chapter 9 provides practical guidance on the identification of waste by different processes, describing (in tables) the typical waste (both hazardous and non-hazardous) that may be generated in each case, and the focus areas of the decision-making on the proper identification of waste. This multifaceted presentation of information makes it possible to find useful practical data for the correct identification of waste.

The Annex to the Manual contains a table (available in Excel version) listing the substances frequently found in waste and their hazardous properties (in the worst-case scenarios). Annex 7 contains a decision-making scheme where the hazard of the waste needs to be assessed for the risk of infection (HP9).

2.4.3 Neighbouring countries: Poland and Latvia

Poland

In preparing the information on hazardous waste management in Poland, reference was made to Polish legislation, and publicly available data by the Polish authorities.

The following documents are followed for the identification and classification of hazardous waste in Poland:

a) Law on Waste

Article 4 of the Polish Law on Waste states that waste shall be classified by assigning it to an appropriate group, subgroup, and type of waste, considering:

1) the source of its generation;
2) the hazardous properties of waste, as defined in Regulation (EU) No 1357/2014 and Regulation (EU) 2017/997, and the rules issued pursuant to Article 3(5);
3) the components of waste which could render the waste hazardous if the concentration limits of hazardous substances are exceeded. The components of waste are specified in Annex 4 to the Law.

b) EU Guidance

[24] https://www.afvalcirculair.nl/onderwerpen/afvalregelgeving/eural/.

[25] https://www.ovam.be/eural-de-europese-afvalstoffenlijst.

It should be noted that Poland has not prepared any national explanatory documents (manuals) on the classification and identification of hazardous waste.

Latvia

In Latvia, the provisions of the WFD relating to the identification and classification of waste have been transposed into a separate piece of legislation: the Regulations Regarding Waste Classification and Properties Rendering Waste Hazardous[26]. This legislation transposes the provisions of the Decision on the List of Waste, i.e. the European LoW, and the instructions for its use. It should be noted that the same legislation also contains provisions on the criteria for by-products and for the termination of the application of waste status.

The Regulations refer to Regulation No 1357/2014 by specifying that the hazardous properties of waste are assessed in accordance with this legal act.

In Latvia, the European LoW is used, i.e. waste is classified under six-digit waste codes; however, it should be noted that a footnote to the hazardous packaging waste code (15 01 10*) indicates that the requirements for the management of hazardous waste shall not be applied to an certain packaging of plant protection products, the volume of which is from one to fifty litres, if the packaging has been rinsed at least three times with a large amount of water after the emptying thereof; this shows that it has been decided to introduce specific regulation for a given waste stream as early as making decision on the transposition of the European LoW and related provisions into national law.

The EU Guidance is translated into Latvian, but there is no reference to it in the Regulations.

Since Latvia has not prepared any national explanatory documents (manuals) on the classification and identification of hazardous, no specific guide for identifying hazardous waste other than those specified in EU legislation and EU Guidance is applicable in Latvia for the identification and classification of hazardous waste.

2.4.4 Experience of foreign countries in classifying empty packaging of dangerous substances or mixtures

As already mentioned in Chapter 2.3, it has been established during drafting the Overview that the issue of classifying empty packaging of dangerous substances produced in the municipal stream (households) and in general is rather confusing; therefore, this Chapter presents the practice of foreign countries in classifying empty packaging.

Table 10. Experience of foreign countries in classifying empty packaging waste

Country	Position on the classification of empty packaging as hazardous waste	Classification of empty packaging waste
Ireland	*Municipal stream.* Aerosol dispensers are classified as hazardous waste[27]. Aerosols contain propellant gases that may be flammable, such as butane. Even supposedly 'empty' aerosol dispensers contain a certain amount of compressed flammable propellant gas. Any other empty household packaging must be discarded into containers of secondary raw materials for recycling if it is **clean, dry, and loose**[28]. **Empty plastic, glass and metal packaging must be rinsed.** Empty aerosol dispensers should be delivered to BWCSs or, if that is not possible,	16 05 04* gases in pressure containers (including halons) containing hazardous substances Empty household packaging is classified as non-hazardous

[26] *Noteikumi par atkritumu klasifikatoru un īpašībām, kuras padara atkritumus bīstamus*, approved by Resolution No 302 of the Latvian Government of 19 April 2011.

[27] Guidance for the Management of Household Hazardous Waste at Civic Amenity Sites by Irish Environmental Protection Agency (2017).

[28] My Waste, the website of the official Irish waste manager: https://www.mywaste.ie/.

Country	**Position on the classification of empty packaging as hazardous waste**	**Classification of empty packaging waste**
	disposed of with mixed waste; if mixed waste is incinerated, the aerosol metal will be sorted from bottom ash and recycled. Empty paint cans must also be discarded into mixed waste containers. Perfume bottles should not be thrown into individual sorting containers and should be taken to waste acceptance sites.	waste (by material).
England (Bristol)	*Municipal stream.* Metal cans, plastic bottles, caps, lids, plastic packaging, empty aerosol dispensers with removable caps are allowed to be discarded into municipal waste containers, regardless of what was contained therein; however, the packaging must be **emptied, rinsed, and compressed** before dumping it into the container. The glass containers must be **emptied and rinsed**[29] before being disposed of in the appropriate container. Next to the black box for paper, magazines and glass, engine oil (in a sealed container)  and car batteries can be put. In separate, untied bags, batteries and small electric items may be left in the black box as well. BWCS accepts all the usual hazardous waste produced by households, such as thermometers, liquids, chemicals, petrol, medicines, paints, rockets (pyrotechnics), asbestos (slate), etc.[30]	Empty household packaging is classified as non-hazardous waste (by material).
UK (England, Scotland, Wales, and Northern Ireland)	Aerosol dispensers are collected in containers together with other secondary raw materials, since around 60% of aerosol dispensers are made of tin steel and around 40% are made of aluminium. Both metals are recycled. Aerosol dispensers also contain small plastic and rubber components, including cap, valve, and immersion tube, which are separated during the recycling process. All empty household packaging, including bottles for shampoo, liquid soap, detergents, washing agents, bleach, hair spray, deodorant aerosols, air freshener bottles, containers of cleaning and polishing agents for furniture other surfaces, and perfume bottles are collected in containers together with other secondary raw materials. **Packages must be emptied and rinsed**[31]. Empty or dry metal paint cans are accepted for recycling by most recycling facilities.	Empty household packaging is classified as non-hazardous waste (by material).
Germany	Paint containers are classified as hazardous waste produced by households, as are packs containing residues of various chemicals, including non-empty aerosol dispensers; all these must be delivered to BWCSs or waste acceptance sites. Residues of paints and other chemicals are to be delivered in their original packaging. However, if paint buckets or paint cans are dry, i.e. paint residues are completely dry/hardened, they may be disposed of in a yellow bin for packaging, as well as empty aerosol dispensers, unless otherwise stated on the packaging[32].	Empty household packaging is classified as non-hazardous waste (by material). Where packaging used to contain hazardous

[29] Bristol Waste Company, sorting instruction and guide: https://bristolwastecompany.co.uk/household/get-it-sorted/.

[30] Bristol Municipality information: https://www.bristol.gov.uk/bins-recycling/hazardous-household-waste.

[31] The Waste and Resources Action Programme website, UK: https://www.recyclenow.com/.

[32] https://abfall.kreis-pinneberg.de/Abf%C3%A4lle+_+Wertstoffe/Sonderm%C3%BCll/Mehr+Infos+zum+Thema+Sonderm%C3%BCll.html.

Country	Position on the classification of empty packaging as hazardous waste	Classification of empty packaging waste
	Glass packaging without lids, including glass perfume bottles and medicine bottles can be discarded into waste bins for glass[33]. Only used and completely emptied packaging which is not made of paper, cardboard or glass, i.e. plastic and metal packaging, may be discarded into yellow bins for lightweight packaging. Packaging components (e.g. lids) must be separated from each other. **Rinsing is optional**[34]. Empty aerosol dispensers, medicine blisters, all cosmetic packaging, washing fluids bottles, etc. can be discarded into this bin.	substances, it is classified as hazardous waste produced by households or hazardous packaging.
Austria	Empty packaging is considered as **hazardous waste** if it used to contain **explosive substances, substances hazardous to health or substances causing acute toxicity**, and is marked with hazard pictograms    GHS01 GHS08 GHS06 'Exploding bomb' 'Health hazard' 'Skull and crossbones' All other empty packaging, including medicine bottles (completely empty), cosmetic, laundry and cleaning bottles, is considered as non-hazardous except that marked with the above pictograms[35].	Empty packaging that used to contain **explosive substances, substances hazardous to health or substances causing acute toxicity**, and packaging that is not completely emptied of substances that are **hazardous to health, corrosive, irritant highly flammable, flammable or labelled as 'not to be disposed of together with household waste'** are classified under the waste code 15 01 10* (packaging containing residues of or contaminated by dangerous substances)[36].
Denmark	There are no specific rules governing the classification of packaging containing dangerous substances and mixtures, except packaging that used to contain **pesticides**, which should always be considered as hazardous waste if marked with GHS06 ('Skull and crossbones'). The Danish Environmental Protection Agency recommends that **empty packaging, bearing the GHS06 label should always be classified as hazardous waste**, even when emptied. The same applies to emptied packaging labelled with GHS08 ('Health hazard'), as it may contain dangerous substances with the same low concentration limits (0.1%)[37] [38].	Empty packaging containing **hazardous** substances other than those marked with the pictogram GHS07 ('Exclamation mark') or the Saint Andrew Cross symbol is classified under the

 

[33] https://allaboutberlin.com/guides/sorting-trash-in-germany#everything-else.

[34] https://www.muelltrennung-wirkt.de/muelltrennung-richtig/liste/.

[35] Waste Sorting ABC, Austrian Federal Ministry of Sustainability and Tourism, 2019: https://www.bmk.gv.at/themen/klima_umwelt/abfall/Kreislaufwirtschaft/trennung/abc.html.

[36] Austrian federal law consolidated on the Waste Catalogue, version of 2020: https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20003077.

[37] Guidelines for the classification of hazardous waste. Danish Environmental Agency (2017): https://mst.dk/media/93596/vejledning-i-klassificering-af-farligt-affald_april-2017.pdf.

[38] Guidelines on the Criteria for the Sorting of Household Waste, adopted by the Danish Ministry of Environment (2020): https://www.retsinformation.dk/eli/retsinfo/2020/9920.

Country	**Position on the classification of empty packaging as hazardous waste**	**Classification of empty packaging waste**
	For packaging labelled with the pictogram GHS07 ('Exclamation mark'), the generic concentration limits for the hazardous ingredients are 10% and above, and therefore there is insignificant risk that an empty packaging retains the hazardous property. This means that, for example, empty rinsed packages of a number of detergents, which are otherwise labelled with GHS07, can be in principle considered as non-hazardous. The hazardous nature of all other packaging is determined by the substance residues contained therein[39]. Household packaging for dishwashing and lighter detergents, cleaning and rinsing agents is classified as non-hazardous waste. Only **emptied and rinsed packaging** marked with the pictogram GHS07 ('Exclamation mark') or the symbol of Saint Andrew's Cross is classified as non-hazardous waste:   If the packaging bearing the 'Exclamation mark' or the Saint Andrew's Cross symbols contains residues, the waste is considered hazardous and must be treated as such. In some municipalities in Denmark, packaging **bearing all other hazard pictograms or symbols must be treated as hazardous waste, even if emptied**[40]. Therefore, **all types of aerosol dispensers, containers of paints, solvents, chemicals** are classified as hazardous waste produced by households. However, the Guidelines on the Criteria for the Sorting of Household Waste, adopted by the Danish Ministry of Environment provide for that only empty packaging marked with one of the hazard pictograms GHS06 ('Skull and crossbones') or GHS08 ('Health hazard') is to be classified as hazardous waste, while 'it would be more feasible to classify empty packaging marked with other hazard pictograms as hazardous waste'.	waste code 15 01 10* – packaging containing residues of or contaminated by hazardous substances.
Canada (Province of Toronto)	**Empty** household packaging of chemicals and cosmetics, including hand disinfectants, is collected separately in bins together with other secondary raw materials. These bins may also contain[41]: • Cleaning, washing agents, soap, and shampoo bottles (fitted caps/sprayers/pumps) • Aerosol dispensers (emptied, covered) • Metal paint cans (emptied, lids removed)	Empty household packaging is classified as non-hazardous waste (by material).
Sweden	**Emptied and dry** household packaging is classified as **non-hazardous waste**, except for empty packaging bearing hazard pictograms: **GHS04 ('Gas cylinder'), GHS09 ('Environmental hazard') and GHS06 ('Skull and crossbones'):**	-

[39] Guidelines for the classification of hazardous waste. Danish Environmental Agency (2017): https://mst.dk/media/93596/vejledning-i-klassificering-af-farligt-affald_april-2017.pdf.

