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Movements of waste across the EU's internal and external borders

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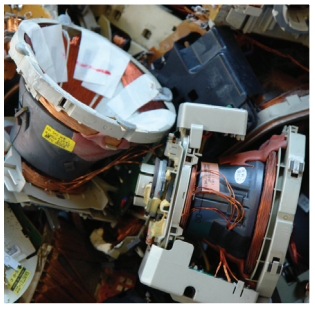

European Environment Agency

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The report is inspired by and makes largely use of an ETC/SCP working paper, which analyses data on transboundary movements of waste provided voluntarily to the EEA by its member countries, and information on drivers and environmental impacts from interviews with stakeholders (ETC/SCP, 2012).

The working paper was prepared by Christian Fischer, Harald Junker, Susanna Paleari, Roberto Zoboli and Joachim Wuttke (ETC/SCP). The EEA is grateful to the countries that provided national data on transboundary shipments of waste based on the codes of the European List of Waste, which supported part of the analysis in this report. The EEA also thanks the competent authorities and industry associations that provided valuable comments during stakeholder interviews carried out by the ETC/SCP.

For this report, technical information has been rewritten to improve clarity for the reader. This necessarily required some simplification, leaving out technical details and shortening of technical terms.

Executive summary

Ever more waste is crossing EU borders — moving between Member States and to and from non-EU countries. Indeed, **the growth in cross-border waste trade during recent years has been remarkable**. Exports of waste iron and steel, and copper, aluminium and nickel from Member States doubled between 1999 and 2011, while waste precious metal exports increased by a factor of three and waste plastics by a factor of five. Similarly, exports of hazardous waste more than doubled in the period 2000–2009.

Change at this scale potentially brings significant environmental, social and economic opportunities. Where waste moves across borders it can enable access to recycling or disposal options that are unavailable or more costly in the source country — meaning lower environmental and financial costs for waste management. Equally, trade can increase the opportunities to use waste as a valuable input to production, avoiding the need to draw on virgin resources and thereby enhancing the resource-efficiency of the economy as a whole.

At the same time, of course, **moving waste across borders clearly involves costs and risks**. Transport itself has environmental impacts, including those resulting from the energy used. Even more important, the destination country must be a willing recipient and equipped to handle the waste safely. Where waste travels across borders illegally the risks can be particularly severe.

As the analysis reveals, **the huge growth in transboundary waste movements has several causes**. EU legislation has certainly played an important role. The introduction of the single market in the EU in 1993 facilitated transboundary movements of goods, including waste. More recently, renewable energy policies have boosted trade in some waste types, for example wood. At the same time, the EU has agreed increasingly stringent and harmonised waste management rules in the last 20–30 years, especially during the last decade. In many cases, these have required countries to find new approaches to waste management, for example diverting substantial amounts of waste from landfills towards recycling. While these are welcome changes, they do necessitate different waste management infrastructure to that used previously; where a region or country lacks such infrastructure, exporting waste to countries equipped with the necessary treatment technology and capacity may represent the best solution for the time being.

Global forces have also played an important role in boosting **non-hazardous waste exports**. **Rapid economic growth in some countries has created enormous demand for raw materials**, particularly in Asia, at the same time as boosting resource prices globally. As resources have become more costly, the incentive to recycle waste or recover energy via incineration has increased markedly in the EU and outside Europe.

While exports of hazardous and non-hazardous waste have both grown in recent years, the drivers and destinations of trade appear to differ. As outlined in Chapter 3, **hazardous waste exports overwhelmingly stay within the EU**, primarily going to neighbouring countries. For hazardous waste, imbalances in national capacity to handle the waste seem to be the main catalyst for cross-border movements. Variance in the costs of recovery or disposal in different locations is another important driver. In some instances waste management facilities in a neighbouring country may be closer or cheaper to reach than domestic facilities.

Contrastingly, as discussed in Chapter 4, **a substantial proportion of non-hazardous waste exports goes to non-EU destinations**. Indeed, Asia now receives the majority of waste plastics exported from EU Member States. Such trade is obviously influenced by economic growth in Asia, creating substantial demand for imports and increasing resource prices. But recycling targets in EU waste directives have also provided a stimulus on the supply side, sharply increasing the availability of recyclable resources in EU Member States. As a result of these combined forces, the value of non-hazardous waste exports has risen hugely. Iron and steel scrap exports, for example, reached EUR 18 billion in 2011 — an illustration of the

growing importance of waste in meeting resource needs.

