Waste Management Systems in three EU Countries

Options & Recommendations for the Improvement of the Hazardous Waste Management System in Serbia

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<th>Description</th>
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<tr>
<td>ADR</td>
<td>European Agreement concerning the International Carriage of Dangerous Goods by Road</td>
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<td>ALSAG</td>
<td>Altlastensanierungsgesetz = Austrian Act on the Remediation of Contaminated Sites</td>
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<td>ASYS</td>
<td>German electronic waste supervision system</td>
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<td>AWG</td>
<td>Abfallwirtschaftsgesetz = Austrian Act on Waste Management</td>
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<td>BMUB</td>
<td>Federal Ministry of Environment, Nature Conservation, Construction and Reactor Safety</td>
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<td>BREF</td>
<td>Best Available Techniques Reference</td>
</tr>
<tr>
<td>CIEP</td>
<td>Chief Inspectorate of Environmental Protection</td>
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<td>EEE</td>
<td>electric and electronic equipment</td>
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<td>ELV</td>
<td>End of life vehicles</td>
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<td>EMAS</td>
<td>Eco Management and Audit Scheme</td>
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<td>EPF</td>
<td>Environmental Protection Fund of Poland</td>
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<tr>
<td>IPPC</td>
<td>Integrated Pollution Prevention and Control – IPPC-plants are defined by the EU Industrial Emission Directive (2010/75/EU)</td>
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<td>Mg</td>
<td>Megagram (tonne)</td>
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<tr>
<td>MoAE</td>
<td>Ministry of Agriculture and Environment of Saxony-Anhalt</td>
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<tr>
<td>MoE</td>
<td>Ministry of Agriculture and Environmental Protection of the Republic of Serbia</td>
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<tr>
<td>NGO</td>
<td>Non-Governmental Organisations</td>
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<td>PEPL</td>
<td>Polish Environmental Protection Law</td>
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<tr>
<td>PPP</td>
<td>Polluter Pays Principle</td>
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<tr>
<td>PRO</td>
<td>Producer Responsibility Organisation</td>
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<td>PRTR</td>
<td>Pollution Release and Transfer Register</td>
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<td>PWMA</td>
<td>Polish Waste Management Act</td>
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<td>UBA</td>
<td>Federal Environment Agency, technical authority of the BMUB</td>
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<td>WEEE</td>
<td>Waste from electric and electronic equipment</td>
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<td>ZKS</td>
<td>Central coordination unit to realise the electronic federal-wide notification of hazardous wastes</td>
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1 INTRODUCTION

Serbia intends to transpose EU waste legislation into Serbian law by the end of 2018 and to transform the Serbian waste management system so that it becomes fully compliant with EU waste management and environmental protection standards as early as possible. In order to meet this objective Serbia faces considerable challenges.

Within the Twinning Project “Improvement of hazardous waste management in the Republic of Serbia” the waste management systems (as regards specific waste streams) of three EU countries were reviewed and analyzed, and compared with Serbian practices. Taking into account the experiences of Austria, Germany and Poland options for improvement of the hazardous waste management system in Serbia were proposed.

The analysis covers the following topics:

- Institutional framework, distribution of responsibilities and administrative set up of hazardous waste management
- Organisation of collection and treatment of hazardous waste
- Financing schemes
- Key merits and drawbacks of the respective system of hazardous (respectively specific waste stream) management
- Hazardous waste generation and treatment, collection and recycling/recovery rates achieved
- Specific legislation
- Involvement of stakeholders in the management of the specific waste streams, public awareness campaigns, information/training of waste management sector experts.

In the country fact sheets the level of detail of the single topics may be different, as only information is shown, which is deemed of being relevant for Serbia.

The final chapter of this report summarises the key success factors of the respective hazardous waste management systems and proposes options for the improvement of hazardous waste management in Serbia.

In order to facilitate a comparison of the government structures of the three covered countries with the administrative structure of Serbia, Table 1 shows the names used for the different administrative levels in these countries. Taking into account the average size, the local self-government unit in Serbia is more comparable to the district/sub-region level in Austria, Germany and Poland than to the city/town/village level. However, the Serbian local self-government unit fulfils the administrative tasks of both the district level and the level of cities/towns/villages.

<table>
<thead>
<tr>
<th>Administrative level</th>
<th>Serbia</th>
<th>Austria</th>
<th>Germany</th>
<th>Poland</th>
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<tr>
<td>Total state</td>
<td>Republic of Serbia</td>
<td>Federal Republic of Austria (federal level)</td>
<td>Federal Republic of Germany (federal level)</td>
<td>Republic of Poland (state)</td>
</tr>
<tr>
<td>Region</td>
<td>General level)</td>
<td>State)</td>
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<td>----------------------------------------------------------------------</td>
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<td>---------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Region</td>
<td>Autonomous province</td>
<td>Bundesland (province)</td>
<td>Bundesland (federal countries)</td>
<td>województwo (region)</td>
</tr>
<tr>
<td>District/sub-region</td>
<td>Local self-government unit (municipality)</td>
<td>Bezirk (district)</td>
<td>Kreis (county)</td>
<td>powiat (sub-region)</td>
</tr>
<tr>
<td>City/town/village</td>
<td>Gemeinde (local community, municipality)</td>
<td>Gemeinde (community, municipality)</td>
<td>gmina (municipality)</td>
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</table>
2 FACT SHEET AUSTRIA

2.1 Institutional framework, distribution of responsibilities and the administrative set-up

2.1.1 Competent authorities:

Austrian public administration is organised by 4 levels,
- the national = federal level
- the level of the 9 provinces
- the level of the 80 districts and 15 towns with a statute of their own
- the level of the 2,100 local communities (municipal level).

According to the Federal Constitutional Law of Austria, the legislative powers for hazardous waste management as well as the powers for the implementation and enforcement of the legal provisions are assigned to the national (federal) level. In respect of any other waste, legislative and enforcement powers are assigned to national (federal) level only in so far as there is a need for the issue of uniform regulations.

Provisions for hazardous waste management and provisions for other waste in so far as there is a need for the issue of uniform regulations are laid out in the Austrian Waste Management Act 2002 (Abfallwirtschaftsgesetz 2002 – AWG 2002).

For any matter of waste management not regulated by the Austrian Waste Management Act, the powers for legislation and enforcement are assigned to the province governor.

In general, as laid down by the Federal Constitutional Law, enforcement is a matter of so-called “Indirect Federal Administration”. This means that federal authority is delegated to competent authorities and administrative bodies at province level.

This means in practice that in each province the treatment plants for hazardous waste and the treatment plants for non-hazardous waste are permitted and inspected by the same administrative entities. The competent authority acts either on behalf of the Minister of Agriculture and Forestry, Environment and Water Management (Indirect Federal Administration) or on behalf of the province governor.

Some competences (e.g. administrative penal authority) are delegated further to the district level.

Transfrontier waste shipment of hazardous waste is a matter of so-called “Direct Federal Administration”. The Minister of Agriculture and Forestry, Environment and Water Management is the competent authority for permitting and inspection of any transfrontier shipment of waste which has to be notified according to the EU-Waste Shipment Regulation.

In any of the provinces, the administrative set-up for the enforcement of legal provisions for waste management provides for a legal department and for a technical department. Usually, the legal department acts as the competent authority. They grant or deny permits for any matter of waste management requiring a permit, especially operational permits for waste treatment installations. If in the course of inspections any infringements against legislation respectively permit conditions are detected, the legal department is responsible for issuing an official notice of the infringement which is then forwarded to the penal authority.
The technical department carries out the appraisal of technical documentation accompanying permit applications and they assess if best-available technology is applied in accordance with national and international standards. During inspections they take stock of current operational conditions and they assess whether – from a technical point of view – permit conditions are met.

Thus, there are no separated organisational units for permitting and for inspections. Instead, the legal and the technical department cooperate in carrying out the tasks of the public authority for permitting and inspections: The technical department provides an expert’s opinion on each individual case, based on the assessment of documents and on findings during site visits. Staff from the legal department participates in inspections. The legal department acts as competent authority, granting or denying permits or issuing official notice of infringements. They act on basis of their legal assessment of application documents, of findings of site visits and of the expert recommendations provided by staff from the technical department.

With regard to special waste streams for which the concept of producer responsibility has been established by law, the Minister of Agriculture and Forestry, Environment and Water Management may entrust certain tasks of the public authority to designated bodies. Up to now, two such bodies have been established, the clearing house for waste for electrical and electronic equipment and the clearing-house for packaging waste. The Austrian Waste Management Act enumerates the tasks which may be delegated by official notice.

2.1.2 Inspection Obligations and Powers of Inspectors

The governor of the province is obliged to inspect the producers of hazardous wastes, waste collectors and conditioners regularly in an appropriate manner. Inspection is performed by a technical expert mandated by a legal expert. The technical expert prepares an expertise based on the inspection including recommendations on which measures should be taken. The legal expert decides which measures are to be taken by the inspected plant/company.

Waste collectors and treatment plants for hazardous wastes have to be inspected at least every five years. The governor of the province may delegate the implementation of inspections of treatment plants to the district administration body, and may also authorise this body to issue instructions and orders on his behalf.

The inspection of compliance with obligations with regard to packaging, end-of-life vehicles or electric and electronic appliances is the responsibility of the Federal Minister of Agriculture, Forestry, Environment and Water Management.

If the inspection incurs exceptional costs, in particular due to the consultation of experts, the inspected persons/companies may be held liable for reimbursement of such costs, when the inspection has given reason to initiate an administrative procedure and results in a legally binding punishment.

To the extent necessary, the authorities responsible for the enforcement of the Waste Management Act within the scope of their competences, the police and customs officials within the scope of their powers and the experts consulted by them are authorised to enter and inspect property and buildings, stop means of transportation, open inspect containers and means of transportation, demand the required information, inspect the necessary documents and demand presentation of the necessary documents, including the stock records and other operating records. Any customs identification marks removed shall be replaced by corresponding official identification marks.
The owner of the property, the owner of a plant or the representative of these persons have to be informed no later than on entry to the property or installation, where possible. In the case of imminent danger, the owner of the property or plant may be informed later.

The above mentioned authorities or the experts consulted by them are authorised to take samples for testing purposes in the required quantity without indemnification.

If (hazardous and non-hazardous) wastes are not collected, stored or treated in accordance with the provisions of the Austrian Waste Management Act or ordinances based on it, or if a material, good, or product is declared waste and has to be treated as waste in order to prevent impairments of the public interest, the authority shall order the owner of the waste or owner of the plant to implement the necessary measures, including the interdiction of unlawful action by official notice.

In the event of imminent danger, the authority shall order the immediately necessary measures and shall have these implemented at the cost of the owner of the waste or the owner of the plant.

If the owner of the waste or the owner of the plant cannot be determined or is for legal or other reasons not able to implement the measures, the owner of the property will be held liable for implementing the measures imposed by the authority or to carry the cost implemented by the authority in order to ward off immediate danger.

If the property owner cannot be held liable either, the municipality has to remove and dispose of any municipal wastes at its own cost. In any other case, when the property owner cannot be held liable, the authority shall carry out the necessary measures with the prior consent of the Federal Minister of Agriculture, Forestry, Environment and Water Management. The funds for covering the costs for these measures are provided by the Federal Minister of Agriculture, Forestry, Environment and Water Management.

Persons who do not oblige to the rules of the Austrian Waste Management Act with regard to proper hazardous waste management receive an administrative fine of between 850 € and 41,200 €. If such a person owns money by illegal activities the minimum fine is 4,200 €. If the infringement is also subject to criminal law, the federal prosecutor is given notice of this infringement.

Upcoming developments:

- Future provisions of the Austrian Waste Management Act will grant a preferential lien (right to distrain) on the property to the Federal Authority in order to cover the costs for measures carried out by the authority.

- The options for action will be increased for the competent authority: Until now, only in the case of immediate danger they may order and implement by themselves any immediately necessary measures. In all other cases they have to order the owner of the waste, the owner of the plant or the owner of the property to implement measures to achieve compliance with the legal provisions.

In future competent authorities will be entitled to confiscate waste and have it removed to an intermediate storage when waste collection and treatment does not comply with the provisions of the Waste Management Act. This will help the authority to enforce proper collection and treatment of end-of-life vehicles.
2.1.3 Monitoring of hazardous waste

In Austria, the monitoring of hazardous waste is based on the system of “Electronic Data Management in the Environment” (EDM).

Legal or natural persons who generate or treat (collect, recover or dispose of) hazardous waste have to register in EDM. They have to fulfil various reporting obligations. The competent authority enters selected data of permits and licences into EDM.

Data from EDM is used for the monitoring of hazardous waste from generation to final recovery or disposal, and for inspections.

The Austrian Waste Management Act lays down which public authorities are granted access to EDM for which purposes.

The Environment Agency Austria is entrusted with operating EDM.

2.1.4 Stakeholder Involvement

In Austria, the stakeholders in waste management are enumerated in Article 8 of the Austrian Waste Management Act, where the Federal Economic Chamber, the Federal Chamber of Labour, the Austrian Towns Association, the Austrian Association of Municipalities and the Federal Chamber of Agriculture are listed as those institutions which have to be invited explicitly to comment on the Austrian Waste Management Plan whenever it is being updated.

Additionally, the private waste management sector has founded an association to advocate the interests of operators of waste treatment installations. The Austrian Water and Waste Management Association (ÖWAV) represents the interests of the private and public waste management in Austria.

The stakeholders play an important role in the development of Austrian legislation on hazardous and non-hazardous waste. They advocate the interests of their members with regard to (hazardous) waste legislation to the legislative authority.

The legislative authorities pursue actively the involvement of stakeholders at any stage of the legislative process. Stakeholders are invited to participate in working groups where certain aspects of upcoming legislation are discussed. When new legislation has been adopted, the waste management sector is informed about it in public seminars and workshops which are organized by the stakeholder organisations. In these seminars, representatives of the public authorities present and discuss the new legislation in detail. It is common practice that the stakeholders inform the legislative authority about their experience or about any problems or difficulties which occur when the legislation is enforced.

2.1.4.1 Voluntary agreements and co-operation efforts

The active involvement of stakeholders opens up opportunities to achieve voluntary commitments of the waste management sector. Most of these voluntary agreements have a limited period of validity. They are concluded when an urgent need for action has been identified but legislation is not or not yet, in place. Some examples are:

Voluntary agreements of the cement industry

In 2001, the Austrian cement industry committed themselves to co-incinerate only such waste (hazardous and non-hazardous) which complies with certain quality standards. The quality
standards included limit values for the content of heavy metals, chlorine and dioxins in the waste.

Limit values for the contents of heavy metals in waste incinerated in cement plants became legally binding in 2010 through an amendment of the Austrian Ordinance on Waste Incineration.

Voluntary agreement on End-of-life vehicles

In 1992, a voluntary agreement was concluded between the sectors of the automotive industry represented in the Austrian Chamber of Commerce, the then Federal Ministry of Economic Affairs and the then Federal Ministry of Environment, Youth and Family Affairs that end-of-life vehicles would be taken back by automotive dealers all over Austria free of charge when a new or used vehicle was bought at the same time. This agreement was prolonged in 1995 for an indefinite period of time. Furthermore the agreement was broadened to include provisions to ensure proper disposal and to provide incentives for controlled collection and environmentally sound recovery. Every year, a report on the implementation of this voluntary agreement and on development perspectives was submitted to the Federal Ministry of Agriculture and Forestry, Environment and Water Management.

This voluntary agreement expired when in the year 2001 the transposition of the ELV-Directive into Austrian legislation came into force.

2.2 Organization of the collection and treatment of hazardous wastes

2.2.1 Hazardous wastes from households

With regard to hazardous household waste, the municipalities or associations of municipalities are obliged by the Austrian Waste Management Act to carry out or organise a separate collection for hazardous household waste as required, but at least twice per year.

The municipality has to determine certain dates and collection points for the collection of hazardous household waste. Dates and collection points have to be announced in a suitable manner and within due time. Civic amenity sites have been installed in most municipalities where hazardous household waste may be delivered free of charge. These sites have fixed business hours and are staffed with persons trained in the handling of hazardous household waste.

Some pharmacies have committed themselves voluntarily to take back medical waste from households.

2.2.2 Extended producer responsibility systems for Waste from electric and electronic equipment (WEEE) and Batteries

Since 1993 a first collection and recovery system (collective scheme), the Umweltforum Batterien (UFB), had established a system of taking back spent portable batteries at the point of sale by means of collection boxes. Umweltforum Batterien also organised the installation of a facility to sort batteries for further treatment. At that time the take back system for consumer batteries worked completely on a voluntary basis.

In accordance with EU requirements Austria in 2005 introduced the obligation for producers to take back waste from electrical and electronic equipment (WEEE) from households free of charge. Subsequently four collection and recovery systems registered in Austria to offer the service of taking over the producer responsibilities for WEEE.
In 2008 take back obligations were extended to portable batteries and accumulators incorporated in electronic appliances. Consequently the four existing collection and recovery systems for WEEE also started to act as PROs for batteries and replaced Umweltforum Batterien.

Producers/importers of electric and electronic equipment and of portable batteries in Austria have (among others) the obligations to:

- register as producers and self-importers;
- label their products;
- report volumes of products put on the market;
- participate in a collection and recovery system;
- take back waste products free of charge;
- provide an opportunity to return waste products free of charge for final distributors by providing a collection facility in each political district;
- meet the recycling efficiency rates;
- report data on collection and treatment to the register;
- provide information to final customers.

By participating in a collection and recovery system, producers may hand over take back, collection, treatment and reporting obligations to the collection and recovery system. That is the producer can delegate all his obligations except the first registration at the producer register. When participating in a collection and recovery system, producers have to pay a license fee (€/kg) for products put on the market. They have to report their market input on a regular basis.

In Austria currently four collection and recovery systems offer the service to take over the producer responsibilities for Waste from Electrical and Electronic Equipment (WEEE) and for portable batteries: a fifth system covers only automotive batteries.

For the collection of WEEE and portable batteries the collection and recovery system cooperate with regional partners, which are either communal waste management organisations or private companies. WEEE from households are collected at municipal civic amenity sites or at the point of sale when a new equipment of the same type is bought.

Portable batteries are collected at the point of sale or at public institutions like hospitals and schools in battery boxes made of cardboard, and at municipal civic amenity sites. For the pick-up and transport of the filled battery boxes a pick-up service is organised.

### 2.2.3 Extended producer responsibility system for End of life vehicles (ELV)

In Austria the management of ELV combines individual with collective systems.

Before the EU ELV Directive was transposed into national law, there had been a take-back system for ELVs based on a voluntary agreement between the Ministry of Agriculture, Forestry, Environment and Water Management, the Ministry of Economic Affairs and the Federal Chamber of Commerce.
This voluntary agreement became obsolete with the adoption of the ELV Ordinance in 2002. In accordance with this ordinance it is possible for producers to fulfil their take-back obligations individually. However, it is also possible to further use the ELV management structure established under the voluntary agreement. A collection and recovery system (ÖCAR Automobilrecycling GmbH) was founded in 2003, representing 2 producers and 10 importers. In terms of managed ELVs the ÖCAR system never played a big role (only a few per cent of the ELVs managed in Austria).

In 2012 Österreichische Shredder started as second collection and recovery system for vehicles. 17 producers/importers participate in the Österreichische Shredder system. In parallel, the ÖCAR system has applied for the extension of its permission to all car producers.

The Austrian ELV-Ordinance allows several options for the car owner to give back his vehicle.

- Official take-back points of the producers/importers, of ÖCAR and of Österreichische Shredder (a list of these official take-back points is published on the website of the Ministry of Environment)
- Car dealers, which are not producers/importers (no obligation for take-back), e.g. in connection with buying a new car
- Collection or treatment companies, which are not part of the collective system (no obligation for take-back).

For each car brand, the average distance to the next take-back point must not be greater than the regional average distance to the next selling point. The take-back is cost-free for the car owner.

- The further steps of ELV- treatment are:
  - Re-use of dismantled spare parts by garages or recycling plants
  - Pre-treatment of ELVs for the purpose of depollution or removal of spare parts in recycling plants
  - Treatment in shredder plants: Separation of recyclable metal parts from shredder light fraction
  - Treatment of shredder light fraction, including separation of recyclable materials.

The Austrian car-recycling-industry deals with the problem that an informal market has established which exports 70 to 80 % of the cars which cannot be put on the Austrian market for used-cars to foreign countries. As a consequence the market for car-recycling in Austria is become much smaller than in previous decades.

2.2.4 Hazardous waste from industries

In Austria the collection and treatment of hazardous waste from industry and commerce is entirely dealt with by the private waste management sector within the strict regulatory framework of hazardous waste legislation.

Any person who accumulates an annual quantity of waste oils of at least 200 litres or other hazardous wastes repeatedly, at least once per year, has to register in EDM (Electronic Data Management in the Environment).

Any person who transfers hazardous wastes to another legal person (recipient) has to declare the type, quantity, origin and whereabouts of the hazardous wastes in a waybill or, in the case
of transfrontier waste shipment, in a movement document as laid out in Annex IB of the EU Waste Shipment Regulation.

Any person who receives hazardous wastes for collection or for treatment has to report the type, quantity, origin and whereabouts of these wastes and the transport company to the governor of the province by means of electronic reporting into EDM. In the case of transfrontier shipment, the receipt of the waste has to be notified in line with the provisions of the EU Waste Shipment Regulation.

Any person who produces hazardous waste and treats it on-site by recovery or disposal operations has to report the type, quantity, origin and whereabouts of such wastes by electronic reporting into EDM. The same permits and licences are required as for any other waste treatment installation where similar hazardous waste is treated.

Any person who collects waste (hazardous or non-hazardous) or treats it by recovery or disposal operations has to register in EDM (Electronic Data Management in the Environment). They have to forward electronically the data on their company name, registered place of business, classification of economic activities, types of plants and treatment methods, plant capacities, types of wastes included in the operational permits and the scope of authorisation to collect and treat waste. They have to submit annual waste balances by electronic reporting to EDM. The waste balances must contain information about the origin of accepted waste types, the relevant quantities and relevant whereabouts, including type and quantity of materials returned to the economic cycle, for the previous calendar year.

The construction and operation of stationary waste treatment plants require a permit from the competent authority.

The construction and operation of mobile waste treatment plants for the treatment of any hazardous waste require a permit from the competent authority. (With regard to mobile treatment plants for non-hazardous waste, certain types of mobile treatment plants require a permit).

### 2.2.5 Hazardous construction and demolition waste

The Austrian Waste Management Plan of 2011 contained guidelines for construction and demolition waste which described recognized standards of good practice for the demolition of buildings. The objectives of these guidelines were to ensure that construction and demolition waste would not be contaminated by hazardous substances during demolition. The main building materials were to be kept separate from each other to facilitate the recycling of construction and demolition waste. The guidelines were not legally binding.

As of January 1st 2016, the Austrian Ordinance on Recycling Aggregates lays down that prior to the demolition of a building it is obligatory to carry out an investigation of pollutants (harmful substances or goods which may become hazardous waste). An inventory of such materials has to be drawn up.

The building has to be deconstructed according to standard specifications laid down in the Austrian Standard on the Deconstruction of Buildings (ÖNORM B 3151). This includes an inspection for pollutants and impurities which hamper recycling. The owner of a building is responsible that the inspection is performed by an expert in demolition. An expert in demolition is a natural person, educated in construction or chemistry with knowledge in demolition works, waste chemistry, construction chemistry and waste management legislation.

When the building includes a volume of more than 3,500 m³ the inspection for pollutants and impurities which hamper recycling is to be performed by authorised experts or expert bodies.
Authorised experts or expert bodies are persons or institutions that carry out biological, chemical and physical tests

- federal or provincial bodies of the federal or other public bodies,
- legally authorised bodies, or
- civil engineers in the relevant field of expertise, engineering offices in the relevant field of expertise.