[40] *Affaldplus*: The requirements for waste sorting set by the waste management company of six Danish municipalities (2021): https://affaldplus.dk/plastdunke.

[41] Toronto Waste Wizard (e-tool): https://www.toronto.ca/services-payments/recycling-organics-garbage/waste-wizard/.

Country	**Position on the classification of empty packaging as hazardous waste**	**Classification of empty packaging waste**
	 Packaging containing residues of hazardous substances is also classified as hazardous waste produced in households[42]. **Packaging containing paint residues, even dry, should also be treated as hazardous waste produced by households; this also applies to packaging containing water-based paint-drying residues**. Empty (cleaned, scraped) metal paint containers (cans) are discarded along with other non-hazardous metal packaging. Only some municipalities allow empty aerosol dispensers to be discarded with metal packaging[43], while in other municipalities empty aerosol dispensers are considered hazardous. An aerosol dispenser is considered empty when nothing comes out upon pushing the spray button.	
Finland	Not all empty packaging bearing warning signs (pictograms) is hazardous waste. **Completely dry and emptied** packaging of household hazardous substances is considered non-hazardous and must be sorted by material (plastic, glass, metal, paper), including empty aerosol dispensers that can be discarded in a bin for metal packaging. The exception is emptied **oil packaging** that is **considered as hazardous waste produced by households**, which cannot be rinsed under domestic conditions[44]. Emptied or completely dry adhesive and paint packaging may be disposed of in a household waste bin, while metal paint cans may be disposed of in a bin for metal packaging.	-
The Netherlands	Packaging for household chemicals is considered to be empty if no substances leak from the packaging when it is poured or shaken. In this case, this packaging may be discarded into a bin for plastic packaging. If residues of hazardous substances are detected during the inspection of such packaging, it must be discarded into a general waste bin. Such packaging must not be delivered separately (with hazardous waste produced by households) unless classified as hazardous waste produced by households[45]. Hazardous waste produced by households (batteries, rechargeable batteries, pesticides and insecticides, petrol, bulbs, pipe cleaners, paints, and thinners, etc.) must be stored separately from other waste and placed at special collection sites, and packaging of such waste (if proved empty by shaking and pouring) may be disposed of in a general waste bin. If it is not clear to the consumer whether the waste is hazardous and whether the packaging is indeed empty, it is recommended to separately deliver such packaging to collection sites[46]. Shampoos, liquid detergents, soaps and other household and hygienic products and their packaging are not considered hazardous waste, and their empty plastic packaging can therefore be discarded into a sorting bin for plastic[47].	Empty household packaging is classified as non-hazardous waste (by material). Where packaging contains residues that is classified as hazardous waste produced by households, it is classified as hazardous waste produced by household and must be treated accordingly.

[42] Swedish waste website: https://www.sopor.nu/sortera-%C3%A5tervinn/foerpackningar/.

[43] Waste sorting and collection at Östra Göinge: https://www.ograb.se/wp-content/uploads/2019/01/Engelsk-Avfall_sophamtning_v14_2016_Tryck.pdf.

[44] Finish information site on hazardous waste sorting: https://vaarallinenjate.fi/.

[45] Empty plastic packaging for chemical waste: https://www.afvalscheidingswijzer.nl/producten/lege-plastic-verpakking-van-chemicali%C3%ABn/.

[46] The Hague City Municipality. Fine chemical waste. https://www.denhaag.nl/nl/in-de-stad/natuur-en-milieu/afval-scheiden-en-hergebruik/klein-chemisch-afval-kca.htm.

[47] The Hague City Municipality. Sorting and recycling of waste. https://www.denhaag.nl/en/in-the-city/nature-and-environment/separating-waste-and-recycling/separating-waste-plastic-tin-and-drink-cartons.htm.

Considering the practice of foreign countries and the situation of packaging waste management in Lithuania, the following preliminary proposals have been submitted to the round table discussion on the classification of packaging waste, which could be included in the Guide:

1. Regarding the classification of packaging generated outside the municipal stream:
    a. If packaging waste contains content (residues), it is classified by the contained substance;
    b. Empty packaging bearing the following hazard pictograms should always be classified as hazardous waste:

    c. Empty packaging of plant protection products, which has been rinsed using triple or integrated rinsing methods, or washed with compressed water jet, may be classified as non-hazardous waste if it is demonstrated, in accordance with the EU Guidance and by laboratory tests, that the packaging does not have hazardous properties;
    d. All other empty packaging waste generated outside the municipal stream is classified in accordance with the EU Guidance;
    e. The concept of 'nominally empty' or 'empty' packaging is regulated.
2. Regarding the classification of packaging generated in the municipal stream:
    a. If the packaging contains residues of substances marked with at least one hazard pictogram, the waste is classified as hazardous waste produced by households and collected separately (during routine collections from residents, at BWCSs). Waste is classified by its content;
    b. Empty packaging of engine oil, paint, varnishes, adhesives and other coatings or materials (resulting from repairs) is classified and managed as hazardous waste produced by households, i.e. collected separately (during routine collections from residents, at BWCSs). The above-mentioned packaging waste should be classified as hazardous packaging under the waste code 15 01 10*;
    c. Any other empty packaging waste produced by households, including aerosol dispensers, should be managed through a sorting system for packaging waste and classified by to packaging material as non-hazardous packaging waste.
    d. The concept of 'nominally empty' or 'empty' packaging is regulated, and it is recommended to rinse the packaging discarded into sorting bins.

During the round table discussion on the classification of packaging waste, the following general observations were made:

- There were no substantive objections to the submitted proposals regarding the classification of packaging;
- The Guide should provide a practical example of the classification of packaging according to the EU Guidance.
- The Guide should contain a separate chapter or section on the classification of PPP packaging (with and without rinsing), including requirements on the scope and frequency of testing, the treatment of rinsing water, etc.;
- The proposal that empty pressure gas cylinders marked with the 'gas cylinder' pictogram should in all cases be classified as hazardous waste is to be removed;

- The proposal that empty packaging of explosive substances marked with the 'exploding bomb' pictogram should in all cases be classified as hazardous waste is to be removed;
- With regard to packaging, the term 'empty' must be regulated rather than 'nominally empty';
- It should be clarified that packaging generated in the commercial stream is subject to the same principles as (household) packaging generated in the municipal waste stream;
- Clear guidance is needed on when rinsing is recommended (type of packaging, type of substances contained, etc.), including examples.

2.4.5 Methods for the identification and classification of hazardous waste used in other countries – summary

As indicated above, the harmonised classification of waste in the European Union and the basic legislation regulating the identification and classification of hazardous waste at EU level are as follows:

- The **WFD**, where Article 7 lays down the framework for the European List of Waste that should have been transposed into national legislation by the Member States;
- **European List of Waste;**
- Properties rendering waste hazardous are listed in Annex III to the WFD (replaced by **Commission Regulation No 1357/2014** of 18 December 2014;
- To give technical guidance on certain aspects of the **Waste Framework Directive** and the **European List of Waste**, the European Commission published the **EU Guidance** providing clarifications and guidance to national authorities, including local authorities, and businesses on the correct interpretation and application of the relevant EU legislation regarding the classification of waste, namely identification of hazardous properties, assessing if the waste has a hazardous property and, ultimately, classifying the waste as hazardous or non-hazardous.

Since all Member States are required to transpose the provisions of the WFD and the Decision on the List of Waste into national law, and to apply the provisions of Regulation No 1357/2014 directly, the legal framework directly related to the identification and classification of hazardous waste is essentially the same in the foreign countries concerned. There are differences regarding additional measures relating to the identification of hazardous waste, such as the obligation imposed in Germany to coordinate the correct identification of the waste with the competent authority.

As regards the guides used for identifying hazardous waste, it should be noted that, in addition to the current EU Guidance, national waste classification guidelines have been developed in some countries to assess the complexity of the process of the identification of hazardous waste, providing additional methodological support, clarifications and practical examples for identifying hazardous waste.

2.5 Good practices of foreign countries in dealing with hazardous waste management

2.5.1 Hazardous waste management permits

2.5.1.1 Nordic countries: Sweden, Denmark, Norway

Sweden

Hazardous waste management activities require permits or notifications, depending on their nature. Activities hazardous to the environment are divided into several types of installations:

- Installations A, usually having a significant environmental impact, such as the paper industry, large power plants, and refineries. Installations A are authorised by the Land and Environmental Court.
- Installations B include sewerage treatment plants, quarries, wind power plants, major mechanical workshops, agriculture with livestock farming, and most industrial enterprises. They are authorised by the environmental verification council of the county administrative board.
- Installations C are activities that generally have a relatively low environmental impact. Examples of installations C are agriculture with livestock farming, gas stations, and hospitals. C installations must be notified to the municipality.

In accordance with the Environmental Code (1998:808)[48], waste treatment activities requiring permit or notification may be authorised only if there are reasonable grounds to believe that the planned treatment meets the requirements for waste management activities.

In principle, the county administrative board deals with issues related to the transport and dumping of waste and examines applications for waste operations subject to permit. In line with the municipalities, it is also responsible for supervising waste management.

Enterprises engaged in activities hazardous to the environment must pay a fee for examination and supervision under the Environmental Code. The fee must be paid annually and covers the State costs of the enterprise's document review and supervision. The fee for examination and supervision must be paid annually, one year after the authorisation has been granted. The fee for examination and supervision must be paid upon the decision of the county administrative board regarding the permit.

Where the municipality is responsible for the supervision of activities, part of the fee must also be paid to the municipality. Besides, a fee is to be paid to the county administrative board to cover its costs of reviewing, supervision-related instructions, and record keeping.

In accordance with Chapter 29 of the Ordinance on Environmental Impact Assessment of the Minister for Environment of Sweden (SFS 2013:251)[49], permits or notifications are required when the following hazardous waste management activities are carried out:

Incineration

Section 5. Permit requirement A and activity code 90.180-i apply to co-incineration plants incinerating hazardous waste, if the amount of waste input is more than 10 tonnes per day or more than 2,500 tonnes per calendar year.

Section 6. Permit requirement A and activity code 90.181-i apply to waste incineration plants incinerating hazardous waste, if the capacity is more than 10 tonnes per day or more than 2,500 tonnes per calendar year.

Section 7. Permit requirement B and activity code 90.190 apply to co-incineration plants incinerating hazardous waste, if the capacity is not more than 10 tonnes per day but not more than 2,500 tonnes per calendar year.

[48] https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/miljobalk-1998808_sfs-1998-808.

[49] https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/miljoprovningsforordning-2013251_sfs-2013-251.

Section 8. Permit requirement B and activity code 90.191 apply to waste incineration plants incinerating hazardous waste, if the capacity is not more than 10 tonnes per day or not more 2,500 tonnes per calendar year.

Disposal

Section 23. Permit requirement A and activity code 90.320-i apply to the landfilling of hazardous waste, if the landfill receives more than 10,000 tonnes of hazardous waste per calendar year.

Section 24. Permit requirement B and activity code 90.330-i apply to the hazardous waste disposal, if:

1. the quantity of hazardous waste delivered is more than 2,500 tonnes but not more than 10,000 tonnes per calendar year; or

2. the quantity of hazardous waste disposed of in the landfill is more than 25,000 tonnes.

Section 25. Permit requirement B and activity code 90.340 apply to the hazardous waste disposal if the landfill is not subject to a permit under Section 23 or 24.

Recycling or disposal of waste arising from own operations

Section 27. Permit requirement B and activity code 90.381 apply to:

1. recycling of hazardous waste generated by own operations, if the amount of waste is more than 500 tonnes but not more than 2,500 tonnes per calendar year; or

2. management of hazardous waste generated by own operations, if the amount of waste is not more than 2,500 tonnes per calendar year.

The permit requirement does not apply if the management is notifiable under Section 38.

Section 28. Permit requirement B and activity code 90.383 apply to the management of hazardous waste generated by own operations, if the amount of waste is more than 2,500 tonnes per calendar year. The permit requirement does not apply if the management is subject to a permit under Section 67.

Section 29. Notification requirement C and activity code 90.391 apply to the recycling of hazardous waste generated by own operations, if:

1. the quantity of waste is not more than 500 tonnes per calendar year; and
2. the treatment results in recycling.

Extraction

Section 36. Permit requirement B and activity code 90.361 apply to the hazardous waste consisting of excavated soil, if the amount of waste does not exceed 2,500 tonnes per calendar year.

The permit requirement does not apply if the treatment is subject to a permit or notification pursuant to Section 25 or 37.

Section 37. Notification requirement C and activity code 90.370 apply to the management of waste consisting of excavated contaminated soils from the site where the treatment takes place, if the treatment lasts for a maximum period of 12 months and is not subject to a permit pursuant to Sections 21, 22, 23, 24 or 25.

Recycling of infectious waste

Section 38. Notification requirement C and activity code 90.382 apply to the recycling of infectious waste in a hospital.