Waste trade can create substantial financial returns and facilitate efficient use of resources but it can also create significant harm, as the example of e-waste illustrates (Chapter 5). E-waste is normally classified as hazardous and it is therefore illegal for EU Member States to export it to non-OECD countries. Despite shortcomings in EU data on e-waste trade, however, there are many indications that a substantial portion of Europe's e-waste is exported to areas such as West Africa and Asia, disguised as used goods.

E-waste is valuable but expensive to handle safely, creating an incentive to exploit the lower wages and weaker protections afforded to informal sector workers in developing countries. Since such workers lack the equipment and skills to handle the waste safely, the result is **significant environmental pollution and health risks for local people, as well as the loss of valuable materials.** The main challenge in e-waste management is thus curbing illegal shipments and ensuring that e-waste is collected and properly treated in EU recycling infrastructure.

Illegal movements of waste pose substantial potential risks for the environment but also distort the market for law-abiding waste treatment companies, traders and producers. **Illegal waste trade is a serious crime that seems to be increasing in the EU**. Intensified and harmonised inspection activities are important to combat these activities. EU-wide analysis of the routes, waste types, organisations involved and connections to other illegal activities could help clarify the drivers and possible ways to curb and control illegal waste exports and imports.

As highlighted throughout the report, **there is obvious value in enhancing the information gathered on cross-border waste movements — and opportunities to do so at relatively low cost**. At present, EU Member States are only obliged to collect and report aggregated data on hazardous waste exports, using the imprecise coding system established under the Basel Convention. In fact, notification procedures require exporters to provide much more detailed information to recipient countries. Moreover, many EEA member countries already have more detailed data based on European Waste List codes, or would be able to generate such data without significant additional effort. Regular reporting and publication of Europe-wide data based on these codes would boost understanding of hazardous waste flows, thereby helping EU and national policymakers track the implementation and effectiveness of EU legislation on transboundary movements of waste.

Looking to the future, trade in hazardous waste is likely to continue growing in Europe. Shifting hazardous waste management from disposal to recovery often requires specific and sophisticated technologies that are not available in every country, thus triggering more exports. Trade in non-hazardous waste can also be expected to grow globally. Although EU policy rightly prioritises reducing waste output above recycling, the fact remains that **better implementation of EU waste directives will increase the supply of recyclables**. At the same time, growing global competition for resources and awareness of the value of waste will boost demand. These trends will increase the opportunities for efficient allocation and use of resources. But they will also enhance the risks, which will persist as long as there are disparities between the environmental and social protections in trading countries.

Overall, Europe needs to enhance efforts to reduce generation of hazardous and other waste through increased emphasis on waste prevention, in the context of resource efficiency and the EU 2020 strategy. New technologies and business models that generate less waste or waste with less hazardous properties need to be developed and applied. Such changes are essential for addressing the root causes of cross-border movements of waste — delivering benefits for the environment, employment, economic growth and for meeting Europe's global responsibilities in an increasingly resource-constrained world.

1 Introduction

The European Environment Agency (EEA) has prepared this report in response to a request from the European Parliament's Committee on the Environment, Public Health and Food Safety for an overview of movements of waste across EU borders.

The principle that nations should not dump their waste on other countries is well established in international and EU law. It is enshrined, for example, in the Basel Convention on the Control of Transboundary Movements of Hazardous Waste and their Disposal (UNEP, 1989), and in the EU's Waste Shipments Regulation (EU, 1993 and 2006a).

Does this mean that everything is under control? Is there 'good' and 'bad' waste trade and do we successfully prevent the 'bad' waste trade without hindering the 'good'? How much do we actually know about exports and imports of waste and its environmental and economic impacts?