Pollutants such as asbestos, waste containing tars, waste containing PCBs or phenol, insulating material containing fluorinated hydrocarbons have to be removed prior to demolition. They have to be stored separated from each other and from any other waste.

Re-usable parts of the building have to be removed prior to demolition when there is a market for them.

The main components of the building have to be stored separated on-site.

### 2.2.6 Collection and treatment of used motor oils from end consumers

The management of spent motor oils from end consumers is regulated by § 12 of the Waste Management Act.

Only filling stations, automobile mechanics, engine service stations, mineral oil trading companies and companies supplying motor oils to the aforementioned (wholesale) institutions may commercially disseminate motor oils. In turn these institutions are obliged to take back from the end consumer the same amount of spent motor oils as fresh motor oil they sell to this end consumer. Up to an amount of at least 24 litres the take back is to be free of charge.

Oil filters for motor vehicles may only be distributed to private end consumers, when at the same time

- either the used filter including the oil quantity contained therein is taken back free of charge
- or when a deposit of 3 € is charged.

In the latter case, the supplier shall take back the replaced used oil filter free of charge and refund the deposit.

In practice no deposit for the oil filter is charged in Austria.

### 2.2.7 Asbestos waste

In Austria all asbestos containing waste is qualified as hazardous waste. According to the Austrian Landfill Ordinance § 10 asbestos waste is to be landfilled on dedicated compartments for asbestos waste under following conditions:

- Asbestos waste must not be mixed with other hazardous waste
- Asbestos waste may only be deposited under supervision of specially trained proficient experts
- If necessary asbestos waste is to be moistened before deposition
- Areas on which asbestos waste is deposited are to be covered at the end of the working hours at the latest, by a cover which durably prohibit asbestos fibre emissions
- Any release of asbestos fibres is to be prevented during deposition and ever after
- After finalisation of the deposition phase a scheme with the exact location of the asbestos waste is to be submitted to the competent authority.
- The competent authority and the operator of the landfill have to take appropriate measures that no unauthorised person can access the site of asbestos disposal.

One landfill reports a price for landfilling of asbestos cement of 60 €/ton.

According to the Austrian Federal Waste Management Plan 2011 asbestos waste has to be packed on site in double polyethylene bags (Big Bags) with a thickness of at least 200 µm. These bags need to be marked appropriately and accompanied by a way bill. For the collection and transport of asbestos waste a specific permit is required.

A decree by the Ministry of Environment from 1995 provides some specifications for the permits:

The management and supervision of the collection and treatment of asbestos waste must be carried out by a competent proficient person. Proficient are those persons who, due to their training and experience, knowledge of asbestos-containing hazardous substances and of the relevant safety regulations, accident prevention regulations and generally accepted technical standards are familiar with asbestos waste to such an extent that they can assess the necessary precautions when handling hazardous substances containing asbestos.

Proof of proficiency must be provided in particular by participating in an officially recognized, state of the art training course on the handling of hazardous substances containing asbestos. Successful participation is demonstrated through the course confirmation.

The employees who are employed in the collection and treatment of asbestos waste are to be instructed as to the dangers posed by asbestos and to the necessary protective measures. The content and timing of the training shall be recorded in writing and confirmed by the instructed by signature. The instruction must include at least the following points:

- Fundamentals of mineral asbestos
  - types of asbestos
  - mineralogy of asbestos
- Recognition and evaluation of asbestos
  - Use and Application of asbestos
  - differentiation between weakly bound asbestos and strongly bound asbestos
- Asbestos from a medical perspective
- Measures for environmental protection
  - assembly and dismantling of bulkheads
  - establishing the material lock and personnel lock
  - operating under-pressure systems
- Rules and regulations when dealing with asbestos
- Safeguards, rules of conduct and hygienic measures
- Use of protective breathing mask and the protective suit
- Use of the security gate
- Code of Conduct in the redevelopment zone, in the grey area and the working area
  - Behavior in danger following accident cases
  - Appropriate disposal
    - treatment of weakly bound asbestos-containing waste and asbestos-contaminated waste.

When asbestos fibres may be released during collection, collection is to be performed in an under-pressure system with 10 air exchanges per hour.

According to the new Austrian ordinance on the recycling of construction and demolition (C&D) material (Recycling-Baustoffverordnung) before demolition of a building which likely will result in 100 tons of C&D waste or more, this building has to be investigated for hazardous substances. This investigation is to be performed by a proficient expert, who needs to be a construction engineer or chemist with training in demolition, waste chemistry, construction material chemistry and waste law. Training for such experts is provided, for example by the Austrian Baurestmaßenrecyclingverband (BRV). A 2 day training course costs 300 to 440 € and contains following topics:
  - Introduction in waste law
  - ordinance on the recycling of construction and demolition material
  - standards and norms
  - hazardous materials
  - drawing samples
  - responsibilities, monitoring, reporting, instructions
  - vocational safety
  - landfill ordinance
  - waste balances and reporting
  - quality assurance.

According to the Austrian ordinance on the recycling of C&D material, asbestos has to be removed from other construction material prior to the demolition of the building. Asbestos material is to be kept separate from other material and handed over to a waste treatment company which has a permit of asbestos waste treatment. Asbestos may not be recycled. This has to be documented. The documentation has to be stored for at least 7 years.
2.3 Finacing of the management of hazardous wastes

2.3.1 Funding of innovative prevention and treatment of hazardous waste

The objective of Federal Environmental Support Scheme is the continuous improvement of the environmental situation in Austria. The scheme shall influence decisions towards environmentally friendly and resource efficient investments. The scheme, however, also aims at increasing the economic and technical rate of innovation. With the 1993 Environmental Funding Act, the tasks which had previously been the responsibility of the Environment and Water Management Fund were re-defined and placed on a new legal foundation. One of a total of four funding objectives aims at environmental protection by minimizing impacts in the form of air pollution, climate-related pollutants, noise (other than traffic noise) and waste. The part of the Federal Environmental Support Scheme which aims at realising this objective is called „Domestic Environmental Funding“.

The budget for the Environmental Support Scheme („Environmental Fund“) comes from the general budget of the Republic of Austria. Since 1 April 1993, Kommunalkredit Austria AG, and subsequently Kommunalkredit Public Consulting GmbH since 1 October 2003, has been in charge of handling the Federal Environmental Support Scheme. The objective of the funding in waste management field is to promote the use of technologies for the recovery and the prevention of hazardous waste within business operations. In addition projects for energy recovery from biogenic waste are funded.

The funding rates are based on the principles of the Waste Management Act of 2002. Hazardous waste prevention measures receive the highest funding rates, followed by recovery measures. For non-hazardous waste only pilot prevention or recovery projects are eligible for funding.

However, in comparison to other fields of environmental protection, only relatively few waste prevention and recovery projects applied for funding.

In the areas prevention of hazardous waste and resource management 18 projects were funded with a total funding volume of 2.3 million €, in the period 2011 to 2013. By this funding investments of 15.5 million € were made possible. These investments reduced hazardous waste generation by 2,700 t/a and material consumption by 113,000 t/a [1].

2.3.2 Funding the remediation of contaminated sites and the treatment of historical hazardous waste

By passing the Act on the Remediation of Contaminated Sites (Federal Law Gazette No 299/1989 as amended) on 1 July 1989, Austria became one of the first European countries to implement binding steps towards a targeted registration of suspected and confirmed contaminated sites. In addition to setting out the framework for instructing the containment and remediation of sites, the Act provides for a financing basis to support suitable remediation measures.

Contaminated site remediation is financed by the so-called ALSAG-levy. Introduced in 1990, originally this ALSAG levy was a charge on waste to be landfilled. The rules for the ALSAG-levy later on were amended to take into account the latest changes in the Landfill Ordinance during the adjustment period (1996-2004 and 2009). For example a charge of € 87.00 per ton became payable for the landfilling of untreated waste that did not conform to the Landfilling Ordinance. This effectively eliminated any landfilling of reactive waste in Austria. From 2006 onwards, an additional charge was introduced for the incineration of waste and the production of fuel prod-
ucts (while the residues from incineration remained exempt). Thereby the ALSAG levy turned into an effective steering mechanism. This means the ALSAG levy now fulfils two functions:

1. The financing of contaminated site remediation
2. The provision of incentive to manage waste higher up in the waste hierarchy by making the landfilling and waste incineration more costly relative to waste prevention, reuse and recycling.

Table 2 shows the current charges of the ALSAG levy.

**Table 2: Current charges for the ALSAG levy**

<table>
<thead>
<tr>
<th>Waste management operation</th>
<th>ALSAG levy in €/t</th>
<th>Applicable to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landfilling of waste</td>
<td>8</td>
<td>on excavated soil, inert waste as well as construction and demolition waste landfills</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>on residual waste landfills</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>on mass waste landfills</td>
</tr>
<tr>
<td>Incineration of waste, production of fuel products from waste, feeding a blast furnace with waste</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Storage of waste for disposal (&gt; 1 year), for recovery (&gt; 3 years) and landfilling with waste (incl. backfill)</td>
<td>8</td>
<td>for mineral waste (up to the quality of construction and demolition waste)</td>
</tr>
<tr>
<td></td>
<td>87</td>
<td>for all other waste</td>
</tr>
<tr>
<td>Export of waste</td>
<td>Same levy as for the above-referenced activities</td>
<td></td>
</tr>
</tbody>
</table>

The ALSAG funds are provided to finance the measures necessary for the implementation of a comprehensive management programme for contaminated sites in Austria (this contribution is earmarked primarily for the registration, assessment and remediation of contaminated sites).

85 % of the ALSAG-fund is used for

- the promotion of securing and remediation measures
- the implementation of securing and remediation measures of the Federal Government in acc. with sec. 18 ALSAG
- the reimbursements of voluntary remediation measures (limited in time and amount).

15 % of the ALSAG-fund is used for

- supplementary investigations at suspected and confirmed contaminated sites as well as for studies on these and on handling costs

To date, the Federal Minister for Agriculture, Forestry, Environment and Water Management has approved 237 funding projects with a total investment volume of approx. € 1,020 million and guaranteed funds of approx. € 774 million.

The approved funds of approx. € 774 million are dedicated for

- 208 contaminated site projects with earmarked funds of approx. € 743 million
- 29 research projects with earmarked funds of approx. € 13 million
- immediate measures at the contaminated site Fischer-Deponie with earmarked funds of approx. € 18 million.

The funds are granted mainly for
- investments in remediation equipment,
- ongoing securing and remediation measures over a period of five years (operating costs),
- as well as planning and construction supervision measures.

The ALSAG fund is managed by Kommunalkredit Public Consulting GmbH (www.publicconsulting.at).

In addition to the ALSAG fund also the Federal Environmental Support Scheme (see chapter 2.3.1) has made a significant contribution to the remediation of historical environmental harm. Since 1990, the Federal Environmental Support Scheme has provided funds of more than € 770 million for the remediation and containment of contaminated sites.

The remediation of contaminated sites financed by the ALSAG and the Federal Environmental Support Scheme improved the state of the environment and prevented harm to human health.

The remediation made it possible to improve the quality of approx. 46 million cubic metres of groundwater per year – equivalent to the annual water consumption of approx. 1.7 million persons.

A total of 16.5 million tons of contaminated site materials were removed, thus preventing the further dispersal of pollutants through seepage water. 246 tons of solvents were extracted from the groundwater. As a direct result of the remediation measures, approx. 145 hectares of brown fields were rehabilitated and reactivated for economic use. 116 contaminated sites in areas where groundwater is used have been remediated; at 8 sites, escaping landfill gases were contained. The remediation efforts resulted in a reduction of climate-relevant greenhouse gases emissions. Mainly methane emissions from landfills were reduced.

In total the ALSAG funds speed up the process and allow stakeholders to voluntarily remediate contaminated sites without running the risk of financial ruin. The Austrian system is standardised throughout the country. As it falls under federal jurisdiction, it has been possible to harmonise implementation procedures throughout Austria.

ALSAG funds guarantee a reliable implementation of high-quality measures. In Austria, investigations into the hazard potential are financed from contaminated site contributions. Accurate conclusions can be drawn from these studies on the hazard to human health and the environment.

2.3.3 Financing of the collection and treatment of hazardous household waste.

The costs for collection, recovery and disposal of hazardous household waste except hazardous WEEE, batteries and packaging are covered by the municipal waste management fees.
The costs for the collection of hazardous and non-hazardous WEEE, batteries and packaging waste are refunded by the respective collective schemes.

2.3.4 Financing of the collection and treatment of hazardous WEEE, batteries and accumulators

Retailers are obliged to take back WEEE free of charge if new electrical or electronic equipment of the same type is bought. WEEE from private households may be delivered free of charge at designated collection points located all over Austria.

Producers and importers of electrical and electronic equipment have to finance the collection and treatment of WEEE. They are obliged to participate in collective schemes. They have to pay a fee to the collective scheme for any new EEE put on the market. The costs for the fee are in practise included in the retail prize.

End-consumers may return portable and automotive batteries and accumulators free of charge at the retailers’ and at collection points (e.g. civic amenity sites).

Producers and importers of batteries and accumulators have to finance the collection and treatment of waste batteries/accumulators. With regard to portable and automotive batteries and accumulators they are obliged to participate in collective schemes. When participating in collective schemes they have to pay a fee to the collective scheme for any batteries and accumulators put on the market. The costs for the fee are in practise included in the retail prize.

The collected fees are used to finance the collection, preparatory treatment and final recovery or disposal of WEEE and batteries/accumulators.

2.3.5 Expired financing schemes

2.3.5.1 Lamps (fluorescent tubes)

The Ordinance on the Labelling, Take-Back and Collection of Deposit on Specific Types of Lamps, Fed. Law Gaz. No. 144/1992, which entered into force on March 14, 1992 and expired when the Austrian ordinance on WEEE came into force, laid down provisions for the collection of waste lamps. A deposit fee had to be charged upon the sale of lamps and a deposit voucher had to be issued to the purchaser. Shops selling new lamps were obliged to take back lamps from end-consumers and to refund the deposit charge upon presentation of deposit vouchers.

Collection of deposit was to be evidenced by designating the lamps correspondingly or by the issuance of deposit vouchers. When, upon take-back, it was evidenced that a deposit had been paid, this amount was refunded to the consumer.

2.3.5.2 Refrigerators

The Ordinance on the Take -Back of Refrigerating Equipment, Federal Gazette 1992/408 which entered into force on March 1, 1993 and expired when the Austrian ordinance on WEEE came into force laid down provisions for the collection and treatment of waste refrigerators. When new refrigeration equipment was bought an advance payment on the future disposal costs had to be made by the purchaser. Additionally, a deposit fee had to be charged upon sale of new refrigerators unless a nation-wide collection and disposal system for waste refrigerators had been established. In practise, deposit fees were never charged as collective schemes had been established in which all manufacturers and importers participated.
The funds collected by means of advance payment on future disposal costs were used for financing the collection and treatment of waste refrigerators.

**2.3.6 Financing of the collection and treatment of all other hazardous waste from industry and trade**

In Austria the collection and treatment of hazardous waste from industry and commerce is entirely dealt with by the private waste management sector within the strict regulatory framework of hazardous waste legislation. Any scarcity of treatment capacity would be overcome by exporting the hazardous waste to other EU Member States.

Nowadays, any investment decision to construct new treatment plants for hazardous waste or to enlarge the treatment capacity depends on market prizes, on presently generated amounts of hazardous waste and on market assessment of future developments.

Nearly 40 years ago, the first incineration plant for hazardous waste was constructed by the municipality of Vienna in order to provide adequate disposal capacities for hazardous waste. Then, the market was not fully developed so involvement of the public sector was required.

Several chemical-physical waste treatment plants were constructed in the 1980ies, many of them by companies formerly involved in the business of fuel supply.

**2.4 Key merits and drawbacks of the Austrian hazardous waste management**

An EU-project [4] has identified following 8 guiding principles to assure a high efficiency of extended producer responsibility systems. These guiding principles can also be used as reference/criteria for assessing the efficiency of hazardous waste management schemes in general:

1. Scope and objectives of the scheme should be clear
2. Specific responsibilities should be allocated to each stakeholder and clearly defined along the whole product life cycle
3. The design and implementation of the scheme should cover the full net costs related to the separate collection and treatment of the end-of-life products.
4. The fees paid to the scheme should reflect the true end-of-life management costs of its products.
5. Notwithstanding the way competition takes place, a clear and stable framework is necessary in order to ensure fair competition, with sufficient surveillance and equal rules for all, supported by enforcement measures (including sanctions).
6. Transparency is required on the performance and costs of the scheme.
7. Key definitions and reporting modalities should be harmonised.
8. Public authorities and obligated industry should be co-responsible for the monitoring and surveillance of the scheme, and should ensure that adequate means for enforcement are in place.
Compared to these criteria the Austrian waste management system provides a good balance between the application of market forces and public surveillance that market rules are met and that the environmental impact of hazardous waste management is kept at a low level.

With respect to municipal waste, municipalities partly act as waste collectors. Municipalities also frequently form waste management associations which organise waste collection, operate waste collection centres and contract the waste treatment.

In all other cases the tasks of public administration are limited to:

- Setting the rules and providing the planning framework
- Permitting
- Inspection
- Monitoring.

Extended producer responsibility systems are mainly self-organised by private companies and their associations, however, coordinated and monitored by independent bodies. Management of hazardous waste from industries is self-organised by private companies, monitored by public authorities.

In total the Austrian waste management legislation is very elaborated and detailed, drawing on 25 years of experience. Nevertheless continuous adaptations to changing technologies, changing waste compositions, changing EU legislation and new challenges are still necessary.

Scope and objectives, as well as responsibilities are mostly clear.

The pay-as-you-through principle is applied as far as practical. This means that municipal waste fees increase with increasing bin-sizes and increasing emptying frequencies. But the specific rules may differ from region to region or eventually from municipality to municipality.

With free market economy transparency is a problem, as competitors do not want to publish their price strategies to competitors. Therefore it was necessary to introduce schemes through which the monitoring bodies get the information which allows them to survey the system, without confidential data getting public.

The monitoring is enhanced by the obligation for all waste collection and treatment companies and for all owners of industrial hazardous waste to report to the central data base EDM. All levels of public administration tasked with monitoring the waste management system have access to this data base. In total it can be concluded that in Austria public authorities and obligated industry are co-responsible for the monitoring and surveillance of the hazardous waste management system.

Some challenges may require additional efforts in future:

- In accordance with the rules of the free market the frequency of switching from one waste collector and waste treatment company to another increases. In addition also the specialisation of waste treatment companies increases. As a consequence waste which once was handed over from the producer to one waste collector to be treated in one installation, may now pass several waste management companies while being split, or being mixed with similar wastes from other waste producers before being treated at several different places. The task to monitor the waste management system becomes more complex as the international waste market becomes more complex.

- With increasing transboundary movements of waste it also becomes more difficult to assure that the final waste treatment meets high environmental standards.
2.5 Collection and treatment of hazardous wastes

2.5.1 Collection of hazardous waste

In Austria some 20,000 tons of hazardous household waste and consumer batteries are collected separately. In addition some 76,000 tons of waste from electrical and electronic equipment (WEEE) are collected separately. In addition the mixed municipal waste contains some 11,000 tons of hazardous household waste and consumer batteries as well as some 11,000 tons of WEEE (see Table 3). In total every Austrian generates 0.38 kg of hazardous household waste and spent consumer batteries as well as 1 kg of WEEE per year. 64 % of the hazardous household waste and spent consumer batteries are collected separately. 87 % of the WEEE from households is collected separately.

Table 3: Generated amounts of hazardous waste, consumer batteries and WEEE from households in Austria [2, 3]

<table>
<thead>
<tr>
<th>Waste Fractions</th>
<th>tons</th>
<th>kg/capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>Separately collected hazardous household waste (Problemstoffe) and consumer batteries</td>
<td>20,438</td>
<td>2.4</td>
</tr>
<tr>
<td>Separately collected WEEE</td>
<td>76,003</td>
<td>9.0</td>
</tr>
<tr>
<td>Mixed municipal waste</td>
<td>1,421,247</td>
<td>167.7</td>
</tr>
<tr>
<td>Hazardous household waste (Problemstoffe) and consumer batteries in mixed waste</td>
<td>11,370</td>
<td>1.3</td>
</tr>
<tr>
<td>WEEE in mixed waste</td>
<td>11,370</td>
<td>1.3</td>
</tr>
<tr>
<td>Total hazardous household waste (Problemstoffe) and consumer batteries from households</td>
<td>31,808</td>
<td>3.8</td>
</tr>
<tr>
<td>Total WEEE from households</td>
<td>87,373</td>
<td>10.3</td>
</tr>
</tbody>
</table>

In Austria approximately 250,000 vehicles are registered permanently per year. In 2013, only 74,000 end-of-life vehicles were collected and treated as waste. The remaining cars are exported as used cars or spare parts. Illegal export is also an issue. Its quantity cannot be determined.

Table 4 shows the amount of all hazardous waste generated in Austria for the year 2013. In total approximately 1.2 million tons (144 kg/capita.year) of hazardous waste is generated annually. The highest masses are contributed by industrial smelting processes, incineration residues, asbestos containing demolition material and cars. In addition to the wastes shown in Table 4 another 1.3 million tons of waste is generated, which is declassified from hazardous to non-hazardous waste.

