4. Waste

The volume of waste is growing in Europe. We have become used to mass consumption and now the time has come when we are faced with a shortage of resources and the need to produce and consume more sustainably.

Waste generation is directly linked to economic growth — the faster the growth, the more waste is generated due to increased consumption. Such a trend is not sustainable and the link between economic growth and consumption must be severed. We should strive for greater sustainability and for developing products with as low as possible environmental impact and life-cycle cost. Depositing waste in landfills is not a sustainable disposal option. Waste materials should be given a new life through recovery and recycling, which requires the implementation of well thought-through and innovative production methods. Huge quantities of waste (including hazardous waste) are still generated in Estonia by the oil shale industry. However, the industry is seeking ways to recover and reduce waste. Reducing the amount of oil shale waste is one of the biggest challenges for Estonia.

Significant progress has been made in recent years in the field of waste management. The number of landfill sites is decreasing. However, despite the increased recovery of materials, waste generation continues to be a serious problem. There was a surge in the separate collection of municipal waste in 2008, after landfills were banned from accepting unsorted municipal waste and separate collection became compulsory. The network of civic amenity site is operational and continues to be improved to ensure better quality of separately collected waste, which in its turn increases the quantity of recovered waste materials.

4.1 Legal background

The development of waste management in the period covered is based on the National Waste Management Plan, approved by the Government in 2008, that sets forth the general development policies in the waste management sector up to 2013. The Waste Management Plan lays down the strategic objectives for waste management based on the EU environmental policy, strategic documents and legislation. In 2008, the European Parliament and the Council adopted a new directive – Directive 2008/98/EC on waste – repealing the EU Waste Framework Directive, the Hazardous Waste Directive and the Waste Oils Directive. The new Framework Directive places greater emphasis on waste prevention and those waste management options that are higher in the waste hierarchy, such as preparing for re-use and recycling. The directive also sets out specific numerical targets for Member States for the recovery of construction and demolition waste as well as municipal waste. The requirements of the Framework Directive were transposed into Estonian law in 2011 by amendments to the Waste Act. The Waste Act was substantially amended in 2010 in relation to the mining waste of Directive 2006/21/EC on the management of waste from extractive industries.

After the intensive economic growth up to 2008, which also increased the amount of waste generated, the following couple of years witnessed a relatively sharp decline in the economy. As a result, production and consumption volumes fell, which had an effect on waste management. Since 2010, the economy has recovered quite fast and this is reflected in waste generation and in the development of the field of waste management. In the period concerned, the development of waste management has been continuous and is aimed at the achievement of strategic objectives. The share of waste deposited in landfills has decreased, while the recovery of waste, including municipal waste and biodegradable waste, is on the increase. The number of landfill sites continues to fall. Depositing waste in landfill sites that do not meet the environmental requirements was stopped by 2009. All such landfills must be rehabilitated by the end of 2015. The provision of waste collection services to the public was improved through waste collection systems managed by local authorities, supported by the extending network of amenity site and collection points. Organisations operating according to the producer responsibility principle have an important role in separate collection and recycling of packaging waste as well as waste from products of concern. This has enabled to achieve EU targets of handling different types of waste. The development of waste management was facilitated by aid granted from EU Structural Funds and the Cohesion Fund, in particular by the implementation of the measure "The development of waste collection, sorting and recycling" pursuant to a regulation adopted in 2009.[1]

1 Terms and conditions of the measure "The development of waste collection, sorting and recycling". https://www.riigiteataja.ee/akt/122032013004

4.2 Waste generation and handling

Over the last one hundred years, people have consumed more resources than their ancestors did in the entire history of mankind. One of the consequences of increased consumption is the large-scale generation of waste. The waste generated poses a threat to both the human and natural environments.

The generation of waste, non-hazardous waste in particular, has escalated in Estonia since 2003, while the generation of hazardous waste has been relatively stable, averaging about 7 million tonnes per year. In the last two years of the period covered – 2010 and 2011 – the amount of hazardous waste has grown, mainly due to the increased production volumes of shale oil, though this is unlikely to be a long-term trend. While an average of 13 million tonnes of waste was generated in 1995–2002, the average amount of waste generated in 2003–2011 was 19 million tonnes. A noticeable decline in waste generation was observed only at the height of the economic crisis in 2009, when the volumes of waste fell to the level of 2002–2003 (Figure 4.1). The generation of waste depends on the economic situation and the development of trade and consumption – more waste is generated during a time of economic upturn, while in a period of downturn the amount of waste decreases. In comparing the relative change in real GDP with the relative change in waste generation we can see that waste generation increased faster, mainly due to the waste intensive oil shale power industry and shale oil production (Figure 4.2). In the past decade, the increase in the volume of municipal waste has been slower than the economic growth. Waste prevention is at the top of the five-tier waste hierarchy proposed in the Waste Framework Directive (2008/98/EC). We need to develop measures that will sever the decoupling. The keywords here are sustainable production and consumption, integrated product policy, producer responsibility and monitoring of the product's environmental impact throughout its life-cycle. Production should be based on the principle that environmental issues are already addressed in the product planning and design phases, i.e. in the conceptual, design, development and manufacturing phases.

In 2007–2011, over 85% of all waste was generated by the industrial sector, with 79% of total waste comprising waste generated by the oil shale industry and energy sector. The wood and cement industries also generate large volumes of waste but most of this waste is recovered (Figure 4.3).

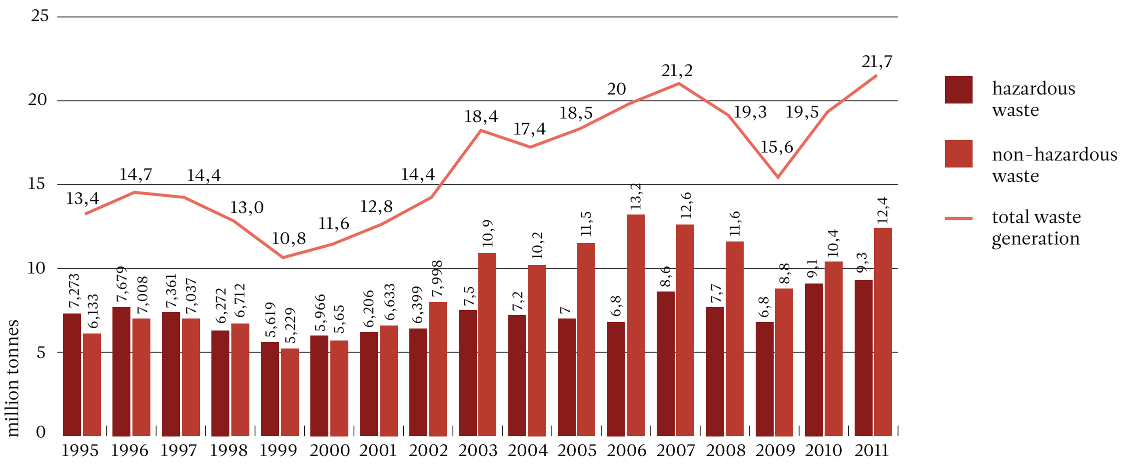

Figure 4.1. Generation of hazardous and non-hazardous waste in 1995–2011. Data: ESTEA (the Estonian Environmental Agency).

Figure 4.2. Waste generation and GDP in 2000–2011 as an index; baseline level: 2000. Data: ESTEA.

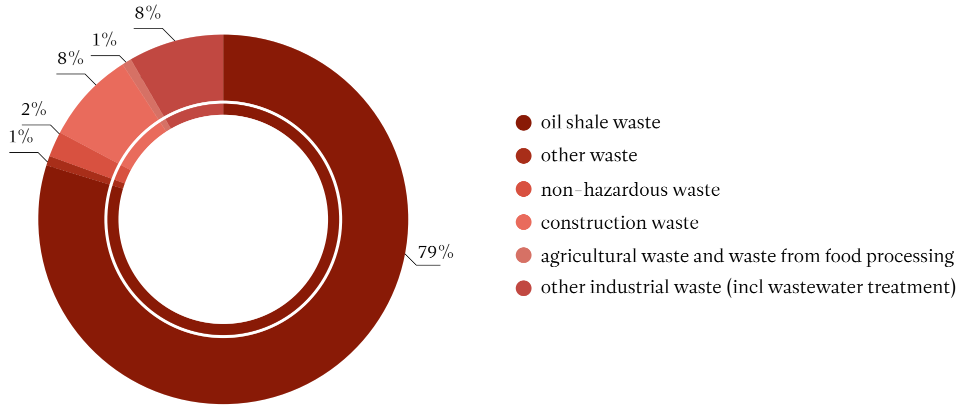

Figure 4.3. Average distribution of waste generation by types of waste in 2007–2011. Data: ESTEA.