The objective of this report is to shed some light on these questions, focusing on the following issues:

- Chapter 2 provides a concise overview of the complex legislation on movements of waste across borders;
- Chapter 3 reviews cross-border movements of hazardous waste because of their potentially significant risks to human health and the environment;
- Chapter 4 uses the examples of metals and plastics waste to explore the opportunities and limitations involved in trading non-hazardous waste;
- Chapter 5 uses the example of e-waste to illustrate the dual characteristics of some wastes — both valuable resource and dangerous pollutant — and highlights the challenges in tracking and managing e-waste exports;
- Chapter 6 briefly summarises the reasons for concern about illegal exports and imports of waste, and the challenges in addressing the problem.

Sources of data on transboundary movements of waste

This report is based on analyses done at the EEA and its European Topic Centre on Sustainable Consumption and Production (ETC/SCP) over the last couple of years. It uses data and information from a variety of sources but primarily draws on officially reported data.

Data on waste movements are generated in response to various reporting obligations, for example:

- The Waste Shipments Regulation (EU, 2006a) requires that EU Member States report to the European Commission annual data on exports and imports of waste subject to notification procedures ([1]). The data include amounts of waste shipped, the destination country and treatment type. These data are the same as those reported to the Secretariat of the Basel Convention using the codes defined in Annexes 1 and 2 of the Basel Convention.
- Exports and imports of non-hazardous waste materials such as waste paper, waste metals and waste plastics can be found in EU trade statistics (Eurostat, 2012b).
- Under the European Pollutant Release and Transfer Register (E-PRTR) Regulation (EU, 2006b), operators of specified industrial facilities in EU-27 Member States, Iceland, Liechtenstein, Norway, Serbia and Switzerland must report hazardous waste exports to other countries, including the amounts of waste, the treatment type and the site receiving the waste.

([1]) Notification is a procedure where the exporter has to ask the competent authorities of the countries of dispatch, transit and destination for a permission for the export before the export actually takes place.

The E-PRTR waste data distinguish between hazardous and non-hazardous waste but do not provide further information on the waste type. In addition, the facility operators need only report if the total amount of hazardous waste transferred out of the facility exceeds two tonnes per year. This means that the data reported under the E-PRTR Regulation cover only around one third of the total hazardous waste shipped between countries as reported under the EU Waste Shipments Regulation. The EEA hosts the E-PRTR data.

A survey by the EEA's ETC/SCP in 2009 showed that 21 of the 30 European countries reviewed register notified shipments in their data systems using both the codes of the Basel Convention and the codes of the European List of Waste (ELW) (EC, 2000), and further countries were working on changing their systems accordingly. ELW codes are much more detailed than Basel Convention codes and provide a better understanding of the type of wastes exported and imported. For the year 2007, 16 EEA member countries provided national data based on ELW codes and those data were analysed by the ETC/SCP (ETC/SCP, 2012) and used in this report.

Finally, the ETC/SCP interviewed selected competent authorities and industry associations in order to acquire insights into the drivers of transboundary movements of waste and possible environmental impacts.

2 How are cross-border movements of waste regulated?

Key points

- The Basel Convention is the foremost piece of international legislation governing transboundary movements of waste. It requires parties to provide prior notification before shipping hazardous and certain other wastes across international borders.
- The EU's Waste Shipments Regulation transposes the Basel Convention's principles into EU law, including the 'Ban Amendment' prohibition on exports of hazardous waste and certain other wastes to non-OECD countries.

The movement of waste across borders is regulated at both EU and global levels. At the international level, exports and imports of waste are governed by the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (UNEP, 1989). The Convention aims to protect human health and the environment from adverse effects of wastes, especially hazardous wastes, addressing both transboundary movements and proper management of waste. It underlines that transboundary movements of hazardous wastes and certain other waste types to developing countries, many of which are incapable of handling such waste, do not constitute environmentally sound management. The Convention is implemented in the EU via the Waste Shipment Regulation (EU, 2006a).

Box 2.1 Key provisions of the Basel Convention

- Waste classified as hazardous in the Convention or by the country of export, import or transit is subject to a prior notification process before transboundary movement. This means that the exporter must inform the competent authorities in the countries of dispatch, transit and destination about a planned movement across national borders (for example regarding the waste type, amount and destination) and needs a written consent from the authorities prior to transporting the waste out of the country.
- The Basel Convention's 'Ban Amendment' prohibits the export of hazardous waste from OECD members to non-OECD countries. Although adopted in 1995, the amendment will not come into force globally until ratified by more parties.
- Every year each party has to submit a report to the Secretariat of the Basel Convention on the annual amounts of hazardous waste generated, imported and exported.