Table 4: Hazardous waste generation in Austria in the year 2013 [2]

<table>
<thead>
<tr>
<th>Austrian Waste Code</th>
<th>tons</th>
<th>kg/capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>31223</td>
<td>Dusts and ashes from other smelting processes</td>
<td>128,500</td>
</tr>
<tr>
<td>31308</td>
<td>slag, ash from waste incineration plants</td>
<td>101,800</td>
</tr>
<tr>
<td>31412</td>
<td>asbestos cement</td>
<td>61,000</td>
</tr>
</tbody>
</table>
### Austrian Waste Code

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Amount (tons)</th>
<th>kg/capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>35203</td>
<td>motor vehicles, machines and machine parts, with environmentally significant levels of hazardous components or constituents (e.g., starter batteries, brake fluid, motor oil)</td>
<td>56,200</td>
<td>6.6</td>
</tr>
<tr>
<td>31309</td>
<td>flue ashes and dusts from waste incineration plants</td>
<td>53,700</td>
<td>6.3</td>
</tr>
<tr>
<td>31211</td>
<td>salt slag containing aluminium</td>
<td>42,700</td>
<td>5.0</td>
</tr>
<tr>
<td>31424</td>
<td>other contaminated soils</td>
<td>42,000</td>
<td>5.0</td>
</tr>
<tr>
<td>31612</td>
<td>lime sludge</td>
<td>41,000</td>
<td>4.8</td>
</tr>
<tr>
<td>54402</td>
<td>drilling and grinding oil emulsions and emulsion mixtures</td>
<td>36,000</td>
<td>4.2</td>
</tr>
<tr>
<td>54702</td>
<td>oil separator contents (petrol separator contents)</td>
<td>32,300</td>
<td>3.8</td>
</tr>
<tr>
<td>54102</td>
<td>waste oils</td>
<td>31,900</td>
<td>3.8</td>
</tr>
<tr>
<td>31484</td>
<td>excavated soil material, fill material from CP plants</td>
<td>31,600</td>
<td>3.7</td>
</tr>
<tr>
<td>54408</td>
<td>other oil-and-water mixtures</td>
<td>27,700</td>
<td>3.3</td>
</tr>
<tr>
<td>17207</td>
<td>railway sleepers</td>
<td>26,300</td>
<td>3.1</td>
</tr>
<tr>
<td>52725</td>
<td>other aqueous concentrates</td>
<td>23,300</td>
<td>2.7</td>
</tr>
<tr>
<td>31423</td>
<td>soil contaminated with oil</td>
<td>21,200</td>
<td>2.5</td>
</tr>
<tr>
<td>51113</td>
<td>other metal-hydroxide sludges</td>
<td>20,600</td>
<td>2.4</td>
</tr>
<tr>
<td>35230</td>
<td>waste electrical and electronic equipment – small equipment with an edge length of less than 50 cm, with hazardous properties</td>
<td>18,100</td>
<td>2.1</td>
</tr>
<tr>
<td>52102</td>
<td>acids, acid mixtures, inorganic</td>
<td>18,000</td>
<td>2.1</td>
</tr>
<tr>
<td>54504</td>
<td>crude oil contaminated soil, excavation, demolition waste</td>
<td>17,000</td>
<td>2.0</td>
</tr>
<tr>
<td>35212</td>
<td>display screen equipment, including picture tube equipment</td>
<td>16,800</td>
<td>2.0</td>
</tr>
<tr>
<td>31217</td>
<td>filter dust containing non-ferrous metal</td>
<td>14,100</td>
<td>1.7</td>
</tr>
<tr>
<td>55374</td>
<td>solvent-and-water mixtures without halogenated solvents 1</td>
<td>14,100</td>
<td>1.7</td>
</tr>
<tr>
<td>55370</td>
<td>solvent mixtures without halogenated organic components, paint and varnish thinners (e.g., &quot;diluents for cellulose lacquers&quot;), including antifreeze</td>
<td>14,000</td>
<td>1.7</td>
</tr>
<tr>
<td>54701</td>
<td>sand filter contents containing oil or cold cleaner solvent</td>
<td>13,100</td>
<td>1.5</td>
</tr>
<tr>
<td>35322</td>
<td>lead accumulators</td>
<td>12,900</td>
<td>1.5</td>
</tr>
<tr>
<td>54930</td>
<td>fuel contaminated with solid grease and oil (waste from workshops, industry and filling stations)</td>
<td>12,700</td>
<td>1.5</td>
</tr>
<tr>
<td>54502</td>
<td>drilling sludges, crude oil contaminated</td>
<td>12,600</td>
<td>1.5</td>
</tr>
<tr>
<td>35205</td>
<td>Refrigerators and HVAC-equipment with fluorine-containing or carbohydrate containing cooling agents</td>
<td>12,100</td>
<td>1.4</td>
</tr>
<tr>
<td>54703</td>
<td>sludge from oil-separating plants</td>
<td>11,600</td>
<td>1.4</td>
</tr>
<tr>
<td></td>
<td>Other hazardous waste types</td>
<td>259,000</td>
<td>30.6</td>
</tr>
<tr>
<td></td>
<td><strong>Total hazardous waste generation</strong></td>
<td><strong>1,223,800</strong></td>
<td><strong>144.4</strong></td>
</tr>
</tbody>
</table>

### 2.5.2 Treatment of hazardous waste (types of treatment plants, available treatment capacities, need to export particular hazardous wastes)

Pursuant to sec. 16 (1) of the Austrian Waste Management Act of 2002, it has been prohibited since 16 July 2001 to deposit hazardous waste on above-ground landfills. Therefore hazardous waste must either be

- treated so that it loses its hazardous characteristics
- or exported for treatment or underground landfills abroad.

The only untreated hazardous waste which may be landfilled on a surface landfill is asbestos waste. Asbestos waste may be landfilled within the Austrian borders on specific compartments of specific landfills under certain conditions.
About 20% of the hazardous waste generated is incinerated in Austria, about 50% is treated in chemical-physical-metallurgical-treatment plants and about 25% are exported for treatment or underground landfilling abroad. The remaining 5% is asbestos waste which is landfilled in Austria.

In Austria there is one incineration plant (Simmeringer Haide – Fernwärme Wien) specialized in the thermal treatment of all hazardous waste in rotary kiln and circulating fluidized bed combustion. This plant treats:

- Contaminated solids and soils
- Sludges
- Oil/water mixes and emulsions
- Chemicals, paints and resins
- Medical and pharmaceutical wastes
- Pesticides and packed hazardous waste.

An additional hazardous waste incineration plant (ABRG – Arnoldstein) is specialized in the thermal treatment of industrial waste and soils contaminated with organic solvents. Also this plant operates a circulating fluidized bed kiln and a rotary kiln.

In Austria 8 chemical-physical (CP) treatment plants with a total capacity of 132,000 t/a treat inorganic waste (such as acids or metals). 22 CP-plants with a total capacity of 287,000 t/a treat organic waste (such as emulsions). 12 CP-plants with a total capacity of 353,000 t/a treat both inorganic and organic waste. In 6 plants with a total capacity of 372,000 t/a waste is stabilized, e.g. through mixing with cement.

Contaminated soils are treated in 16 plants either by a chemical-physical or by a biological treatment method.

In 15 plants with a total capacity of 105,000 t/a, separately collected waste edible oil is recycled mostly for bio-fuel-production.

In one plant each metal-catalysts and activated carbon are regenerated.

**2.6 Specific legislation (including permitting criteria, e.g. exclusion of particular wastes) taking into account specific aspects of waste management**

**2.6.1 Legislation for mobile treatment plants**

The Austrian Waste Management Act of 2002 specifies mobile treatment plants as waste treatment installations which can be operated temporarily at different sites. When a plant is operated more than 6 months at the same site it is not considered as mobile plant. An exception are plants for the remediation of contaminated sites, which can stay more than 6 months at the same site and still can be considered as mobile plants.

According to § 24a of the Austrian Waste Management Act of 2002, the governor of the province in which the waste treatment company has its seat, is responsible for issuing the permit of
the mobile plant. If the waste treatment company has its seat abroad, the governor of the province in which a mobile plant is planned to be applied first, is responsible for issuing the permit of the mobile plant.

§ 52 of the Austrian Waste Management Act of 2002 in connection with the ordinance on mobile waste treatment plants (Verordnung über mobile Anlagen zur Behandlung von Abfällen) from 2002 provide the rules for permitting a mobile waste treatment plant.

Following types of mobile plants for the treatment of waste require a permit:

1. Plants for the treatment of electric or electronic equipment or for the treatment of parts of electric or electronic equipment.
2. Plants for the treatment of end-of-life-vehicles and their parts
3. Plants for shredding different types of food waste including contaminated or otherwise hazardous wood waste
4. Plants for crushing different types of construction and demolition waste
5. Plants for crushing all other types of waste
6. Plants for the thermal treatment or co-incineration of waste, including pyrolysis and gasification plants.
7. Sieving plants
8. Sifting plants
9. All plants for the treatment of hazardous waste.

Also major changes to these types of mobile plants require a permit.

The application for the permit needs to be accompanied by following documents:

1. A description of type, purpose and scope of the planned treatment
2. A description of the waste types to be treated and of the treatment processes
3. General criteria which are to be fulfilled by a site on which the plant may operate
4. A description of the plant including corresponding plans, flow sheets and drawings
5. A description of the wastes which are expected to be generated through the operation of the plant including measures to prevent and treat this waste in form of a waste management concept
6. A description of the expected emissions, including measures to prevent and – when prevention is not possible to limit the emissions.

During the permitting process the applicant, the labour inspector and the environmental attorney of the province have a right to be heard. The environmental attorney of the province may also appeal to the court of administration.

A permit has to be granted for the mobile treatment plant, when it is to expect that the plant safeguard following interests:

1. Life and health of human beings are not endangered.
2. Pollutant emissions are limited at least according to the best available techniques.
3. Neighbours are not molested by noise, odour, smoke, dust, vibrations or in any other way beyond a reasonable degree.

4. The property of neighbours is not endangered (a mere reduction of the market value of the neighbours property is not meant here).

5. The generated non preventable waste is treated by best available techniques.

6. Other public interests are considered with due diligence.

If necessary the authority has to prescribe appropriate measures and deadlines so that the above interests are assured. In any case the authority has to specify the principle requirements which are to be met by the sites on which the mobile waste treatment plant may operate. This includes requirements to consider the respective environment, to limit emissions and to protect the neighbours.

If the above shown conditions cannot be assured, the permit must not be issued.

If the owner of the mobile waste treatment plant plans to implement major changes to the plant, including for example adaptations to apply best available techniques, these changes must be reported to the permitting authority.

The recipient of the permit has to inspect the mobile treatment plant regularly and to assure that it fulfills the permitting conditions and all legal requirements. The recipient of the permit has to engage an authorised expert or an authorised expert body for this inspection.

Authorised experts or expert bodies are persons or institutions:

- that carry out biological, chemical and physical tests
  - federal or provincial bodies of the federal or other public bodies,
  - legally authorised bodies, or
  - civil engineers in the relevant field of expertise, engineering offices in the relevant field of expertise, and chemical laboratories,
  
  provided that they participate in inter-laboratory tests in accordance with the state of the art and taking into account the parameters to be determined, matrix and sampling for the materials to be tested, and additionally that there are no conflicts of interests, that only validated methods are used, and that a quality assurance system has been established.

- persons or institutions that perform hygiene tests and which additionally have the experience and, for quality assurance, an authorisation to handle pathogenic micro-organisms.

The inspection must include an on-site-checking of the plant.

If the permit does not stipulate differently, the “self”-inspection has to be repeated every 5 years.

Every inspection must result in an inspection-report which has to include all identified deficiency and proposals for removing them.

If deficiencies are identified, the recipient of the permit has to send a copy of the report immediately to the responsible public authority. In short time he also has to submit a description of how the deficiencies were removed. The original of the report and all corresponding documents are
to be stored by the recipient of the permit for at least 7 years. The report and the corresponding documents are to be shown to the authorities on demand.

According to § 53 of the Austrian Waste Management Act the recipient of a permit shall be authorised to set up and operate the mobile treatment plant for a maximum of six months at a suitable site as set out in the permit.

If the above shown interests are not sufficiently protected at a certain site despite compliance with the stipulations, conditions or time limits imposed in the permit, the authority within whose local competence the mobile treatment plant is set up and operated shall order the necessary suitable measures. If the above shown interests cannot be protected despite the ordered measures, the erection and operation at this site shall be interdicted.

Mobile treatment plants for the clean-up or stabilisation of contaminated sites may on application be operated at the same site for more than 6 months, but not longer than until completion of the clean-up.

2.6.2 Specific legislation for waste management plants which are also IPPC-plants

The Austrian waste management act sets the rules for waste management plants which are also IPPC plants as specified by the EU Industrial Emissions’ Directive (2010/75/EG). These plants need a waste management permit with additional specifications.

According to § 39 of the Austrian waste management act the following information/documents in particular shall be enclosed with the application for authorisation of a waste treatment plant:

1. information about the suitability of the intended site;
2. information about the form, purpose, scope and duration of the project;
3. the land register identification of the property affected by the treatment plant, indicating the name of the owner and enclosing an extract from the land register that is not older than six weeks;
4. the written consent of the property owner on whose property the treatment plant is to be established, if the applicant is not the owner;
5. statement of water rights legally exercised by the owner;
6. a description of the operation, including information about the types of waste to be treated, the treatment methods, and a list of machinery and other plant equipment;
7. construction specifications with the necessary designs and drawings;
8. description of the anticipated wastes that will accumulate during operation of the treatment plant and measures for their prevention, recovery or disposal (waste management concept);
9. a description of the anticipated emissions from the treatment plant and information about the prevention or, if this is not possible, reduction of emissions.

The application for authorisation of an IPPC waste treatment plant must include following additional information:
1. information about the materials and energy used and generated in the treatment plant;
2. a description of the condition of the plant site;
3. a description of the sources of emissions from the treatment plant;
4. a description of the type and quantity of foreseeable emissions from the treatment plant into any environmental medium;
5. a description of anticipated significant impacts of the emissions on the environment;
6. information about measures to monitor emissions;
7. information about other measures to meet the requirements set out in § 43 (3) (see below);
8. a generally understandable summary of the provided information.

According to § 43 (3) of the Austrian waste management act a permit for an IPPC treatment plant shall be granted, if it may be expected that the IPPC treatment plant fulfils the following requirements:

1. All suitable and economically proportionate measures to prevent environmental pollution have been taken, in particular with the use of methods, equipment and operating modes in accordance with the state of the art.
2. Energy will be used efficiently.
3. The necessary measures will be taken to prevent incidents and control their consequences.
4. Necessary measures will be taken to prevent the hazard of environmental pollution after liquidation of the treatment plant, and to restore a satisfactory condition of the treatment plant site, if necessary.

When granting the authorisation, the comments as set out in § 40 (see below) shall be taken into account.

According to § 40 (1) of the Austrian waste management act the application for authorisation of an IPPC treatment plant shall be made public in two daily newspapers of high circulation in the province, and in the Official Gazette of Wiener Zeitung. The publication shall indicate that the application shall be available for inspection during the office hours of the authority for a specified period of at least six weeks, and that any person may comment on the application during this period.

According to § 40 (2) of the Austrian waste management act, if the IPPC treatment plant could affect a neighbouring country, the authority shall inform this country about the project.

2.7 Public awareness campaigns (How to overcome “not in my backyard” with regard to needed hazardous waste treatment plants)

In order to maintain the high level of Austrian waste management, particularly the success in the sorting of household municipal waste, the population must be informed continuously about waste prevention, re-use, proper waste sorting and collection, as well as the suitable treatment. In addition, there is a growing need to build awareness of waste management issues and sus-
tainable consumer behaviour. To this end a bundle of public relation and information measures are applied in Austria.

The activities of the municipal environmental and waste advisers provide the backbone for the public relations work of the Austrian waste management system on the municipal level. A good example is the provision of waste advise by the Vienna municipality MA-48 (https://www.wien.gv.at/umwelt/ma48/beratung/abfallberatung.html). The counselling services include:

- A telephone hot-line (Misttelefon)
- Free activities for kindergartens and schools (For kindergartens, for example, waste advisers realise an interesting, exciting, funny and instructive 2 hour info program with theatre performance and games rug for waste separation)
- Guided tours and lectures, information stands at events
- Mobile (on-site) waste advice
- Advice for small enterprises.

The activities of the municipal waste advisers have been supported by the Federal Ministry of Agriculture, Forestry, Environment and Water Management since 1997 through the project “Communication Network with Waste Consultants”. The network consists of approx. 300 waste and environmental advisors.

The association magazine VABO-Blatt communicates current and important news. VABO-Blatt is published six times a year. Since the start of 2005, VABO has also been publishing a monthly electronic newsletter (VABO Newsletter) reaches a still wider audience.

The waste management award “PHOENIX – ideas instead of waste” is awarded to innovative projects and ideas related to sustainable materials and resource management.

The Federal Ministry of Agriculture, Forestry, Environment and Water Management publish general information on waste, more specific information e.g. on the prevention of waste, research results, sector-specific programmes and the like on its internet site: www.bmlfuw.gv.at/. This includes a booklet giving guidance on how to separately collect waste properly (Abfalltrenn-ABC https://www.bmlfuw.gv.at/publikationen/umwelt/abfalltrennung_kompost/abfall_trenn-abc.html)

Nationwide public relations campaigns are initiated by the Federal Coordination Group for Waste Management Public Relations Work. Representatives from the Austrian Federal Provinces, from extended producer responsibility systems, from the Waste Electrical or Electronic Equipment Coordination Point (EAK), from the Association of Austrian Waste Disposal Companies (VOEB), from the Federation of Austrian Environmental Consultants (die Umweltberatung) and from the Austrian Waste Management Consulting Association (VABO) participate in this group. The Federal Ministry of Agriculture, Forestry, Environment and Water Management is charged with the Coordination Group’s organisation.

With respect to the installation of hazardous waste treatment plants usually a broad variety of measures are applied from the owner of the prospective plant and the involved public institution in order to provide factual information on the risks and benefits of this plant.

This comprises
• town hall meetings in which respected experts inform on the potential hazards and health risks and how they are kept to a minimum
• the possibility to take into account the concerns of the population during plant design
• the realisation of reasonable proposals from the population
• the application of emission limitation techniques which go much beyond the standard of best available technology
• ordinances which prescribe strict emission limits, a long list of emission parameters which are to be measured continuously and an even longer list of emission parameters which are to be measured on a regular basis by independent experts
• a tight schedule of “self”-inspections by independent experts and environmental inspections by experts of the public authority
• participation of the company in a certified environmental management scheme
• on-time publication of the continuously measured emissions on internet or on public screens in town centers (under the catch-phrase “transparent plant” (Gläsernes Werk))
• continuous measurements of key pollutants on the immission side which are published on internet
• benefits provided for the neighbouring population such as remediation of existing pollutions or district heat at reduced prices
• an appealing plant design by famous architects (as for example applied for the waste incineration plant Spittelau in Vienna)
• an illustration of the benefits provided by the plant for the neighbours, for the employed workers, for the community and for the environment.

Part of the “transparent plant” strategy is the publication of core documents of the environmental impact assessment for plants for which an environmental impact assessment was performed. These documents are published on the internet site http://www.umweltbundesamt.at/uvpdatenbank. Also some plants offer guided tours through the plant.

In accordance with the Act on Environmental Information 2015 (Umwetlinformationsgesetz 2015) all citizens have the right to receive from the public authorities all available information on:

• the condition of the environmental media
• the state of environmental factors (e.g. materials, energy, noise, radiation, waste, emissions, releasing substances or organisms)
• Implemented measures to limit environmental impacts (e.g. laws, plans, programs, administrative decisions and activities that affect the environmental media and factors)
• reports on the implementation of environmental legislation
• cost / benefit analyses
• the state of human health and safety
  (www.bmlfuw.gv.at/umwelt/betriebl_umweltschutz_uvp/kontrolle-info/Umweltinformation.html).

Twinning Project "Improvement of hazardous waste management in the Republic of Serbia - IWHMS"
It is the aim of these measures to create trust and to provide sound information of benefits and remaining risks. It is also the aim of these measures that all who carry additional risks also receive some benefits.

In spite of these measures it may be necessary to erect the plant at already contaminated sites away from population centres. Under such circumstances it helps when the plant can prove that by its operation it reduces environmental risks and impacts. It also helps when the plant manager and the owner of the plant live near to the plant, so that they carry an own personal interest that the pollution is kept to a minimum.

2.8 Information and education of the waste management sector

The Austrian Federal Waste Management Plan provides guide on the proper management of different waste streams, including end-of-life vehicles, waste batteries and WEEE. The Federal Waste Management Plan is publicly available on www.bundesabfallwirtschaftsplan.at.

Also the homepage of the Ministry of Agriculture, Forestry, Environment and Water Management provides information on the proper management of end-of-life vehicles, waste batteries and WEEE (www.bmlfuw.gv.at/greentec/abfallressourcen.html).

The Ministry of Agriculture, Forestry, Environment and Water Management also provides training seminars for specific waste administration and waste management topics such as the Electronic data management system. With respect to the monitoring of the transboundary shipment of waste special training is provided to

- Inspectors
- Custom’s officers
- Policy and
- Prosecutors.

The Austrian Ministry for Finances and the Federal Chancellery operate the homepage Unternehmensserviceportal (Service gateway for enterprises). This homepage among others provides basic guidance on the management of general hazardous waste, end-of-life vehicles, municipal hazardous waste, waste batteries, waste oils, WEEE and chemicals.

Vocational training for waste management experts is provided by the Institute for Waste Management of the Vienna University of Natural Resources and Life Sciences (BOKU). Within the scope of the BOKU - areas of competence Soil - Ecosystems and Water - Climate - Environment, the Institute of Waste Management generates innovative programs, methods, and procedures for

- closing of natural and anthropogenic cycles
- proper low-emission treatment of waste materials
- monitoring and remediation of environmental damages
- sustainable integration of ultimately landfilled waste materials in the cultural landscape.

Research results are published in a semi-annual newsletter.
The Institute for Waste Processing Technology and Waste Management of the Montanuniversität Leoben provides a study programme on recycling, featuring: waste management, process technology, metal and polymer recycling and the foundations of materials technology, economics and legal frameworks. The Montanuniversität Leoben also organizes the bi-annual waste conference Recy & DepoTech (www.recydepotech.at/).

Process engineering and chemical engineering are taught at the Technical Universities of Vienna and Graz.

Central institutions for the professional information and training of the waste management sector experts are:
- the Austrian Water and Waste Management Association (ÖWAV)
- the Austrian Association of Waste Treatment Companies (VÖEB)
- and the Austrian Chamber of Commerce (WKÖ)

The Austrian Water and Waste Management Association (ÖWAV) provides an education and training program comprising:
- Conferences and expert seminars (including the annual Austrian Waste Management Conference)
- Workshops and symposia
- Courses on waste treatment plants
- Knowledge and experience transfer for personnel of waste treatment plants
- Specialized training for executives.

In addition ÖWAV provides:
- first-hand information regarding legal, technical and economic development in the waste management sector
- opportunities for participation in setting technical regulations and laws through collaboration in working groups
- contacts to decision-makers
- the professional journal »Österreichische Wasser- und Abfallwirtschaft« (Austrian Water and Waste Management, in German)
- the newsletter »ÖWAV-News« (in German) distributed by e-mail
- information on latest developments in the waste management sector
- contacts to international associations
- the website www.OEWAV.at with additional up-to-date information.

The core of the ÖWAV information programme for waste management experts are their seminar. The participation in a one day seminar typically costs 400 € for the general public, 220 € for members of the ÖWAV and 25 € for students.
The Austrian Association of Waste Treatment Companies (VÖEB)

- organizes specialized waste management seminars and
- publishes brochures, position papers and the semi-annual VÖEB-Magazine discussing current waste management topics (www.voeb.at/).

The homepage of the Austrian Chamber of Commerce (WKÖ) provides information on latest legal changes and what they mean for the daily waste management operations. Currently tackled topics comprise, among others:

- new obligation on record keeping and waybills
- duties of the company waste experts
- procedures for permitting and for notifying major changes to existing plants
- How to implement the new ordinance on recycling construction materials
- Regional waste laws
- Transboundary waste movement
- Preparation of waste management concepts
- End-of-life vehicles
- WEEE
- Remediation of contaminated sites.

Further information sources for Austrian waste management experts are

- Austrian, European or international norms
- Guidelines of the associations of German engineers VDI- (for example the VDI-guideline 3460 Emission Control Thermal Waste Treatment) (www.vdi.de/technik/richtlinien/)
- Expert magazines in German language, such as
  - Recycling Magazin (www.recyclingmagazin.de/)
  - Müll und Abfall (www.muellundabfall.de/)
  - Entsorge Magazin (www.entsorga-magazin.de/)
  - ReSource (www.rhombos.de/shop/zeitschriften/resource-00024/resource-5.html).
3 FACT SHEET GERMANY

3.1 Institutional framework, distribution of responsibilities and the administrative set-up

Germany is a Federal State with 16 singular Countries (“Bundesländer”). The Constitution [6] determines the principle of the federal system (Art. 20) and the responsibilities and legislative duties of State and Countries (Art. 70 to 82). The legislation can be distinguished between the

- Exclusive right of legislation for the Federal State
- Concurrent legislation of Federal State and Federal Countries. The Countries have the right of legislation until the Federal State uses its own right for a general legislation, especially in case of need for unique federal regulations. The subjects of concurrent legislation are determined in Art. 74 of the Constitution; the area of waste management belongs to these subjects.
- Exclusive right of legislation for the Federal Countries

Usually, the Federal Countries are responsible for the administration of federal legislation acts (Art. 83 of the Constitution). In single cases, competencies are assigned to administration units on the level of Federal State. Besides this, Art. 28 of the Constitution determines the right of self-administration of the Counties.