4.2.1 Recovery of waste

The recovery of waste to the greatest extent possible is, besides waste prevention, a top priority of waste management. The preferred option of waste recovery is preparing waste for re-use, followed by recycling as a material or raw material. Only then other options, such as energy recovery, the reprocessing into materials that are to be used as fuels or for backfilling and landscaping operations, should be considered.

The recovery of waste is encouraged by the following measures: pollution charge upon release into the environment; excise duty on packaging to be paid in case the recovery obligation is not fulfilled; the producer responsibility principle, according to which the producer must ensure the collection, recycling, recovery or disposal of waste resulting from products of concern (such as batteries, tyres, electronic equipment) placed on the market by the producer.

The recovery of waste has increased in Estonia. While 20% of all waste was recovered in 2005, in the following five years the recovery rate was 33%. The share of recovered waste declined slightly in 2008–2009 due to the economic crisis, but it started to increase again in 2010. A surge occurred in 2011 when waste recovery increased to 55% (Figure 4.4). The main reason was the increased recovery of oil shale mining waste, caused by a concurrence of different circumstances — the semi-coke landfills in Kohtla-Järve were closed and pitch lakes containing the waste from oil production were filled with mine waste; also, several large-scale road construction projects were launched (Aruvalla-Kose, Haljala junction, Luige junction, etc.) in which mine waste is used as a trackbed filling material, and the construction of a recreational centre began in Mäetaguse rural municipality. The pollution charge for depositing oil shale mining waste and tailings is on the increase. Increased pollution charges for depositing waste mainly affect the AS Eesti Energia Kaevandused company whose pollution charges depend on how much mine waste they manage to recover. Therefore, for the past five years, the company's priority has been to increase the share of recovered waste. The company has constructed several powerful crushed stone production plants. About 70% of the mine waste generated by the company was recovered in 2010 and 2011, as compared to 20% in previous years. However, such growth is not sustainable.

The recovery of oil shale ash from power generation, which accounts for about 33% of total waste, is also increasing. Oil shale ash is used in the production of building materials as well as in various mixes and large-scale mass stabilisation processes; in agriculture it is to reduce the acidity of the soil and in the production of mineral fertilisers. AS Eesti Energia is seeking, in cooperation with technology researchers, new and more efficient methods for oil shale ash recovery. In 2007–2011, about 3% of the total volume of oil shale ash was recovered (Figure 4.5).

Large parts of other types of waste, such as the waste generated by the wood processing industry (almost 100%), construction and demolition waste (including excavated soil), scrap metal, sewage sludges well as garden and park waste, are also recovered.

Recovery operations include preparing waste for recovery — collecting waste for processing, sorting mixed waste and crushing waste. Most of the crushed and sorted waste is scrap metal, construction waste and packaging waste (about 40% of the total waste), a large part of which is exported and recovered outside of Estonia.

New recovery methods are developed, such as the production of rubber mats from end-of-life tyres and construction materials from plastic waste as well as the production of biogas from manure, slurry, landfill gas, sewage sludge and biowaste, etc. It is paramount that Estonia seeks and finds possibilities to increase the recovery of oil shale waste.

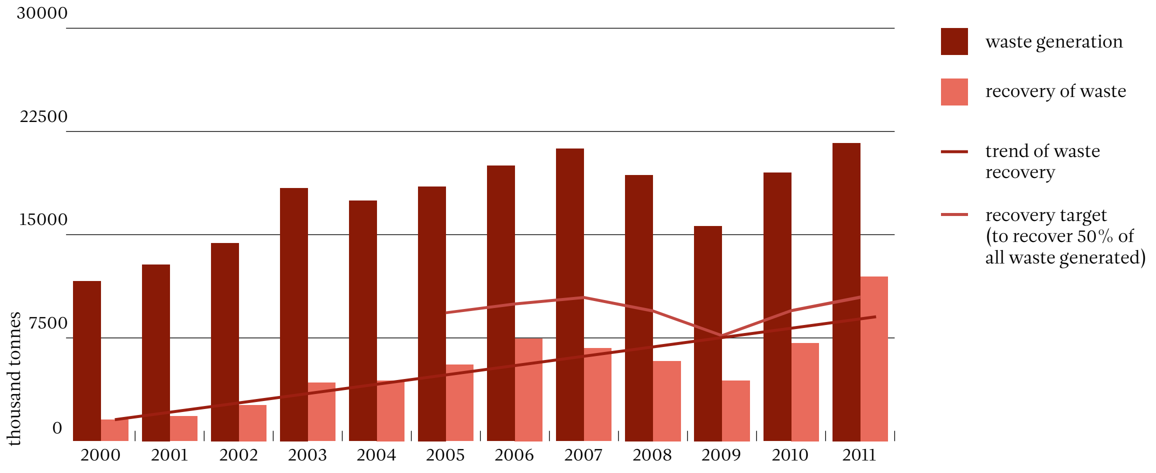

Figure 4.4. Recovery of waste in 2000–2011. Data: ESTEA.

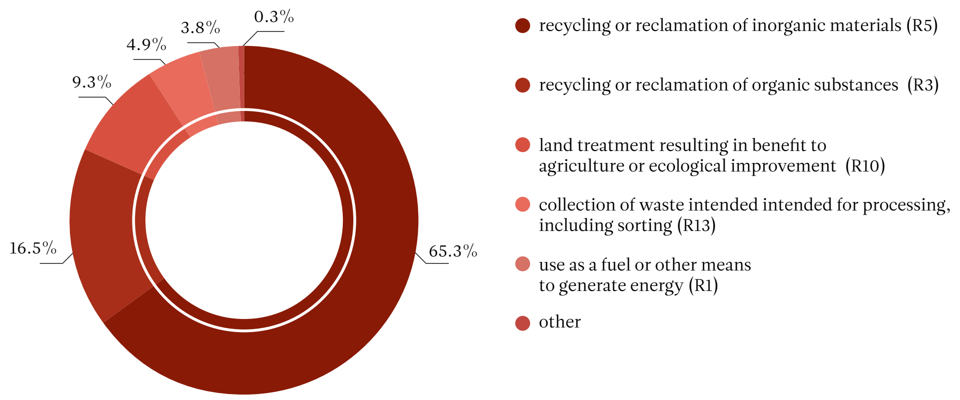

Figure 4.5. Recovery of waste (average distribution) in 2007–2011. Data: ESTEA.

4.2.2 Waste disposal

Waste disposal refers to any operation carried out to release waste into the environment or prepare waste for release into the environment. The main method of disposal has been the deposition of waste in landfills and this will continue to be the predominant method in the future – as long as oil shale continues to be mined and used for energy and shale oil production. Wastes from oil shale mining and the energy sector accounted for 95% of total waste deposited in landfills in the last decade.

While the quantities of waste disposed of in recent years have remained at more or less the same level, the share of disposed waste in total waste generated is decreasing year on year – from 74% in 2001 to 60% in 2010 (Figure 4.6). In 2011, 43% of waste was deposited in landfills; however, when broken down by types of waste, it appears that the decrease in the volume of waste deposited in landfills mainly occurred on account of wastes from mineral non-metalliferous excavation, i.e. mine waste. While an average of 4 million tonnes of mine waste was disposed of in the decade preceding 2011, in that year the amount was only as much as 826,624 tonnes. The oil shale mines in Ida-Viru County have developed an original way of recovering mine waste — the enormous heaps of mine waste are redeveloped into recreational facilities.

New ways have been sought for increasing the use of recovered oil shale ash in road construction, cement production, for the neutralisation of acid agricultural soil and potentially also for filling underground mines. This should considerably decrease the amount of landfilled waste.

The disposal of other types of waste has decreased year on year due to the implementation of measures aimed at increasing the recovery of waste. While waste other than oil shale waste accounted for 6% of total landfilled waste in 2003, in 2010 and 2011 the share of such waste was just 3%.

The smallest amounts of waste were disposed of in 2009, the year when the total amount of waste decreased due to the economic recession.

A number of restrictions have been imposed on landfills by the Waste Act over the past decade in order to reduce the amounts of waste released into the environment and to render it less hazardous. The landfilling of untreated waste, liquid waste, waste with certain hazardous qualities and waste of undefined composition was prohibited in 2002–2004. Depositing end-of-life tyres in landfills is also prohibited. Since 2007, no animal waste can be deposited in landfills. Since 2010, the municipal waste deposited in landfills may not include more than 45% biodegradable waste by weight.

There are other methods of waste disposal besides depositing in landfills; one of them is the physico-chemical treatment of waste. This is in essence pre-treatment, in the course of which waste is made more suitable for disposal. Waste treated this way includes bilge water from ships and other vessels, liquid waste containing oil and other hazardous substances, laboratory chemical, sludge from septic tanks, etc.

The incineration of waste without the recovery of energy has decreased (from 2,500 tonnes in 2004 to 21 tonnes in 2010). No waste was incinerated in 2011 for the sole purpose of disposing of waste.