The EU approach to exporting and importing waste is characterised by four main principles:

- Waste for final disposal is considered to be a bigger environmental burden than waste for recovery, where waste is used as a resource. The EU's Waste Framework Directive (EU, 2008) therefore provides that the EU must be self-sufficient in waste disposal capacity. The Member States must promote this aim individually — an inducement to establish a network of national landfills and other disposal installations.

- In principle, waste for disposal should be handled in one of the nearest appropriate installations.

- Shipments of waste for recovery are subject to less restrictive regulation and in general these wastes can be shipped within the EU. However, for hazardous and certain other wastes special procedures must be followed.

- Exporting hazardous waste from the EU to non-OECD countries for recovery is prohibited, since these countries usually do not have proper and sufficient treatment capacity.

The EU's main piece of legislation to implement these principles is the Waste Shipments Regulation (EU, 2006a) (Box 2.2). Most of these principles also apply in the European Free Trade Association (EFTA) countries: Iceland, Liechtenstein, Norway and Switzerland. There are some additional provisions, however, for example regarding exporting waste for disposal from the EU to EFTA countries.

Box 2.2 Key provisions of the Waste Shipments Regulation ([2])

- The EU prohibits the export of hazardous waste to non-OECD countries.
- Exports of non-hazardous waste to non-OECD countries, for example paper waste, must be notified to the authorities in the countries of dispatch, transit and destination in advance, according to the arrangements agreed between the EU and individual non-OECD countries.
- It is, in principle, possible to ship all kinds of wastes within the EU, regardless of whether the waste goes for disposal (for example landfilling) or recovery.
- For shipments of waste for disposal within the EU, Member States can implement a general or specific ban on imports and exports.
- For shipments of waste for recovery within the EU, Member States have more limited possibilities for objecting to imports and exports.
- The authorities in the countries of dispatch, transit and destination must be notified of all shipments of wastes for disposal and of hazardous waste for recovery.
- Some Member States (for example, Bulgaria and Romania) have obtained transition periods, which means that shipments of specified non-hazardous wastes for recovery from other EU Member States are subject to a notification procedure.

([2]) Until 12 July 2007 EU Regulation No 259/93, afterwards EU Regulation No 1013/2006. The latest regulation also incorporated the provisions included in the OECD Decision C(2001)107/Final on the control of transboundary movements of wastes destined for recovery operations, which applies to OECD countries. There are some additional provisions in EU Regulation 1013/2006 regarding waste shipment to EFTA and OECD countries that are not EU Member States.

3 How much hazardous waste is being exported, by whom and for what purpose?

Key points

- In 2009, EU Member States generated 74 million tonnes (Mt) of hazardous waste in total (28 % more than in 2000).
- In the period 2001–2009, hazardous waste exports from Member States grew by 131 %, from 3.2 Mt to 7.4 Mt.
- Almost all hazardous waste exports from EU Member States are to other Member States (97 % in 2009).
- In 2001 EU Member States imported around 3 Mt of hazardous wastes, whereas in 2009 that figure reached 8.9 Mt (an increase of 197 %).
- In 2009 the Netherlands was the biggest exporter of hazardous waste among EU Member States (2.7 Mt) and Germany was the biggest importer (3 Mt).
- Around three-quarters of EU transboundary waste movements are for recovery operations such as recycling of materials or use as fuel, with the rest moving for disposal.
- There is considerable scope to improve reporting on transboundary movements of hazardous waste at little cost by exploiting detailed data already collected by EEA member countries.

Hazardous waste is defined in the Waste Framework Directive (EU, 2008) as waste with hazardous properties such as being explosive, flammable, irritative, toxic or corrosive. Hazardous waste therefore poses substantial potential threat to the environment and human health, and moving it across borders requires special care. Exports and imports of hazardous waste must be closely monitored to ensure that the regulatory framework is managing risk effectively.

3.1 How much hazardous waste is moving across EU borders?

There is clear evidence that EU output of hazardous waste is increasing. According to the latest available data, in 2009 about 74 Mt of hazardous waste were generated in the EU-27. That constituted a 28 % increase since 2000. The decrease in 2009 is likely to have been due to the economic downturn starting in 2008.