Drainage

Section 39. Notification requirement C and activity code 90.375 apply to the drainage of non-hazardous or hazardous waste, if the amount of waste treated is not more than 2,000 tonnes per calendar year.

Electrical waste

Section 44. Notification requirement C and activity code 90.90 apply to the case-by-case sorting, dismantling or other treatment of WEEE prior to further treatment.

The notification requirement does not apply to the treatment of components or equipment containing insulating oil.

End-of-life vehicles

Section 45. Permit requirement B and activity code 90.119 apply to the emptying, dismantling or other professional recovery of end-of-life motor vehicles that are not covered by the Car Scrapping Ordinance (2007:186). The permit requirement does not apply if the recycling is subject to notification under SFS 2016:1188.

Section 46. Notification requirement C and activity code 90.120 apply to emptying, dismantling or otherwise professionally recovering end-of-life vehicles covered by the Car Scrapping Ordinance (2007:186), or other end-of-life motor vehicles with the total weight not exceeding 3,500 kilograms, if the vehicles are managed under the Car Scrapping Ordinance.

Preparation for reuse

Section 47. Notification requirement C and activity code 90.29 apply to preparation of waste for reuse.

Storage of waste

Section 50. Permit requirement B and activity code 90.50 apply to the storage of hazardous waste as part of its collection, if at any time the quantity of waste is:

1. more than 5 tonnes, and consists of oil;
2. more than 30 tonnes, and consists of lead-acid batteries;
3. more than 50 tonnes, and consists of WEEE;
4. more than 30 tonnes, and consists of impregnated timber;
5. more than 50 tonnes, and consists of motor vehicles; or
6. more than 1 tonne in other cases.

Section 51. Notification requirement C and activity code 90.60 apply to the storage of hazardous waste as part of its collection, if at any time the quantity of waste is:

1. more than 200 kilograms but not more than 5 tonnes, and consists of oil;
2. more than 1,500 kilograms but not more than 30 tonnes, and consists of lead-acid batteries;
3. more than 1 tonne but not more than 50 tonnes, and consists of WEEE;
4. more than 200 kilograms but not more than 30 tonnes, and consists of impregnated timber;
5. not more than 50 tonnes, and consists of motor vehicles; or
6. more than 200 kilograms but not more than 1 tonne in other cases.

Underground storage of waste

Section 52. Permit requirement A and activity code 90.454-i apply to an underground storage facility containing more than 50 tonnes of hazardous waste.

Section 53. Permit requirement A and activity code 90.455 apply to the permanent storage of mercury waste with at least 0.1% mercury by weight in deep geological storage facilities.

The permit requirement does not apply if the storage is subject to a permit pursuant to Section 52.

Section 54. Permit requirement A and activity code 90.457 apply to the underground storage facility containing not more than 50 tonnes of hazardous waste.

Storage pending recycling or disposal

Section 56. Permit requirement B and activity code 90.408-i apply to the storage of hazardous waste pending treatment requiring a permit under sections 5, 6, 7, 8 or 67, if the quantity of waste at any time exceeds 50 tonnes.

Ship recycling

Section 57. Permit requirement A and activity code 90.451 apply to the recovery of waste by professional ship disposal covered by Regulation (EU) No 1257/2013 of the European Parliament and of the Council of 20 November 2013 on ship recycling and amending Regulation (EC) No 1013/2006 and Directive 2009/16/EC.

Other activities related to recycling or disposal

Section 67. Permit requirement A and activity code 90.435-i apply to the recycling or management of hazardous waste, if the capacity is more than 10 tonnes per day or more than 2,500 tonnes per calendar year, and the activity is related to concerns:

1. biological treatment;
2. physico-chemical treatment;
3. solvent recycling;
4. recycling of inorganic materials other than metals or metal compounds;
5. regeneration of acids or bases;
6. recovery of components used for pollution abatement;
7. recycling of catalysts;
8. oil re-refining or other reuses of oil;
9. surface impoundment;
10. blending or mixing prior to treatment in a co-incineration or waste incineration plant or prior to treatment of the waste in accordance with any of the other paragraphs of this section; or
11. repackaging prior to treatment in a co-incineration or waste incineration plant or prior to treatment of the waste in accordance with any of the other paragraphs of this section.

Section 71. Permit requirement A and activity code 90.440 apply to the treatment of hazardous waste, if the quantity of waste input is more than 2,500 tonnes per calendar year.

The permit requirement does not apply if the treatment is subject to a permit under any other provision of this Section.

Section 72. Permit requirement B and activity code 90.450 apply to the professional treatment of hazardous waste, if the capacity does not exceed 2,500 tonnes per calendar year.

The permit requirement does not apply if the treatment is subject to a permit under any other provision of this Section.

An enterprise holding permit must be covered by civil liability insurance.

All those carrying out environmentally hazardous activities are subject to self-monitoring requirements. The purpose of corporate control is to ensure that the activities do not have an adverse impact on the environment or human health.

There are specific rules on self-monitoring that apply to activities subject to permit and notification. The company must document:

- who is responsible for environmental protection in the company;
- procedures for checking the operation and management of equipment;
- business risk assessment procedures;
- the procedure for notifying the Environmental Department of any operational disturbances that may affect human health or the environment;
- list of chemicals to be handled.

The municipal Environmental Department supervises activities that are nearly environmentally hazardous, i.e. the Environmental Department verifies the compliance of the activities with laws and decisions. During on-site inspections, the Environmental Unit assesses the chemical waste management, emissions to the atmosphere and water, and self-control at the enterprise. The aim of supervision is to reduce the environmental risks of activities. The Environmental Department charges a fee for inspections.

Transport permits are issued only if the applicant has human, technical and financial resources to enable the proper transportation of the waste covered by the application.

In Sweden, in accordance with the Waste Ordinance (2020:614)[50], a special permit is required to a shipment of waste arising from or during a professional activity if:

- the hazardous waste amounts to more than 100 kilograms or more than 100 litres per;
- the waste contains mercury;
- the waste contains cyanide, cadmium or

PCBs.

This permit is not required for:

1. waste containing dangerous agrochemicals (waste type 02 01 08*);
2. volatile ash and steam boiler dust (waste code 10 01 04*);
3. infectious waste (waste codes 18 01 03* and 18 02 02*);
4. wastes containing asbestos (waste codes 06 07 01* and 17 06 01*); and

50 https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/avfallsforordning-2020614_sfs-2020-614.

5. wastes from incineration or pyrolysis of municipal waste (waste codes 19 01 05*, 19 01 06*, 19 01 07*, 19 01 10*, 19 01 13* and 19 01 15*).

The obligation to register hazardous waste information in the Waste Register has entered into force since 1 November 2020. Data must be registered by:

- hazardous waste producers,
- hazardous waste carriers,
- hazardous waste managers,
- intermediaries or traders in hazardous waste.

Denmark

a) Permits for the management of hazardous waste and certifying authorities

Pursuant to the Ordinance No 1394 on the approval of listed companies of the Minister for Environment of Denmark of 21 June 2021[51], environmental approval must be obtained by undertakings planning to carry out hazardous waste management activities listed in Annex 1 or 2.

***Annex 1*.**

5. Waste management

5.1. Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving one or more of the following activities:

(a) biological treatment;

(b) physico-chemical treatment;

(c) blending or mixing prior to submission to any of the other activities listed in points 5.1 and 5.2;

(d) repackaging prior to submission to any of the other activities listed in points 5.1 and 5.2;

(e) solvent reclamation/regeneration;

(f) recycling/reclamation of inorganic materials other than metals or metal compounds;

(g) regeneration of acids or bases;

(h) recovery of components used for pollution abatement;

(i) recovery of components from catalysts;

(j) oil re-refining or other reuses of oil;

(k) surface impoundment and underground catchment.

5.2. Disposal or recovery of waste in waste incineration plants or in waste co-incineration plants:

(a) for non-hazardous waste with a capacity exceeding 3 tonnes per hour; (s)

(b) for hazardous waste with a capacity exceeding 10 tonnes per day. (s)

5.4. Landfills, as defined in Article 2(g) of Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste (2), receiving more than 10 tonnes of waste per day or with a total capacity exceeding 25,000 tonnes, excluding landfills of inert waste. (s)

5.5. Temporary storage of hazardous waste not covered under point 5.4 pending any of the activities listed in points 5.1, 5.2, 5.4 and 5.6 with a total capacity exceeding 50 tonnes, excluding temporary storage, pending collection, on the site where the waste is generated

5.6. Underground storage of hazardous waste with a total capacity exceeding 50 tonnes. (s)

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[51] https://www.retsinformation.dk/eli/lta/2021/1394.

Annex 2

K. Waste recovery and disposal

K 201. Installations recovering hazardous waste where the activities of the installation are not listed in point 5.1 or 5.2 of Annex 1.

K 203. Installations for the temporary storage of hazardous waste pending its recovery or disposal with a capacity of less than or equal to 50 tonnes, excluding installations listed in points K 209, K 210, K 211, or K 212.

Reprocessing, including transhipment, repackaging, or sorting of hazardous waste prior to recovery or disposal with a capacity of 10 tonnes per day or less, excluding installations listed in points K 209, K 210, K 211, or K 212.

K 209. Car dismantling (car recycling).

K 210. Ship dismantling. (* see point 26 of Annex 4)

K 211. Recycling sites receiving waste from households and similar waste from businesses with a capacity of 30 tonnes of waste per day or with more than 4 containers with a total volume of at least 30 m^3.

K 212. Installations for the temporary storage of non-hazardous waste or WEEE prior to recovery or disposal with a capacity of 30 tonnes of waste per day or with more than 4 containers with a total volume of at least 30 m^3, excluding installations listed in point 5.5 of Annex 1 or point K 211.

Reprocessing, including transhipment, repackaging, or sorting of non-hazardous waste or WEEE prior to recovery or disposal with a capacity of 30 tonnes of waste per day or with more than 4 containers with a total volume of at least 30 m^3, excluding installations covered by point 5.1 of Annex 1 or point K 211.

K 216. Mining waste installations that accumulate or deposit waste generated from exploration, extraction, processing, and storage of mineral resources or from quarrying operations, excluding waste generated from but not directly associated with those activities. (s)

K 217. Landfills for hazardous waste receiving 10 tonnes per day or less, with a total capacity of less than 25,000 tonnes.

Other hazardous waste disposal installations with a capacity of less than or equal to 10 tonnes per day.

K 218. Shredders of other metal waste, including WEEE and ELVs and their components with a capacity of not more than 75 tonnes per day. (s)

Where the activities of an enterprise are listed in one of the points marked with 's' in in Annexes 1 or 2, the certifying authority is be the Danish Environmental Protection Agency; otherwise, the municipality.

If the planned activity requires environmental impact assessment (EIA) procedures, the EIA application may be submitted together with the application for environmental approval and, if necessary, for a potential sewerage permit.

Enterprises engaged in waste management activities may not be built or started until environmental approval has been granted. Also, enterprises should not be expanded or modified structurally or operationally, including from the point of view of waste generation, in such a way as to increase pollution before development or replacement is approved.

However, the certifying authority may authorise construction works related to the specified activities, except for waste disposal facilities, to commence before the approval is granted, provided that they are provided for in the territorial planning documents or in the Law on Urban Planning. Construction works are carried out under the responsibility of the customer.

The environmental permit specifies:

- Assessment of the project applied for.
- Conditions of establishment and operation of the enterprise.
- Statement of reasons for the decision.

Decommissioning and after-treatment conditions are established for waste disposal landfills and mining waste management installations.

An enterprise whose activities are not covered by the BAT conclusions must be re-assessed regularly and at least every 10 years. However, the first regular reassessment is carried out eight years after the initial approval has been granted. After the publication of the BAT conclusion, the installations covered by the BAT conclusion are re-assessed.

Pursuant to the Law on Environmental Protection[52], enterprises that:

1) extract metals from cables;
2) perform the rinsing or cleaning of chemical substances or chemical waste storage structures;
3) operate scrap metal installations, including scrap metal installations for motor vehicles;
4) separate solid mechanical parts, etc., e.g. appliances, machine engines, etc., and resell them; or
5) carry out mechanical shredding of scrap metal

must have a financial security agreed with the certifying authority. The security must cover the costs incurred by the supervisory body in relation to the subsequent waste transport and disposal or other management of waste.

The enterprise pays the certifying authority or supervisory body for environmental approval, reporting and environmental inspections. User charges are calculated based on detailed rates. The hourly rate is adjusted annually. The aim is for control to be based on dialogue, responsibility, and trust, and for control of businesses to focus on the essential elements that are beneficial to the growth and development of the enterprise.

The authorising authorities and supervisory bodies collect user charges each year in November from enterprises in which the authority has performed the services necessary for the user for the previous year, from November 1 of the previous year to November 1 of the current year.

b) Hazardous waste management

Responsibility for the identification of waste

According to paragraph 4 of the Waste Order, in Denmark, the council of each municipality decides whether the waste is hazardous, i.e. the enterprise generating the hazardous waste classifies it and submits the classification to the municipality that initiates a dialogue with the enterprise, if it does not agree, or accepts the classification, if it agrees.