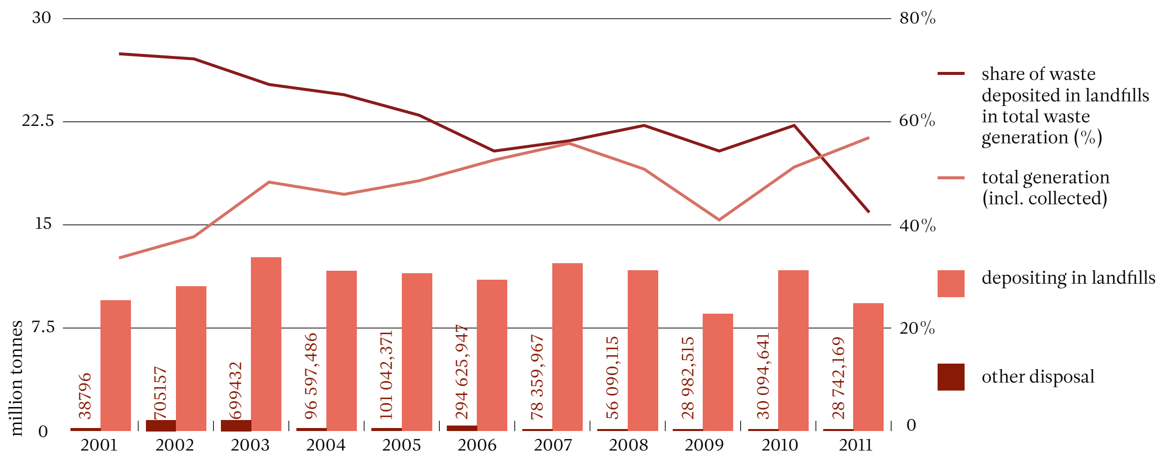

Figure 4.6. Waste disposal in 2001–2011. Data: ESTEA.

4.3 Generation and handling of hazardous waste

The largest part of all hazardous waste is generated by the production of oil shale energy and shale oil, mainly in the form of oil shale ash and semi-coke (Figure 4.7). The most voluminous and also the most dangerous waste from oil production is waste pitch or fusses. By implementing a new filtering technology, AS VKG Oil has significantly reduced the generation of that type of waste. However, hazardous waste generated by the oil shale industry still constitutes nearly 95% of the total amount of hazardous waste. This determines the share of hazardous waste in total waste generation, which has been between 40% and 47% in recent years and depends mainly on the intensity of the production of oil shale energy and shale oil.

Unfortunately, energy production from oil shale inevitably generates huge quantities of waste due to the high mineral content (more than 50%) of oil shale. Improved technology and more efficient use of resources, however, present opportunities for reducing waste generated per production unit. In the field of oil shale energy this is achieved by replacing old boilers with new ones that are based on fluidised bed combustion technology, which has clearly reduced the amount of oil shale ash per production unit (Figure 4.8). A similar trend could be observed in the production of shale oil, but the generation of solid waste has stabilised or even increased in recent years due to the intensification of production.

The generation of other types of hazardous waste has been more or less stable over the years. The amount of other types of hazardous waste generated in Estonia in 2010 was 162 kg per inhabitant. By comparison, the EU27 average in the same year was 188 kg[2].

Other types of hazardous waste generated in large volumes are: cement clinker dust trapped by electric filters at cement production plants (55,000 tonnes in 2011); waste consisting of various oil products, including tank bottom sludge, bilge water, waste oils (over 100,000 tonnes in total); soil polluted with hazardous substances removed from objects that have been cleaned (31,400 tonnes); wood polluted with hazardous substances (7,400 tonnes); end-of-life vehicles (11,400 tonnes); construction materials containing asbestos, including fibre-cement boards (eternit) (3,900 tonnes); lead batteries (2,800 tonnes), etc.

The bulk of hazardous waste generated in Estonia was deposited in landfills (a total of 8,166,000 tonnes in 2011) because recovering such huge quantities of waste, in particular the waste generated by the oil shale industry, is difficult. However, 1,139,000 tonnes of hazardous waste was recovered in 2011, mainly phenol-containing water that was used to produce fine chemicals (443,000 tonnes); semi-coke used in closing the landfills in Kohtla-Järve and Kiviõli (280,000 tonnes); cement clinker dust used as lime fertiliser (30,400 tonnes), etc. A total of 21,200 tonnes of hazardous waste were used to produce energy, including 12,900 tonnes of oilcontaining waste that was used as an alternative fuel to operate the rotary kilns of AS Kunda Nordic Tsement.

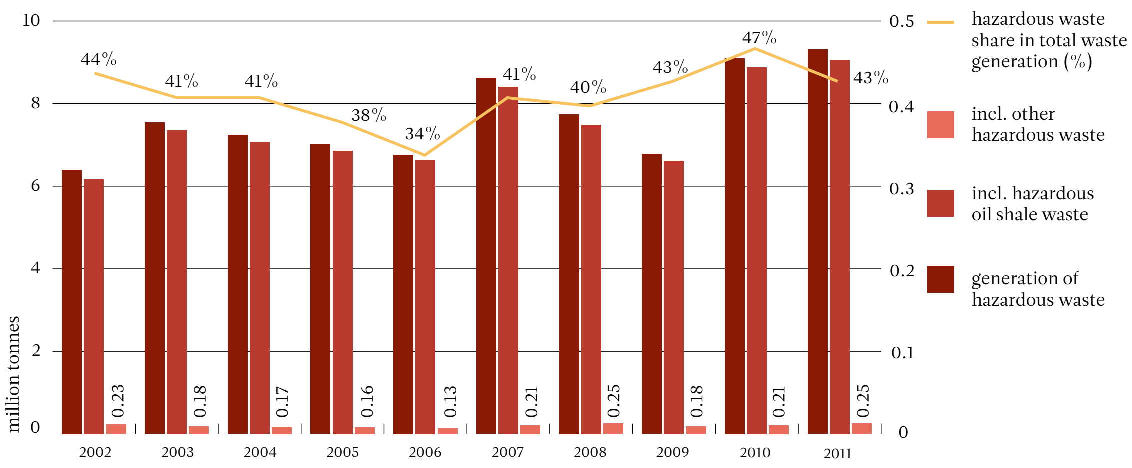

Figure 4.7. Generation of hazardous waste in 2002–2011. Data: ESTEA.

2 Terms and conditions of the measure "The development of waste collection, sorting and recycling". https://www.riigiteataja.ee/akt/122032013004

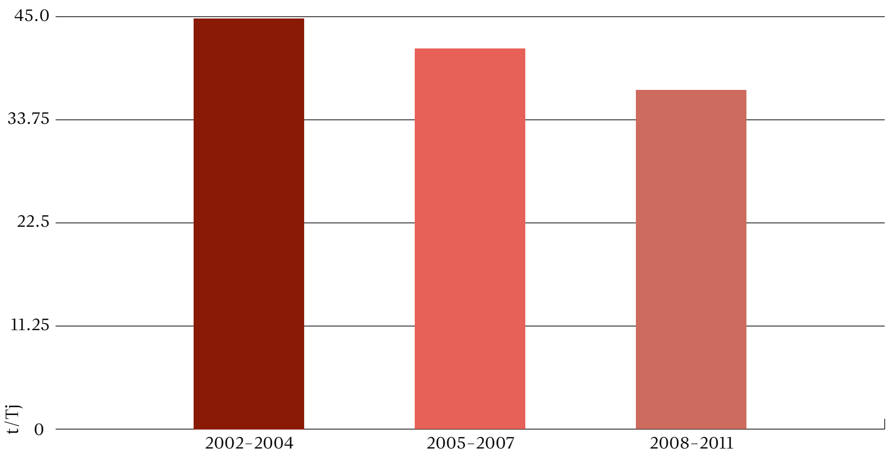

Figure 4.8. Average amount of oil shale ash (in tonnes) generated by power stations per one TJ of energy.

4.4 Generation and handling of municipal waste

Municipal waste is waste consisting of everyday items, substances or their residues, including hazardous waste, that have lost their value to their first owners and are discarded. Municipal waste includes the office and trade waste that is similar to the waste generated by households. The amount and composition of municipal waste is directly dependent on the economic situation and consumption as well as demographic developments (size and location of the population, etc.). The population of Estonia has decreased by 5.5% over the past decade. A large part of the population and businesses are concentrated in bigger towns (Tallinn, Tartu, Narva, Kohtla-Järve and Pärnu) and the surrounding areas. This is also where the bulk of municipal waste is generated.

Municipal waste accounts for 3% of the total waste generated in the country. Estonia produced an average of 360 kg of municipal waste per person in 2000–2011. The pollution load of municipal waste has decreased significantly since 2008 (Figure 4.9). Reasons for this include the economic downturn and the resulting decrease in the purchasing power as well as methodological changes in the calculation of municipal waste amounts. Separate collection of packaging waste, which is increasing year on year, has also reduced the calculated amount of municipal waste because separately collected packaging waste, despite being mainly generated by households, is entered in the list of wastes as a separate group.