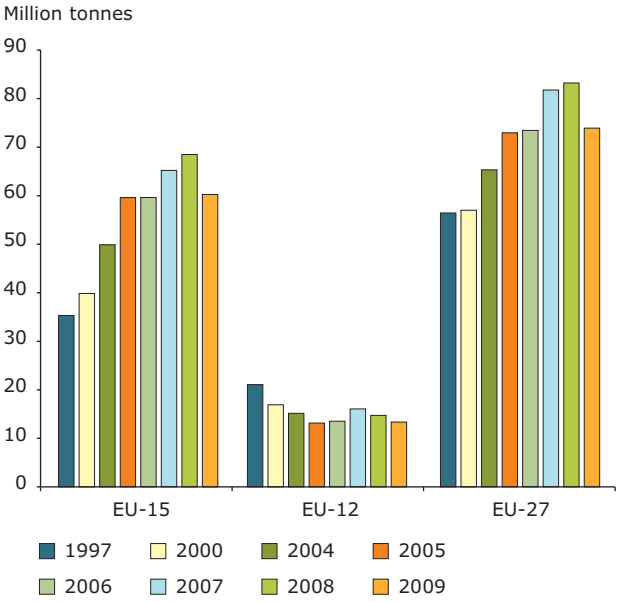
As Figure 3.1 shows, however, the aggregate growth masks contrasting trends within the EU. Whereas EU-15 output of hazardous waste grew substantially (70 %) in the period 1997–2009, EU-12 production actually declined by 36 % ([3]).

Among EU Member States, Germany generated the most hazardous waste in 2009 with 17 million tonnes (Mt). It was followed by Italy (11 Mt), France (11 Mt) and Estonia (7 Mt). Estonia's large output of hazardous waste primarily results from oil shale mining (95 %) ([4]).

([3]) 'EU-15' refers to the 15 Member States of the EU before 1 May 2004; 'EU-12' refers to the 12 Member States that joined the EU on or after 1 May 2004.

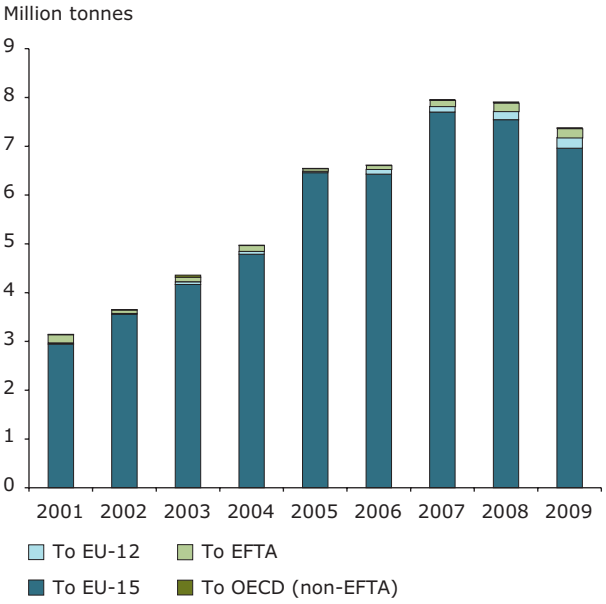
([4]) Oil shale is a mineral mined in Estonia that is further processed into shale oil, a fossil fuel. The process generates large amounts of hazardous waste. Shale oil is exported from Estonia and used as fuel in power plants. Most oil shales are fine-grained sedimentary rocks containing relatively large amounts of organic matter (known as 'kerogen') from which significant amounts of shale oil and combustible gas can be extracted by destructive distillation.

Figure 3.1 Hazardous waste generation in the EU, 1997–2009



Source: ETC/SCP, based on national reporting to the European Commission and the Basel Convention Secretariat.

Figure 3.2 Exports of hazardous waste from EU-27 Member States to EU and non-EU countries, 2001–2009



Note: Exports to OECD countries (excluding EFTA) account for 0.1–1.0 % of all exports.

Source: ETC/SCP, based on country reporting to the European Commission (Eurostat).