The council of the municipality notifies the Danish Environmental Protection Agency of the decisions when waste that is regularly generated in an enterprise and meets the criteria set out in Annex 3 to the Waste Order but is not identified as hazardous waste in the list of wastes has been classified as hazardous waste in accordance with Annex 3.

The municipal council must also inform the Danish Environmental Protection Agency about waste that is generated continuously in the enterprise and does not meet the criteria set out in Annex 3 to the Waste Order, but that is identified as hazardous waste in the list of waste.

The municipal council also decides whether a lightweight vessel of 1,500 tonnes (own weight) or a smaller vessel is waste. At the same time, the municipal council decides whether this vessel is classified as hazardous waste.

The Danish Environmental Protection Agency decides whether a vessel of more than 1,500 tonnes (own weight) is waste and whether it should be classified as hazardous waste.

Enterprises whose activities generate hazardous waste must notify the municipality irrespective of the amount of waste generated. They must also notify the municipality if the amount of hazardous waste has increased significantly.

[52] https://www.retsinformation.dk/eli/lta/2019/1218.

Hazardous waste is divided into recyclable waste (for the recovery of materials) and non-recyclable waste.

Non-recyclable hazardous waste must be delivered to the municipal hazardous waste collection system (municipal waste recycling sites, waste incineration installations, landfills). Every year, an enterprise may deliver up to 200 kg of hazardous waste to a municipal recycling site. If the enterprise generates more than 200 kg of hazardous waste, the hazardous waste must be transferred to the enterprise designated by the municipality (waste management enterprise or reception site).

Hazardous waste suitable for recycling may also be transferred by the enterprise to other undertakings managing such waste.

The municipalities of Denmark are responsible for the proper management of waste from natural persons as well as waste from all enterprises destined for incineration and landfilling.

Construction waste management[53]

In Denmark, repair/demolition/renovation of buildings must be notified to the municipality prior to the start of the works. This can be done by applying or notifying the repair/demolition/renovation of a building in accordance with construction legislation and at least two weeks before demolition or renovation/repair commences. The notification must include information on whether there is waste in the building containing PCBs, what type of waste it is, and how much waste it will generate after demolition or renovation/repair.

The notification obligation applies to all demolition and renovation/repair works with an area of more than 10 m^2 or where the works generate more than 1 tonne of waste.

If the building was constructed or renovated between 1950 and 1977, the notification must be supplemented by the PCB screening and, where necessary, mapping. PCBs are mainly found in:

- connections;
- double glazing;
- fluorescent tubes;
- durable paints and floor coverings.

If PCB sediment screening or mapping is required, further information on its results must be provided in the notification.

Construction waste containing more than 50 mg PCB/kg is hazardous waste.

Waste containing 50 mg PCB/kg or more must be treated in an incineration plant authorised to incinerate hazardous waste. However, certain waste fractions containing 50 mg PCB/kg or more may also be disposed of under the POP Regulation.

Pursuant to the PCB Guidelines of Copenhagen, the Danish Environmental Protection Agency considers that construction waste containing PCBs is generally considered to be free of pollution at concentrations below 0.1 mg PCB/kg.

Construction waste with a total PCB content exceeding 2.0 mg/kg (measured at source and on the surface, where the highest concentration is identified) cannot be used as secondary raw material in construction.

Treatment of impregnated timber[54]

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[53] https://mst.dk/affald-jord/affald/bygge-og-anlaegsaffald/.

[54] https://mst.dk/affald-jord/affald/affaldsfraktioner/impraegneret-trae/.

If pressure-impregnated timber is treated with creosote or arsenic, when it becomes a waste, it is normally considered a hazardous waste. If only timber surface has been treated or other agents have been used, the Danish Environmental Protection Agency considers that this is not normally a hazardous waste.

Explanation by the Danish Environmental Protection Agency about what renders timber hazardous:

Creosote and arsenic salts are classified as carcinogenic in the list of dangerous substances. Arsenic salts are also classified as hazardous to the environment and toxic. Waste containing more than 0.1% (m/m) of carcinogens is classified as hazardous waste.

A test of creosote-impregnated poles that had been present in nature for 40 years has shown that creosote accounts for 15–75% of the baseline. Creosote concentrations in freshly impregnated timber are estimated at approximately 17%. This means that the concentration of creosote in timber after 40 years is approximately 3–13%.

A test of arsenic-impregnated timber has shown that 20–25% of arsenic is eluted after 2–4 years of use, with arsenic concentrations ranging from 0.3% to 0.6% (as arsenic salts). Therefore, both examples meet the criteria for hazardous waste.

Many other impregnation techniques do not classify wood waste as hazardous:

Old copper-impregnated timber is generally not classified as hazardous waste as the copper content is between 0.1% and 0.2% by weight of timber with more recent agents, and around 0.3% with older agents. Copper compounds are classified as hazardous waste in terms of health hazards at concentrations above 20% or 25% (depending on the copper compound concerned).

Old chromium-impregnated timber is also generally not classified as hazardous waste, as chromium is detected in timber as a chromium III compound that is not classified as hazardous to health or the environment. The chromium content is approximately 0.3%.

Boron content in old timber is considered to be extremely low and is therefore not classified. Boric acid and other boric salts are classified as harmful to reproduction; waste containing more than 0.3% of substances harmful to reproduction is hazardous waste.

Old timber impregnated with tin compounds (TBTN/TBT agents) is not classified as hazardous waste as the concentration of tin compounds is usually approximately 0.08%. Tributyl compounds are classified as hazardous waste at concentrations of 1%.

According to Denmark's 2019 statistics on hazardous waste management, approximately half of the hazardous waste collected in Denmark in 2019 has been treated by incineration or landfilling. Hazardous waste that is not suitable for incineration, such as asbestos sheets, and where there are no other options for managing such waste, is landfilled.

In 2019, 40% of hazardous waste was recycled, 31% was incinerated in waste incineration plants, 23% was landfilled, and 5% was recovered.

Norway

The activities of hazardous waste management are subject to a permit issued by the Environmental Agency, the county governor or an institution authorised by the Ministry of Climate and Environment[55].

The Environmental Agency is authorised by the Ministry of Climate and Environment to issue permits for hazardous waste management installations and supervise compliance with the established obligations.

The county governor or an institution authorised by the Ministry of Climate and Environment issue permits for installations of the collection and intermediate storage of hazardous waste and supervise compliance of these enterprises with the established requirements.

Exemptions from permit requirements apply for:

(a) enterprises holding permits to manage hazardous waste generated by own operations;

[55] Waste Regulations, https://lovdata.no/dokument/SF/forskrift/2004-06-01-930/KAPITTEL_12#KAPITTEL_12.

(b) recovery of hazardous waste carried out within the enterprise where the waste was generated, provided that the recovery process does not entail a risk of pollution within the meaning of Section 7 of the Pollution Control Act;

(c) points of distribution, where distributors are obliged to accept hazardous waste when a consumer purchases a new item;

(d) collection of hazardous waste from ships up to 50 tonnes;

(e) municipal sites, stations, and mobile installations for collection of hazardous waste receiving waste from residents, with a total storage capacity not exceeding 50 tonnes. Sites covered by this exemption are allowed to receive up to 1,500 kg of hazardous waste per resident per year, and must be operated in accordance with the applicable requirements (up to 50 tonnes of hazardous waste can be stored for up to 6 months);

(f) points of distribution, where used batteries are accepted.

The manager and employees of an enterprise planning to engage in the activities of hazardous waste management, storage or collection must have appropriate training or experience in handling hazardous waste. If the competent authority finds that the competence of the staff is insufficient, it may be requested to draw up and implement a plan for the upgrading of competence.

To obtain a permit, it is first necessary to apply to the municipality for the consent that the municipality agrees to have another waste management installation in its territory. The municipality may decide to redirect an applicant to another municipality with fewer waste management installations.

The municipality indicates the location where the waste management activity is permitted (the municipality may even indicate a specific site/premises), as the activities of waste management enterprises must be compatible with the urban construction and development plan. A hazardous waste management enterprise may be instructed to acquire premises, and upon cessation of activities, the enterprise may be forced to demolish the building, and clean up the environment and soil.

Prevention and control for waste management enterprises is strict and defined very clearly in the permit issued. Beside covering waste management and storage, the permit also determines the frequency of inspections based on the capacity of the installation and controlling municipal and state administration staff is assigned.

In transporting hazardous and non-hazardous waste from the country the police are involved for checking the persons who will transport and manage the waste. The inspection is carried out through Interpol to determine any prior convictions or possible corruption cases amongst the traders in waste[56].

Financial security[57]

Installations for the acceptance and intermediate storage of hazardous waste must have a financial security covering the costs of the management of all hazardous waste in the event of closure, the suspension of the operation or insolvency of the installation.

The security must cover the maximum costs that may arise from the responsible management of hazardous waste, including the cost of transporting the waste. The security amount must be calculated considering the types of hazardous waste that may be accepted at the installation, and the maximum capacity of hazardous waste that may be stored under the permit issued.

[56] https://www.toll.no/en/corporate/export/export-declaration/.

[57] https://lovdata.no/dokument/SF/forskrift/2004-06-01-930/KAPITTEL_20-2#%C2%A717-4.

The security is granted for the benefit of the responsible authority in the form of a pledge in a blocked bank account with a deposit equal to the amount to be secured or an unconditional demand guarantee from a bank issued to the responsible authority. The competent authority may, following a specific assessment, allow another form of security, where it can be demonstrated that this will ensure an equivalent level of safety.

Every five years or more frequently, if required by the responsible authority, the enterprise assesses whether the security amount is sufficient to cover the all the cost related to hazardous waste in the event of closure, the suspension of the operation or insolvency of the installation.

These provisions do not apply to installations operated by a municipal or semi-municipal enterprise.

The Waste Regulations also require that future costs for the management of stored hazardous waste be included in the annual financial statements of the enterprise in accordance with the Law on Accounting.

2.5.1.2 Western European countries: Germany, Ireland, and the Netherlands

Germany

Given that Germany is a federation of numerous federal states (ger. *Länder*), waste management regulation, like other regulation in Germany, is carried out in two levels: basic rules and general principles are laid down by federal law, and their implementation may vary slightly between the federal states, while maintaining the basic principles laid down by federal law.

Firstly, in Germany, the implementation of the provisions of the Industrial Emissions Directive requires to hold a pollution permit (or approval) under the Federal Pollution Control Act58 for the activities listed in the Annexes to the Directive, including hazardous waste management activities, i.e.:

- Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving one or more of the following activities: biological treatment; physico-chemical treatment; blending or mixing prior to submission to any of the other activities listed above; repackaging prior to submission to any of the other activities listed above; solvent reclamation/regeneration; recycling/reclamation of inorganic materials other than metals or metal compounds; regeneration of acids or bases; recovery of components used for pollution abatement; recovery of components from catalysts; oil re-refining or other reuses of oil; surface impoundment or underground catchment;
- Disposal or recovery of waste in waste incineration plants or in waste co-incineration plants: for hazardous waste with a capacity exceeding 10 tonnes per day;
- landfills receiving more than 10 tonnes of waste per day or with a total capacity exceeding 25,000 tonnes, excluding landfills of inert waste;
- storage of hazardous waste (other than landfilling) pending any of the above activities with a total capacity exceeding 50 tonnes, excluding temporary storage, pending collection, on the site where the waste is generated;
- underground storage of hazardous waste with a total capacity exceeding 50 tonnes.

The main waste legislation in Germany is the Federal Law on Waste Management that lays down the basic principles and requirements for waste management, including requirements for economic entities carrying out waste management activities. In addition to the permits

[58] https://www.gesetze-im-internet.de/bimschg/BJNR007210974.html.

referred to above, this Law (Article 54) establishes an obligation to hold permits for waste carriers, collectors, traders, brokers. These requirements are set out in more detail in the Ordinance on the Notification and Permit Procedure for Collectors, Carriers, Traders, and Brokers of Waste[59], which provides that:

- Notification of the commencement of operations by collectors, transporters, dealers, and brokers of waste pursuant must be submitted to the (regional) competent authority;
- This measure does not apply if the enterprise holds the above-mentioned permit;
- The shipment of hazardous waste requires a transport permit (issued according to the notification).

It should be noted that the above-mentioned Ordinance lays down, inter alia, the reliability requirements for enterprises planning to carry out activities subject to permit, and for the qualification of employees of the enterprise. During the reliability check, it is verified whether the enterprise or the owner of the enterprise has been convicted of violating provisions of criminal law or offences against the environment; where such facts are established, the enterprise is considered non-compliant with the reliability requirement, and no permit is issued. The verification of the qualification of employees of the enterprise aims at assessing whether they have the appropriate education and special training.

Ireland

Waste disposal and recovery activities in Ireland are subject to permit under the Waste Management Act[60].