According to this structure, the legislative basis of waste management in Germany exists on three levels:

- Federal State: release the Federal Cycle Management Law [7] including all Regulations on the basis of this Law (comparable with Ministerial Order according to the Serbian Legislation), as well as additional Laws on special terms like Law on Batteries, Law on Electric and Electronic Devices, Law on Waste Shipments including all Regulations on their basis; this legislation belongs to the resort of the competent Federal Ministry (BMUB)
- Federal Countries: release Waste Management Laws for their region and further Regulations on the basis of these Laws which contain determinations concerning e.g.
  - the competencies (which authority shall be responsible for the different types of administration tasks resulting from legislation of the Federal State)
  - the fees to be reimbursed for all administrative acts of the competent authority
  - special waste management tasks which are applicable only in the relevant Country (only possible if the Federal Law does not comprises this matter or allows the Countries to release special regulations)
- Counties and county-free cities:
  - release statues for the administration of all tasks they are responsible for as a part of the self-administration (in connection with waste management especially the whole organisation of management of municipality wastes)
  - tasks which are delegated to the Counties by the Countries are not subject of statues because these tasks are determined by the legislation of the Federal State or the relevant Country and are delegated to the Counties (assigned administration).
Figure 1 shows the basic structure of administration in Germany. First Level is the Federal State with its 16 Countries. Second level is represented by these Countries, in the Figure 1 as example related to Saxony-Anhalt. Saxony-Anhalt itself is structured in 11 counties/districts and 3 county-level cities which represent the 14 competent Counties on the third level (Germany: 295 counties and 107 county-free cities). The further sub-structure of counties in Saxony-Anhalt in totally 218 Municipalities, thereof 104 cities (Germany: 11,091) could be seen as the fourth level but this is not relevant for the terms of waste management.

In this connection, the development of the administrative structure shall be taken into account. Up to middle of 1994, Saxony-Anhalt was structured into 37 counties (old structure from the former GDR was temporarily maintained) and after this up to middle of 2007 into 21 counties instead of currently 11 counties. In the same way, the number of Municipalities was reduced 2010 from former 857 to currently 218. Furthermore, the Country of Saxony-Anhalt was sub-structured up to End of 2003 into 3 individual Governmental Districts. This territorial sub-structure was replaced by the unique **State Administration Authority** ("Landesverwaltungsamt"). The main reason for these changes in Saxony-Anhalt was to optimise the administrative levels in the Country of Saxony-Anhalt and the adjustment on the actual needs with the parallel effect of reduced administrative costs. Nevertheless, other Federal Countries in Germany haven more or less comparable administrative structures, including sub-structuring Governmental Districts depending on the territory and the population of the relevant Country (e.g. North Rhine-Westphalia with 17,64 Mio. inhabitants has a sub-structure of 5 Governmental Districts).

For further comparison reasons: Germany has a total population of approximately 81.2 Mio., 2.24 Mio. inhabitants thereof are residents of Saxony-Anhalt; Serbia has a population of approx. 7.1 Mio. The area of Saxony-Anhalt is 20,452 km², 5.7 % of the territory of Germany (357,340 km²); Serbia has a territory of 77,474 km². The correlation between Serbia and Saxony-Anhalt is about 1:3 by population ad by territory.

The structure of the institutional framework in Saxony-Anhalt concerning the waste management is shown in Figure 2; the total framework of the Ministry of Agriculture and Environment...
(MoAE) is shown in Annex 1. This structure can vary in other Federal Countries. There, it has to be distinguished between the administration on the level of Country and of Counties. The field of waste management is currently assigned to the resort of the MoAE; in other Countries it belongs e.g. to the resort of economic affairs. But also other Ministries in Saxony-Anhalt are involved in the administration of waste management, especially the Ministry of Economics (concerning the waste disposal in underground and surface mining areas) or the Ministry of Internal Affairs (concerning the general responsibility for the administrative structure and the general supervision of the Counties). The MoAE is assisted by a technical authority, the State Agency for Environmental Protection (“Landesamt für Umweltschutz”). Most of the administration tasks in the Country level are assigned to the State Administration Authority because the central administration of the Country’s competencies is the main goal of this authority. Nevertheless, some single competencies were assigned to another authority like the State Agency for Environmental Protection because of there is a need for administrative decisions which have to be met independent from the measures taken by the Administration Authority. Actually, the MoAE has none own competencies in the enforcement of waste management. The special task to administrate and to supervise all necessary measures concerning remediation of contaminated areas and sites is concentrated within a specialised authority, the State Institute for Contaminated Sites, which belongs to the administrative structure on Country level.

![Diagram of administrative structure](image)

**Figure 2: Overview on the current administrative structure in Saxony-Anhalt**

The administration by the lower authority (14 Counties and county-free cities) comprises self-administrative tasks and delegated tasks. The authority shall guarantee that all financial and administrative aspects concerning these both kinds of tasks are distinguished strictly.

Finally, it has to be mentioned that some organisations outside the administrative level have got competencies in the field of waste management, e.g. public institutions, Chambers of Industry and Commerce or private companies under governmental or Counties’ supervision.
The tasks and duties on waste management are mainly defined and determined in the Cycle Management Law [7]. This law implements the requirements from the Waste Framework Directive of the European Union [8] into the German legislation and determines additional national requirements on waste management. In addition, the requirements of the Waste Shipment Regulation [9] have to be enforced immediately. Concerning the hazardous waste management, these tasks can be summarised as shown in Error! Reference source not found. and have to be mainly enforced by the Countries. Nevertheless the most of waste management tasks are assigned to the administration by Countries, the Federal Ministry has own competencies (besides the legislation duties), especially to draw up a Waste Prevention Program (under involvement of the Countries) and has delegated some tasks to the own Federal Agency of Environment, especially tasks in connection with the waste shipment, take-back obligations (WEEE, batteries) as well as report duties to the European Commission.

Table 5: Administration tasks concerning hazardous wastes and the assignment of competencies

<table>
<thead>
<tr>
<th>Task</th>
<th>Administration competence</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>In general, waste producers and waste owners are responsible for recovery or disposal of their wastes (PPP)</td>
<td>Assigned to the Counties by Waste Law of Saxony-Anhalt</td>
<td>Belongs to the self-administration of the Counties, therefore there is no alternative possibility to assign the competence</td>
</tr>
<tr>
<td>derogating from this, producers and owners of wastes from private households have to leave these wastes to the public waste management entity</td>
<td>Assigned to the Counties by Waste Law of Saxony-Anhalt combined with the possibility to exclude these wastes by statue</td>
<td>If these wastes are excluded (practiced in general) then the producer/owner is responsible by itself</td>
</tr>
<tr>
<td>derogating from this, the public waste management entity is also responsible for the management of wastes for disposal from other sources/origin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waste management concepts and balances</td>
<td>Counties</td>
<td>Duty in connection with the self-administration</td>
</tr>
<tr>
<td>Give-back and take-back obligations</td>
<td>Special competencies resulting from special legislation, e.g. Law on Batteries…</td>
<td>Part of responsibilities of producers and dealers of goods to take precautions for the management of these goods (disposal/recovery) after their use</td>
</tr>
<tr>
<td>Voluntary take-back of hazardous wastes shall be notified to the authority</td>
<td>State Administration Authority</td>
<td></td>
</tr>
<tr>
<td>Waste management plans</td>
<td>State Administration Authority; Also possible to concentrate on Ministerial level</td>
<td>Possible are partly plans for municipality wastes, for hazardous wastes, for other commercial wastes; Waste Management Plan of Saxony-Anhalt [18]</td>
</tr>
<tr>
<td>Waste prevention program</td>
<td>Federal state level</td>
<td>In case of participation of the Federal Countries, otherwise the countries have to draw up their own programs</td>
</tr>
<tr>
<td>Licensing of waste management plants</td>
<td>State Administration Authority as well as Counties</td>
<td>Depending on the kind of plant and the capacity The licensing of backfilling of surface mining areas with wastes belongs to the legislation for mining or for nature preservation</td>
</tr>
<tr>
<td>The licensing of waste treatment plants is part of the legislation for immission control ([24] in connection with [25]) or for construction.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Only the licensing of landfills is part of the waste management legislation [7]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duty of consultation</td>
<td>State Agency for Environmental Protection Counties</td>
<td>Information about available waste management plants Information concerning their own self-administration tasks</td>
</tr>
<tr>
<td>------------------------------</td>
<td>---------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Supervision and control</td>
<td>State Administration Authority as well as Counties</td>
<td>Depending on the kind of plant and the capacity. The competencies are organised in line with the competencies for the licensing procedure</td>
</tr>
<tr>
<td>Waste classification in single cases</td>
<td>Counties</td>
<td>Derogating waste classification in connection with the Regulation on Waste list [10]</td>
</tr>
<tr>
<td>Registration (for details see chapter 1.2) complete duty to register data about the management of hazardous wastes by the generator/owner, the collector/transporter, the disposal/recovery plant and the dealer/broker</td>
<td>State Administration Authority and State Agency for Geology and Mining as well as Counties</td>
<td>For disposal/recovery plants the competencies are organised in line with the competencies for the licensing procedure. For all other, the Counties are competent. Requirements according to the Notification Regulation [11].</td>
</tr>
<tr>
<td>Notification procedure (for details see chapter 1.2) Similar to the procedure of notification of waste shipments, the management of hazardous wastes within Germany has to be notified in advance (all parties and authorities involved) and has to be proved during the transportation</td>
<td>State Administration Authority and State Agency for Geology and Mining Counties State Agency for Environmental Protection</td>
<td>Approval of the intended recovery/disposal in connection with the Notification Regulation [11]. Information about the disposal ways Allocation of identification numbers</td>
</tr>
<tr>
<td>Notification procedure in case of waste shipments according the EU-Regulation [9]</td>
<td>State Administration Authority and State Agency for Geology and Mining</td>
<td>Enforcement in connection with the Notification and Licensing Regulation [12]. Competent for licensing of seminars to obtain special expertise</td>
</tr>
<tr>
<td>Notification or licensing of waste collectors/transporters and waste dealers/brokers</td>
<td>Counties State Agency for Environmental Protection</td>
<td>Acceptance of communities of disposers and agreement to special supervising contracts Competent for licensing of seminars to obtain special expertise</td>
</tr>
<tr>
<td>Certified waste disposal plants Opportunity according national legislation to get a member of a community of disposers or to make a special supervising contract Similar to the EMAS</td>
<td>State Agency for Environmental Protection</td>
<td></td>
</tr>
<tr>
<td>Duties according to the organisation of enterprises Allocated operations supervisor for waste management</td>
<td>State Administration Authority as well as Counties</td>
<td>Depending on the kind of plant and the capacity. The competencies are organised in line with the competencies for the licensing procedure</td>
</tr>
</tbody>
</table>
3.2 Organization of the collection and treatment of hazardous wastes

It is the aim of waste management plans (for Saxony-Anhalt [18]) to determine all details concerning the disposal/recovery of wastes in the relevant territory in order to guarantee the security of a proper waste management over the next years. The plans have to be checked and – if necessary – amended at least all 6 years and shall consider the prognostic development of waste management (amount of generated wastes, plans to establish needed treatment capacities to guarantee the disposal security) over the next 10 years.

According to the waste legislation in Saxony-Anhalt, the waste management is organised on the principle of private enterprises which act according to the relevant waste management market.

3.2.1 for hazardous wastes from households

According to the Law on Waste of Saxony-Anhalt [13], the Counties are allowed to exclude hazardous wastes from their collection, transportation or disposal duties because of their kind, amount or condition. Such exclusion shall be part of the relevant statues of the County and shall assign the excluded waste management activities (collection, transportation, and disposal). This option is not applicable for hazardous wastes from private households because this source belongs to the self-administration areas of the Counties. So the Counties are responsible for the collection and disposal of wastes from private households and similar wastes from enterprises including such wastes which are classified as hazardous wastes. The Counties determine the conditions and, if appropriate, the time periods for collection, transportation and disposal measures. The generators have to concede these wastes to the County.

These wastes can be conceded by usually separately collecting systems:

- pick-up-system where the County collects the waste on scheduled tours with own mobile collecting vehicles or
- bring-system where the waste owner transports the waste to a stationary collecting point (temporary storage plant) of the County or – if it is a sub-contracted activity in the relevant County – of a private enterprise.

Examples for such collecting devices and plants are displayed in Annex 2.

The Counties shall organise the disposal of all conceded wastes. It is possible to do this in own plants (e.g. landfills) or by commissioning the wastes to third parties (e.g. private enterprises). Today, the Counties in Saxony-Anhalt usually are not operators of waste management plants because there exist a wide range of private enterprises for waste management activities. In order to use these private waste management facilities, the Counties have to sub-contract waste management activities to these enterprises. Therefore, special contract conditions for public supplies and services [14] are applicable and before sub-contracting specific activities the authority shall a call for submissions. Such sub-contracts can comprise the collection of wastes, their transportation or their disposal. For the disposal of conceded hazardous wastes the notification duties described in chapter 1.2.2 are applicable but registration duties are not applicable for private households. The County acts as the waste owner instead of the private household as the real waste generator.

Specific hazardous wastes from private households are part of a special chapter of regulations determining the product responsibility. In these cases, the producer or dealer of products shall take measures for a proper waste management when its products became waste. In order to fulfil these specific waste management activities, the waste generators have to give back the
wastes after use of the product to the producer/dealer or usually to a common and federal-wide collecting system (collecting scheme) for the relevant wastes. Furthermore, the producer/dealer has the obligation to take back the wastes by itself or to guarantee that the waste shall be taken back by an assigned permanent collecting system which is organised by the producer/dealer in advance. The relevant collecting schemes have not only been used for hazardous wastes from private households but also for equal wastes coming from other sources like public institutions or private enterprises. Hazardous wastes with take-back and give-back obligations regulated in Federal Laws or Regulations are

- electric and electronic equipment, batteries (subject to own Laws besides the Federal Cycle Management Law)
- packaging of hazardous goods (subject of Regulation under the scope of the Federal Cycle Management Law)
- end-of-life-vehicles (Regulation)
- waste oils (Regulation)
- halogenated solvents (Regulation)
- Chemicals harmful for ozone shield (Halon) (Regulation)
- Chemicals harmful for climate change (fluorinated greenhouse gases) (Regulation).

Counties are partly involved in the collection system and shall provide the give-back possibility for private households. The collecting systems of the producers and dealers are designed very detailed and different and are under the responsibility of the producers/dealers, so the details are not described in this connection.

Counties shall draw up concepts and balances for their waste management activities according to the Federal Cycle Management Law [7]. The requirements on the concepts and balances are determined by the Federal States (Saxony-Anhalt: Law on Waste [13]). Concepts and balances of the Counties are the basis for the waste management plan for municipality wastes (Saxony-Anhalt: part 1 of [18]).

Balances are based on the data from the previous calendar year that have to be summarised and recorded by the Counties in standardised electronic program. The balances have to be hand out to the State Agency for Environmental Protection until March of the current year; the Agency is responsible to aggregate all County balances to a balance for the Country [15].

Concepts give an overview about the state of waste management in the relevant County. It contains at least data to

- kind, amount and whereabouts of all wastes
- current and planned measures for waste avoidance and recovery of all conceded wastes
- reasonable determination of excluded wastes
- proof that the waste disposal is secured for the next 10 years
- planned measures for own waste management facilities.

Concepts shall be draw up under participation of all stakeholders, shall be released by the County Parliament and shall be made public.
3.2.2 For other hazardous wastes

Hazardous wastes not from private households are mainly excluded by Counties’ statues because of their kind. In the result, the waste generator/owner is responsible for the disposal according to the legislation. He is responsible to declare its waste and to assign the right six-digits waste code according to the European List of Wastes and to choice a proper disposal way and disposal plant for its own wastes. He stays responsible during all time its waste is managed up to the final disposal or recovery. If necessary, the waste generator shall analyse its waste by own means, by means of the selected treatment plant (if offered) or by private laboratories according to determined standards. Such an analysis is necessary especially in case of hazardous wastes as part of the notification procedure (see below), if the hazardousness of the waste has to be clarified in connection with the right declaration or if the selected treatment plant is required by license to take-over wastes only considering specific limit values (e.g. incineration plants concerning limitation of emissions and landfills concerning identification and control analyses).

The management of hazardous wastes has to be supervised and notified to the competent authorities from the source up to the final disposal measure. This supervision consists of

- the notification of the intended disposal measure in advance to the authority and their approval (comparable to the notification procedure for waste shipments)
- a movement document to be carried with the waste from source to final disposal.

For the supervision, the Countries have developed a common electronic system (ASYS). The waste generators and the waste disposers are obliged to enter their notification and movement data into the electronic system, so the authority is able to process these data immediately on an electronic way. This allows the federal-wide communication of all participants. To organise and to maintain this communication

- the BMUB releases and amends the electronic data interface [19] in order to standardise the communication procedure and to secure the data transfer and exchange
- the Federal Countries operate a central coordination unit - ZKS [20] in order to guarantee the opportunity for a federal-wide disposal of hazardous wastes
- the waste generators and disposers have to register itself to the ZKS and have to use qualified electronic signatures to reproduce the relevant responsibility during the waste disposal.

The use of forms as paper sheets according to the legal basis [11] is only foreseen in case of malfunction of the system. But the ZKS displays these forms as dialogue masks. The forms are fully displayed in Annex 4, the numbers of forms refer to the relevant form displayed in annex 4.

For the notification procedure, the forms have to be used as follows:

- single notification: cover sheet (1), declaration of the waste generator (2a and 2b) including waste analysis (3), declaration of the disposer (4) and approval of the authority (5)
- collecting notification: same procedure as single notification but the waste collector/transporter notifies the disposal instead of the single waste generators under conditions:
  - collected wastes have the same waste code and the same composition
  - collected wastes are intended to the same disposal way
- waste generators do not have > 20 t/a per site; in this case a single notification is required (exception for certain wastes like waste wood, waste oils, lead-batteries…)

- special case: application for release from the duty of approval by the competent authority using the application form (6), the declaration of the disposer (4) and approval of the authority (5); in this case the authority allows the waste disposer once the take-over of certain hazardous wastes independent who is the generator; certified waste disposal plants are automatically released from the duty of approval by the competent authority.

The principle of single and collecting notification is shown in Figure 3. In step 1 the waste generator/collector fills in the forms (1 to 3), hands out to the disposer who fills in the form (4). This completed notification is sent in step 2 to the authority which has to check the intended disposal and to approve it. The approval is given to the disposer, to the waste generator and to the supervision authority of the waste generator. In general, the approval is valid for 5 years.

![Figure 3: system of notification of hazardous wastes](image_url)

This notification procedure is obligatory for all hazardous wastes. The competent authority can on application of the waste generator, transporter or disposer exempt from this duty. Furthermore, the authority can determine notification duties for non-hazardous wastes in single cases.

Besides the notification duty, some Federal Countries (BW, BY, BE, BB, HH, HE, NI, RP, SH) have legislated individual duties to tender/concede hazardous wastes to a special institution which is responsible to assign the waste to certain plants. Usually, these institutions are private enterprises under association of waste generators, disposers and competent authorities and under control of the relevant Country. For details see [21].
The actual transportation of wastes has to be proven by using the movement document. This form consists of 6 pages (cover and 5 blueprints). In the usual case of electronic data interchange the pages are replaced by secured electronic pages.

If the waste collector uses a collecting notification, he is obliged to hand out the take-over document (8) to each single waste generator. These take-over documents are not part of the electronic data interchange but are used only in paper form. The same form has to be used in case of minor amount of hazardous wastes: If the waste generator has only less than 2 tons hazardous wastes per year, then he has no obligation for a prior notification. Instead he has to prove the proper disposal of its wastes using the take-over form. The principle of using the movement forms is displayed in Figure 4.

![Figure 4: system of using the movement forms for the disposal of hazardous wastes](image)

In step 1 the waste generator fills in the data on the form, confirms and hands out the waste and the form to the transporter. The transporter adds its own data, confirms and gives back the added form (copy) to the generator. This is the proof of proper take-over of the wastes.

In step 2 the waste transporter hands out the waste and the form to the disposal enterprise. The disposer adds its own data, confirms and gives back the added form (copies) to the transporter and the generator. This is the proof of proper take-over of the wastes to its final disposal.

In step 3 the waste disposal enterprise hands out the finally added form (copy) to its supervision authority which forwards the form (copy) to the supervision authority of the waste generator.

The notification system and the system of movement forms are adjusted on the relevant principles according to the waste shipment procedures [9]. If the authority is familiar with this procedure and the forms that have to be used in case of shipments, these forms can also be used for the supervision of management activities within the own country. There do not exist any formal requirements on the forms for internal supervision.
As shown already in Figures 3 and 4, the relevant forms have to be collected by the responsible enterprises in a waste record book. The principle of registration is shown in Figure 5.

The enterprises are responsible to assign all movement forms to the relevant notification form in the right time order (step 1). This collection of notification and movement documents displays the register for hazardous wastes. So, the enterprises fulfil their legislative registration duties. The registers for hazardous wastes are in general electronic registers because the registered forms are electronic, too. The registers do not have to be sent to the authority but the authority can oblige the relevant enterprise to send the electronic register for control purposes.

Besides this, the authorities obtain the same data from the electronic system (step 2).

It is the duty of authorities to control all waste management enterprises regularly concerning their proper handling of (hazardous) wastes. One focus of controls is the check of all data in the registers (step 3). The time period for supervision measures of waste management enterprises depends on the kind of plant and on the legal requirements especially for plants according to the Industrial Emission Directive [22]. According to this Directive, the authorities have to draw up an inspection plan for the relevant plants. The inspection plan for Saxony-Anhalt [23] is published by the MoAE.

![Diagram of system of registration](image)

*Figure 5: system of registration*

The federal legislative requirements for notification procedure, movement control and registration are [7] and [11]. The inspection of enterprises is under federal requirements [7] and besides this under the requirements determined by the Federal Countries by decree.
Finally, all enterprises for collecting/transportation of hazardous wastes and all enterprises which are dealer/broker of hazardous wastes need an approval from the competent authority (County). The federal legislative requirements are [7] and [12]. This approval can be applied for in an electronic way (service of the ZKS, see [20]) on the basis of forms which are displayed within the system.

The relevant enterprises (owner and responsible persons with assigned tasks) have to fulfil special requirements:

- reliability: no offences against various legislative areas, especially environmental ones
- special knowledge: education, experiences, seminars (basic and further education) which have to be approved by the authority (competent in Saxony-Anhalt: State Agency for Environmental Protection).

There exist some exceptions from the duty for an approval, concerning hazardous wastes especially in the following cases:

- Means of waste collection and transportation of the Counties
- enterprises who act not on a commercial basis, e.g. manufacture enterprises which carry hazardous wastes from maintaining/repair measures to their sites or to disposal plants
- enterprises which fulfil take-back obligations
- certified enterprises.

These enterprises need just to announce/notify the intended activities to the authority (without approval). The notification need to be confirmed by the authority.

During the transportation of wastes, the collecting/transportation enterprise has to carry on the approval or the alternative confirmed notification. Certified enterprises shall carry on the relevant certificate. The means of transportation on public roads have to be signed as shown in Figure 6.

![Figure 6: example for the A-sign on vehicles on public roads](image-url)
3.3 Financing of the management of hazardous wastes

In general the Polluter Pays Principle (PPP) has to be considered. This principle is the basis for financing the management of hazardous wastes from private households and also from the other business activities.

The costs of waste management of the Counties are displayed in the annual waste balance. These costs include the expenses for the

- different waste management activities like collection/transport, treatment, pre-treatment
- administration with consultation, publications, personnel, operating processes.

If the County generates revenues from the waste management, e.g. by selling valuable recyclables like paper, clothing etc., these were considered as cost reducing contribution.