As shown in Figure 3.2, the amount of hazardous waste exported from EU Member States has increased from 3.2 Mt in 2001 to 7.4 Mt in 2009, which corresponds to a 131 % increase. In 2009, about 10 % of hazardous waste generated in EU Member States was exported, compared to roughly 5 % a decade earlier. The recent decrease of exports in 2008 and 2009 is probably due to the economic downturn that started in 2008.

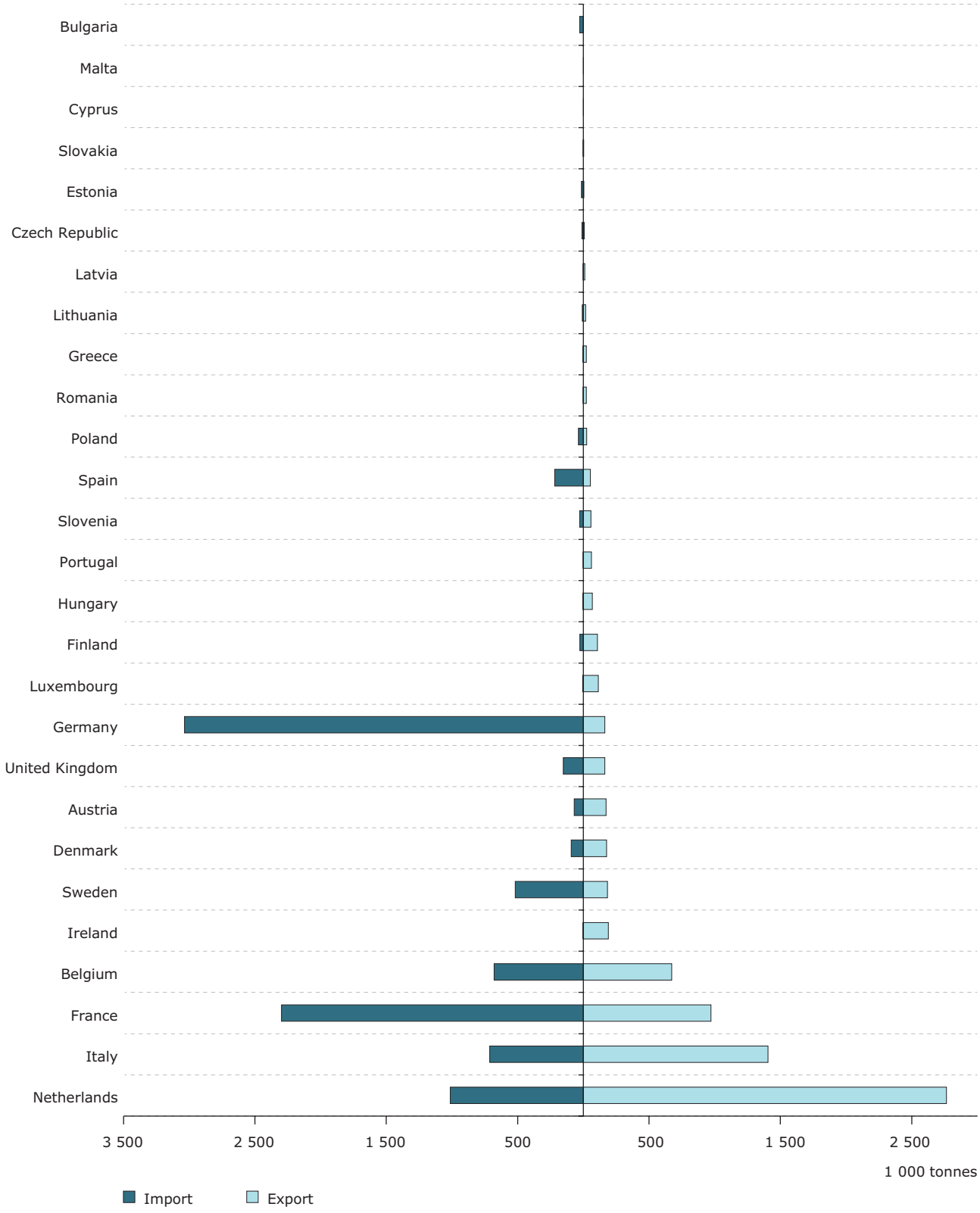
Figure 3.2 also shows that almost all hazardous waste exports from EU Member States went to other EU Member States (97 % in 2009), in particular EU-15 Member States, which accounted for 94 % of the total in 2009. Exports out of the EU make up only a small fraction of total hazardous waste exports (3 % or 189 000 tonnes in 2009), primarily to EFTA countries.