All waste recovery and disposal activities are divided into the following groups:

- Activities exempted from the permit/licence/registration requirement;
- Activities requiring to hold a waste licence or an integrated pollution licence;
- Activities requiring to hold a waste facility permit;
- Activities subject to a registration certificate.

Waste or integrated pollution licenses are issued by the Irish Environmental Protection Agency (licences are mandatory for more intense polluting activities), waste facility permits, and registration certificates are issued by local authorities.

The cases requiring a waste licence, or an integrated pollution licence are set out in the Waste Management (Facility Permit and Registration) Regulations[61]; the type of authorisation (licence/permit/registration) required depends on the type of waste, the capacity, and the method of waste management. The below examples show the variations of the authorisation required based on the said criteria:

- The storage, pending collection, of household hazardous waste, where:
    - intake does not exceed—in the case of liquid waste, 25 tonnes, in the case of non-liquid waste, 25 tonnes, and the maximum period of storage of waste does not exceed 30 days, the activity is subject to a registration certificate;
    - intake does not exceed—in the case of liquid waste, 25 tonnes, in the case of non-liquid waste, 25 tonnes, but the total quantity stored does not exceed 200 tonnes, and the maximum period of storage of waste does not exceed 30 days, the activity is subject to a waste facility permit;
    - the total quantity stored exceeds 200 tonnes, the activity is subject to a waste licence;
- ELVs:

[59] https://www.gesetze-im-internet.de/abfaev/.

[60] https://revisedacts.lawreform.ie/eli/1996/act/10/front/revised/en/html.

[61] https://www.irishstatutebook.ie/eli/2007/si/821/made/en/print?q=821&years=2007.

    - storage, where less than six ELVs are stored simultaneously, is subject to a registration certificate;
    - storage and treatment of ELVs, regardless of capacity, is subject to a licence;
- WEEE:
    - storage and treatment, where the annual intake does not exceed 10 tonnes per year, is subject to a permit;
    - storage and treatment, where the annual intake exceeds 10 tonnes per year, is subject to a licence;
- the operation of a waste incineration plant of any capacity and processing any type of waste is subject to an integrated pollution licence; a licence is also required for the landfill of hazardous waste.

As the statutory requirements for the type of authorisation required are incredibly detailed and assess a large number of parameters, operators may, prior to commencing the activity, fill in a declaration in a prescribed form, submit it to the Environmental Protection Agency, and obtain precise information on the type of authorisation required.

The Netherlands

In the Netherlands, there is an obligation to have a so-called 'all-in-one permit for physical aspects' for all activities that may have any environmental impact. Depending on the type of activity, its environmental impact, and capacity, the activities may be subject to notification or permit. These regulations are laid down in the Activities Decree[62]; it also distinguishes between three types of enterprise activities: types A, B and C.

The differences between types A, B and C are as follows:

- Type A. Type A enterprises perform less environmentally harmful activities, such as many office and school buildings and shops. They are not required to submit a notification to the competent authority when they start up or make changes. They also do not require an all-in-one permit for physical aspects for the environmental purposes.
- Type B. Type B enterprises are required to submit a notification to the competent authority in the case of a start-up or a change. They do not require an all-in-one permit for physical aspects.
- Type C. Type C enterprises require an all-in-one permit for physical aspects for the environmental purposes. They are required to submit a notification for activities, based on which the decision to grant (or not grant) a permit is made[63].

The following basic methods are available to determine whether an enterprise falls under the Type C activities:

- An enterprise is Type C if its activities are listed in the Annex to the Industrial Emissions Directive;
- An enterprise is Type C if its activities meet the criteria (that are divided into diverse groups: type of activity, physical impact on the environment, impact on a particular environmental component, etc.) set out in Annex 1 to the Environmental Law Decree[64].

For the purposes of this Annex, Type C enterprises include all hazardous waste storage operators, irrespective of the capacity involved. Type C also covers, in general, all activities related to the treatment of hazardous waste, but exceptions are set depending on the

[62] https://wetten.overheid.nl/BWBR0022762/2021-07-01.

[63] The notification is submitted via the Activities Decree online module.

[64] https://wetten.overheid.nl/BWBR0027464/2017-07-01#BijlageI.

activities carried out and the type of waste treated; e.g. An enterprise is not considered to be Type C enterprise if it:

- stores not more than 100 cubic metres of WEEE;
- stores not more than 5 cubic metres of used batteries;
- store not more than 50 tonnes of the following hazardous waste: lubricants, used oil and oil and grease-containing waste from the operation and maintenance of installations; tarry or bituminous roof waste, composites of tarry or bituminous roof waste, roofing gravel bound with tar or bitumen; fire extinguishers; organic non-halogenated solvents; empty uncleaned packaging of paint, glue, sealant or resin, and other dangerous substances; liquid fuels.

2.5.1.3 Neighbouring countries: Poland and Latvia

Poland

In Poland, pursuant to Articles 180 and 181 of the Law on Environmental Protection[65], permits are granted to enterprises generating a certain amount of waste and managing waste (depending on the nature of the activities carried out, an integrated permit or waste management permit is required).

Waste producers require a permit for production of waste:

- of mass exceeding 1 tonne per year for hazardous waste, or of the mass exceeding 5,000 tonnes per year in for non-hazardous waste. A waste production permit is required in these cases,

Permits issued to waste managers:

- Under Decree No 1169 of the Minister for the Environment of 27 August 2014 on types of installations likely to cause significant pollution of specific natural elements or the environment as a whole[66], an integrated permit is required for the hazardous waste management activities referred to in Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control).
- The waste collection permit must be held by the waste collectors who carry out the collection of waste, which is understood as the collection of waste pending shipment to the recycling sites, including pre-sorting that does not substantially alter the nature and composition of the waste or impact the classification of the waste, and temporary storage of waste.
- Waste management permits must be held by waste managers carrying out waste treatment activities (R1–R13, D1–D15), which are understood as recovery or disposal processes, including pre-treatment or disposal.

The waste collection permit and the waste management permit are issued by the relevant competent authority in accordance with the Law on Waste.

A competent authority is:

1) the Marshal of the Voivodship, issuing permits for:

- projects that may in all times have significant environmental impact within the meaning of the Law of on the provision of information on the environment and its

[65] https://isap.sejm.gov.pl/isap.nsf/download.xsp/WDU20010620627/U/D20010627Lj.pdf.

[66] http://isap.sejm.gov.pl/isap.nsf/download.xsp/WDU20140001169/O/D20141169.pdf.

protection, public participation in environmental protection and environmental impact assessment of 3 October 2008;

- non-hazardous waste used for the filling of certain areas, provided that the amount of waste deposited in the excavation or pitch is at least 10 tonnes per day, or the total capacity is at least 25,000 tonnes;
- utility installations; and
- issuing a waste collection permit if the total annual amount of all types of waste exceeds 3,000 tonnes;

2) the starosta[67], in other cases.

3) the Regional Environmental Protection Directorate issues a waste collection permit and a waste management permit in enclosed areas.

A waste collection permit or a waste management permit is issued by the competent authority after consultation with the head of municipality (the mayor of the municipality, town, or city), who has the competence at the waste collection or treatment site.

Before issuing a permit, the enterprise is inspected by the Voivodship Environmental Protection Inspector, in the presence of a representative of the competent authority, and the facility is evaluated by the district (municipality) Commander of the State Fire Service.

An application for a waste collection permit and an application for a waste management permit must be accompanied by:

1) an extract from the judicial record with regard to environmental crimes or crimes against public health;

2) an extract from the judicial record of the waste holder with regard to offences against the environment;

3) a statement that a natural person or a legal entity and the waste holder being a legal person or an organizational unit without legal status, a partner, a proxy, a member of the management board or a member of the supervisory board of that waste holder exercising economic activity as a natural person, in the last 10 years no final decision on withdrawal of a waste collection permit, a waste recycling permit, a waste collection and processing permit, or a waste production permit covering waste collection and recycling has been issued, or no administrative pecuniary penalty in an amount exceeding in total PLN 150,000 has been imposed at least three times for improper storage, handling, transport, and classification of waste, failure to install or inadequate installation of a video surveillance system, etc.;

4) a statement that a shareholder, a proxy, a member of the management board or a member of the supervisory board of the waste holder is not or was not a shareholder, a proxy, a member of the supervisory board or a member of the management board of another entrepreneur,

(a) in relation to whom in the last 10 years a final decision on withdrawal of a waste collection permit, a waste recycling permit, a waste collection and recycling permit, or a waste production permit covering waste collection and recycling has been issued; or

(b) in relation to whom in the last 10 years an administrative pecuniary penalty in an amount exceeding in total PLN 150,000 has been imposed at least three times for improper storage, handling, transport, and classification of waste, failure to install or inadequate installation of a video surveillance system, etc.,

[67] Starosta: since the administrative reform of 1999, starosta is elected by the district assembly; starosta manages and represents the district and is the chairperson and head of the district board.

- for infringements committed while being or having been a partner, a proxy, a member of the supervisory board or a member of the management board of that other entrepreneur.

In the event of a criminal conviction or an infringement referred to above, a permit is not issued.

A waste collection permit and a waste management permit are issued for a limited period, not exceeding 10 years.

A recycling permit for a ship recycling facility operator is issued for a specified period not longer than 5 years that may be extended for a specified period not longer than another 5 years.

A waste holder who is required to obtain a waste collection permit or a waste management permit must hold a financial security for the remediation of the waste and the installation. The security may be collateralised by a collateral, bank guarantee, insurance guarantee or insurance policy.

According to Article 25 of the Law on Waste, enterprises storing, managing, and disposing of waste, which are obliged to obtain a permit for relevant activities, must install a video surveillance system for controlling the place of storage of waste.

Enterprises must provide the Voivodeship Environmental Protection Inspector with the access to the recorded image in real time, by transmitting information making it possible to log on to the video surveillance system of the waste storage site in a manner ensuring that the information is kept confidential.

The Voivodship Environmental Protection Inspector makes use of the access to the video surveillance system in case of:

1) the conducted control;

2) the substantiated suspicion of an environmental offence or crime.

A video surveillance recorded images of the waste storage or disposal site must be stored in the enterprise for one month from the date of recording. At the request of the controlling authorities, enterprises must provide a video recording or a copy thereof.

Latvia

In Latvia, hazardous waste management activities may require, depending on the nature and capacity of the activities, to obtain:

1. a pollution permit, which is divided into categories A, B, C, depending on the type of activity and capacity;
2. in cases where the activity does not require a pollution permit, a special permit for waste management is required.

First, the obligation to obtain a permit for the management of any waste (hazardous or non-hazardous) is laid down in Article 12(1) of the Waste Management Law[68]. Article 12(5) of the Law include separate provisions concerning the permit for the management of hazardous or production waste, providing that the waste managers must hold either a waste management permit or a pollution permit.

Article 12. (1) Prior to the performance of the relevant activities the waste manager shall receive a permit from the State Environmental Service for:

1) collection of waste;

68 https://likumi.lv/doc.php?id=221378.

> *2) transport of waste;*
>
> *3) reloading of waste;*
>
> *4) sorting of waste;*
>
> *5) storage of waste;*
>
> *6) digging up of a closed or re-cultivated waste dump and resorting of waste.*
>
> *[...]*
>
> *(5) A manager of hazardous waste or production waste shall:*
>
> *1) receive the permit referred to in Paragraph one of this Section for the collection, transport, reloading, sorting, or storage of hazardous waste or production waste;*
>
> *2) receive a permit for the recovery or disposal of hazardous waste or production waste in accordance with the laws and regulations regarding pollution.*

Besides, Article 12(4) of the Waste Management Law requires waste producers who store hazardous waste destined for landfill on site for more than three months to obtain a waste management permit, in which case the permit shall is issued for a period not exceeding one year.

> *Article 12. (4) Legal persons who store hazardous waste or production waste destined for landfill for more than three months shall receive a permit specified in Paragraph one of this Section for storage of waste for a period of time which does not exceed one year.*

As indicated above, special waste management permits are required if the activity is not subject to obtaining a pollution permit under Category A, B, or C. Among other things, pursuant to the Regulations Regarding the Procedures for Issuing and Cancelling of a Permit for Collection, Transport, Reloading, Sorting or Storage of Waste, as well as Regarding the State Fee and the Procedures for Payment Thereof[69], no separate special permit for waste management is required where the conditions for waste management are included in the pollution permit under one of the categories.
Waste management permits are issued for the following activities (irrespective of the hazardous properties of the waste):

- collection of waste from waste generators, sites for collection of sorted waste, centres or stations for sorting and reloading of waste, sites (locations) for collection of separate kinds of hazardous waste or of production waste, sites for acceptance of utilised packaging or sites (locations) for collection of waste from waste generators or for separate collection of household waste and transport;
- waste treatment and storage;
- sorting and storage of waste;
- storage of waste;
- transport of waste;
- digging up of a closed or re-cultivated waste dump and resorting of available waste.