Error! Reference source not found. shows the total costs of municipality waste management up from 2010 without gained revenues. The total costs for 2014 of 154.43 Mio. € correspond to specific costs of approximately 69 € per resident which are covered by fees that the households have to pay on the basis of County decisions which are regularly maintained. The variety of waste management systems in the Counties does not allow a serious comparison of the costs between the Counties, so all costs can only be displayed totally for Saxony-Anhalt.

| Table 6: costs of municipality waste management in Saxony-Anhalt in Mio. € |
|-----------------|-----|-----|-----|-----|-----|
| area            | 2010 | 2011 | 2012 | 2013 | 2014 |
| collection/transport | 60.95 | 69.18 | 68.91 | 73.42 | 67.83 |
| collecting points  | 5.07  | 5.37  | 7.19  | 7.84  | 7.84  |
| biological treatment | 4.37  | 8.64  | 6.29  | 5.87  | 10.04 |
| mech.-biol. treatment | 5.82  | 5.83  | 5.24  | 6.17  | 9.59  |
| thermal treatment | 38.18 | 44.77 | 35.23 | 34.99 | 32.88 |
| pre-treatment/recycling | 2.62  | 5.81  | 5.86  | 5.89  | 5.67  |
| landfill           | 4.92  | 5.47  | 5.21  | 7.45  | 2.94  |
| administration     | 13.19 | 17.99 | 15.08 | 14.25 | 17.65 |
| total              | 135.13 | 163.06 | 149.0 | 155.87 | 154.43 |

The rate of all waste management areas on the total costs is shown in Figure 7. According to this, the costs for collection/transport, thermal treatment and administration represent \( \frac{3}{4} \) of the total costs.
Figure 7: rate of costs for municipality waste management activities

The costs as shown above comprise not only the management of hazardous wastes but mainly the management of all typical municipality wastes, the costs for the management of hazardous wastes by the Counties are included in these costs. Further typical parts of the costs to be covered by the Counties are costs for the disposal of illegally dumped wastes. For wastes which are dumped in the free landscape, the County is responsible for collection and organization of their proper disposal. For wastes which are dumped on private estates, the owner is responsible for the collection and the handover to the County and the County is responsible for pick-up and organization of their proper disposal.

In the same way as the private households have to cover the costs for waste management activities provided by the Counties, all other commercial waste generators/owners have to cover the costs for the respective waste management measures according to the PPP. The difference is that the commercial waste generators pay the costs on the basis of individual invoices from the waste disposers. These costs are usually calculated per tons and have a wide range depending on

- the relevant disposal facility and their state of the art
- the kind of wastes and the contained pollutants (concentration and kind)
- the amount of wastes, time period the waste is delivered to the relevant plant and further contract conditions of the disposer.

These costs can vary between 15 €/t (e.g. for minor contaminated huge amounts of mineral wastes for landfilling) up to 2,000 €/t (e.g. for small amounts of wastes contaminated with substances that need a special treatment and pre-treatment to be disposed). In connection with the following explanations concerning the financial guarantees, Saxony-Anhalt has elaborated a list of average waste specific costs that can be provided if needed. Additional costs in a wide range are generated in connection with waste analyses.

Further costs are generated for waste treatment plants in the connection with the

- permit of plants and installations
- continuous operation and supervision/inspection of plants and installations
- shut off of plants, setting of operations and the maintenance of illegal situations in plants.

Also these costs, the operator has to cover according to the PPP.

According to the German legislation for licensing plants (for landfills [7], for treatment plants in general [24]) the competent authority shall determine a financial security/guarantee especially for waste management installations. For other plants, e.g. industrial production plants, the authority can determine such a financial guarantee. The aim of the financial guarantee is to secure a proper operation of the plant, especially

- that the plant has no negative effects on the environment or displays other dangers, disadvantages, impairments
- that present wastes are disposed/recovered in a proper way
- in case of damages or illegal conditions the proper operation of the plant can be maintained/recovered, also in case of final stop of waste management operations; this is especially important in case of landfills which have finalized the landfill period and are in the af-
Towards supervision and closing period; for this period the plant usually does not generate sales/revenues to finance the closing activities.

The operator has to deposit the financial security – usually by a bank guarantee – in connection with the licensing procedure. The authority shall be the beneficiary of the financial guarantee in order to cover the costs if the operator is not able or not willing to take measures to prevent damages or to maintain the proper operation of the plant. In most cases the authority has to deals with overloaded waste storage areas or with wastes, the operator is not allowed to take over.

In the case of a damage, an illegal state in the plant or in case of an intended closing of the plant, the operator is obliged first to take all necessary measures by itself to avoid damages for health or environment and to maintain or to restore the former legal state of the plant. Instead of the operator, the owner of the estate can be held responsible for any damages. If the operator does not meet the necessary measures, the authority has to act instead of the operator according to the general administration legislation. The authority shall take the deposited financial guarantee to cover their costs for the implementation of all necessary measures. If the financial guarantee is not high enough to cover all costs, the authority shall take the costs and can reclaim it from the operator afterwards. When the costs of the authority cannot be reimbursed/reclaimed from the operator, these costs stay as part of the financial budget of the relevant authority. For these cases, the annual administrative budgets shall contain a special chapter with concrete plans of financial expenses.

The remediation of contaminated sites is a special area that needs special measures for waste management as well as special financial frameworks. Old industrial areas from former GDR times represent a possible danger for environmental media, especially soil and water, and for health. Furthermore, these areas were mainly not in a state for a further use and are an obstacle for needed new investments. It is the task of public administration to ban all endangers by proper remediation of all sites and to release the future investors from any responsibilities in connection with this sites. Therefore, the Federal Countries have to cover all costs in connection with the risk assessment and the remediation itself.

The costs for the remediation are split on the basis of an administration agreement from 1992 between Federal State and Federal countries. In 2001, the financial obligations for the Federal State were delegated to the Federal Country by closing a general contract to transfer a general financial compensation to the Country. This financial compensation is used as special investment fund on the capital market up today (> 1 Bio. €). This guarantees the long-term availability of financial resources for the purposes of remediation of contaminated sites. The task of remediation is managed by the State Institute for Contaminated Sites. This Institute acts also a competent authority for the soil protection on the managed sites (enforcement of the relevant Federal legislation on soil protection). Detailed information about the tasks and operation of the Institute, the projects (compare Figure 8) managed by the Institute and the legislative basics are available at [26].

Saxony-Anhalt is affected in a special manner concerning contaminated sites because it was the focal point of the chemical industry in the former GDR (80%).
Summary, for remediation measures were expended > 1.3 Bio. € up to now, only for the larger ecological projects (7 in Saxony-Anhalt) almost 900 Mio. € as follows:

- Bitterfeld-Wolfen 320 Mio. € + 10 Mio. € for the redevelopment of the chemical site
- Buna 225 Mio. €
- Leuna 85 Mio. €
- Magdeburg-Rothensee 39.8 Mio. €
- Mansfelder Land 38 Mio. €
- Zeitz 26.7 Mio. €
- Natural gas fields Altmark 150 Mio. €.

Up to May 2015 totally 1,850 measures of remediation were finished, 14,991 further measures still have to be realized. For the present time, 248 projects are under remediation simultaneously and for 52 projects the check of the individual assessment of remediation needs has started.

One of the main goals of remediation activities is – besides the avoidance of future negative effects on health and environment – the further use of sites for new industrial activities.

In addition to the remediation activities performed by the environmental authorities, 1.4 Bio. € were expended for the remediation of mining areas and processing plants for lignite.

The polluter-pay-principle is applicable in case of waste shipments, too. According to this, the notifier or the person who arranges the shipment of green listed wastes is responsible also in case of illegal shipments or if a shipment cannot be finished as intended. Only if the responsible person is not known or cannot be identified within the legislative time limit for take-back
measures, the competent authority has to act instead of the responsible person (reliability of the state). Usually, the competence can assigned to the right authority in the Country the waste comes from. Nevertheless, there are cases where the source of the waste remains unclear. For such cases, the Counties arranged a State Contact and assigned the tasks for all necessary measures in case of illegal shipments to a central authority. The fixed costs for the administration by the authority (currently approx. 100,000 € per year) as well as all variable costs from certain take-back measures are financed by all Countries on the basis of Federal Country rates (see below).

Finally, it has to be advised to the management of costs that have to be paid by the Federal Countries. For such cases the costs are split according to fixed individual rates. These rates are calculated as country-specific factor according to the tax amount (contributes 2/3 to the factor) and the population (1/3) and annual updated. The actual rates are shown in Error! Reference source not found..

Table 7: Federal Country rates [%] to finance/cover common costs

<table>
<thead>
<tr>
<th>Federal Country</th>
<th>rate 2015</th>
<th>rate 2014</th>
<th>population</th>
</tr>
</thead>
<tbody>
<tr>
<td>BW</td>
<td>12.86456</td>
<td>12.97496</td>
<td>13.20</td>
</tr>
<tr>
<td>BY</td>
<td>15.51873</td>
<td>15.33048</td>
<td>15.63</td>
</tr>
<tr>
<td>BE</td>
<td>5.04927</td>
<td>5.04557</td>
<td>4.27</td>
</tr>
<tr>
<td>BB</td>
<td>3.06053</td>
<td>3.06053</td>
<td>3.02</td>
</tr>
<tr>
<td>HB</td>
<td>0.95688</td>
<td>0.94097</td>
<td>0.82</td>
</tr>
<tr>
<td>HH</td>
<td>2.52968</td>
<td>2.52738</td>
<td>2.17</td>
</tr>
<tr>
<td>HE</td>
<td>7.35890</td>
<td>7.31557</td>
<td>7.51</td>
</tr>
<tr>
<td>MV</td>
<td>2.02906</td>
<td>2.04165</td>
<td>1.97</td>
</tr>
<tr>
<td>NI</td>
<td>9.32104</td>
<td>9.35696</td>
<td>9.64</td>
</tr>
<tr>
<td>NW</td>
<td>21.21010</td>
<td>21.24052</td>
<td>21.72</td>
</tr>
<tr>
<td>RP</td>
<td>4.83710</td>
<td>4.83472</td>
<td>5.06</td>
</tr>
<tr>
<td>SL</td>
<td>1.22173</td>
<td>1.21566</td>
<td>1.22</td>
</tr>
<tr>
<td>SN</td>
<td>5.08386</td>
<td>5.10067</td>
<td>4.99</td>
</tr>
<tr>
<td>ST</td>
<td>2.83068</td>
<td>2.85771</td>
<td>2.75</td>
</tr>
<tr>
<td>SH</td>
<td>3.40337</td>
<td>3.38791</td>
<td>3.49</td>
</tr>
<tr>
<td>TH</td>
<td>2.72451</td>
<td>2.74835</td>
<td>2.66</td>
</tr>
</tbody>
</table>

Projects and measures that have to be financed on the basis of country rates are for instance

- the development, maintenance, update and operation of electronic systems like ASYS
- the fulfilment of take-back obligations from illegal waste shipments, if the waste generator is unknown (and insofar the obligation cannot be assigned to a competent country authority).
3.4 Collection amounts of hazardous wastes (overview, separate for hazardous waste from households and other hazardous wastes)

Typical wastes that are collected by the Counties of Saxony-Anhalt including their relevant amount in 2014 are listed in the following Error! Reference source not found.. These data are part of the annual Waste Management Balance [15] which is elaborated by the State Agency for Environmental Protection on the basis of annual balance data from the Counties. The total amount is 16,604 tons and comprises besides all hazardous wastes also such wastes that shall be collected separately, too, in order to avoid misuse and the illegal disposal in the landscape.

Table 8: separate collected wastes by the Counties

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>15 01 10*</td>
<td>packaging containing residues of or contaminated by dang. subst.</td>
<td>13</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>16 01 03</td>
<td>end-of-life tyres</td>
<td>261</td>
<td>261</td>
<td>0.</td>
</tr>
<tr>
<td>16 01 04*</td>
<td>end-of-life vehicles</td>
<td>57</td>
<td>57</td>
<td>0.</td>
</tr>
<tr>
<td>16 02 13*</td>
<td>discarded equipment containing hazardous components...</td>
<td>14,800</td>
<td>14,800</td>
<td>0.</td>
</tr>
<tr>
<td>16 05 04*</td>
<td>gases in pressure containers (including halons) cont. dang. subst.</td>
<td>8</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>16 05 05</td>
<td>gases in pressure containers other than those mentioned in 16 05 04</td>
<td>0.</td>
<td>0.</td>
<td>0.</td>
</tr>
<tr>
<td>16 06 01*</td>
<td>lead batteries</td>
<td>32</td>
<td>23</td>
<td>9</td>
</tr>
<tr>
<td>16 06 02*</td>
<td>Ni-Cd batteries</td>
<td>1</td>
<td>1</td>
<td>0.</td>
</tr>
<tr>
<td>16 06 04</td>
<td>alkaline batteries (except 16 06 03)</td>
<td>4</td>
<td>4</td>
<td>0.</td>
</tr>
<tr>
<td>20 01 13*</td>
<td>solvents</td>
<td>145</td>
<td>74</td>
<td>71</td>
</tr>
<tr>
<td>20 01 14*</td>
<td>acids</td>
<td>7</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>20 01 15*</td>
<td>alkalines</td>
<td>6</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>20 01 17*</td>
<td>photochemicals</td>
<td>2</td>
<td>0.</td>
<td>2</td>
</tr>
<tr>
<td>20 01 19*</td>
<td>pesticides</td>
<td>31</td>
<td>12</td>
<td>19</td>
</tr>
<tr>
<td>20 01 26*</td>
<td>oil and fat other than those mentioned in 20 01 25</td>
<td>39</td>
<td>31</td>
<td>8</td>
</tr>
<tr>
<td>20 01 27*</td>
<td>paint, inks, adhesives and resins containing dangerous substances</td>
<td>776</td>
<td>420</td>
<td>357</td>
</tr>
<tr>
<td>20 01 28</td>
<td>paint, inks, adhesives and resins other than those ment. in 20 01 27</td>
<td>332</td>
<td>110</td>
<td>222</td>
</tr>
<tr>
<td>20 01 29*</td>
<td>detergents containing dangerous substances</td>
<td>5</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>20 01 30</td>
<td>detergents other than those mentioned in 20 01 29</td>
<td>1</td>
<td>1</td>
<td>0.</td>
</tr>
<tr>
<td>20 01 31*</td>
<td>cytotoxic and cytostatic medicines</td>
<td>0.</td>
<td>0.</td>
<td>0.</td>
</tr>
<tr>
<td>20 01 32</td>
<td>medicines other than those mentioned in 20 01 31</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>20 01 33*</td>
<td>batteries and accumulators incl. in 16 06 01, 16 06 02 or 16 06 03</td>
<td>20</td>
<td>19</td>
<td>1</td>
</tr>
<tr>
<td>20 01 34</td>
<td>batteries and accumulators other than those mentioned in 20 01 33</td>
<td>14</td>
<td>14</td>
<td>0.</td>
</tr>
<tr>
<td>20 01 99</td>
<td>other fractions not otherwise specified</td>
<td>45</td>
<td>29</td>
<td>16</td>
</tr>
<tr>
<td>total</td>
<td></td>
<td>16,604</td>
<td>15,877</td>
<td>727</td>
</tr>
</tbody>
</table>
The highest amount is displayed by waste electric and electronic equipment which is collected by the Counties (inter alia because such equipment can also be given back to the dealer) and disposed in accordance with the national register for waste electric equipment (Foundation EAR). This foundation was created by producers as their Clearing Point for the purposes of take-back-obligations according to the Law on Electric and Electronic Equipment [16]. Entrusted with sovereign rights by the UBA, the Foundation EAR registers the producers of electrical and electronic equipment and coordinates the provision of containers and the pick-up of electrical and electronic waste equipment at the sites of Counties all over Germany.

The Counties usually do not obtain own plants for the disposal of these wastes. Instead, the collected wastes are given to private enterprises as sub-contractors of the Counties.

For the disposal of other hazardous wastes not from private households, the generator/owner is obliged instead of County. These wastes have to be notified in advance and to be proven with a transportation form (see chapter 1.2.2). The data are compiled and checked with the federal-wide electronic system ASYS. This system allows the easy statistic assessment of the situation on hazardous waste disposal. This annual assessment is also part of the Waste Management Balance which is elaborated by the State Agency for Environmental Protection on the basis of all transportation forms. In the last years were assessed summary approximately between 140.000 and 150.000 documents.

According to this assessment, the amount of notified wastes is as shown in Figure 9. This picture displays all hazardous wastes which have to be notified obligatory on the legal basis as well as other wastes which have to be notified only on basis of a decision by the competent authority in single case. The amount of hazardous wastes which were generated in Saxony-Anhalt 2014 was about 1.28 Mio. tons (whole Germany: 22.4 Mio. tons; the respective amount of Saxony-Anhalt: 5.7 %). These wastes were disposed in Saxony-Anhalt (approx. 830,000 tons), in other Federal Countries (approx. 445,000 tons) and outside of Germany (3,600 tons). At the same time, 1.08 Mio. tons hazardous wastes were imported from other Federal Countries and about 167,000 tons from other States. So, in Saxony-Anhalt were disposed about 2.076 Mio. tons hazardous wastes in 2014 (import overflow of 1.246 Mio. t).

This import overflow can also be found for whole Germany. In 2013, according to statistical elevations were generated approx. 21.74 Mio. t hazardous wastes and disposed or recovered approx. 26.07 Mio. t hazardous wastes.
Figure 9: Amount and disposal of wastes with notification duties in 2014 in Saxony-Anhalt

This statistic shows that in Saxony-Anhalt the amount of disposed wastes is much higher than the amount of generated hazardous wastes. This situation can be observed during the last years; Annex 3 shows this development since 1992. This import overflow can be observed since 1992 with the exception of two years (see Figure 10).

Figure 10: Difference between the amounts of disposed and generated hazardous wastes in Saxony-Anhalt
This high amount of waste import leads to the situation that the rate of imported waste is more than 50 % from the total amount of disposed hazardous wastes in Saxony-Anhalt (see Figure 11).

The kinds of hazardous wastes which were generated in Saxony-Anhalt in 2014 with an amount of more than 10,000 tons are listed in Error! Reference source not found.. This table enables also the comparison with the situation in 2013. From all actual 408 kinds of hazardous wastes only 253 were generated in Saxony-Anhalt 2014. Only 22 kinds of hazardous wastes have an amount of more than 10,000 tons and represent approximately 82.2 % of the total amount of generated hazardous wastes. The recovery rate is about 87 % and comparable over the last years.

Table 9: selected in Saxony-Anhalt 2014 generated hazardous wastes with an amount of ≥ 10,000 tons

<table>
<thead>
<tr>
<th>Waste code</th>
<th>Kind of waste</th>
<th>Amount 2014 [t]</th>
<th>Amount 2013 [t]</th>
</tr>
</thead>
<tbody>
<tr>
<td>19 03 06*</td>
<td>wastes marked as hazardous, solidified</td>
<td>295,951</td>
<td>257,045</td>
</tr>
<tr>
<td>19 01 07*</td>
<td>solid wastes from gas treatment</td>
<td>159,398</td>
<td>164,464</td>
</tr>
<tr>
<td>19 02 04*</td>
<td>premixed wastes composed of at least one hazardous waste</td>
<td>85,089</td>
<td>126,666</td>
</tr>
<tr>
<td>12 01 09*</td>
<td>machining emulsions and solutions free of halogens</td>
<td>66,889</td>
<td>47,842</td>
</tr>
<tr>
<td>19 12 06*</td>
<td>wood containing dangerous substances</td>
<td>59,548</td>
<td>68,949</td>
</tr>
<tr>
<td>19 03 04*</td>
<td>wastes marked as hazardous, partly (5) stabilised</td>
<td>54,330</td>
<td>73,257</td>
</tr>
<tr>
<td>17 05 03*</td>
<td>soil and stones containing dangerous substances</td>
<td>52,073</td>
<td>107,001</td>
</tr>
<tr>
<td>19 12 11*</td>
<td>other wastes from mechanical treatment of waste cont.</td>
<td>51,584</td>
<td>26,073</td>
</tr>
</tbody>
</table>
### Fact Sheet Germany

#### Twinning Project

**“Improvement of hazardous waste management in the Republic of Serbia - IWHMS”**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>2014</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>06 01 01*</td>
<td>Sulphuric acid and sulphurous acid</td>
<td>33,880</td>
<td>37,875</td>
</tr>
<tr>
<td>19 02 05*</td>
<td>Sludges from physical/chemical treatment containing dang. subst.</td>
<td>27,241</td>
<td>21,785</td>
</tr>
<tr>
<td>10 03 08*</td>
<td>Salt slags from secondary production</td>
<td>24,510</td>
<td>20,991</td>
</tr>
<tr>
<td>17 06 05*</td>
<td>Construction materials containing asbestos</td>
<td>19,616</td>
<td>22,405</td>
</tr>
<tr>
<td>17 02 04*</td>
<td>Glass, plastic and wood containing or contam. with dang. subst.</td>
<td>18,181</td>
<td>16,889</td>
</tr>
<tr>
<td>17 09 03*</td>
<td>Other construction and demolition wastes containing dang. subst.</td>
<td>16,793</td>
<td></td>
</tr>
<tr>
<td>06 05 02*</td>
<td>Sludges from on-site effluent treatment containing dang. subst.</td>
<td>13,169</td>
<td>11,559</td>
</tr>
<tr>
<td>17 01 06*</td>
<td>Concrete, bricks, tiles and ceramics containing dang. subst.</td>
<td>12,928</td>
<td></td>
</tr>
<tr>
<td>01 05 06*</td>
<td>Drilling muds and other drilling wastes containing dang. subst.</td>
<td>12,667</td>
<td></td>
</tr>
<tr>
<td>15 02 02*</td>
<td>Absorbents, filter materials (including oil filters n.o.s., wiping cloths, protective clothing contaminated by dangerous substances)</td>
<td>12,191</td>
<td>11,228</td>
</tr>
<tr>
<td>07 07 01*</td>
<td>Aqueous washing liquids and mother liquors</td>
<td>10,620</td>
<td></td>
</tr>
<tr>
<td>13 05 02*</td>
<td>Sludges from oil/water separators</td>
<td>10,595</td>
<td></td>
</tr>
<tr>
<td>07 01 08*</td>
<td>Other still bottoms and reaction residues</td>
<td>10,317</td>
<td></td>
</tr>
<tr>
<td>19 01 13*</td>
<td>Fly ash containing dangerous substances</td>
<td>10,284</td>
<td></td>
</tr>
<tr>
<td>19 07 02*</td>
<td>Landfill leachate containing dangerous substances</td>
<td>12,596</td>
<td></td>
</tr>
<tr>
<td>17 03 01*</td>
<td>Bituminous mixtures containing coal tar</td>
<td>10,377</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>1,278,713</strong></td>
<td><strong>1,297,327</strong></td>
</tr>
</tbody>
</table>

### 3.5 Treatment of hazardous waste (types of treatment plants, available treatment capacities, need to export particular hazardous wastes)

For the disposal of hazardous wastes, a **wide range of various plants** is available. This range of plants represents the average state of the art concerning the disposal of hazardous wastes. In 2014 approximately 150 waste management plants were taking-over hazardous wastes for the disposal/recovery. The list of plants and the relevant amount of disposed hazardous wastes is part of the annual waste balance [15]. The amount of hazardous wastes that were taken over by any individual plant varies as follows:

- 7 plants with an annual input amount of > 100,000 tons, up to max. 219,000 tons
- 26 plants with an annual input amount of 10,000 > 100,000 tons
- 38 plants with an annual input amount of 1,000 > 10,000 tons
- 46 plants with an annual input amount of 100 > 1,000 tons.

The aggregated amount of hazardous wastes that were taken over in 2014 by different types of waste management plants is shown in Error! Reference source not found.. These Plants can be seen as service provider of waste management activities. Mostly operated on a private commercial basis, these plants acquire their jobs and offer their portfolio to the waste generators. Besides this, the operators of waste management plants usually advise and support the waste generators in questions of notification or taking samples/analytics.