Hazardous waste imports into EU Member States have likewise increased, additionally boosted by inflows from non-EU countries. According to the reporting to the European Commission, in 2001 total imports were around 3 Mt, whereas in 2009 they reached 8.9 Mt — an increase of 197 %. Of this, 1.3 Mt came from non-EU countries, mainly from EFTA countries (1 Mt).

The reported amount of hazardous waste exported from one country should in principle match the reported amount imported into another. In a large number of cases, however, data reported by the country of dispatch differ from those reported by the destination country. Focusing only on trade within the EU, in 2009 Member States reported about 27 % more exports of hazardous waste than imports (EC, 2012). The reason for this disparity is unclear but in some cases the exporting country may classify waste as hazardous while the importing country classifies it as non-hazardous or viceversa.

Figure 3.3 presents the biggest national exporters and importers of hazardous waste in the EU. In 2009 the Netherlands exported the most hazardous waste (2.8 Mt), followed by Italy (1.4 Mt), France (1 Mt) and Belgium (0.7 Mt). Germany was the biggest importer of hazardous waste in 2009, with 3 Mt, followed by France (2.3 Mt), the Netherlands (1 Mt), Italy (0.7 Mt) and Belgium (0.7 Mt).

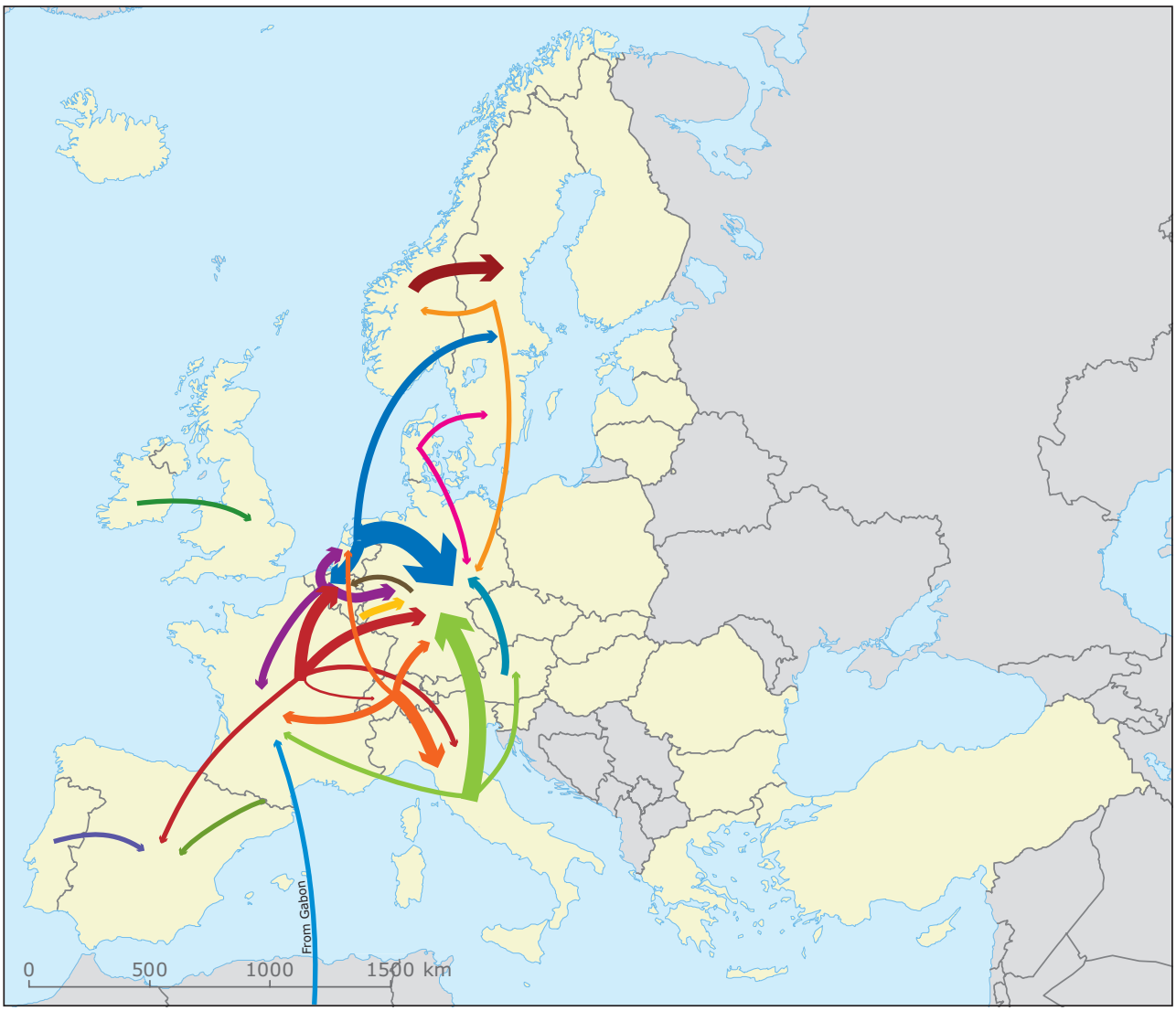
Figure 3.3 Hazardous waste exported and imported by EU Member States, 2009