Requirements for the issue of pollution permits are laid down in the Law on Pollution[70]. Annex 1 to this Law lists activities that require a Category A permit, including some hazardous waste management activities:

- installations for the disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving one or more of the following activities:
  (a) biological treatment;
  (b) physico-chemical treatment;
  (c) blending or mixing prior to submission to any of the other activities listed in points 1 and 2 hereof[https://likumi.lv/ta/id/6075 - p2](https://likumi.lv/ta/id/6075#p2);

[69] https://likumi.lv/doc.php?id=236019

[70] https://likumi.lv/doc.php?id=6075.

(d) repackaging prior to submission to any of the other activities listed in points 1 and 2 hereofhttps://likumi.lv/ta/id/6075 - p2;
(e) solvent reclamation/regeneration;
(f) recycling/reclamation of inorganic materials other than metals or metal compounds;
(g) regeneration of acids or bases;
(h) recovery of components used for pollution abatement;
(i) recovery of components from catalysts;
(j) oil re-refining or other reuses of oil;

- installations for the incineration or recovery of waste, as well as installations for the co-incineration of waste to which the laws and regulations regarding the requirements for the incineration of waste and operation of the installations for the incineration of waste apply, with the following capacity:
  (a) for non-hazardous waste, where the capacity is more than 3 tonnes per hour,
  (b) for hazardous waste, where the capacity is more than 10 tonnes per day;
- installations for the landfills which may accept more than 10 tonnes of waste per day or with a total capacity exceeding 25,000 tonnes, excluding landfills of inert waste;
- waste storage facilities that do not comply with the concept of landfill but which, before carrying out the above activities, contain hazardous waste with a total storage capacity exceeding 50 tonnes. Part of this is carried out on hazardous waste (not applicable to temporary storage of waste at source);
- installations for the disposal of hazardous waste where waste containing PCBs/PCTs is disposed of;
- underground storages of hazardous waste with a total capacity exceeding 50 tonnes.

The activities subject to a Category B pollution permit are listed in Annex 1 to the Procedure by Which Polluting Activities of Category A, B and C Shall Be Declared and Permits for the Performance of Category A and B Polluting Activities Shall Be Issued[71], and include the following installations related to the management of hazardous waste:

- installations for the disposal or recovery of hazardous waste, including petroleum product waste, the capacity of which does not exceed 10 tonnes per day;
- installations for the incineration or co-incineration of hazardous waste with the capacity up to 10 tonnes per day and subject to the legislation on the operation of waste incineration and waste incineration plants;
- landfills that can receive up to 10 tonnes of waste per day or with a total capacity not exceeding 25,000 tonnes, excluding landfills of inert waste;
- installations for the treatment in shredders of ELVs with a capacity up to 75 tonnes per day or for recovery or storage of shipwrecks;
- installations for the storage of hazardous waste (excluding storage at source) for more than a year;
- installations for temporary (not more than a year) storage of hazardous waste with total capacity up to 50 tonnes, for example, reloading stations and container warehouses, excluding storage of waste at source;
- installations for treatment in shredders of electrical and electronic waste the capacity of which does not exceed 75 tonnes per day;
- installations for recovery and storage of ELVs, except treatment in shredders;
- installations for recovery and storage of WEEE, except treatment in shredders.

The activities subject to a Category C pollution permit are listed in Annex 2 to the Procedure by Which Polluting Activities of Category A, B and C Shall Be Declared and

71 https://likumi.lv/ta/id/222147-kartiba-kada-piesakamas-a-b-un-c-kategorijas-piesarnojosas-darbibas-un-izsniedzamas-atlaujas-a-un-b-kategorijas-piesarnojoso-da....

Permits for the Performance of Category A and B Polluting Activities Shall Be Issued; however, this Annex does not include activities related to the management of hazardous waste.

2.5.1.4 Permits related to the generation and management of hazardous waste – good practices in other countries: summary

To assess whether the practice used in other foreign countries for the generation and management of hazardous waste in the granting of permits (or other means of authorisation such as licences, registration) may be considered and applied as good practice in Lithuania, we review the current requirements for environmental permits at EU level and in Lithuania[72].

At the EU level, requirements for waste management permits (including hazardous waste management activities) are essentially laid down in two pieces of legislation:

- pursuant to the provisions of the WFD, permits are to be granted for all waste treatment activities and may, where appropriate, be integrated into permits in accordance with the requirements of the Industrial Emissions Directive.
- The Annex to the Industrial Emissions Directive lists the activities related to the management of hazardous waste subject to permit in accordance with the provisions of the Industrial Emissions Directive.

In Lithuania, the above provisions of the Industrial Emissions Directive and the WFD referred to above concerning the requirement to hold a permit for the waste treatment activities have been transposed to the Law on Waste Management and the Law on Environmental Protection, as well as implementing legal acts – Rules for the Issue, Amendment and Revocation of Integrated Pollution Prevention and Control Permits (the '**IPPC Rules**'), and the Rules for the Issue, Amendment and Revocation of Pollution Permits (the '**Rules on Pollution Permit**'); according to the provisions of these legal acts, the currently applicable requirements in Lithuania are as follows:

- any waste treatment activity (whether hazardous or not) are subject to an IPPC or a permit:
  - the activities listed in Annex 1 to the IPPC Rules (corresponding to the activities specified in the Industrial Emissions Directive) are subject to an IPPC permit;
  - other waste treatment activities must have a part of the recovery or disposal of the waste covered by the pollution permit;
- in certain cases (as hazardous waste at source for more than half a year), the share of recovery or disposal of the waste in the pollution permit must also be held by the enterprises, where the waste is generated by operations;
- there are no other cases where waste producers would require an environmental permit due to the generation of hazardous waste.

A cross-border analysis of permits (or other authorisation measures such as licences, registration) for the generation and management of hazardous waste leads to the following conclusions:

- In principle, all countries require a permit (licence) at some level for the treatment of any waste, which makes it difficult to find examples of good practice in this case (as regards the criteria for authorisation for the treatment of waste), since the number of

[72] Examination of EU and Lithuanian legislation on requirements to hold permits for waste management activities is not within the scope of this Report; therefore, it provides only a brief overview.

permit types and the diversity of the authorities issuing them depend heavily on the administrative structures of the country;

- As an example, good practices of certain countries (Poland, Germany) could be considered to verify not only technical and environmental indicators but also the reliability of the operator prior to the issuance of a permit, i.e. to assess whether the person wishing to carry out the activity has committed administrative environmental offences or criminal offences in the past;
- As another example of good practice, which could be seen as a means of ensuring stricter control of hazardous waste at the very beginning of the process (at source of waste), is the practice in some countries of requiring permits not only from waste managers but also from waste producers (depending on the amount of waste generated, the method of waste management, etc.).

2.5.2 Prevention and control measures

2.5.2.1 Nordic countries: Sweden, Denmark

Sweden

In Sweden, proper classification and identification of waste is one of the preventive measures. The classification of waste determines how the waste will be further managed and what legal requirements apply to the waste management.

Sweden has put in place the following measures to control and reduce the generation of hazardous waste:

- To control the presence of hazardous waste in Sweden, from November 2020 all enterprises must notify the Swedish Environmental Protection Agency (register in the Waste Register) of the hazardous waste generated by their activities[73].
- The Swedish municipalities (Environmental Department) control both the waste producers and the waste managers, i.e. the management, sorting and transfer of waste is assessed during inspections of the enterprises. The aim of municipalities is to cooperate with the enterprise and business in finding sustainable solutions to reduce waste generation.
- Municipalities have been instructed to inform households about waste prevention measures that reduce waste generation. This may include, for example, processing to reduce food waste or consumption[74].

Denmark

In Denmark, the prevention and control of hazardous waste is carried out at the source of the generation of hazardous waste, i.e.:

- Enterprises generating hazardous waste must notify the municipality of hazardous waste generated during their activities, regardless of the volumes[75]. The enterprise must classify hazardous waste arising from its activities and present this classification to the municipality, which in turn initiates a dialogue with the enterprise, if it does not agree, or accepts the classification, if it agrees.

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[73] *Rapportera till avfallsregistret (naturvardsverket.se)*.

[74] *Avfall (naturvardsverket.se)*.

[75] https://mst.dk/affald-jord/affald/affaldsfraktioner/farligt-affald/.

- Repair/renovation or demolition of buildings must be notified to the municipality prior to the start of the works, and it should be assessed whether and how much PCB-containing waste is likely to be generated by these activities[76]. This pre-identifies whether hazardous waste may be produced during construction and repair.
- Since 1 January 2021, the Waste Order has been amended and national simplified criteria for sorting household and commercial waste have been introduced[77]. From 1 January 2022, in Denmark, waste will be sorted into 9 fractions: food, paper, cardboard, glass, metal, plastic, food and beverage packs, as well as hazardous waste and residual waste. All waste bins will be marked with pictograms.

  The bin for hazardous waste will be marked with the hazardous waste pictogram:

  

  Hazardous waste, such as chlorinated cleaning agents, containers contaminated with paint and aerosols, etc., will be dumped into this bin. Hazardous waste must not contain products which may present a risk during collection and disposal, such as pressure vessels and fireworks, etc.

  In this way, natural persons and businesses will already separate municipal hazardous waste at source.

  It should be noted that the information on what can be dumped into a municipal metal waste bin indicates that metal waste must not contain waste that could cause recycling problems such as electronics, cylinders, and hazardous waste packaging. Plastic waste bins cannot contain packaging containing insecticides. Disposal of hazardous waste into residual municipal waste bins is also be prohibited.

2.5.2.2 Western European countries: Germany, Ireland, and the Netherlands

<u>Germany</u>

In Germany, the following main measures are laid down in relation to the prevention and control of the proper management of hazardous waste:

- The waste shipment control: All waste (including hazardous waste) may only be transported by vehicles bearing a special mark ('A') (Article 55 of Federal Law on Waste Management);
- Appropriate competence of waste producers and specialists in waste management: according to the Federal Law on Waste Management, in an enterprise generating hazardous waste, there must be a specialist responsible for waste subject to strict qualification requirements;
- Security clearance of waste managers: under the Federal Law on Waste Management, waste management permits (irrespective of the type of a permit) are granted only to enterprises meeting certain reliability criteria.

As an exceptional example of good practice in the prevention and control of the proper management of hazardous waste, it is important to mention the Ordinance on the Record-

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[76] https://mst.dk/affald-jord/affald/bygge-og-anlaegsaffald/.

[77] https://www.retsinformation.dk/eli/lta/2020/2159.

keeping for the Disposal of Waste[78] that is issued with the aim to implement the requirements of Articles 49 and 50 of the Federal Law on Waste Management. It regulates the verification of the end of treatment of hazardous waste and the prior approval of the suitability of the intended method of treatment.

In principle, all actors in the hazardous waste management process — hazardous waste producers, holders, collectors, transporters, and processors — must provide proof of proper management of this waste to each other and to the competent authority. Since the introduction of the Electronic Waste Inspection Procedure (eANV) on 1 April 2010, the paper-based procedure used hitherto has been replaced by an electronic procedure. The eANV involves both the exchange of data between commercial undertakings involved in the waste management process and the transmission of data to the responsible supervisory authorities. In general, where a waste producer plans to transfer waste to a particular waste manager, they must, through the eANV, provide detailed data on the waste process in which it was generated, its composition and other information used to identify the waste. The transfer of waste to the waste manager is subject to verification by the competent authority of this information and confirmation that the waste may be transferred to the notified waste management method. Where waste is transferred to the waste manager (be it the collector, the carrier, or the final management enterprise), all actors in the process must record the receipt and transfer of the waste through the eANV and the treatment facility must provide information on the completion of the disposal.

2.5.2.3 Neighbouring countries: Poland and Latvia

Poland

Poland’s National Waste Prevention Programme of 2014[79] for hazardous waste includes the following measures:

1. Implementation of ecodesign principles in the following ways:
   1) reduce the use of harmful substances at the production stage;
   2) implement clean production processes generating low waste;
   3) implementation of quality and environmental management systems in industrial enterprises;
   4) implementation of procedures for registration, evaluation, and authorisation of chemicals (REACH);
   5) introduction of eco-labelling for products meeting specific criteria.
2. For household chemical substances, plant protection products, paints, etc.:
   1) education in the field of eco-labelling and reduced use of particularly dangerous substances;
   2) education in the field of conscious purchasing;
   3) education on separate collection of hazardous waste to protect contamination of other waste.

In Poland, controls on waste collectors and waste managers are tightened, starting at the very initial stage of permit issuance. An application for a permit must contain:

[78] https://www.gesetze-im-internet.de/nachwv_2007/BJNR229810006.html.

[79] https://archiwum.mos.gov.pl/srodowisko/odpady/zapobieganie-powstawaniu-odpadow/.