**Table 10: disposal ways for hazardous wastes in Saxony-Anhalt 2014**

<table>
<thead>
<tr>
<th>plant code</th>
<th>description</th>
<th>Amount 2014 [t]</th>
<th>percentage [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>UTV</td>
<td>Underground stowage plants</td>
<td>593,868</td>
<td>27.9</td>
</tr>
<tr>
<td>REC</td>
<td>Recycling plants</td>
<td>394,300</td>
<td>18.5</td>
</tr>
<tr>
<td>CPB</td>
<td>Chemical-physical treatment plants</td>
<td>333,297</td>
<td>15.6</td>
</tr>
<tr>
<td>SON</td>
<td>Other plants</td>
<td>237,397</td>
<td>11.1</td>
</tr>
<tr>
<td>DEP</td>
<td>Landfills</td>
<td>176,108</td>
<td>8.3</td>
</tr>
<tr>
<td>BB</td>
<td>Soil treatment plants</td>
<td>137,210</td>
<td>6.4</td>
</tr>
<tr>
<td>ZWL</td>
<td>Temporary storage plants</td>
<td>97,654</td>
<td>4.6</td>
</tr>
<tr>
<td>VBr</td>
<td>Incineration, thermal treatment plants</td>
<td>86,843</td>
<td>4.1</td>
</tr>
<tr>
<td>UTD</td>
<td>Underground landfill</td>
<td>75,074</td>
<td>3.5</td>
</tr>
<tr>
<td><strong>total</strong></td>
<td></td>
<td><strong>2,131,751</strong></td>
<td></td>
</tr>
</tbody>
</table>

Because of the geological situation in Saxony-Anhalt with large areas of salt stocks and respective mining areas (current and former ones), there are good conditions for underground stowage of mines (4 plants) as well as for underground landfilling (1 plant). These special conditions are not available all over Germany or Europe, so the plants offer their portfolio also to waste generators abroad Saxony-Anhalt. The disposal of proper hazardous wastes in salt mines represents the state of the art for recovery (stowage especially of mineral wastes) and for final disposal (underground landfill in secured chambers and individual packaging).

Also on (surface) landfills wastes can be disposed off during the intended time period for fill in wastes and be recovered during the following time period of closure. The requirements on landfills for waste are regulated in the Regulation for Landfills [17] on the basis of European Legislation. Depending on the landfill class, the requirements on basement systems, landfill corpus, cover sheets, water management sheets, recultivation sheets, revegetation sheets etc. are determined as the state of the art. There is none landfill for hazardous wastes in Saxony-Anhalt which fulfills these legislative requirements but there are some former landfills that were allowed to continue operations under conditions and that are in the closure period now. Especially mineral wastes are relevant for the disposal and the recovery on landfills.

Other treatment plants that are part of the licensing procedure of the immission legislation shall be operated according to the state of the art, too. This state of the art is determined by BREF.
that are compiled in relevant documents of the European Commission and that has to be fulfilled by the operator of treatment plants after a transitional time period.

A common technology for the treatment of hazardous wastes is the **chemical-physical treatment**, for instance by means of neutralisation, precipitation, filtration, stripping, distillation etc. There are many of plants providing one or more of these technologies in Saxony-Anhalt, either as a special waste management installation or as a production plant that is allowed to insert and to process also wastes.

Special technologies can be used for the treatment of contaminated soil. The aim is to reduce organic pollutants e.g. by stripping with thermal measures or by biological means like microorganisms.

A further common technology is the **thermal treatment** of hazardous waste especially by means of incineration. The state of the art for thermal treatment of hazardous wastes is the rotating kiln. In Saxony-Anhalt there are 3 of such kilns, one as a production plant for the recovery of chlorine from chlorine-containing wastes and two as production plants for cement that are licensed also for the recovery of high-caloric hazardous wastes. Besides this technology, there are 7 plants in Saxony-Anhalt for the incineration of wastes on a grate. Specific hazardous wastes can also be treated with this technology according to the state of the art.

Further not very specified treatment plants are for recycling of hazardous wastes. Examples for such treatment measures are the re-refraining of waste oils, the dismantling of devices like electronic equipment or end-of-life-vehicles or the distillation of solvents…

A very important part of plants is represented by **temporary storage installations**. These waste management plants are the buffer between the waste generators and the final disposal/recovery activities and are available all over Saxony-Anhalt. Often these storage plants have fixed contracts with subsequent waste disposal plants on a certain waste amount for better conditions (less expensive). So, this storage plants can usually offer better prices to the waste generators than the final waste disposal plant by itself.

The development of the rates of all different types of waste management activities for hazardous wastes can be seen in Figure 12.
Figure 12: development of the rates of various waste disposal ways in Saxony-Anhalt

The relevant number of plants and market shares of hazardous waste management facilities for whole Germany is as follows (data rely to statistical elevations in 2013):

- landfilling including recovery as closing measures 211 plants 22.7 %
- chemical-physical treatment 449 plants 18.7 %
- thermal treatment 187 plants 17.7 %
- underground stowage 11 plants 8.3 %
- soil treatment 82 plants 5.6 %
- treatment of construction wastes 155 plants 4.4 %
- WEEE and ELV dismantling 1417 plants 4.3 %
- others approx. 588 plants 18.3 %.

The transportation of hazardous wastes abroad from or to Saxony-Anhalt is a usual procedure. Especially Germany as a member state of the European Union shall guarantee the principle of the Waste Framework Directive to create a network of plants for the proper disposal/recovery of all wastes which are generated in the own territory. As shown above, in Saxony-Anhalt a wide range of waste management installations is available, but not every. Further management installations are operated in other Federal Countries and the waste generators can use these capacities if available. The figures for import and export of wastes from/to other Federal Countries are shown in Figure 13, which shows again the import overflow explained in chapter 1.5.

Figure 13: Import/export of hazardous wastes between Saxony-Anhalt and other Federal Countries

Besides the import and export between the Federal Countries of Germany, the transboundary shipment of wastes to and from other states according to the relevant European legislation [9] is a common procedure.
213,279 tons of wastes which had to be notified were imported in 2014 from other States to Saxony-Anhalt, 166,840 tons thereof hazardous wastes. This represents 10 % of the total amount of all hazardous wastes disposed in Saxony-Anhalt. 6,905 tons of notified wastes were exported in 2014 from Saxony-Anhalt to other States, 3,599 tons thereof hazardous wastes. The total figures are displayed in Error! Reference source not found. including the relevant data for 2013.

Table 11: Import and export figures concerning Saxony-Anhalt 2014 and 2013

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>BE</td>
<td>11,753</td>
<td>587</td>
<td>6,159</td>
<td>564</td>
</tr>
<tr>
<td>BG</td>
<td>38</td>
<td>18</td>
<td></td>
<td></td>
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The development of waste shipments since 2000 is shown in Figure 14.
3.6 Specific legislation for mobile treatment plants (including permitting criteria, e.g. exclusion of particular wastes) taking into account specific aspects of waste management

The construction and the operation of industrial plants listed in [25] are required to have a license according to the legislation on immission control. This legislation defines the requirements of two licensing procedures: a fully licensing procedure mainly for plants which are part of the European Industrial Emission Directive (IED) and for plants which are identified as plants under the scope of European Seveso-Directive and a simplified licensing procedure mainly for other industrial plants.

The permit has to be granted by the competent authority (immission control) if the legislative requirements are fulfilled.

The plants are, if its operation is expected at least 12 month after implementation on the same place. Derogating from this, for waste treatment plants the requirement to obtain a license is applicable without any time limits, except plants for waste treatment on the place of generation.

For waste management plants, the authority is obliged to raise a financial security/guarantee explained in chapter 1.3. For other industrial plants the authority can raise a respective financial guarantee.

The legislation on licensing industrial plants requires the operator to fulfil the state of the art which is defined within Best References Documents (BREF) released by the EU.
The licensing procedure for landfills (plan approval process) and the relevant technical requirements are part of the waste legislation and regulated in the Federal Cycle Management Law and the subsequent Landfill Regulation. Also for landfills, the operator has to pay or to prove a financial security/guarantee for all necessary measures after closing the landfill and all relevant reclamation activities. The state of the art of landfills refers to the relevant European legislation and distinguishes between five classes of landfills. The disposing of wastes on certain landfills is allowed if limit values for certain organic and inorganic parameters are not exceeded.

Plants for stowage of wastes in surface and underground mining areas are licensed according to the legislation on mining/geology or according to the legislation on nature conservation.

Treatment plants that are not part of the legislation on immission control (see above [25]) are required to apply for a license granted by the competent authority for construction.

Mobile treatment plants are used in Germany mainly for cracking, shredding or classification of mineral wastes in construction and demolition measures (e.g. road construction) or for treatment of wastes in situ (e.g. remediation of contaminated sites).

Furthermore, the disposal of oily wastes from sinks can be seen as a kind of mobile waste treatment because the relevant vehicles do not only carry the oily wastes but also separate them from the liquid phase intended for waste water treatment.

All licensed waste management plants are subject to the inspection (supervision and control) by the competent authority. These inspection measures are realized according to the principle that the competent authority for licensing shall also be competent for the inspection.

All IED-plants have to be inspected on the basis of a supervision plan (currently elaborated and released by the Ministry) and a supervision program for each single plant (elaborated by the relevant competent authority). The supervision plan defines criteria for the assignment of plants to the regular and minimum supervision periods (once every 1, 2 or 3 years) depending on individual risks the plants are posing. Besides these regular inspections, further occasional inspections shall be carried out by the authority in case of start-up or closing of plants, of illegal states or illegal operation procedures and of public complaints about the plant. If an occasional inspection is carried out, a follow-up is needed in order to check if the measures taken by the operator were helpful to guarantee the right operation of the plant.

For all other non-IED waste management plants, the criteria for inspection shall not as strict as for IED-plans.

Besides the inspection of waste management plants also waste generators and waste transporting or dealing enterprises are subject to supervision and control on basis of the same requirements. The competence for the inspection of production plants which generate wastes is delegated to the lower authorities within the Counties but the competence for the inspection of waste treatment plants concerning the generated wastes follows the competence for the treatment plant. The inspection of transports does not only comprise the check of sites where the transport business is carried out but also the control of waste transports on streets. For these cases, waste transporting cars can be easily identified by the A-sign (compare explanations in chapter 1.2.2). Because the authority competent for waste inspections is not allowed to stop vehicles from the fluent traffic, the inspection of waste transports on streets can only be realized
together with personnel from the police or – in case of transboundary waste shipments – together with personnel from customs offices or from the Federal authority for traffic of goods.

The criteria and main subjects of inspection in waste management plants, in waste generating enterprises or of waste transporters are not part of federal legislation. Therefore, the MoAE released decrees about the inspection matters and defined the subjects as follows:

- check the compliance of all notification and movement documents from transboundary and internal waste shipments within the registers
- check the technical equipment including input and output storage areas, make a waste balance about the input and output waste streams
- check whether the conditions from the license, from all additional requirements established by the competent authority and from previous inspections are fulfilled
- check the conditions from legislation concerning the operators of waste management plants, especially
  - duty to appoint responsible persons for waste management installations and for certain waste producers
  - are the minimum requirements on special knowledge gained from seminars and further education (to be approved by authority) met, especially in case of qualified (certified) waste management enterprises, for waste collectors/transporters and waste dealers/brokers as well as for operators of landfills
- check the conditions from specific legislation on certain hazardous waste streams, e.g.
  - Waste oil regulation: This regulation determines used partly or fully mineral oils, synthetic and biogenic oils as waste oil and classifies these waste oils (22 different waste codes according to the European List of Wastes) into 4 collecting categories (in general: mineral oils, synthetic oils, halogenated oils with PCB-content > 50 mg/kg which is under the scope of PCB/PCT waste regulation (see below), biodegradable oils) that can be collected together. The main requirement of this regulation is the priority of re-refining waste oil (production of basic oil unless the limit value of PCB does not exceed 20 mg/kg) over all other recovery measures (substantial and energetic). A further main requirement of the regulation is a general prohibition to mix waste oil with other wastes, with PC-waste oil or waste oil of various collecting categories. Waste oil collectors and recovery installations shall take and store samples of waste oils and the installations shall analyse these waste oils concerning PCB and summary halogenated contents and declare the determined concentrations within the movement form (compare chapter 3.2.2) or within an own form (defined in the regulation). Besides the European requirements on the extended producer’s responsibility for WEEE, ELV, batteries and packaging, the Waste oil regulation determines take-back obligations for the dealers of motor and engine oils. Dealers (mainly filling stations, do-it-yourself-markets, car repairs) have to guarantee that the consumers can give back such used (waste) oils free of charge to its take-back installation. This is applicable for oil filters, too. The producers have to advice all consumers – by labelling of relevant oil packaging – that they shall give back used (waste) oil to the take-back installation of a dealer in order to avoid damages of the environment and that they are not allowed to mix waste oils with other substances.
Waste wood regulation: This regulation determines 4 waste wood categories (A I: natural or only mechanical treated wood, A II: glued or coated wood, A III: wood coated with halogenated substances e.g. PVC, A IV: wood treated with wood protecting substances) besides PCB-waste-wood with a PCB-content > 50 mg/kg which is under the scope of PCB/PCT waste regulation (see below). In addition, typical assortments of waste wood are defined which are the basis for a general separation duty unless the amount of waste wood in Categories A I to A III is < 1 m³ or < 0.3 t/d. For the use of pre-treated waste wood for recycled wooden composites, the regulation defines limit values (parameters: heavy metals, halogens, PCP, PCB) and requires the exclusion from A-IV-waste-wood as well as the elimination of coatings prior to the recycling. In order to prove the compliance to all legal requirements, the charges of pre-treated waste wood have to be analysed in general every 500 t according to a specified control system. Besides self-control procedures of the pre-treatment facility for the use of waste wood for recycled wooden composites, an additional control by authorized institutions is required every 3 month. Waste wood which is not suited for recovery shall be energetically treated (in fact this represents the prohibition to landfill waste wood, in addition to the requirements of the landfill regulation which determines a maximum content of total organic components in wastes).

PCB/PCT waste regulation: This regulation completes the requirements from the immediately applicable European POP-Regulation 850/2004 to destroy POP-contents in wastes in general. The German regulation puts the duty to dispose PCB-containing wastes (PC-content > 50 mg/kg) in concrete terms and defines certain disposal measures (D8, D9, D10, D12, D15 followed by D10 or D12) which only are allowed to be used for PCB disposal. The waste owner is obliged to separate – if possible – PCB-containing compartments from wastes (e.g. PCB waste oil from transformers, PCB construction and demolition wastes) in order to enable the recovery of all PCB-free compartments and to dispose all PCB immediately. In addition to the general registration duty, all disposal facilities for PC-waste shall register the kind, amount and source of PCB-waste as well as PCB concentration and to declare these data to the waste generator and every 3 month to the competent authority. The PCB register shall be separated from all other registers to enable the extended right of public to get insight to the PCB-register.

Besides legal binding conditions on specific waste streams, in Germany a number of guidelines were elaborated by working groups of the Countries and were released by the assembly of the ministerial waste management departments of all Countries. It is up to the Countries to implement these guidelines in their region and to get the respective regulations enforced by the competent authority. For this purpose, usually decrees are released which are at least binding for the authorities to be considered e.g. in case of supervision aspects. The main guidelines on special waste streams which were implemented by decree are e.g.

M20 - conditions on the recycling of mineral wastes: This point has been subject to a legislation procedure on Federal level since several years. So this guideline displays the requirements until it is going to be replaced by a legal regulation. The scope of the guideline is the recovery of mineral wastes in technical buildings, in soil-connected uses and in recycling products. The guideline defines classes of use with various values for organic and inorganic parameters in solid wastes and in eluates for mineral construction and demolition material (soil, from road and buildings construction), for slags from thermal waste treat-
ment, for mineral wastes from casting processes, for ashes and slags from power stations. These classes are: Z0 unlimited use especially for soil intended to refill surface excavations; Z1 limited open use in technical measures; Z2 limited use with defined technical security measures, Z3 conforms with landfill class I; Z4 conforms with landfill class II; Z5 conforms with landfill class III (landfill for hazardous wastes). The guideline determines the specific requirements on the recovery of mineral wastes within various measures, e.g. to take into account geological background concentrations, the exclusion of sensitive uses (e.g. protection areas for drinking water). The guideline determines furthermore the procedure of self-control and control by external licensed institutions, the documentation and quality assurance, the taking of samples and analysis.

- **M18** - disposal of wastes from medical healthcare: Main content of this guideline is the determination of a separate collection of various kinds of medical wastes, either within the medical institution or in case of infectious wastes immediately on the place of generation. Special requirements are defined concerning the packaging of sharp compartments (crush-proof one-way-containers), of body parts and infectious wastes (dense and tight standardized and licensed containers for hazardous goods) and on the internal collection and transportation. In case of pre-treatment of infectious wastes in the medical institution for disinfection purposes, only standardized measures shall be used. According to the legally binding landfill regulation, infectious wastes (codes 18 01 03 and 18 02 02 according to European List of Wastes) and body parts and organs (code 18 01 02) are not allowed to be landfilled. The guideline requires the thermal treatment without any previous treatment or partly recycling of such wastes. Besides waste-specific matters, the medical institutions shall be reliable in the subjects of protection on infections and dangerous goods (especially for medicines, usually needed chemicals, cytotoxics).

- **M23** - disposal of asbestos wastes: This guideline was released for waste specific items in addition to the Technical Rule on Hazardous Substances 519 displaying the aspects for health and workers protection. Typical asbestos waste from construction and demolition measures shall be identified, to be notified to the authority and to be separated (taking into account the special requirements on health protection) in advance to the relevant measure. The complete separation of asbestos parts from construction and demolition measures has to be proven within a reconstruction concept. Further typical asbestos wastes result from WEEE, so in case of dismantling respective security measures have to be met. Asbestos wastes shall be packed into dense plastic bags or in standardised and licensed plastic bags (weakly bound asbestos). Besides chemical treatment with hydrofluoric acid and thermal treatment (incineration in rotating kilns with at least 1100 °C, melting with at least 1400 °C, plasma melting), the disposal on landfills in separate areas with daily covering is possible. The guideline describes the detailed requirements on the procedure to take-over and to landfill asbestos wastes. Weakly bound asbestos wastes shall be solidified especially with cement before landfilling, preferably on place of generation.

- check the conditions from specific legislation on certain waste management plants, e.g.
- landfill regulation which determines kinds of wastes that are not allowed to be landfilled, limit values for the take-over of wastes in various landfill classes, procedure for take-over of wastes including identification and control analysis...
- regulation on underground stowage of wastes which determines the priority of metal recovery according to limit values, limit values for wastes to be subject on stowage (in unmixed state), exceptions from limit values in case of higher natural background concentration or in case of salt mines with long-term security proof.

Special conditions on inspections are laid down in Article 50 of the European Waste Shipment Regulation 1013/2006. According to this, the inspection of shipments have to be planned according to a risk profile concerning mainly affected waste streams transport routes and involved persons (notifier, waste generator, transporter, waste management plants).

The result of inspections has to be published by the competent authority and to be amended in case of follow-up results.

Inspectors are allowed according to the Federal Law to enter the sites where waste management plants are operated, to take measures and samples and to check documents. The operator is obliged to give all information to the inspectors and to assist them with own personnel and equipment. Costs for the inspection shall be covered by the operator according to the polluter-pays-principle.

Competent authorities are responsible not only to check the compliance of operated waste management plants with the legal conditions but also to take measures in case of non-compliance. These measures comprise all orders to the operator to maintain or to restore the legal state in the plant as well as measures to punish illegal behavior. This second step is necessary – and according to European standards required as a kind of determent – because no legal requirement can be enforced without penalties against legal offences.

The German legislation distinguishes between criminal offences which have to be checked and punished by the attorney/prosecutor. The Law on criminal offences defines the environmental-related illegal facts and the relevant penalty (imprisonment or financial fine); for waste management activities are relevant:

- illegal handling of wastes
- illegal operation of plants
- both also in cases of extraordinary serious offences.

The competent authority is obliged to make the criminal complaint on detected illegal activities to the prosecutor.

For minor offences, the competent authority has the opportunity to punish illegal activities with fines by itself. Such minor offences and the relevant penalty (financial fines) are defined within each single waste law or regulation. The waste management authority decides in these cases independent from the prosecuting authorities in their own responsibility whether and how a minor offence shall be punished.
3.7 Public awareness campaigns related to the management of hazardous wastes (How to overcome “not in my backyard” with regard to needed hazardous waste treatment plants)

In general, the not-in-my-backyard-principle cannot be avoided but only reduced. It is only a question of dialogue between the three involved parties:

- public and their individuals
- operators of actual or intended plants
- competent authority.

The operator has the duty to make all information about the relevant waste management activity public during the licensing procedure. In this connection, all affected parties (private persons, NGO, other enterprises, all competent authorities) can give their statements, can raise objections. It is up to the operator to prepare all documents needed for licensing procedure in such a way, that the risks are explained in a comprehensible manner. Raised objections can be invalidated by providing additional information.

Licensing procedures include the publication of all information in a proper way as well as the public discussion of all raised objections and statements. The public discussion and objective facts shall help to overcome the not-in-my-backyard philosophy. The public discussion of problems with citizen's initiatives belongs to the means of dialogue.

If an operator plans to erect a waste management facility it could be helpful to use such sites that are part of an already existing industrial area or to reactivate former industrial sites. The legal conditions for such industrial areas are checked in general in advance and have usually a better acceptance in the public. In this connection it can be discussed to take into account former mining areas to install a landfill. Also these areas have usually a better acceptance because of the former industrial activity on this place. But the technical requirements have to be met, too, so the use of former industrial areas needs a special check in advance. Also the reactivation of remediated and former contaminated sites is a possible way and displays the main goal of the Country concerning these sites (compare Chapter 1.3).

The policy of enterprises shall include an offensive explanation and publication of the commercial activities and the risks that can result from the activities and what is intended to avoid any risks. Such image brochures can help to convince the public about the environmental-sound operation of the relevant plant. Usually, enterprises use currently the option of open-door-days to show the operation processes to the interested public. The relationship between enterprises and authorities can be improved (strengthen the understanding) if each party offers the possibility to the other party to participate on the own working processes. The enterprises can use also the possibilities of certification systems like general Quality Management according ISO 9001, special ecological audit certification according to EMAS on the basis of European legislation or special audit as certified waste management enterprise according to Federal legislation. Such certificates in general show the special responsibility and expenses the enterprises took voluntary.

Certain industrial or business facilities are obliged to publish data within Pollutant Release and Transfer Register (PRTR) on the basis of supranational agreement which is implemented into the European Union by Regulation. PRTR represents the national environmental database/inventory of potentially hazardous chemical substances and/or pollutants released to air, water and soil and transferred off-site for treatment or disposal including estimates of releases from diffuse sources, such as agriculture. The operators quantify and report the amounts of
substances released to each environmental medium (air, water, soil) or transferred off-site for waste management or wastewater treatment. These data are normally compiled by environmental authorities.

Public campaigns can be helpful in order to deal with special situations like the disposal of stocks of outdated pesticides and similar wastes. Therefore, the authority, mainly ministerial level, shall plan the estimated expenses and the enforcing authority shall organise the measures like choice of proper disposal ways, determination of time and place of waste collection and financing. Such organised actions are awareness raising and in total less expensive and avoid wrong and environmental damaging waste management.

3.8 How the waste management sector is informed about hazardous waste management (information and education of the waste management sector)

In general, the entities of waste management sector are responsible to inform themselves about the current state in their own interest. Annual Waste management balances, statistics, the waste management legislation and the specific requirements from waste management plans are public available, so the information is possible. In addition, there is a right for everyone to get information about the environmental state from the authority. The relevant legislation of the Federal Countries guarantees the free access to environmental information and their active publication by the data-holding authority according to the European legislation. Concerning information needs of waste generators about available treatment ways and about relevant conditions in a certain region, the authorities are obliged to give these requested information (Counties for the management of municipality wastes, State Agency for Environmental Protection for other wastes). If foreign data are subject to the publication by authorities, general requirements on the data privacy and business secrets have to be taken into account.

Enterprises which have appointed responsible persons for waste management activities shall guarantee the continuous improvement and maintenance of the knowledge about the environmental legal requirements in general and the waste management requirements specially. Usually, these responsible persons take part on regular further education seminars on specific topics which are offered by private training enterprises and experts and which require partly an approval by the competent authority. Besides this, experts from authorities offer in single cases similar education seminars, if needed.