There was a surge in the separate collection of municipal waste in 2008, after landfills were banned from accepting non-separated municipal waste and separate collection became compulsory. Local authorities continue to extend the obligation of separate collection. The network of amenity sites waste handling facilities is operational and continues to be improved to ensure the better quality of separately collected waste, which, in turn, increases the quantity of recovered waste materials. The separate collection of municipal waste was relatively stable in 2009–2011 — an average of 54 kg per person in a year, or 20% of the total municipal waste. The separate collection of waste is facilitated by better cooperation between local authorities in planning waste management as well as by the increased environmental awareness of the public. The development of the network of amenity sites and collection points should be based on the principle of proximity, i.e. amenity sites must be located as close as possible to where the waste is produced, easily accessible and accept as many types of waste as possible (Figure 4.13).

Most of the separately-collected municipal waste is scrap paper and cardboard, followed by scrap metal and wood waste as well as biodegradable kitchen and canteen waste, waste electrical and electronic equipment, wood and glass waste (Figure 4.11).

The generation of hazardous municipal waste has risen slightly in the last five years, constituting 0.2% of all household waste on average in 2002–2006 and 0.7% in 2007–2011. The development of a network for the collection of hazardous waste from households and waste electrical and electronic equipment has facilitated the collection of hazardous municipal waste, which is also reflected in the municipal waste data. In years past, much of the hazardous waste was classified as mixed municipal waste, which is why the rise in the hazardousness of municipal waste does not stem from an actual increase in the percentage of hazardous municipal waste but rather from more professional waste handling and improved quality of waste data.

The depositing of municipal waste in landfills has significantly decreased since 2006. While 74% of municipal waste was deposited in landfills in 2006, in 2011 the share of such waste was 61% (Figure 4.10). The main type of waste deposited is mixed municipal waste that has been pre-sorted. The amount of mixed municipal waste that is mechanical-biologically treated, i.e. most mixed waste of energy value is separated and used as fuel, increased significantly in 2010 and 2011 — an average of 30,000 tonnes of mixed municipal waste was processed. In the future, the bulk of mixed municipal waste will be sent to the Iru incinerating facility, which is operated by Eesti Energia, to be used for the cogeneration of electricity and heat. Most of the recovered municipal waste is organically recycled biologically recycled, composted and used for land treatment (Figure 4.12). The waste organically recycled biologically recycled includes garden and park waste, biodegradable kitchen and canteen waste and wood waste generated by households. Recovery operations include the preparation of municipal waste for recovery (collection for processing, including the sorting of mixed waste). A large part of collected and sorted municipal waste (such as scrap paper and cardboard and scrap metal as well as discarded electrical and electronic equipment) is exported and recovered outside of Estonia. Pursuant to the Waste Framework Directive 2008/98/EC, at least 50% of the glass, paper, metal and plastic contained in municipal waste must be prepared for re-use or recycled by 2020.

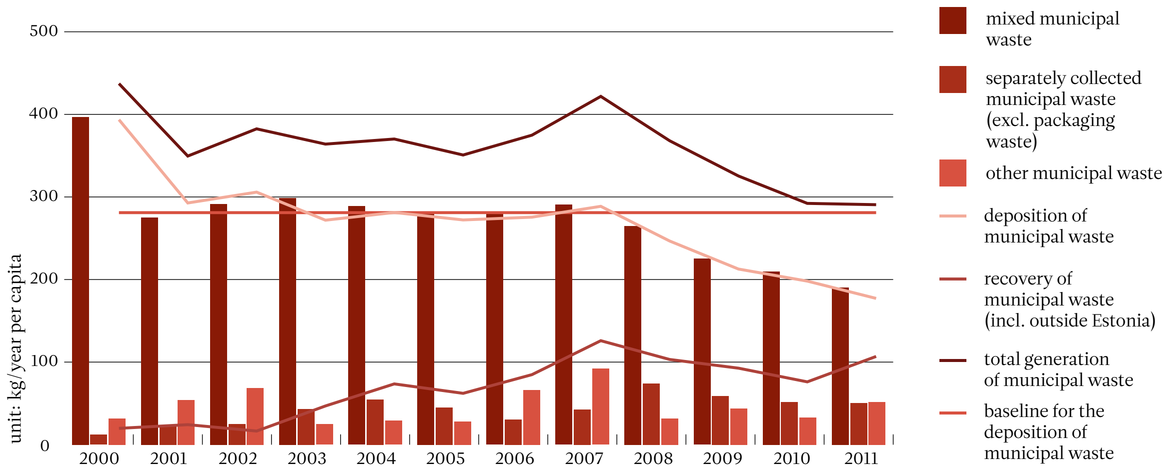

Figure 4.9. Generation, depositing and recovery of municipal waste in 2000–2011. Note: Other municipal waste includes garden and park waste, septic tank sludge, street-cleaning residues waste and bulky waste (furniture, etc.). Data: ESTEA.

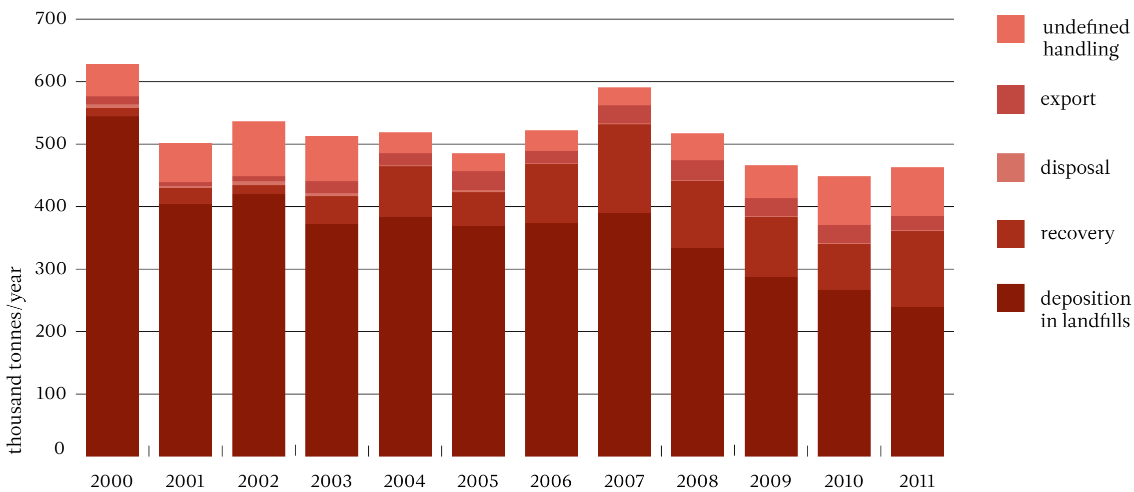

Figure 4.10. Municipal waste handling in 2000–2011. Note: Disposed waste mainly includes septic tank sludge and sewerage cleaning waste that is discharged in sewage system. Data: ESTEA.

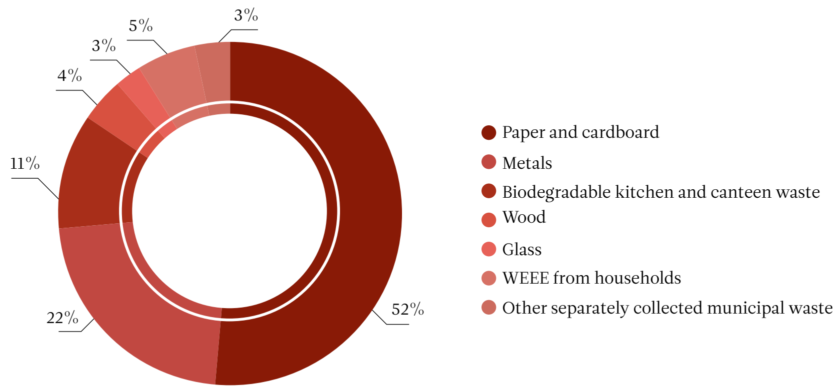

Figure 4.11. Average distribution of separately collected municipal waste in 2007–2011. Data: ESTEA.

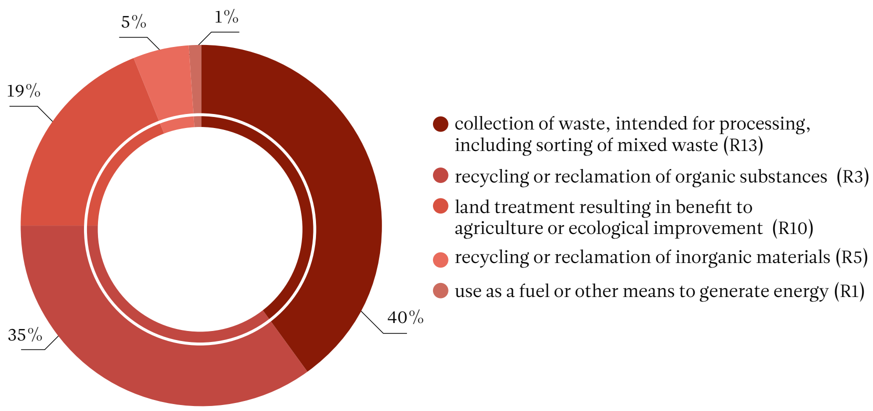

Figure 4.12. Recovery of municipal waste (average distribution) in 2007–2011. Data: ESTEA.