- statement of clean judicial record with regard to environmental crimes or crimes against public health;
- statement of clean judicial record with regard to environmental offences;
- a statement that in the last 10 years no final decision on withdrawal of a waste collection permit, a waste recycling permit, a waste collection and processing permit, or a waste production permit covering waste collection and recycling has been issued, or no administrative pecuniary penalty in an amount exceeding in total PLN 150,000.

Video surveillance cameras directly accessible to the Voivodship Environmental Protection Inspector must be installed during the operation.

A specialised Department for combating environmental crime has been established within the structures of the Chief Inspectorate for Environmental Protection. The Department for combating environmental crime carries out tasks above the Voivodship level directly with the authorities involved in combating environmental crime and cooperating internationally through the exchange of information and experience. These measures allow for rapid and effective coordination at inter-regional level.

Penalties for environmental offences have been increased. These penalties are still planned to be increased and tightened in the future.

Latvia

In Latvia, Article 12(1) of the Waste Management Law[80] defines one of the preventive measures – obligation for waste managers to hold a financial security. This requirement applies to all waste managers whose activities are subject to a waste management permit or a pollution permit. The Law also provides for exceptions in which cases the requirement to hold a financial security does not apply, but the exception covers activities of management of non-hazardous waste; therefore, all persons required under the Waste Management Law to obtain a permit (for waste management or pollution) must hold financial securities.

Waste Management Law, Article 12

(1 ^{2}) In order to obtain a permit for the activities referred to in Paragraph one of this Section, and also for the recycling or recovery of waste in accordance with the laws and regulations regarding pollution, the waste manager shall submit a financial security to the State Environmental Service. The financial security shall be a first demand guarantee letter issued by a credit institution or an insurance policy issued by an insurer which includes irrevocable commitment of the insurer to disburse the insurance compensation upon the first request of the State Environmental Service, and also incontestability of such request.

(1 ^{3}) The waste manager shall maintain the financial security in effect throughout the term of operation of the permit. If during the term of operation of the permit the waste manager does not have a valid financial security, the operation of the permit is suspended until submission of the relevant security to the State Environmental Service.

(1 ^{4}) The State Environmental Service is entitled to request the compensation of the financial security either in full or partial amount depending on the execution of the commitment of the waste manager. The State Environmental Service shall utilise the received compensation to cover the expenditures in cases where the waste manager:

1) has failed to transport the waste to the intended place and collection, transport, storage, or recycling of the relevant waste must be ensured;

2) has failed to recycle or recover waste in the specified volume and the recycling and recovery thereof must be ensured;

3) has failed to ensure the re-cultivation of a closed or re-cultivated waste dump after digging up of the waste dump and resorting of waste and re-cultivation of the territory must be ensured.

(1 ^{5}) The amount of the financial security shall be determined, taking into account the type of the permit for a waste management, recycling, or recovery activity.

(1 ^{6}) The State Environmental Service has the right to request that the provider of the financial security disburses the amount of the financial security within six months after expiry of the term of the financial security if the basis for such disbursement has incurred during the term of operation of the financial security.

[80] https://likumi.lv/doc.php?id=221378.

Other preventive measures in Latvia concerning the management of hazardous waste are the requirement to keep records of waste applicable to all hazardous waste producers and managers.

2.5.2.4 Other countries: Canada

Ontario Regulation 449/21[81] (Canada) on Hazardous and Special products, initiating the transition from the Municipal Hazardous or Special Waste (MHSW) Program to the Producer Responsibility Model for Hazardous and Special Products, entered into force on 1 July 2021. The new Producer Responsibility Model and its implementation mean that producers (and not municipalities) will undertake financial and operational obligations related to the collection, handling, recycling, and disposal of their products.

The Hazardous and Special Products Regulation determines which dangerous and special products are covered by the Producer Responsibility Model. These products are divided into five categories:

- Category A: non-refillable pressurized containers and oil filters;
- Category B: antifreeze, oil containers, paints and coatings, pesticides, refillable pressurized containers, and solvents;
- Category C: devices that contain mercury, including barometers, thermometers, and thermostats;
- Category D: fertilisers; and
- Category E: refillable propane containers.

Producers are therefore responsible for responsible for collecting, managing and/or promoting the recycling or proper disposal of these products:

- Non-refillable pressurized containers (Category A)
- Oil filters (Category A)
- Antifreeze (Category B)
- Oil containers (Category B)
- Paints and coatings (Category B)
- Pesticides (Category B)
- Refillable pressurized containers (Category B)
- Solvent (Category B)

. The producer responsibility applies only to the products listed with containers (packages) of 30 litres or kilograms or less. The producers of the regulated products are responsible for the products from cradle to grave[82].

Similarly to other provinces, the new Ontario Regulation on Hazardous and Special Products allows producers of regulated substances to conclude a contract with a producer responsibility organisation. These organisations provide collection, management, and administration services to help manufacturers comply with legal requirements.

Collection and management of hazardous and special products waste. The Regulation lays down requirements for producers to set up a number of collection points for hazardous and special products, depending on the size of the producer, the type of product, the points of distribution, and the population in the municipality.

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[81] https://www.ontario.ca/laws/regulation/r21449.

[82] https://www.dragun.ca/hazardous-and-special-products-regulation-comes-into-force-on-july-1st/.

Each producer of dangerous and special products of categories A, B, C or E must ensure that the waste is disposed of no later than three months after the date of collection of the hazardous and special products.

If producers have collected hazardous and special product waste referred to in column 1 of the table below through the collection system special products, they must ensure, from 1 January 2023, that such waste is recycled in installations with an average recycling efficiency of at least the value indicated in column 2 of the table below (Table 11).

Table 11. Efficiency indicators for the recycling of hazardous and special products waste for waste managers

Hazardous and special products waste	Average recycling efficiency Index (%)
1	**2**
Antifreeze	90
Barometers, thermometers, thermostats	90
Non-refillable pressurized containers	95
Oil containers	95
Oil filters	95
Paints and coatings	75
Refillable pressurized containers	95
Solvents	10

Manufacturers of oil filters must ensure the management of at least 85% of waste, and manufacturers of non-refillable pressurized containers of at least of 20% (2022) and at least 30% of waste (since 2025) in terms of the average volume of products placed on the market, calculated as the average over the last three years.

2.5.2.5 Prevention and control measures – summary of experience of other countries and overview of possibilities to adapt it in Lithuania

When analysing prevention and control measures in other countries, it should first be noted that, in practice, in all countries, as in Lithuania, the requirements of the WFD concerning the obligation for Member States to ensure that hazardous waste is accounted for, including its transfer for management and traceability, are met through the development of electronic systems.

Specific accompanying measures in addition to the obligation to keep records of the generation and movement of hazardous waste, such as the so-called 'approval procedure' in Germany, which involves the producers of certain hazardous waste, must obtain the consent of the competent authorities before making a decision to transfer hazardous waste to a particular treatment, could be considered as good practice.

As regards control measures for shipments of waste, examples of best practice could be assessed in some countries (e.g. Germany, Poland, Austria) the requirement to only transport waste by vehicles bearing a special mark (specific requirements for vehicles also apply in Germany).

2.5.3 Measures taken to resolve the management of hazardous waste that is ownerless or attributable to bankrupt enterprises or those under liquidation due to bankruptcy

This point contains the measures applied by state institutions of other countries when dealing with the management of hazardous waste that is ownerless or attributable to bankrupt enterprises or those under liquidation due to bankruptcy. The decisive point of this Chapter contains proposals for the application of analogous measures in Lithuania.

2.5.3.1 Measures taken in other countries to resolve the management of hazardous waste that is ownerless or attributable to bankrupt enterprises or those under liquidation due to bankruptcy

2.5.3.1.1 Nordic countries: Sweden, Denmark, Norway

Sweden

According to Chapter 10 of the Environmental Code (1998:808)[83], liability for environmental damage and serious environmental damage is divided into two groups: for the operator and the landowner.

Point 2 of Chapter 10 of the Environmental Code establishes that the person who has carried out the business activities (operator) or taken actions which led to the pollution is responsible for the measures necessary to eliminate the pollution or harm to human health or the environment. Where several operators are responsible for pollution, they must be jointly and severally liable for the measures to be taken to eliminate pollution.

Where there is no operator able to perform or pay for the environmental damage, the environmental protection authority may claim compensation from the owner who owns or has owned the polluted area, provided that the owner knew or should have known about the pollution at the time of purchase of the property or land.

According to the information prepared by the Cooperation Group of County Administrative Boards[84], the enterprise in bankruptcy wherein dangerous substances for the environment are stored or have been stored and thereby cause or have caused damage to the environment is held liable for the repair of damage. The environmental supervisory body may instruct the enterprise in bankruptcy about the application of measures in accordance with Article 10 of the Environmental Code.

Under the Law on Bankruptcy, the bankruptcy administrator must notify the environmental supervisory body if they have reason to believe that the bankrupt debtor has left chemical products, biotechnological organisms, or hazardous waste to be disposed of. The obligation to notify must also apply where there is a suspicion of soil or water contamination.

According to the information published in the Swedish press[85] on the fire and bankruptcy of the company AB Think Pink, it was stated that when the liquidator was unable to manage the waste and the owner of the property was absent, i.e. there was no contact point, the municipality was responsible for the waste management of that company. This article poses the question of who is responsible when waste remains untreated, and the liable enterprise or landowner is no longer present. In such a case, the municipality is faced with the question of what to do. Many businesses and industries are located in small municipalities, which may make it quite difficult for the municipality to manage abandoned waste. In line with this grievous practice, proposals have been made that the government should consider establishing a framework to deal with such situations.

One option currently under discussion is that regulators such as municipalities should be able to require the waste management enterprise to ensure financial security by covering environmental damage or recovery costs. This will protect taxpayers from being covered by their funds after the enterprise's bankruptcy.

83 https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/miljobalk-1998808_sfs-1998-808.

84 https://www.miljosamverkansverige.se/wp-content/uploads/Handlaggarstod-ekonomiska-sakerheter.pdf.

85 https://www.dagenssamhalle.se/offentlig-ekonomi/kommunal-ekonomi/sopskandalen-kostar-laxa-8-miljoner-hade-vi-kunnat-gora-nagot-roligare-for/.

Another proposal is that waste should not be stored for more than three years until it has been disposed of. The aim is to stop the movement waste of unscrupulous companies from various locations to evade sorting and recycling.

Denmark

According to the information provided by the Danish Horten law-firm on the environmental conditions on bankrupt properties[86], it is established that, in the event of the bankruptcy of an enterprise that receives, produces and stores environmentally hazardous waste, and the bankrupt estate does not continue to operate the undertaking, the environmental authorities have a duty to dispose of the waste of the bankrupt enterprise.

Environmental authorities may use several measures to cover the risk of any management costs, such as:

1. Establish conditions for ensuring safety in case of environmental approval of an enterprise;
2. Notify the claim in the bankruptcy case; or
3. Examine the possibility of bringing an action for damages against the responsible management of the enterprise in bankruptcy.

In the case of waste left over by certain enterprises that must have a financial security for their activities, environmental authorities may cover the costs of waste management by that financial security. It should be noted that the security covers the costs incurred by the supervisory body in relation to the subsequent waste transportation and disposal or other management of waste. Therefore, other costs, including the costs of restoring the polluting enterprise's assets, are not covered by the security.

The environmental authority may bring an action for damages against the management of the enterprise in bankruptcy. Management members would be held liable if, in the performance of their duties, they deliberately or negligently have caused damage to third parties and if other conditions for compensation have been met.

However, often none of these options is appropriate, for example, because a financial security cannot be required because no financial security can be reclaimed or due to the lack of funds in insolvency proceedings to satisfy ordinary claims.

These challenges, which mean that, in the event of bankruptcy, environmental authorities are often responsible for the waste management of an enterprise in bankruptcy, increasingly lead to the need for legislative changes. One of the amendments proposed by the Law on Environmental Protection is to provide for the extension of the security to include several activities that are particularly harmful to the environment.

Norway

Municipalities announce tenders for the collection and management of ownerless waste. Waste is managed from the municipal waste charge.

Upon bankruptcy of a waste management enterprise where hazardous waste is stored, the bankruptcy administrator must immediately inform the competent authority about the types and quantities of hazardous waste left. The notification obligation does not arise until the total amount of hazardous waste does not exceed 1 kg. The waste of a waste management enterprise in bankruptcy is managed with the funds of a security issued for the benefit of the responsible authority.

2.5.3.1.2 Neighbouring countries: Poland and Latvia

[86] https://www.horten.dk/viden/artikel2021/miljoforhold-paa-konkursramte-ejendomme.

Poland

In recent years, the number of cases of unscrupulous waste managers leaving waste has increased in Poland. Illegal disposal of waste takes place in forest areas, quarries and abandoned industrial areas. A major problem is that fraudulent operators leave waste on premises and on a private holding.