The stakeholders of waste management are obligatory participated in the process of legislation. They can give statements and advices to the legislative authority according to their experiences and needs. Stakeholders like chambers for industry and commerce as well as various waste management associations represent the interests of waste management enterprises in this context and against the competent authorities during enforcement of legislation.

Specific technical literature and releases are available to inform about general legislative or detailed technical items. Some publishers offer digitally based and regularly updated software solutions.
The operators of waste management plants are obliged to appoint the tasks of waste management to a specially **allocated waste operations supervisor**. He is responsible to have the current knowledge according all waste management activities including the relevant legal basis. He has to report to the operator about all waste specific measures every year.

The waste operations supervisor has to be reliable and must obtain a waste specific knowledge. The knowledge usually can be obtained from waste specific seminars and relevant further education which are offered by educational institutions.

For some waste management activities, these waste specific seminars are required to be licensed by the competent authority. The relevant license is issued to the educational institution which offers such seminars. The institution has to apply for the license and has to fulfil minimal contents that are determined in the relevant legislation (e.g. [12] for waste collecting/transporting enterprises).
4 FACT SHEET POLAND

4.1 Institutional framework, distribution of responsibilities and the administrative set-up

4.1.1 Administrative structure of Poland

There are three levels of administrative structure in Poland:
- regions (called województwo)
- sub-regions (called powiat)
- municipalities (called gmina)

In Poland there are 16 regions. Each region is divided into sub-regions. There are 380 sub-regions which are divided into municipalities (in total 2478 units).

The governments of regions, sub-regions and municipalities elected in general for 5 years term are called self-government.

4.1.2 Competences to adopt legislation on waste management

- The legislative initiative belongs to:
  - Government, in particular Minister of Environment,
  - Parliament
  - public - according to the Constitution of Republic of Poland legislative initiative can also be undertaken by 100.000 citizens

- Types of waste management legislation:
  - directly binding EU legislation e.g. regulation of Council and European Parliament adopted on EU level
  - primary legislation – acts on law adopted by the Parliament
  - secondary legislation – ministerial ordinance enacted by minister responsible for particular issues

The self-government (regional, sub-regional and municipality) cannot adopt legislation.

4.1.3 Competences and key actors in the field of waste management

The competences in the field of waste management are assigned in primary legislation:
- Environmental Protection Law
- Waste Management Act
- Act on ELVs
- Act on WEEE
- Act on batteries and accumulators
4.1.3.1 Competencies for permitting

The following actors are identified as responsible for permitting in the field of waste management:

- marshal – head of self-government on regional level (województwo)
- starosta – head of self-government on sub-regional level (powiat)
- wójt, burmistrz or prezydent miasta – heads of self-government on municipality level (gmina)

Permits for treatment of waste are issued by starosta (sub-regional level). If waste treatment facility requires IPPC permit, it is issued by marshall (regional level).

Regional and sub-regional governments are responsible for waste management of all types of waste, except for household waste.

Household waste management is responsibility of municipality and it is based on Act on order maintenance of municipality.

There are three types of authorities on municipal level. It depends on the size and type of municipality. Wójt is head of the smallest and mainly rural municipalities. Burmistrz is head of medium size and large municipalities of mixed type (rural and urban). Prezydent miasta (mayor of town) is head of municipality that comprises only territory of town without rural neighbourhood.

4.1.3.2 Enforcement

Enforcement of environmental legislation is a task of Inspection of Environmental Protection, central administration body supervised by the Minister of the Environment. The role of inspection is to control the compliance with environmental legislation and monitor the state of environment.

It is an institution that comprises:

- Chief Inspectorate of Environmental Protection – headquarters based in Warsaw
- 16 Regional Inspectorates of Environmental Protection – based in each of the regions

Only regional inspectors perform inspections in facilities on a daily basis, including waste treatment and collection sites.

Environmental inspectors are entitled to:

- enter economic entities with equipment and experts necessary to perform inspection,
- enter other entities 24h/day,
- enter means of transport (but cannot stop them, cooperation with police or traffic inspectors needed),
- take samples and carry out analysis to check the state of environment,
- stop the facility if this is necessary for analysis or sampling,
- request any documents, written or oral information, including interrogation.

As a result of a control that confirmed the violation of environmental legislation, inspector may issue written orders for facility operator to undertake specific action to restore full compliance with legal requirements and set the deadlines for those actions.

If the facility operates in a manner that poses direct risk to human health or environment, inspector may issue an administrative decision on suspending the operation of such facility.
4.1.3.3 Imposing administrative fines and giving tickets

In situations clearly defined in the legislation, tickets for minor infringements or administrative fines for major violations can be imposed.

For minor infringements, inspector may give tickets which amount to approx. 250 EUR. These tickets are given directly by the inspector at the time of inspection and shall be indicated in the inspection report.

For major violations of legislation financial penalties are foreseen, e.g.:

- illegal waste treatment – up to 250.000 EUR
- illegal shipments of waste – up to 75.000 EUR
- violation of WEEE legislation – up to 500.000 EUR
- violation of ELVs legislation – up to 75.000 EUR

Administrative fines are imposed in a form of administrative decision by the Head of Regional Inspectorate. Entity or person which received the administrative fine may appeal to the 2nd instance – Chief Inspector of Environmental Protection.

Tickets and administrative fines are an immediate solution which allows to react adequately and quickly to certain infringements.

For specific violation which is penalized in Criminal Code, inspector is obliged to inform the prosecutor.

The following actions are considered crimes in waste management in Poland (art. 183 of Criminal Code):

- storage, discarding, treatment or transport of waste or substances in a way which poses risk to life or health of people or causes damage flora or fauna, import/export of waste, against legislation, is subject to imprisonment from 3 months to 5 years.
- import/export of hazardous waste without required notification or permit or with violation of permit conditions is subject to imprisonment from 6 months to 8 years.

4.1.3.4 Training of enforcers

Since 2010 Chief Inspectorate of Environmental Protection organizes regular training of all institution involved in control of waste shipments. There are six 2-days workshops organized every year with approx. 400 participants representing:

- customs
- border police
- environmental inspectors
- traffic inspectors
- public prosecutors (joined the workshops in 2014)
- police.

Workshops are regional and representatives of all above mentioned institutions meet for two days. It allows them to get to know each other which proved to be highly beneficial for their further work. Agenda of such workshop comprises general aspects of waste management, waste shipments specific issues and interactive case study.
Decision has been taken to enlarge the group with public prosecutors 2 years ago and it proved to raise the profile of waste issues amongst prosecutors and resulted in better understanding of environmental crimes in that group. The workshops are entirely financed by the National Fund of Environmental Protection and Waste Management (see more info in chapter 1.3)

4.1.3.5 Hazardous waste shipments

In Poland there is only one competent authority for waste shipments – Chief Inspector of Environmental Protection who is responsible for notification procedures and dealing with illegal shipments.

Enforcement of EU Waste Shipment Regulation [27] is responsibility of:
- regional inspectors of environmental protection – inspections of facilities importing waste
- border police and customs – external borders of the EU (Ukraine, Belarus and Russian Federation, seaports and airports)
- traffic inspectors – road controls.

4.2 Organization of the collection and treatment of hazardous wastes

4.2.1 For hazardous wastes from households

All issues related to household waste collection and treatment are regulated in the Act on order maintenance of municipality. It is a responsibility of municipality to set up a system of collection of waste from private households and ensure its proper treatment. This task includes:

a) building local facilities for household waste treatment (incl. sorting plants)

b) organizing collection of household waste from private buildings

   Municipality selects through tender procedure companies that provide for regular collection of waste at the territory of each municipality. If territory of municipality is bigger than 10.000 inhabitants, more than one company may be selected.

c) ensuring the selective collection of waste at source for at least the following waste streams: paper, plastic, glass waste, combined packaging, metal scrap, bio-waste

   There are different schemes in use – dedicated containers for blocks of flats, bags for single houses. There is also the possibility to provide for only two types of containers: one for recyclables and the other for the mixed waste incl. bio-waste. Such a solution requires further sorting of the waste from “recyclables” container. Municipalities have been given certain flexibility as to the type of scheme to use.

d) establishment of network of stationary collection points to collect certain streams of hazardous waste that may be generated in private households:

   - out dated pharmaceuticals and chemicals
   - WEEE
   - batteries and accumulators
   - construction and demolishing waste
Such places shall also accept certain non-hazardous waste e.g. used tyres, garden waste, discarded furniture and other oversized waste. Each municipality is obliged to establish at least one collection point and publish on its website the address(es) of such collection point(s).

4.2.2 For other hazardous wastes

4.2.2.1 Existing legal provisions
The framework legislation on waste management in Poland is Polish Waste Management Act [28] (PWMA). The provisions are grouped into thematic sections as presented below.

- **Classification of waste, including conditions to declassify hazardous waste to non-hazardous waste.**

Hazardous waste is defined as waste exhibiting at least one of the hazardous characteristics listed in annex 3 to PWMA (explosive, oxidizing, highly flammable, irritating, toxic, eco-toxic, cancerous, infectious, poisonous, corrosive, impairing fertility). Waste is classified with 6-digit code in waste catalogue that is compliant to European Waste Catalogue [29]. Hazardous waste code is marked with asterisk ‘*’ e.g.:

- 20 03 01 – household waste,
- 16 01 04* - end-of-life vehicles (marked as hazardous)

It is forbidden to declassify hazardous waste to non-hazardous through mixing it with non-hazardous components to dilute the hazardous content. The holder of waste can declassify hazardous waste, only through dedicated administrative procedure, if it is proven that the waste does not contain hazardous characteristics. Marshall as competent authority on regional level must validate declassification of waste in an administrative decision.

- **By-products**

Substance or object that derive from production process but production of which is not the main purpose of the process can be classified as by-product if the following conditions are met:

- further use of it is certain,
- it can be used directly in another process as input material,
- it is produced as integral part of production process
- further use is in accordance with legislation and will pose no harm to human health and environment.

The producer of such substance or object willing to classify it as by-product shall confirm it via administrative procedure by sending application form to regional competent authority (marshal office). By-product status is considered as confirmed if marshal did not raise objections within three months from the receipt of such application. Administrative decision is issued only in case of objections. Otherwise tacit consent is assumed.

It also applies to hazardous substances or objects.
- **End of waste status**

End of waste status is assumed if specific conditions stipulated in the EU legislation are fulfilled. The EU conditions are stipulated for 4 waste streams of non-hazardous waste: aluminium, copper and ferrous metal scrap and glass waste destined for smelters [30]. End of waste status was not foreseen for hazardous waste so far so it is not applicable for hazardous waste.

- **Waste hierarchy**

There is the same waste hierarchy that applies to hazardous and non-hazardous waste: prevention of waste generation, preparation for reuse, recycling, other recovery processes including energy recovery and disposal. Disposal is the least preferred option and there are further limitations for that kind of waste treatment:
  - only waste that cannot be reused, recycled or otherwise recovered may be disposed,
  - all recyclable content has been selected from the waste prior to disposal.

- **Principle of proximity**

Waste shall be treated at the place of its generation. Waste that cannot be treated at the place of its generation should be transported to the facilities located as close as possible to the place of its generation taking into account waste hierarchy and best available technics. It is forbidden to treat sewage sludge and infectious medical waste from human and veterinary healthcare in region other than region of its generation.

- **Treatment of hazardous waste**

It is forbidden to mix:
  - different types of hazardous waste,
  - hazardous waste with non-hazardous waste,
  - hazardous waste with other substances to dilute the hazardous content.

There is an exception from that principle. It is allowed to make any of those mixtures in course of treatment process to improve safety and effectiveness of disposal/recovery process but only if this does not increase the threat to human health and environment. It is often used in hazardous waste incineration plants. If the waste was intentionally or unintentionally mixed for any other purpose, it has to be separated if it is technically feasible, cost effective and will result in elimination or limitation of threat to human health and environment.

- **Collection and transport of waste**

Waste shall be collected in a selective manner. It is forbidden to collect some types of waste in place other than places of generation (infectious medical waste, mixed household waste, sewage sludge).

Transport of waste shall be carried out in accordance with requirements for human health and environmental protection. Transport of hazardous waste shall be carried out in accordance with provisions related to transport of hazardous substances. It means that provisions of ADR for
road transport, RID for railway transport or IMDG for sea transport apply for hazardous waste. ADR/RID rules may not be followed if specific provisions of ADR/RID clearly exclude it (e.g. lead acid batteries if content of \( \text{H}_2\text{SO}_4 \) is less than 3 %) or if it has been proved that the substance does not exhibit hazardous properties.

Holder of waste which hands over the waste to the carrier is obliged to indicate the address and name of the next holder of waste. Carrier of waste is obliged to transport the waste to indicated address and hand it over only to indicated holder.

Currently waste carriers must be authorised by sub-regional authority – starosta. In the transport permit starosta indicates the codes of waste, which carrier is authorised to transport. Since January 2018 all waste carrier will have to be registered in nationwide waste database and be given a specific registration number. Applications for registration will be sent to regional authorities (marshal).

Provisions on labelling the means of transports are now at the final stage of approval. When it comes into force all vehicles transporting waste shall be marked with dedicated plates:

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ODPAD
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Alternatively it might be possible to label the vehicle with the following plate (as in Austria or Germany)

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A
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- **Storage of waste.**

Waste can be stored only at place to which the holder of waste has a title (ownership, rent, lease etc.). Storage of waste is allowed only as a consequence or intermediate stage of generation, collection or treatment process.

Waste can be stored not longer than 3 years if this is justified by organization of technical requirements of treatment processes. Waste destined for landfilling can be stored only in case there is a need to collect a sufficient amount for transport to landfill site and no longer that one year.

Maximum storage time (3 years or one year in case of D10 operation) is calculated for all waste holders together.

- **Responsibility for waste management.**

Responsibility for waste management is assumed first of all by waste generator. Waste generator may pass the duty to other entity authorised for collection or treatment of waste. In such a case the responsibility for waste management passes with the waste to the next holder. There are exceptions from that principle:

- waste carriers do not assume responsibility for waste management, waste generator is responsible for waste until waste carrier hands over the waste to the next holder,
• generator of infectious medical waste remains responsible for the waste until it is incinerated,
• dealers and brokers do not assume responsibility if they do not take possession of waste.

• Treatment of waste in facilities and devices.
As a general rule it is specified in PWMA that waste can be treated in facilities or by means of equipment. Waste treatment facilities and devices shall be permitted for waste related activities. There are exceptions from this general rule. Minister of Environment is entitled to publish the list of waste which can be recovered outside facilities and devices with indication of specific recovery process can be performed outside facilities [31]. The list also covers some hazardous waste types:
080317* - waste toner and ink – for repair or refilling of cartridges in R11 process
170503* - soil and stones cont. dangerous substances – for remediation in R5 process
170505* – dredging spoil containing dangerous substances - for remediation in R5 process
090111* - single use camera – dismantling of WEEE in R12 process
160212* - WEEE cont. asbestos – dismantling of WEEE in R12 process
160213* - WEEE cont. other hazardous components – dismantling of WEEE in R12 process
160215* - hazardous components dismantled from WEEE – dismantling of WEEE in R12 process
200135* – WEEE cont. dangerous substances - dismantling of WEEE in R12 process
There is also a position on this list saying “all waste – destined for treatment necessary to reach end of waste status according to the EU legislation in R12 process (cleaning, sorting, cutting etc.)” but this does not include hazardous waste as the EU legislation on end of waste criteria refers only Al, Cu and Fe metal scrap and glass waste.

• Waste management plans.
Waste management plans are adopted at two levels:
• one national plan adopted by the Cabinet of Ministers (central government)
• one regional plan per each region adopted by regional self-government body (at level of województwo)
Waste management plans include information on:
• waste management state of affair: types and amount of generated waste, waste treatment facilities,
• waste prevention measures
• Investment plans
• prognosis for future taking into account changes in economy and demographical situation,
• timetable for realization and monitoring of plan.
Waste management plans shall be reviewed at least every 6 years.

• Waste management permits.
Activities in the field of collection of waste and waste treatment require permits. If facility performing waste treatment requires IPPC permit, conditions of collection and waste treatment become a part of IPPC permit. Permits are issued by:

- marshal – in case of IPPC permits
- starosta – in other cases.

IPPC permit is valid for unlimited time.
Permit for collection and treatment of waste is valid for max. 10 years.
Permit for waste collection and treatment can be withdrawn if the company does not fulfil requirements. Such company may not be granted new permit for another 2 years.

Specific provisions regarding certain waste streams.

PWMA contains specific provisions regarding treatment of certain waste streams: PCB waste, waste oil, medical waste, sewage sludge, waste from TiO₂ industry.

- PCB waste.

It is forbidden to recover PCB. PCB shall be disposed of through incineration. Waste containing PCB can be treated if PCB content has been eliminated. If such an elimination is not possible PCB waste shall be disposed of as pure PCB.

- Waste oil.

Waste oil shall be collected separately if technically feasible. Waste oils of different characteristics cannot be mixed if this could impair recovery process. Waste oils shall be regenerated in the first place (it is understood that regeneration means refining of used oil to get rid of contaminants and products of oxidizing processes).

- Medical waste.

It is forbidden to recover medical waste. Infectious medical waste shall only be disposed of by incineration in waste incinerators. It is not allowed to incinerate such waste in co-incineration facilities e.g. cement kilns etc. Before permitting facility for incineration of medical waste, positive opinion of sanitary inspection must be obtained.

- Household sewage sludge.

Household sewage sludge can be treated outside facilities i.e. submitted for limited agriculture use in very specified conditions. Sewage sludge can be hand over only by original generator directly to final treatment (no intermediate stages allowed e.g. collection, brokers, dealer, interim treatment etc.). Use of sewage sludge is possible only if they are properly stabilized by waste generator through biological, chemical or thermal processes.

Waste generator informs regional environmental inspection about the intention to pass the sewage sludge to end user 7 days in advance. Sewage sludge cannot be used in national parks and other protected areas, close to water bodies (rivers, lakes) and water supply reservoirs, on land that is frozen or covered with snow etc.
● Waste from TiO₂ industry.

Due to possibility of high content of sulphates, there are specific conditions for landfilling of such waste. It is forbidden to locate the waste in the sea.

● Special provisions are dedicated to waste resulting from accidents.

Generation of waste during accidents is inevitable. And it requires immediate actions. Sub-regional authority (starosta) can make an administrative order imposing the obligation for immediate waste treatment on the entity responsible for accident. In certain situations when it is not possible to issue such order (no possibility to establish responsible entity) starosta will organize the waste treatment financed from regional environmental protection fund.

● Specific provisions regarding certain waste streams.

● Landfilling of hazardous waste.

There are several types of landfills:
- regular landfill of waste
- underground landfill site
- hazardous waste landfills
- neutral waste landfills

Hazardous waste can only be disposed of at hazardous waste landfills. At hazardous waste landfills only hazardous waste can be accepted. It is allowed to create special sectors dedicated to solid hazardous waste on other landfills. Provisions and requirements referring to hazardous landfills shall apply to such sectors.

● Incineration of hazardous waste.

Thermal treatment of hazardous waste is always considered D10 operation even if facility uses energy from the process. There are specific conditions for accepting hazardous waste at incineration plant:
- detailed description of waste, its characteristics, together with laboratory analysis,
- protection and precautionary measures,
- information with which substances the waste cannot be mixed,
- sampling before unloading the waste.

Operators of landfills and waste incinerators must be certified in waste management. Certified are issued by regional authority (marshal) after dedicated exam has been passed by those operators.

Additionally and complementary to PWMA, there is legislation that refers to particular waste streams:
- WEEE Act
- ELVs Act
Batteries and accumulators Act

WEEE Act

New legislation in this field has been adopted in mid-2015 and came into force on 1 January 2016 as a transposition of WEEE directive (directive 2012/19). It has modified the previous WEEE collection scheme, which existed since 2005. EEE has been classified into 6 groups:

Group 1 – temperature exchange equipment (refrigerators, freezers)
Group 2 – screens and monitors with surface greater than 100 cm²
Group 3 – lamps
Group 4 – large equipment (any equipment, except for groups 1-3, at least one dimension of which exceeds 50cm)
Group 5 – small equipment (any equipment, except for groups 1-3, which none of dimensions exceeds 50cm)
Group 6 – small IT and telecom equipment (none of dimensions exceeds 50cm)

It has imposed obligations on entities marketing new products (EEE):

- to register and use registration number on every financial document
- to label each EEE item properly
- to carry public awareness raising campaigns (worth at least 0.1 % of net income if it exceeds equivalent of 25EUR annually),
- to organize and finance collection and treatment of WEEE from households,
- to organize and finance collection and treatment of WEEE from other sources provided it comes from EEE marketed by that entity after 13.08.2005,
- to reach the following WEEE collection thresholds:
  - until 31.12.2020 - min. 40 % of marketed EEE (by weight) and min. 50 % for lamps
  - since 01.01.2021 – min. 65 % of marketed EEE (by weight) or 85 % of EEE produced in Poland (by weight).
- to reach the following recovery and recycling thresholds:
  - group 1 and 4 – 85 % of recovery, 80 % of preparation for reuse and recycling
  - group 2 – 80 % of recovery, 70 % of preparation for reuse and recycling
  - group 5 and 6 – 75 % of recovery, 55 % of preparation for reuse and recycling
  - group 3 – 80 % of recycling
- to establish contract with treatment facility performing at least dismantling and preparation for reuse
- to establish financial guarantee if marketed EEE is destined for households to secure the payment of “product fee”
- to pay the “product fee” if recovery and recycling targets are not fulfilled.
Financial guarantee is paid to the bank account indicated and administered by marshal.
Product fee is calculated at the end of each calendar year and shall be paid to the bank account indicated and administered by marshal by 15.03 of next calendar year. If it is not paid by that deadline or subsequently on the order of marshal, an additional fee is imposed which amounts to 50% of regular product fee.

Marshal transfers product fee and additional fee to National Fund of Environmental Protection. Marshal may keep 10% of the fees to cover costs of administration of the system. National Fund of Environmental Protection may decide to use financial revenues to finance of co-finance undertakings or activities connected with waste management, waste prevention and eco-education.

Entities marketing new EEE are obliged to fulfil those requirements by themselves or through recovery organizations (collection scheme) acting on their behalf. Recovery organization is a legal person associating EEE producers or importers (entities marketing EEE). It has to be joint-stock company the start-up capital of 1,250,000 Euro.

There is obligation that entities involved in EEE/WEEE market shall be registered:
- entities marketing EEE (official seat in Poland required)
- authorised representative (acting on behalf of EEE producers or entities marketing EEE which are not registered in Poland)
- WEEE collectors
- treatment facilities
- recyclers
- other recovery facilities
- recovery organizations.

Above mentioned actors are obliged to report annually to marshal. There is interim provision that Chief Inspector of Environmental Protection performs all duties of marshal until January 2018.

- **ELVs Act**

Legislation in this field exists since 2005 but in 2015 underwent major amendment which came into force on 1 January 2016.

ELVs legislation refers only to vehicle of category M1 (vehicles having not more than 8 seats) or N1 (vehicles of weight not exceeding 3.5 tons) or motorcycles of category L2e (3-wheel motorcycles).

It imposes obligations on entities placing vehicles on the market (producers or importers):
- to ensure that materials and equipment of the vehicle does not contain lead, mercury, cadmium and chromium (VI) unless it is necessary to achieve required technical standards
- to label elastomers of >200g and other plastics of >100g in the vehicle
- to develop dismantling manual for each new type of vehicle and make it available free of charge for every dismantling facility
● to ensure ELVs collection network at the territory of Poland

Requirement of ELVs collection network:
● in each of 16 regions there has to be at least 3 dismantling facilities or collection points but at minimum one dismantling facility an 2 collection points located in different towns – for importers or producers marketing >1000 vehicles/year
● at territory of Poland there has to be at least 3 dismantling facilities or collection points but at minimum one dismantling facility an 2 collection points located in different towns – for importers or producers marketing <1000 vehicles/year.