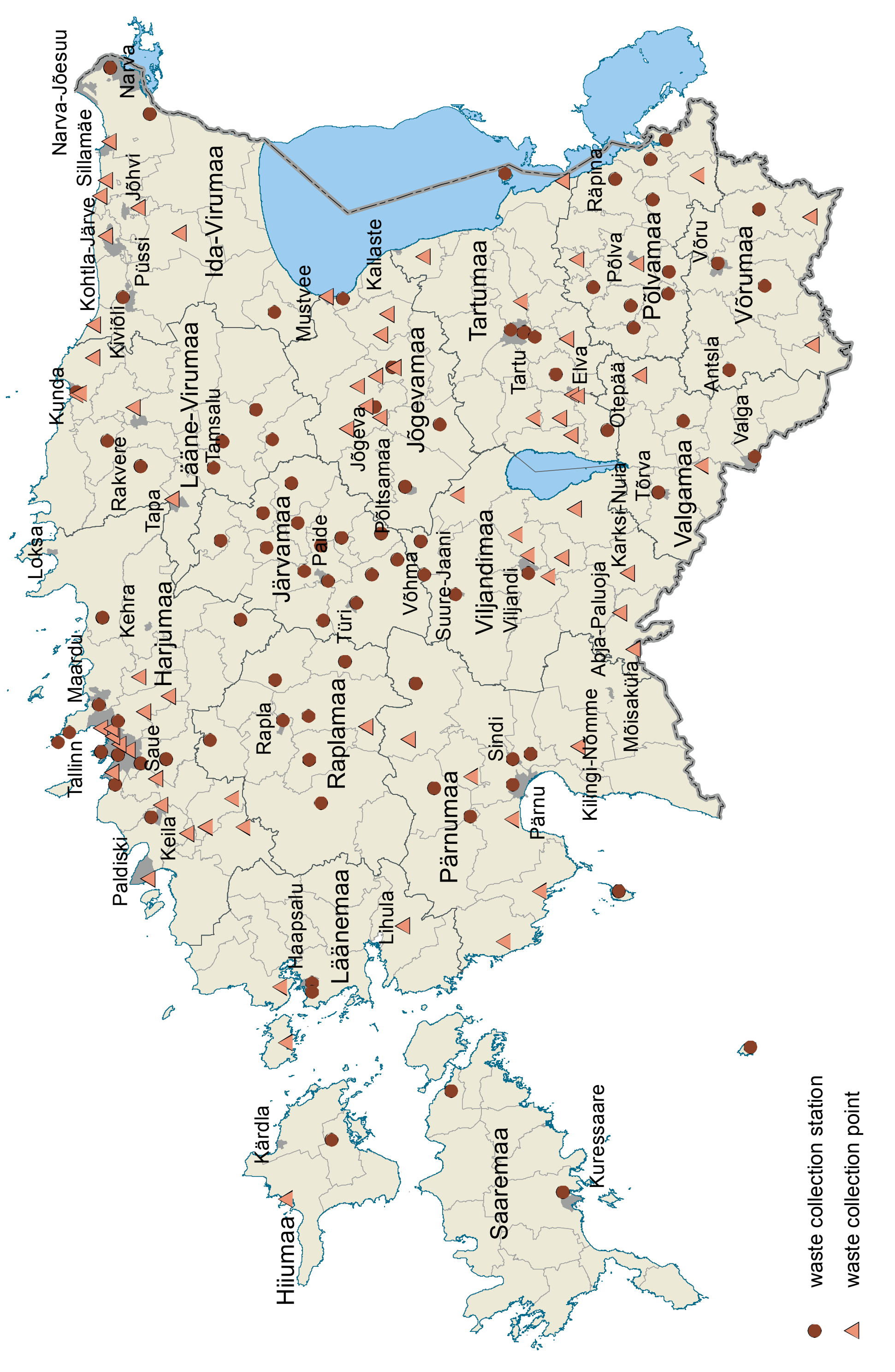

Figure 4.13. Waste collecting stations and collection points. Data: ESTEA.

4.5 Generation and recovery of packaging waste

Packaging is something that surrounds every product sold to consumers. After the packaging is removed, it becomes waste which must be collected, recovered or disposed of.

In the collection and recovery of packaging waste, Estonia has implemented the producer responsibility principle since 2004. The producer responsibility principle means that business operators who deal with packaging (producers and importers of packaging) must collect and recover the packaging waste from products placed on the market by them and bear the costs of waste handling. In order to implement the producer responsibility principle, recovery organisations have been established which organise the collection and recovery of packaging waste across Estonia.

In 2013, there were four recovery organisations in Estonia:

Eesti Pakendiringlus MTÜ; Eesti Taaskasutusorganisatsioon MTÜ; Tootjavastutusorganisatsioon OÜ; Eesti Pandipakend OÜ (handling of deposit-bearing containers).

The adoption and recast of the Packaging Act (in 1995 and 2004, respectively) laid the foundation for a nationwide system for the collection and recovery of packaging waste. The Act has been repeatedly amended over the years, such as to add material-based requirements for the recovery of packaging waste or to specify the obligations of and requirements for packaging businesses and recovery organisations. The current targets for the recovery of packaging waste were established in 2009. The targets were set for both total packaging waste and for different types of packaging materials.

The generation of packaging waste increased from 110,000 tonnes in 2001 to 214,470 tonnes in 2008. A significant increase in packaging waste generation in 2008 was mainly caused by the rapid economic growth. The onset of the economic recession in 2009 reduced the volumes of packaging waste to the level of 2007. The decline continued in 2010 and the volumes only started to grow in 2011 (Figure 4.14). When comparing the volumes of packaging waste with the general economic indicators, it is clear that the development of the economy has a noticeable effect on the generation of packaging waste.

When the economy recovers and consumption increases, more packaging waste is generated. The packaging waste generated in Estonia in 2011 was about 140 kg per person, which is slightly below the EU average (157 kg per person).

In 2006, for the first time Estonia met the targets for the recovery of packaging waste, as established by the European Commission. The recovery of packaging waste decreased in 2007–2008 compared to the generation of such waste; therefore, the targets were not met. In 2009, Estonia failed to meet the target by only 1%. The recovery of packaging waste has remained stable in recent years, despite a surge in the generation of waste in 2009. Estonia met the targets for the recovery of packaging waste again in 2010 and 2011.

The share of plastic packages in packaging waste has increased in recent years (Figure 4.15). This means that plastic has become a preferred packaging material, which may suggest that, besides suiting the convenience of customers, goods are also “overpacked”. The types of packaging waste that are generated in the largest quantities are plastic, paper and cardboard, followed by glass, metal and wooden packaging.

Paper and cardboard are the packaging materials that are recovered most often (Figure 4.16). The recovery of glass decreased most in 2010. The reason for the decline was the lack of activity in the construction sector, which uses glass as raw material in concrete blocks, and decreased production and demand for glass packaging. The share of wood and metal in recovered materials increased due to the new method for calculating the recovery of packaging waste introduced in 2010. According to the new method, the wooden packaging contained in waste fuel is also considered recovered packaging waste and the metal packaging contained in ferrous metal scrap is recorded as packaging waste.

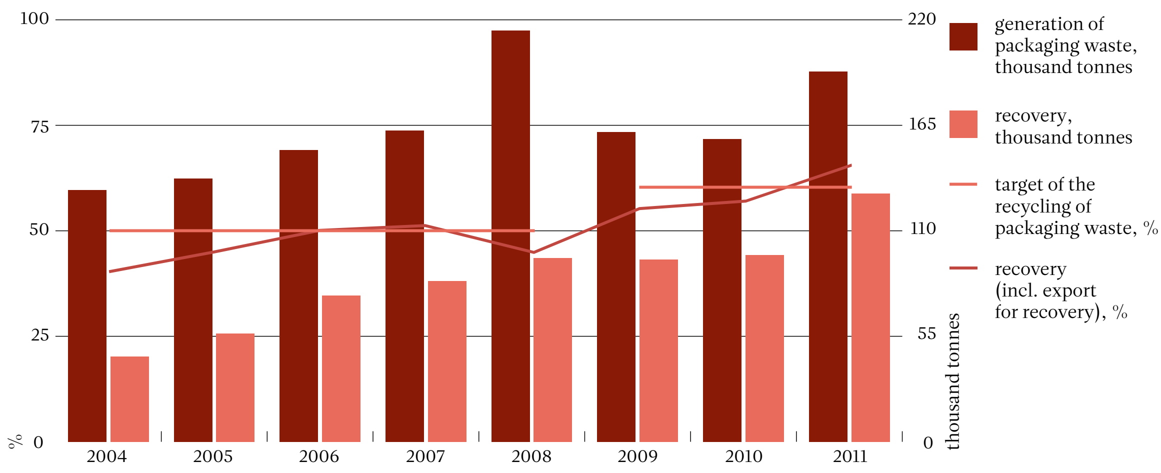

Figure 4.14. Generation and recovery of packaging waste in 2001–2011. Data: ESTEA.