Article 24b of the Law on Waste lays down the distribution of responsibilities to treat waste that is shipped in breach of the provisions of the Law, namely,

1. where no entity responsible for the management of detained waste is established, the entity carrying out the shipment of waste must manage the waste at its own expense;
2. where waste holders responsible for waste management are identified, they must manage the waste at their own expense;
3. the decision to oblige the operator referred to in point 1 or 2 to dispose of the waste is determined by the starosta who has the competence in the location where the shipment of the waste was stopped.

The decision must be enforced immediately.

Articles 26 and 26a of the Law on Waste determines who must immediately remove the waste from a location not intended for its storage, namely:

- the waste holder must immediately remove the waste from a location not intended for storage thereof;
- if the waste is not disposed of, the mayor of the municipality, town, or city, by an ex officio decision, obliges the waste holder to remove the waste from a location not intended for its storage, unless the obligation to dispose of the waste arises from the decision revoking, annulling, or terminating another decision relating to the waste management;
- the order to remove waste from closed areas owned by the municipality must be issued by the competent regional environmental protection director.

If the waste holder does not have the right of ownership over the immovable property from where they must remove the waste, the landowner must permit the waste holder to remove the waste from the immovable property and, in the event of execution of a replacement decision, it is the obligation of the executive institution.

Where the risk to human life or health, or the environment necessitates the immediate disposal of waste, the competent authority takes measures to dispose of and manage the waste.

A competent authority is:

1) where the landowner is a municipality, the responsible authority is the regional environmental protection director;

2) where the obligation to dispose of the waste arises from the decision revoking another decision relating to the waste management, the responsible authority is the body authorised to adopt, annul, revoke, or terminate the decision relating to the waste management;

3) in other cases, the responsible authority is the mayor of the municipality, town, or city.

3. For the purpose of disposing of waste, the competent authority, by the decision addressed to the landowner, determines:

1) the size and date of the accumulation of waste on a plot of land, facilities, or other location;

2) the scope and methods of carrying out activities aimed at the removal of waste;

3) the date of commencement and completion of the shipment.

4. The decision referred to in paragraph 3 is taken after approval has been given for the immediate shipment of the waste by:

1) the Voivodship Environmental Protection Inspector;

2) appropriate bodies of the State Sanitary Inspectorate or Military Sanitary Inspectorate within their authority concerning:

(a) an assessment of the significant risk to human life and health due the presence of waste,

(b) contamination of water intended for human consumption by the presence of waste;

3) the regional environmental protection director, except for the cases when the decision is taken by this institution;

4) the district (city) commander of the State Fire Service.

5. The competent authority requires the waste holder responsible for waste management to reimburse the costs of the waste disposal and management activities. These costs must be reimbursed by the waste holder within 14 days from the date of submission of the application.

6. If the waste manager fails to reimburse the costs within the specified time limit, the competent authority issues a decision on the allocation of funds from the financial security of the waste manager.

7. Where the waste manager does not have a financial security, the competent authority, by decision, obliges the waste holder to reimburse the costs, indicating the amount of those costs and the method and date of reimbursement.

If the operator who has unlawfully transported the waste cannot be found, the obligation to remove the waste lies with the owner of the property, who must bear the full cost of the removal.

Where immediate action is required in the event of this situation, the removal of an illegal landfill is ensured by the municipality. In these circumstances, the municipality finances those activities from its own resources and recovers the costs incurred from those responsible for the regular disposal of the waste.

The Criminal Code provides for penalties and even imprisonment for 3 months to 5 years for the illegal storage and management of waste.

An illegal landfill may be notified in a special interactive form developed on the website of the Chief Environmental Inspectorate: https://www.gios.gov.pl/pl/zglos-interwencje-formularz.

Latvia

In Latvia, as in all EU Member States, there is a requirement for enterprises engaged in waste management activities to have a financial security; however, in Latvia, there is an additional requirement that can be applied as one of the measures to reduce risks from the generation of ownerless waste or the transfer to the State budget of the financial burden of waste management of enterprises in bankruptcy; the Waste Management Law requires the provider of the financial security to pay the amount of the financial security within six months of the expiry of the financial security period.

2.5.3.1 Measures to resolve the management of hazardous waste that is ownerless or attributable to bankrupt enterprises or those under liquidation due to bankruptcy – proposals for the application of measures in Lithuania

In principle, in all countries, the legal framework provides that the operator is to bear the fiscal responsibility for the management of operational waste; however, since experience shows that this responsibility is not always enforceable, additional measures have been introduced in some countries.

Preliminary it should be noted that the implementation of the WFD requires all countries to have a financial security for enterprises treating hazardous waste, which could be used in cases where activities are suspended for one reason or another and the operator does not manage the remaining waste or where the waste manager goes bankrupt. The funds of that financial security may be used to compensate the competent authorities (depending on the State administrative structure, either local authorities or authorities responsible for environmental protection control) for the costs of waste management.

2.6. Proposals on the application of foreign practices in Lithuania and improvement of legal acts

As indicated above (see Chapter 2.1), all the provisions of the Waste Framework Directive and related EU legislation on the identification and classification of hazardous waste have been transposed into the national legal frameworks of Lithuania, as well as those of other countries whose situation has been analysed in the context of this Report. However, in Lithuania, the procedures for identifying and classifying hazardous waste are still complex and unclear for most of interested parties. The surveys showed another weakness in the system: it is not clear which authorities (Environmental Protection Agency or Environmental Protection Department) are responsible for providing methodological assistance and advice on the identification and classification of hazardous waste. It should be noted that in most of the countries whose experience has been examined in the preparation of this Report, responsibility and functions for providing such methodological assistance are assigned to a particular competent authority (depending on the administrative management structure of the country); while in some countries (e.g. Germany, Denmark), there are cases where the accuracy of the identification of waste needs to be coordinated with the competent authority before waste is transferred to waste managers. At present, in Lithuania, the correctness of the identification of waste carried out by waste producers can only be verified when an IPPC or pollution permit is issued (amended, revised) or when an activity inspection is carried out (as indicated above (see Chapter 2.3.1.3), during the inspection, the waste is identified, usually visually or by reference to the safety data sheet of the product from which the waste was generated); for other waste producers, there are no procedures in place for verifying the correct identification of waste.

In this context, the following options to address the identified problems should be considered:

- The legislation (the Law on Waste Management or the Law on State Control of Environmental Protection, the Regulations of the Environmental Protection Agency and the Environmental Protection Department) should clearly define **which authority is responsible for consultation, provision of methodological support**, **and resolving disputed situations** (e.g. where a waste producer and a waste manager cannot reach an agreement) in the area of the identification and classification of hazardous waste.
- The obligation for certain **groups of waste producers to provide evidence of the correct identification of waste to the competent authority for approval** should be considered, e.g. in cases where a waste producer is not required to hold an IPPC permit for the activities carried out, the resulting waste is identified by the mirror non-hazardous waste code and falls within one of the identified problem streams (see Chapter 2.3.4, Table 9).

The Overview has also found the need **to regulate the concept of 'nominally empty packaging'** to avoid disputes in the identification and classification of waste from empty or nominally empty packaging (see Chapter 2.4.4 for details).

As indicated above (see Chapter 2.3.2), in terms of laboratory testing, the key problem identified during the surveys is that there is no accredited laboratory in Lithuania to carry out waste composition tests, and therefore the following options to address this problem should be considered:

- The feasibility should be considered to obtain accreditation for waste testing by the EPA laboratory (or at least a part of it) given the current technical capacity and/or subject to the extension thereof.
- The financing facilities should be planned to encourage accreditation processes for private laboratories.

The following recommendations and/or proposals are added subject to the evaluation of the comments and proposals received while drafting the Guide and the public presentation thereof[87]*:*

- *In Lithuania, the obligation to have specialists with proper qualifications is imposed only on hazardous waste managers and hazardous waste producers, although to properly identify hazardous waste and take appropriate decisions on its storage at source and transfer for further management there is indeed a need for specific knowledge. Considering the above, the regular training on the management and identification of hazardous waste should be considered for waste producers in the ME/EPD/EPA or through public procurement.*
- *Given the complexity of the hazardous waste identification process, it is recommended to consider the following measures in the future to facilitate the challenge of the identification of hazardous waste:*
    - *The information on the hazardous properties of waste produced in Lithuania should be collected and stored (possibly by the competent authority indicated in the above recommendations), by placing the data on a public database, thus allowing economic entities and representatives of public authorities to have access to the information on the hazardous properties and hazardous substances that may render the waste hazardous; where necessary, the Guide should be updated accordingly on the basis of the data received;*
    - *The inventory of hazardous waste (or waste that can be both hazardous and non-hazardous, depending on the properties) generated in Lithuania should be drawn up based on the above data, including the concentration limits of certain substances that render the waste hazardous*[88]*;*
    - *Based on the above data, the Overview, and the Guide, a support tool should be developed (e.g. a spreadsheet) to identify certain hazardous waste that is most frequently produced in Lithuania; this tool should be updated regularly, taking into account the available data;*
- *It is proposed to entrust one of the bodies subordinate to the ME or to set up an authority to provide advice to waste holders on the identification of waste and to allocate funds for the development of such an authority, setting long-term objectives for improving the control of waste identification and developing the application of the Guide; it is also recommended that the support for the waste identification studies should be planned, so that studies on the identification of relevant hazardous properties of waste could be carried out by associations, scientific and research institutions or other bodies, the results of which would be made publicly available in a regularly updated database;*
- *The cases of the mandatory documented evidence of the waste identification procedure should be regulated;*
- *At present, the List of waste provides one code for the identification of hazardous waste of contaminated soil (17 05 03* – soil and stones containing dangerous substances); this code should identify hazardous soil waste contaminated with different hazardous substances and, as appropriate, with different hazardous properties and proper handling methods. For example, treatment technology for oil-contaminated soil waste may be absolutely inappropriate for treating heavy metal-contaminated soil waste. Therefore, the proposal to introduce national eight-digit waste codes for identifying hazardous waste from contaminated soil, depending on the contaminating substances contained in the waste, should considered. For example, a separate code could be used only for oil-contaminated soil waste (or where*

[87] The information was updated after the coordination of the Overview, on 14 April 2022.

[88] This list should be supplemented and updated on a regular basis.

contamination with oil products is significantly higher than that with other substances), heavy metal-contaminated soil waste, etc. Before deciding what national eight-digit codes are needed and how many of them should be added, it is plausible to carry out the analysis (at least a survey of waste producers and managers handling the contaminated soil) aimed at identifying the types of contaminated soil waste most commonly produced in Lithuania;

- *The manuals for the stream classification and management of certain waste should be developed. The question of how to correctly identify and classify wood waste, but also how to handle certain types of wood waste, is becoming increasingly important. For example, different practices are in place in foreign countries for the classification of impregnated wood waste, which is unambiguously classified as non-hazardous waste in some countries (e.g. in Austria), while others require testing (e.g. the United Kingdom), or such waste is considered hazardous (e.g. in Germany). Some countries also argue that such waste cannot be used as solid biofuels in industrial boilers (e.g. in Finland), but it can be incinerated as non-hazardous waste in waste incineration or co-incineration plants only. As the market situation for biofuels evolves, demand for the recycling of wood waste into furniture panels increases; therefore, there is a need for an informative, comprehensive, and clear guide to the classification and management of wood waste.*

As indicated above (see Chapter 2.5.2.5), in Lithuania, as in other countries whose experience has been analysed in the preparation of this Report, the permits for waste management activities are issued subject to the provisions of the Industrial Emissions Directive and the WFD on the obligation to hold a permit for waste treatment, which have been transposed into national legislation; in general, any waste treatment activity must be subject to a certain type of permit (in Lithuania, it is an IPPC or a pollution permit). However, some countries (e.g. Poland, Germany) have established not only environmental criteria but also **reliability criteria** to be met by an undertaking intending to carry out waste treatment activities (there is a practice to verify not only technical and environmental indicators but also the reliability of the operator prior to the issuance of a permit, i.e. to assess whether the person wishing to carry out the activity has committed administrative environmental offences or criminal offences in the past). Similarly, in some cases, a permit **is required not only for waste treatment activities but also for waste generation**, which ensures stronger control of waste management at the beginning of the process, at the source of the waste. However, to decide whether such good practices of other countries could be applied in Lithuania, an additional assessment should be carried out to:

- find out whether there are trends in Lithuania indicating that violations related to waste management are committed by persons who could be considered unreliable (e.g. convicted under the Criminal Code);
- conduct an analysis of potential producers of hazardous waste to decide in which cases activities that do not require an IPPC should be subject to a permit requirement for the generation of hazardous waste.

It should be noted that the above proposals are preliminary and need to be assessed in a holistic way in the context of other measures foreseen in this Report and the Guide.

3 Reference List

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4 Annexes

Annex 1. Report on the results of the population survey conducted by 'Spinter research' (UAB Spinter tyrimai) 'Survey of the country's population on the generation and sorting of hazardous waste in households' (in Lithuanian)

Annex 2. Classification of household hazardous waste in Ireland