Entities, which did not ensure the network, shall pay the “network fee” with max. amount ~5000 EUR. If regular network fee is not paid, additional fee is imposed on such entity with amount of 20 % of regular fee.

Network fee is paid to the account of National Fund of Environmental Protection and can be used to support activities aiming at prevention of illegal dismantling of ELVs or undertakings or activities connected with waste management, waste prevention and eco-education.

Last holder of vehicle is obliged to pass it to dismantling facility or to ELVs collection point and de-register the vehicle within 30 day therefrom.

ELVs collection points have to establish a contract with dismantling facilities. Dismantling facility is obliged to accept ELVs without imposing any charges. It may require charges if the vehicle was registered in non-EU country, it is incomplete (2.5 EUR for every missing kilogram) or contains other waste. It may impose charges for accepting car parts. Dismantling facility is obliged to reach the following targets:
● 95 % of recovery and 85 % of recycling of the ELVs accepted at the facility annually.

If targets are not reached, dismantling facility pays the fee, which amounts to 0.02 EUR for every missing kilogram. If the targets are not met in 2 consecutive years, the third year fee is doubled.

Fee is paid to the marshal who can keep 5 % of all fees and transfer the remaining amount to National Fund of Environmental Protection.

Dismantling facilities may pass the ELVs to shredders.

4.2.2.2 national waste management plan
The Waste Framework Directive 2008/98/EC introduces an obligation to develop waste management plans and waste prevention programmes, which are expected to describe prevention measures existing in a country and to establish the objectives of waste prevention.

The National Waste Management Plan [32] covers a full range of tasks necessary to ensure integrated waste management in the country in a manner that guarantees environmental protection, taking into account present and future options and economic considerations, as well as the technological level of the existing infrastructure. The Plan considers the trends in contemporary global economy, as well as considerations related to national economic development.

The Plan includes both a programme for waste prevention in respect of each type of waste, and a strategy for reducing the landfill of biodegradable waste.
The Waste Management Plan pertains to waste generated in the country and, in particular, municipal waste, hazardous waste, packaging waste and municipal sewage sludge, and waste imported into the country.

The National Waste Management Plan covers the following:

- description of the current state of waste management containing information about:
  - the type, quantity and origin of waste which is to be subjected to the recovery or disposal processes,
  - holder of waste carrying out activities in the field of waste collection, recovery or disposal,
  - distribution of the existing facilities for waste collection, recovery or disposal,
  - identification of problems in the field of waste management,
- projected changes in waste generation and management,
- objectives for waste management including deadlines for their achievement,
- waste management system,
- tasks to improve the situation in the field of waste management,
- type of actions and a timetable for their implementation,
- financial instruments for achieving the objectives in the field of waste management, including the following elements:
  - an indication of the sources of financing for the planned activities,
  - schedule of works and expenditures for planned activities aimed at prevention of waste generation or reduction of the quantity of waste and their negative impact on the environment, as well as their proper management, including the reduction of quantities of biodegradable waste in municipal waste for landfill,
- a monitoring system and a method of evaluating whether the objectives in the field of waste management were achieved.

For the purposes of the plan, waste was divided into:

- household waste,
- post-consumer waste (used oil, batteries, WEEE, ELVs)
- hazardous waste (medical waste, PCB, asbestos, pesticides)
- other waste (construction and demolition waste, sewage sludge, certain industrial waste, packaging waste.

- Waste oils.

Waste prevention for waste oils has been achieved by more rational use of better quality oils, introduction of modern technologies with less demand and less consumption of oils. Since 2004 recovery (50 %) and recycling (35 %) targets has been achieved (in 2013 – 55 % and 39 % respectively).

In 2013 there were 17 facilities treating used oil. Their capacity exceeds the supply from national market and some of them were importing waste.

- Batteries.
There are 24 waste treatment facilities dealing with waste batteries. In Poland there is no capacity for alkali batteries. However there is unused capacity for lead acid batteries.

In 2014 national target (35 %) for collection of batteries were not met although it was close to reach it – 33.4 %.

In 2014 Poland has met recycling efficiency targets:
- 65 % for lead acid batteries – 77 %
- 75 % Ni-Cd batteries – 85 %
- 50 % other batteries – 56 %.

### 4.3 Financing of the management of hazardous wastes

In Poland “polluter pays” principle applies. Therefore costs of hazardous waste management are borne mainly by waste producer or the holder of the waste. Hazardous waste may only be passed to authorized facilities for recovery or disposal – responsibility of generator or holder.

Extended Producer Responsibility - waste management costs are borne by producer of a product or entity responsible for marketing of the product (WEEE, ELVs, batteries).

Financing of the collection and treatment of household waste is organized and financed through municipality from the waste management fee paid obligatorily by inhabitants.

Each municipality establishes waste management fee taking into account:
- type of waste (mixed or sorted)
- size of municipality and distance to waste management facility
- density of habitation,
- type of area (rural or urban)
- type of building (block of flats, single house etc.)
- number of containers.


The National Fund for Environmental Protection and Water Management was established in 1989 as a result of the regime transformation in Poland. The fund is the pillar of the Polish system of financing environmental protection. The basis of its operation as a State legal person is the Act on Environmental Protection Law – it is a separate and independent entity supervised by the Minister of Environment.

The National Fund carries out independent financial economy, acting pursuant to the Act of The Environmental Law and according to the ‘the polluter pays’ principle.

The fund generates its income from:
- charges and fines for the use of the environment,
- maintenance and concession charges,
- energy sector charges,
- sales of greenhouse gases emission units.
The National Fund ensures absorption of foreign funds allotted for the environmental protection, for example, from the Cohesion Fund, the European Regional Development Fund, the LIFE+ Program, the Norwegian Financial Mechanism and the European Economic Area Financial Mechanism.

The National Fund offers its beneficiaries support in efficient and timely implementation of projects. Above all, it provides financial support to projects fulfilling environmental obligations imposed on Poland resulting from the European Union membership.

The basis for accepting and examining applications for co-financing by the National Fund are priority programmes. The programmes specify principles for granting support and project selection criteria. In most programmes continuous calls for applications are organized. The above mentioned system guarantees that the financing process is transparent, objective and impartial, based on the selection criteria established earlier.

Through National Fund co-financing of waste management or waste prevention programs can be ensured. NFEPWM may co-finance investments in waste management infrastructure listed in investment plans which are part of regional waste management plans. Investments plans are prepared by regions and approved by the Minister of Environment.

Financing of National Fund of Environmental Protection and Water Management refers to the following area of waste management:

- Undertakings linked with waste management, waste prevention and education
- Development of national waste data base
- Treatment of waste from illegal shipments
- Training programmes of enforcers involved in control of waste shipments (customs, border police, environmental inspectors, traffic inspectors, police and prosecutors)
- Treatment of waste from accidents
- Analysis of waste performed by Environmental Inspection
- Remediation of „historical” soil contamination

Other areas of relevance are:

- Water protection
- Air protection and climate change
- Nature protection
- Monitoring of the state of environment
- Ecological education
- Functioning of EMAS
- SEVESO accidents and mining damage reparations.

The National Fund also supports activities undertaken by the Minister for the Environment in fulfilling international obligations of Poland under multilateral environmental agreements, for example, the Climate Convention, the Convention on Biological Diversity or Basel Convention on transboundary movement of hazardous waste and its disposal.
4.4  Key merits and drawbacks of the different systems of hazardous waste management

Poland achieved self-sufficiency with regard to most of the hazardous waste generated at its territory. Obsolete pesticides and PCB waste were practically eliminated. National programme to eliminate asbestos is in progress. There are efforts to reduce the amount of waste that is landfilled. Specific waste streams of concern such as WEEE, batteries and accumulators or ELVs are collected separately and treated in environmentally sound manner. Training programme for enforcement officers and inspectors ensures high efficiency of their work and very good cooperation on regional and national level. National Fund for Environmental Protection and Water Management ensures proper and transparent distribution of co-financing to support individual citizens, industry and public administration.

4.5  Collection amounts of hazardous wastes (overview, separate for hazardous waste from households and other hazardous wastes)

In 2013 there were 142 million tons of waste generated in Poland:

- mining waste (52 %),
- industrial waste (20 %),
- energy production (17 %)
- household waste (8 %)
- other waste (5 %).

1.5.1. household waste

11.3 million tons of household waste was generated in Poland in 2013 out of which 9.5 million tons were collected in 2013 including 7.139 million collected from households.

Out of those 7.139 million tons, approximately 1.028 million were selected waste. Not more than one ton of all selected household waste was declared as hazardous.

63 % of all collected waste was landfilled, 13 % biologically treated and 8 % was incinerated or co-incinerated.

1.5.2. hazardous waste

According to the data reported to Marshall offices there was 1.34 million tons of hazardous waste generated in Poland in 2013. This figure presents waste classified as hazardous according to Basel Convention (categories Y1-Y45).

In 2013 there was 117000 tons of WEEE collected which allowed Poland to meet the target of 4 kg of WEEE per capita as established in the EU legislation [33].
1.5.3. shipments of waste
Chief Inspector of Environmental Protection as competent authority in Poland in 2014 issued 194 decision on transboundary waste movements out of which 166 covered hazardous waste (decisions comprised 177 permits and 17 objections).
There were 118 permits for import of waste that covered the amount of 322,000 tons of waste and 10 objections for amount of 23,000 tons of waste. The most popular countries of origin were Germany and Lithuania (48 permits altogether). Most popular waste stream was: solid waste from treatment of exhaust gases for recovery.
There were 39 permits issued for export of waste, which covered 256,000 tons of waste and 5 objections for amount of 15,000 tons. Most popular country of destination were Germany and the Netherlands. Most popular waste stream was treated wood waste and alternative fuel (191210). There were also 20 permits for transit of waste, 2 objections and one tacit consent.

4.6 Treatment of hazardous waste (types of treatment plants, available treatment capacities, need to export particular hazardous wastes)
In 2012 there were in total 2521 recovery and disposal facilities for hazardous and non-hazardous waste including:
- 773 facilities for energy recovery (R1) with estimated capacity of 16,069,552 tons per year,
- 85 facilities for incineration (D10) with estimated capacity of 1,546,193 tons per year,
- 961 recycling facilities (capacity not estimated)
- 643 landfills for non-hazardous waste with estimated capacity of 280,044 m³,
- 49 landfills for hazardous waste with estimated capacity of 2022 m³.

Facilities for energy recovery in vast majority co-incinerate waste together with conventional fuels.
As regards incineration of hazardous waste, there are four dedicated facilities in Poland. There is only one household waste incinerator, located in Warsaw with capacity of 70,000 Mg/year. However investments have been undertaken to build 6 facilities dedicated to incineration of household waste. At the moment three of those incinerators became operational. Together they will reach maximum capacity of approx. 1 million t/year.
In 2013 there were 96 facilities for mechanical and biological treatment of household waste with capacity of over 7 million t/year and 78 facilities for treatment of bio-waste.

Poland ensures self-sufficiency with regard to most of the hazardous waste generated at its territory. There are certain waste streams, which have to be exported due to lack of final disposal facilities: transformers containing PCB and mercury waste.

4.7 Specific legislation for mobile treatment plants (including permitting criteria, e.g. exclusion of particular types of waste) taking into account specific aspects of waste management
There are no provisions referring directly and exclusively to mobile treatment plants in the existing legislation in Poland.
In the PWMA it is specified that waste can be treated in facilities or by means of equipment. According the definitions, facility is a stationary technical device or set of devices connected technologically that may cause emissions. Equipment is defined as non-stationary technical device. It can therefore be understood that mobile treatment units may fall into definition of equipment.

PWMA requires that facility or equipment for waste treatment shall function in full compliance with environmental legislation and shall not cause the violation of emission standards.

Application for waste treatment permit shall cover:
1) identification of entity,
2) list of waste foreseen for treatment,
3) the amount of each type waste foreseen for treatment as well as those generated as a result of treatment,
4) indication of the place where the waste will be treated,
5) indication of place and conditions of storage of waste,
6) detailed description of waste treatment methods, including D/R codes and description of technology applied with annual capacity of facility of equipment,
7) presentation of technological and organizational capability for treatment of waste with indication of qualification of staff, number of facilities or equipment foreseen to treat the waste,
8) indication of foreseen period for treatment of waste,
9) description of activities undertaken to monitor treatment of waste,
10) description of activities to undertake in case of termination of waste treatment including the protection of the area where waste treatment has taken place.

It might be understood that stationary facilities and waste treatment equipment (which can be mobile) are subject to the same requirements as regards permitting. However information required as item 4, 5 and 10 above may indicate stationary character of facility and/or equipment. In practice mobile units are not a common and popular solution in Poland.

4.8 Public awareness campaigns related to the management of hazardous wastes (How to overcome “not in my backyard” with regard to needed hazardous waste treatment plants)

There are public awareness campaigns carried out by environmental institutions in Poland. Ministry of Environment prepared several successful and well-received campaigns focused on waste on national level.

[www.naszesmieci.mos.gov.pl](http://www.naszesmieci.mos.gov.pl) (only in Polish)

Chief Inspectorate of Environmental Protection organizes every year the awareness raising campaigns to promote environmentally sound management of WEEE. It is addressed to both adults and school children. The high peak of the campaign is in October during POL-EKO - international fairs ecological technologies.

CIEP and MoE organize annually a big event for Earth Day (22 April) where pro-eco attitudes, including hazardous waste management, are promoted.
There are also contests of the Minister of Environment that indicate that certain entities are environmentally friendly.
www.zielonemiasta.eu/en/ (available in English)

EMAS certification and ISO 14001 is also well-recognized instrument assuring high level of environmental protection of waste treatments facilities.

As to the not-in-my-backyard attitude, it might be concluded that local solutions are required. They may encompass careful location of such facilities in industrial rather than residential area as well as information campaigns carried out by facility operators.
Last but not least, openness for a dialogue with local communities and transparency in undertaking actions are of great importance. An example of a good practice is one of the hazardous waste incineration plants that organized “open door day” and invited local community and media to visit their facility. They also organized and sponsored environmentally oriented activities in schools in the area. It helped to ease the controversies that arose around their activities in local community. Nowadays they have no problems with their neighbours’ acceptance.

4.9 How the waste management sector is informed about hazardous waste management (information and education of the waste management sector)

The most reliable and widespread source of information for waste management sector is official websites of CIEP and MoE. On both websites there are sections dedicated to waste management where industry may find legislation and interpretations of provisions.
www.gios.gov.pl
www.mos.gov.pl

Website of CIEP contains the Technical Guidelines adopted by Basel Convention which refer to management of hazardous waste (mercury [34], POPs [35], WEEE [36], incineration of hazardous waste in cement kilns) and correspondent guidelines (available in Polish).
For English:
www.basel.int ➔implementation section

CIEP publishes guidelines for industry in specialized sectorial magazines as well as popular newspapers. Guidelines are focused on general requirements, WEEE management and waste shipments.
Another option for industry to obtain information is to request it from competent authorities on the basis of legislation transposing Aarhus directive.
5 OPTIONS AND RECOMMENDATIONS FOR IMPROVEMENT OF HAZARDOUS WASTE MANAGEMENT SYSTEM IN SERBIA

Based on the key success factors of the hazardous waste management systems in Austria, Germany and Poland, as described above options and recommendation for improvement of the Serbian system were proposed.

5.1 Austria
Following institutions are considered as key success factors for the Austrian hazardous waste management system:

- The establishment of a fund for the remediation of historical contaminated sites.
  - financed through fees on waste treatment activities (landfilling, incineration)
  - used as an instrument to speed up the adaptation of (hazardous) waste management to the best available techniques,
  - used to achieve environmental policy goals by providing incentives for using waste as a resource (circular economy).
- Close monitoring of hazardous waste flows from generation to final treatment, by implementing a shared IT-system (an electronic data base for any obligatory waste reporting).
- Establishment of a public investment fund for co-financing of investments in waste management infrastructure. This fund is filled by the general Austrian budget. The guidelines for granting subsidies can be adapted very flexibly to new challenges.
- Fostering competition among collective schemes and waste treatment companies with “self-control” by independent certified third parties while maintaining an efficient monitoring by public administration.

5.2 Germany
Key success factors for realizing a sustainable hazardous waste management system in Germany and more specifically in the region of Saxony-Anhalt are:

- Draw up a legal framework defining adequate requirements on waste management as well as rights and duties of waste management enterprises and authorities, e.g. free market to manage commercial wastes in general.
- Use of sufficient amounts of funds (private and additional public from the general budget, administrated by entities of public administration) and credits to build the infrastructure for hazardous waste management based on best available techniques in a short period of time on the basis of an administrative mid-term waste management concept.
- Closing of inefficient, non-compliant waste treatment plants and especially landfills over an adequate transitional time period.
- Granting of investment subsidies for updating the waste management infrastructure; with over time decreasing volume, so that currently in general only innovative techniques are co-financed.
• Funding the remediation of contaminated sites (~“historical hazardous waste”) with money from the general budget of the federal and the regional government as long-term task.
• Flexibility to adapt the administrative and legal set up to changed conditions or new challenges whenever necessary.
• The public administration possesses legislative measures to avoid distortions of the free market, especially options (which up to now have not been used)
  o to make waste management plans legally binding
  o to impose on waste generators the obligation to deliver hazardous waste to certain plants
  o to oblige waste generators to concede wastes to special institutions which decide about their disposal.

5.3 Poland
For Poland following instruments have been identified as key success factors for establishing a sustainable hazardous waste management system

• Establishment of the National Environmental Protection Fund (EPF), as a separate entity (not as a part of state administration).
• Introduction of a system of administrative fines for infringements against Waste Management Legislation.
• Collected emission fees, product fees and fines for infringements against the environmental law are earmarked for environmental protection and are administrated by the EPF.
• Limitation of the budget-share dedicated to self-administration of the EPF.
• Subsidies are granted to investments into waste management infrastructure, not to treatment/recycling/disposal activities (with a few clearly defined exceptions e.g. illegal shipments of waste, waste from accidents).
• Subsidies are used to achieve the goals laid down in the waste management plans. Investment plans, being part of waste management plans at regional level, give strict guidance on how to prioritise subsidies for investments.
• High transparency how the funds are administrated and how subsidies are granted (the transparency rules are established by an ordinance of the Minister of Environment, and detailed rules for each priority program are developed by the EPF).

5.4 Conclusions
Based on the experience gained in Austria, Germany and Poland with establishing hazardous waste management systems compliant with EU requirements following recommendations can be provided:

The Republic of Serbia should stick to its objective to fully transpose EU waste management legislation into Serbian law till then end of 2018.

In order to comply with EU waste legislation major investments and a sound financial basis for these investments and for operating a compliant waste management system will be required.
It is recommended to improve the current implementation of the polluter-pays-principle in Serbia: e.g. to reduce the administrative burden for the companies which require subsidies from the Environment Ministry (Fund).

An Environmental Protection Fund should be established as a separate non-profit organisation under supervision of the MoE for:

- co-financing the infrastructure for hazardous waste management
- (co-)financing the remediation of historically contaminated sites
- (co-)financing the disposal/treatment of historical hazardous waste stock-piles.

Apart from “fees for products put on the market”, the income of the EPF could be secured by imposing “fees on the use of the environment” (example from Poland), “fees on waste disposal” (example from Austria) or by allocating an adequate budget post from the general budget (example from Germany). Fees and fines for infringements against Environmental law should also be paid to the EPF.

The instrument of extended producer responsibility should be realised to its full potential:

- Collective schemes should be introduced for all waste types for which corresponding EU requirements exist (WEEE, batteries, ELV) as already implemented for PPWD. Within the legal framework the responsibilities have to be clearly defined for producers and the other stakeholders (collective schemes, municipalities, public utility companies etc.). The mechanism of achieving the collection, recovery and recycling targets (individually or by collective schemes) including monitoring process shall be defined. Adequate administrative capacity for enforcement needs to be installed.
- The fee system which is in place in Serbia should be adapted to avoid a double paying for products covered by collective schemes.
- Necessary steps to assure competition among the collective schemes and to assure a high efficiency and effectiveness of these schemes should be taken: a legal framework should be set up which allows the competent authority:
  - to issue a permit for the “new” collective schemes. The permit should contain the minimum requirements for operating (e.g: upper limits for self-administrative cost, targets with regard to collection, recycling, recovery rates referring to the contracted quantities).
  - to ensure that the collective schemes fulfil their responsibilities according to the market share, and that the total area of Serbia is covered by their services. This responsibility could be delegated to a “clearing house”.

In order to make enforcement more effective, a system of administrative fining (for misdemeanours) should be introduced, thus cases of misdemeanours should no longer go to the criminal court. Fines must be executed quickly, and they must be sufficiently high to have a deterring effect. The revenues from the fines should be used for environmental protection. The competent authority for imposing fines could be the inspectorate. An instance for appeals would be needed.

As long as any infringement against Waste Legislation continues to be a criminal offence, a very good exchange of information between the enforcement authority (for hazardous waste: Ministry of Agriculture and Environmental Protection) and the prosecutors is needed. Prosecutors should train the enforcement authority how to prepare the notification of crimes in such a way that they can be prosecuted effectively. The enforcement authority should raise awareness of the prosecutors for environmental crimes.
6 REFERENCES


References


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[26] **STATE INSTITUTE FOR CONTAMINATED SITES:** [http://www.laf-lsa.de/ueber-uns/aufgaben/](http://www.laf-lsa.de/ueber-uns/aufgaben/)


[31] **Ordinance of the Minister on Environment of 11.05.2015 of the type of waste which can be recovered outside facilities (OJ 2015/796)**


[34] **Decision BC 12/4 Technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with mercury**

[35] **Decision BC12/3 Technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with persistent organic pollutants**

[36] **Decision BC12/5 Technical guidelines on transboundary movements of electrical and electronic waste and used electrical and electronic equipment, in particular regarding the distinction between waste and non-waste under the Basel Convention**

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8 ANNEXES

Annex 1: Institutional framework of the MoAE of Saxony-Anhalt

This annex displays the total institutional framework of the MoAE of Saxony-Anhalt. Authorities which have special competencies in waste management are marked.
Annex 2: Examples for collection devices and plants for hazardous wastes from private households

- Vehicle for collection of hazardous wastes from private households in pick-up-system

- Storage site of a County for the collection of hazardous wastes in bring-system

- Storage site of a private enterprise which is allocated with the task of waste collection designated inter alia for the collection of hazardous wastes in bring-system
Annex 3: Amounts of generated and disposed hazardous wastes in Saxony-Anhalt since 1992

The chart shows the amounts of generated and disposed hazardous wastes in Saxony-Anhalt from 1992 to 2004. The data is presented in metric tons. The chart distinguishes between the amounts of hazardous waste generated and disposed in Saxony-Anhalt and other amounts imported or exported.
Annex 4: Notification and Movement Forms for the disposal of hazardous wastes in Germany

1: cover sheet
2a: declaration of the waste generator (p.1)
2b: declaration of the waste generator (p.2)
3: waste analysis
Annexes

Annex 4 (continued): Notification and Movement Forms

4: declaration of the disposer

5: confirmation/approval of the authority

6: application for release
Annex 4 (continued): Notification and Movement Forms

7: Movement document

8: take-over document in certain cases
Annex 5: Examples for the remediation of contaminated sites in Saxony-Anhalt

ÖGP Bitterfeld-Wolfen

ÖGP Buna

ÖGP Leuna

ÖGP Hydrierwerk Zeitz
Annex 5 (continued): Examples for the remediation of contaminated sites in Saxony-Anhalt

ÖGP Mansfelder Land

ÖGP Magdeburg Rothensee

ÖGP Erzgebirger Altmark
Annex 5 (continued): Examples for the remediation of contaminated sites in Saxony-Anhalt

Alte Gruben

Additnal

Tagebaurestloch Großkugna

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