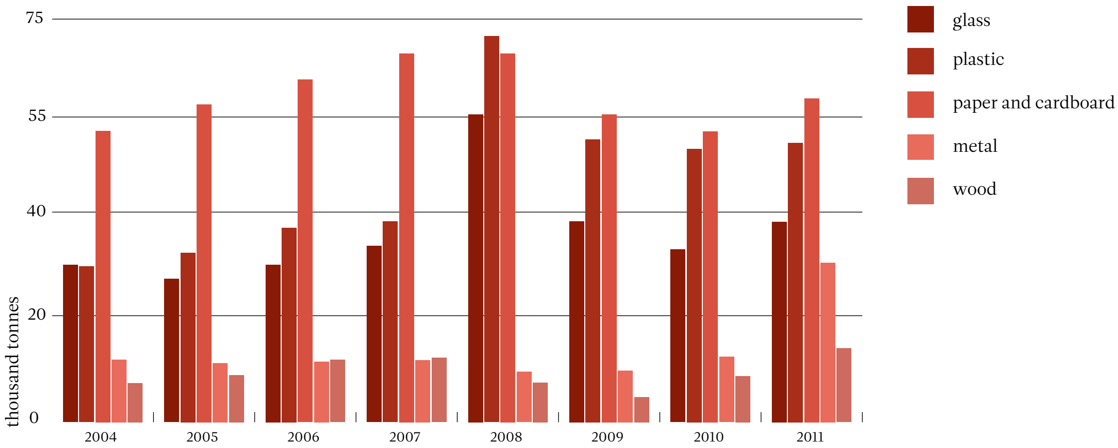

Figure 4.15. Generation of packaging waste by types in 2004–2010. Data: ESTEA.

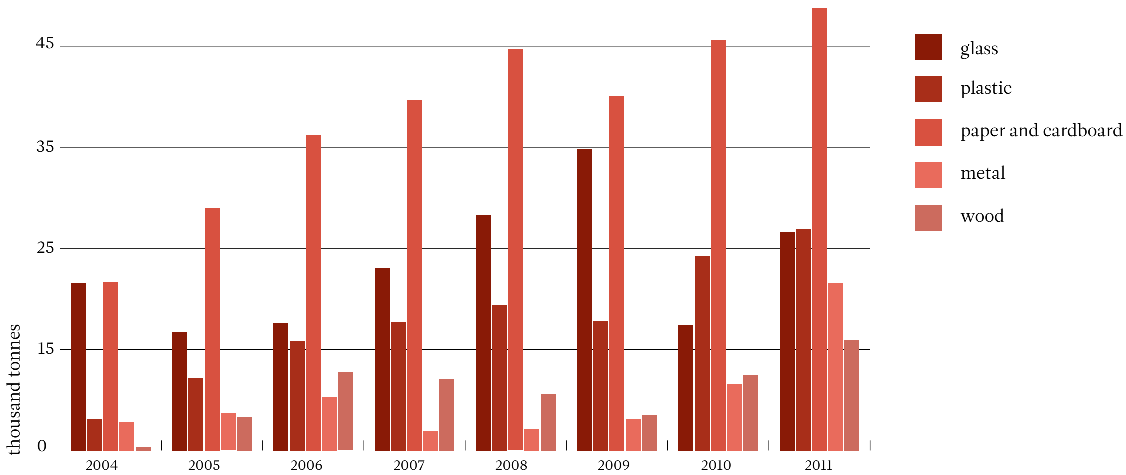

Figure 4.16. Recovery of packaging materials by types in 2004–2011.

4.6 Generation and recovery of waste from products of concern

Products of concern are products that may pose a risk to the environment and public health when they become waste. Products of concern include motor vehicles and their components, electrical and electronic equipment and their components, accumulators and batteries as well as tyres. Until 18 July 2010, equipment containing PCB were also considered to be products of concern.

Products of concern are subject to the producer responsibility principle, according to which the producer must ensure the collection, recycling, recovery or disposal of waste resulting from products of concern placed on the market by him. Producers – defined in the Waste Act as persons who plan, design, manufacture, process, sell or import products as a business or professional activity – must accept waste free of charge and bear all costs related to waste handling.

Producer responsibility for products of concern was implemented in 2004 upon the enforcement of a new Waste Act. The requirement for the collection and handling of end-of-life vehicles and tyres as well as waste electrical and electronic equipment (WEEE) entered into force for manufacturers in 2005. Since 2006, all manufacturers of products of concern are required to register in the register of products of concern (PROTO) and submit data on the products placed on the market as well as on the collected and recovered waste. As of 19 April 2013, the PROTO register included 608 manufactures of products of concern.

4.6.1 Generation and recovery of end-of-life motor vehicles

The producer responsibility principle applied to motor vehicles of categories M1, N1 and L2 (passenger cars and vans).

According to the Estonian Road Administration, 11,035 vehicles were discarded in 2006 (Figure 4.17). The number of discarded vehicles increased in the two subsequent years, reaching 13,843 in 2008. The data for these years include the vehicles deleted from the Road Administration traffic register without the right to undelete. Such accounting is not very accurate as it is not known how many of these vehicles had been scrapped before they were deleted from the register. Some improvements were made to the Road Administration's system and for 2009 and 2010 it was possible to obtain data on the number of end-of-life vehicles that had been deleted from the register based on a certificate confirming that the vehicles had been scrapped (7,528 and 7,268, respectively).

From 1 January 2006, producers are required to recover at least 85% of the average mass of end-of-life vehicles generated in a year. The mass of components, materials and substances reused and recycled must be at least 80% of the average mass of end-of-life vehicles. These targets are applied if test scrapping of end-of-life vehicles is carried out at least once every three years for the purpose of calculating the targets for recovery and recycling.

The targets for the recovery and recycling of end-of-life vehicles were not met in 2010 because no use was found for the shredder light fraction (plastic, textile and other non-metal materials) and it was landfilled (Figure 4.17).

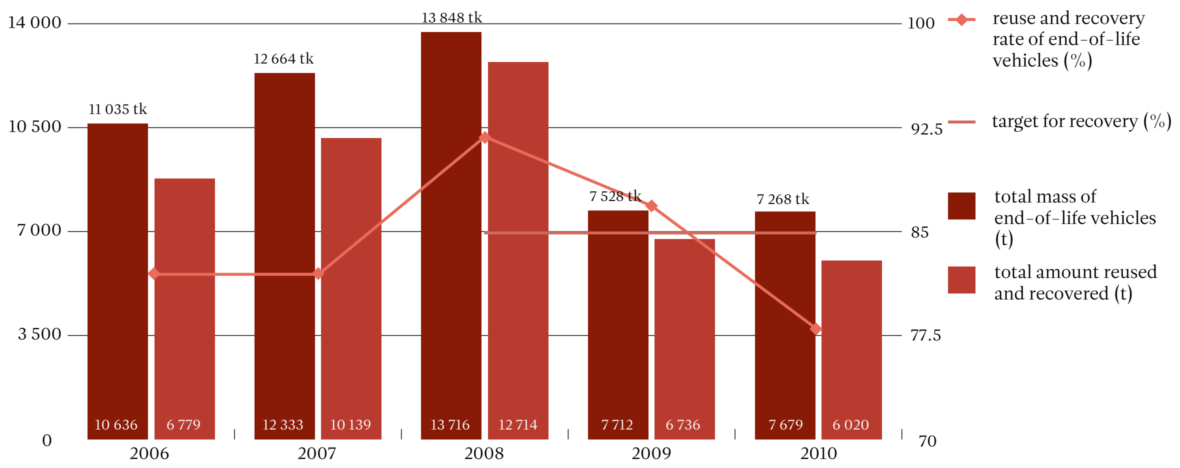

Figure 4.17. Re-use and recovery (including recycling) of end-of-life vehicles generated in Estonia and handled in Estonia or in other countries (2006–2010).

4.6.2 Waste electrical and electronic equipment and their recovery

Producer responsibility is also applied to waste electrical and electronic equipment (hereinafter "WEEE") that is divided into ten categories. The Waste Act establishes targets for the recovery and recycling of WEEE by categories.

The amount of WEEE collected from households was 4.3 kg per person in 2006, 4.6 kg per person in 2007, 4.4 kg per person in 2008, 3.6 kg per person in 2009 and 4.2 kg per person in 2010. The decline in 2009 was probably caused by the fact that the growth rate of the economy was low and the sales of new electrical and electronic equipment dropped. The equipment that is more valuable as metal is often disposed of as scrap metal and not as WEEE. In order to ensure that equipment is taken to waste handlers and collection points as complete, an amendment to the Waste Act was adopted in 2010, according to which no waste handler may accept components of electronic equipment that are classified as hazardous waste or incomplete equipment.[3]

4.6.3 Collection and recovery of end-of-life tyres

Since 1 January 2005, producer responsibility is applied to the tyres of motor vehicles and trailers. Producers must ensure the collection of end-of-life tyres in all counties, taking into account the population density while making the returning of tyres as convenient as possible for users.

The collected end-of-life tyres must be recovered because their depositing in landfills is prohibited, except when shredded tyres are recovered in a landfill as construction material. Although tyres are extremely inert, do not degrade readily and do not emit harmful substances, whole tyres are difficult to manage in landfills – the biggest risk is a potential fire and the pollution of the atmosphere, soil and ground water with various harmful compounds.

When end-of-life tyres are recovered, they are sorted in order to separate tyres that can be re-used or re-treaded. Re-treading is economically viable because it is cheaper than buying new tyres. The re-treading technology is also environmentally sustainable because it extends the useful life of tyres and reduces the amount of waste.

While the collection of end-of-life tyres has remained stable in recent years, the recovery of tyres varies significantly. The inventories of waste handlers nearly doubled in 2007 compared to 2006; a large quantity of end-of-life tyres was also returned to a waste handler who failed to submit data on the further handling of tyres. The collection of end-of-life tyres continued in 2008, while the inventories nearly doubled compared to 2007. This means that more than 100% of generated end-of-life tyres were recovered in 2009 and 2010, a part of them from the amounts accumulated warehouses in previous years. A large quantity of end-of-life tyres have been recovered in 2010 on landfills that were closed and rehabilitated in 2009. On average, 72% of collected end-of-life tyres were recovered in 2006–2011. This does not include the tyres exported from Estonia for recovery elsewhere.

3 Regulation of the Government of the Republic No 65 "Requirements, Procedure and Targets for Collection, Return to Producers and Recovery or Disposal of Waste Electrical and Electronic Equipment, and Time Limits for Reaching Targets". https://www.riigiteataja.ee/akt/13173439

4.6.4 Collection and recovery of batteries and accumulators

Batteries and accumulators are divided into portable, industrial and those used in motor vehicles. Collection and recycling targets have been set for batteries and accumulators.

The differences in the quantities of batteries and accumulators collected and recovered in Estonia are caused by the import of lead-plate batteries. In 2006–2011, about 84,000 tonnes of lead-plate batteries were imported and recovered (Figure 4.18).

4.6.5 Collection and disposal of equipment containing PCB

Equipment containing PCB[4] is any piece of equipment containing PCBs or having contained PCBs (e.g. transformers, capacitors, receptacles containing residual stocks) which has not been decontaminated. Decontamination refers to all operations that enable equipment, objects, materials or fluids contaminated by PCBs to be reused, recycled or disposed of under safe conditions, and which may include replacement, meaning all operations in which PCBs are replaced by suitable fluids not containing PCBs. Equipment of a type for which there is a good reason to believe that it may contain, or may have contained, PCBs is treated as if it contains PCBs, unless it is reasonable to assume the contrary.

The use of equipment containing PCBs has been prohibited since 1 January 2011; the holders of equipment containing PCBs that were in good working order were required to discard or decontaminate such equipment or remove PCBs contained in the equipment by no later than 31 December 2010. According to the register of equipment containing PCBs the last of such equipment were discarded by the end of 2011. The holders justified their failure to meet the deadline by difficult economic circumstances. In 2007, the recorded quantity of equipment containing PCBs was 67.2 tonnes; this number started to decrease in 2010 and all equipment containing PCBs was discarded by the end of 2012.

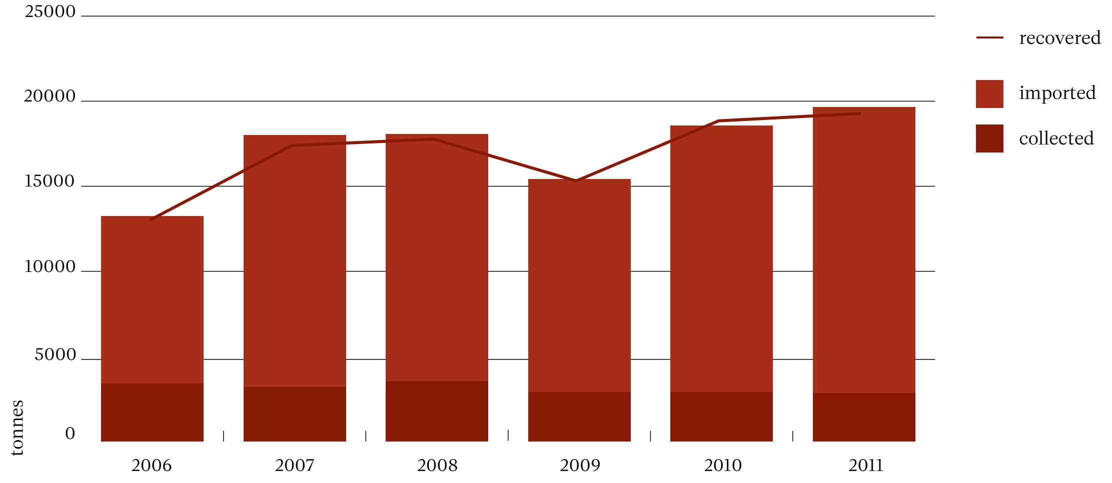

Figure 4.18. Accumulators and batteries collected and recovered in 2006–2011.

4 PCBs are polychlorinated biphenyls, polychlorinated terphenyls, Monomethyl-tetrachlorodiphenyl methane, Monomethyl-dibromo-diphenyl methane and other preparations or mixtures that contain any of the above substances more than 0.005% by weight

4.7 Transboundary shipment of waste

Import and export shipments of waste forms an integral part of Estonian waste management. It is neither possible nor economically expedient to handle all waste locally, in Estonia, and therefore it is reasonable to ship part of the waste out of the country. There are also several amenity site in Estonia that use waste imported from neighbouring countries as raw material.

In 1997–2011, the import of waste accounted for 1.0% and export 2.9% of total waste generated (Figure 4.19). The export volumes of waste have been quite stable — an average of 470,000 tonnes per year. Until 2010, the import of waste also remained at about 96,000 tonnes per year. After that, the import of waste increased significantly to 811,000 tonnes, or 4.2% of total waste generated, due to the import of asphalt removed from road surfaces (asphalt millings). Asphalt millings are used in road construction and port extension works. This changed the ratio of import and export shipments of waste. While earlier exports exceeded imports (in 2006–2009, six times more waste was exported from than imported to Estonia), in 2010 and 2011 the quantities imported exceeded the quantities exported by nearly 0.7 times.

More hazardous waste was imported than exported. Lead batteries processed by AS Ecometal in Sillamäe constituted an average of 94% of all hazardous waste imported to Estonia in 2004–2011. Waste electrical and electronic equipment, waste oil, refrigerating equipment and luminescent lamps are exported because these types of waste are not handled in Estonia. The main import and export partners were Latvia, Lithuania, Finland and Sweden.

The main types of non-hazardous waste imported were, besides asphalt millings, refuse derived fuel and waste wood for the production of pellets. The largest portion of exported non-hazardous waste was waste metal, which constituted about 84% of the total export of waste in 2004–2011. The main destination of waste metal was Turkey. The second largest by quantity was waste paper. The quantities of exported waste paper remained practically stable at about 60,000 tonnes per year. The main destination countries were Finland and Lithuania, and recently Germany.

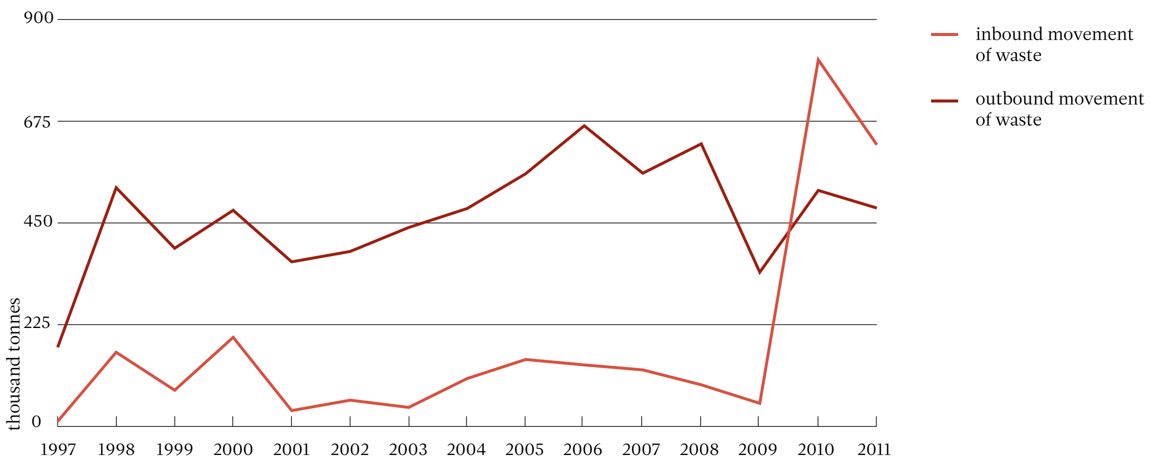

Figure 4.19. Inport and export shipments of waste in 1997–2011. Data: ESTEA.

4.8 Number of landfills in use and classification

There are three types of landfills: landfills for non-hazardous waste (mixed municipal waste and other non-hazardous waste); landfills for hazardous waste and landfills for inert waste (i.e. waste that does not undergo any significant physical, chemical or biological transformations, such as mineral mine waste).

The requirements for the establishment, use, closure and aftercare of landfills are laid down by the Minister of the Environment Regulation No 38 "Requirements for the establishment, use and closure of landfills" of 29 April 2004.

After quite stringent requirements were established for landfills by the Landfill Regulation in 2001, many landfills were closed. While in 2001 there were still 157 landfills in operation (figure 4.20), only 59 were left in 2002. The closing of landfills continued until 16 July 2009 when all landfills not meeting the requirements of the Waste Act were closed. After that date, only five landfills for non-hazardous waste remain operational: Tallinn landfill in Jõelähtme, Harju county; Paikuse landfill in Pärnu county; Torma landfill in Jõgeva county; Väätsa landfill in Järva county and Uikala landfill in Ida-Viru county. Also operational is the landfill site for construction waste (classified as landfill for non-hazardous waste) at Maleva 4, Tallinn, where a former clay quarry is being filled with mineral waste – mainly construction and demolition waste. The oil shale mining deposited in Ida-Viru county is classified as inert waste.

There were seven landfills for hazardous waste in Estonia in 2011, mainly used for depositing waste from oil shale processing. The industrial waste landfill that belongs to AS Kunda Nordic Tsement is used for depositing the clinker dust generated as a result of exhaust gas treatment. Other types of hazardous waste are handled and deposited at the Vaivara Hazardous Waste Handling Centre established by the state. The semi-coke landfills in Ida-Viru county had to be brought into compliance with the requirements by 16 July 2009. 16 ha of the Kiviõli semi-coke landfill was covered. Kiviõli Keemiatööstuse OÜ continues to use the rest of the site as it was brought into compliance with the EU requirements. 92 ha of the total 172 ha of the Kohtla-Järve semi-coke landfill were closed because the area did not meet the requirements. The area that complies with the requirements is being used by the chemical plant VKG Oil AS.

Pursuant to the Waste Act, all closed landfills must be rehabilitated by 31 December 2015. The rehabilitation of a landfill site involves the collecting and compacting of waste, re-grading of slopes taking into account the nature of the site and capping the waste deposits with vegetation or by different means. As of the beginning of 2013, the majority of landfill sites closed in 2009 were rehabilitated (Figure 4.21).

Table 4.1. Changes in the number of landfills in 2003–2011

Type of landfill	2003	2004	2005	2006	2007	2008	2009	2010	2011
Landfill for hazardous waste	10	10	11	10	10	9	10	7	7
Landfill for non-hazardous waste	37	33	26	24	18	15	15	6	6
Landfill for inert waste	3	3	2	2	2	2	2	2	1
TOTAL:	50	46	39	36	30	26	27	15	14

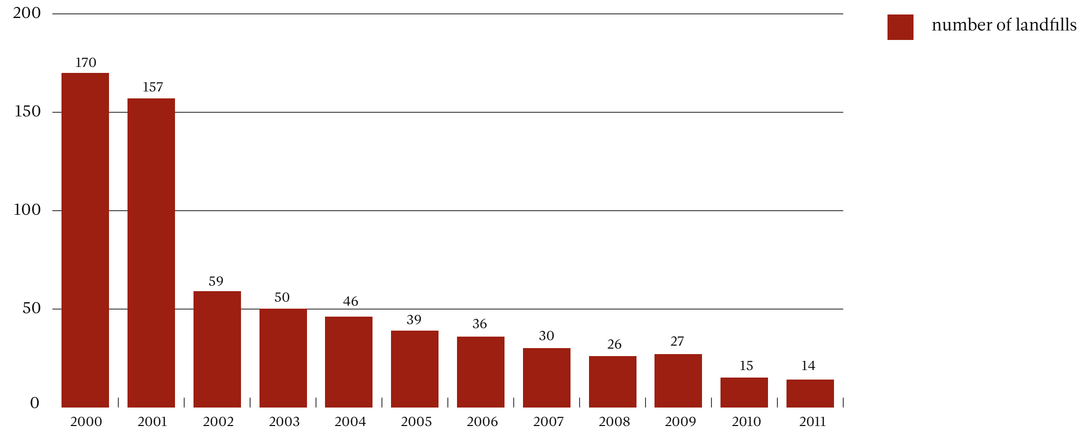

Figure 4.20. Number of landfills operational in 2000–2001. Data: ESTEA.

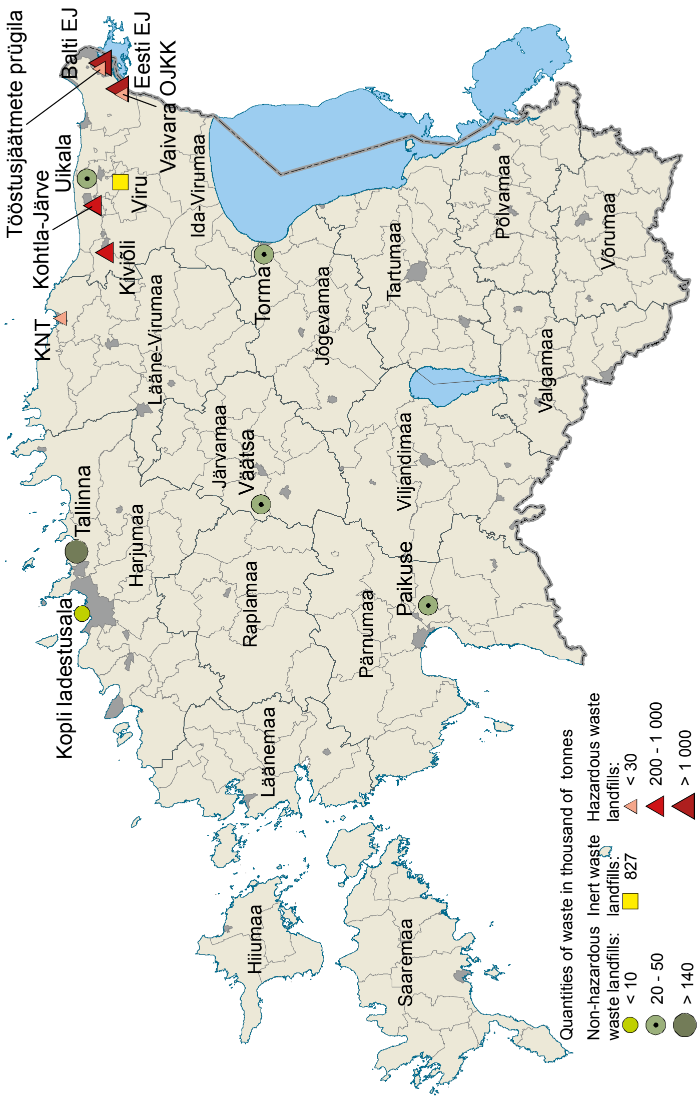

Figure 4.21. Amount of waste deposited in landfills in 2011. Data: ESTEA.

Sources:

- Data sets and registers of the Estonian Environmental Agency: the Waste Reporting Information System (JATS), the Register of Products of Concern (PROTO) and the Information System for Environmental Permits (KLIS).
- Data of the Estonian Institute for Sustainable Development (SEI).

Further reading:

- Waste recovery operations Riigi Teataja: jäätmete taaskasutamis- ja kõrvaldamistoimingute nimistud (State Gazette: the list of waste recovery and disposal operations) (RT I 2004, 23, 157) *https://www.riigiteataja.ee/akt/732778*
- The list was updated in 2012. The valid list is available at: (RT I, 14.12.2011, 4) *https://www.riigiteataja.ee/akt/114122011004?leiaKehtiv*