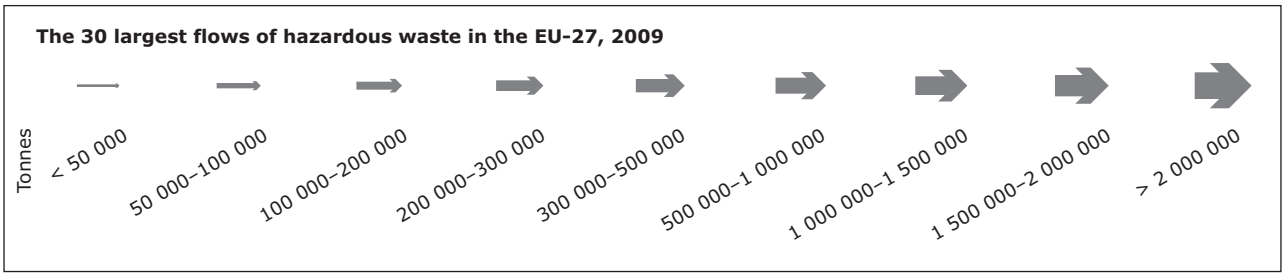


Note: Data for France are not quality-checked by Eurostat.

Source: ETC/SCP, based on national reporting to the European Commission (Eurostat).

Map 3.1 The 30 largest flows of hazardous waste in the EU-27, 2009





Note: Data for France are not quality-checked by Eurostat.

Source: ETC/SCP, based on national reporting to the European Commission (Eurostat).

Map 3.1 shows the 30 largest flows of hazardous waste between European countries in 2009. These flows represent more than 80 % of all exported hazardous wastes from EU Member States. Germany, the biggest importer, received large amounts of hazardous waste mainly from the Netherlands (2 Mt) and from Italy (1 Mt). The scale of imports into Germany can be explained by a variety of factors including the diversity of facilities, its substantial waste management capacity, the availability of advanced technologies and Germany's location in the middle of Europe and bordering many countries (ETC/SCP, 2012).

As shown in Map 3.1, many of the largest cross-border movements of hazardous waste take place among western and central European countries and (unsurprisingly) involve neighbouring countries. The Netherlands, Germany, Italy, France and Belgium seem to be the biggest traders.

The map also illustrates the substantial exports from EFTA countries like Switzerland and Norway to EU Member States such as Italy, France, Germany and Sweden.

3.2 What types of hazardous waste are exported?

Hazardous waste exports according to the Basel Convention categorisation

Applying the Basel Convention's waste categorisation, the hazardous waste shipped across Europe in greatest quantities during 2007 was residues from industrial waste disposal operations, for example fly ash from incinerators and residues from mechanical waste sorting. More than 3 Mt were shipped, corresponding to 38 % of all exported hazardous waste.

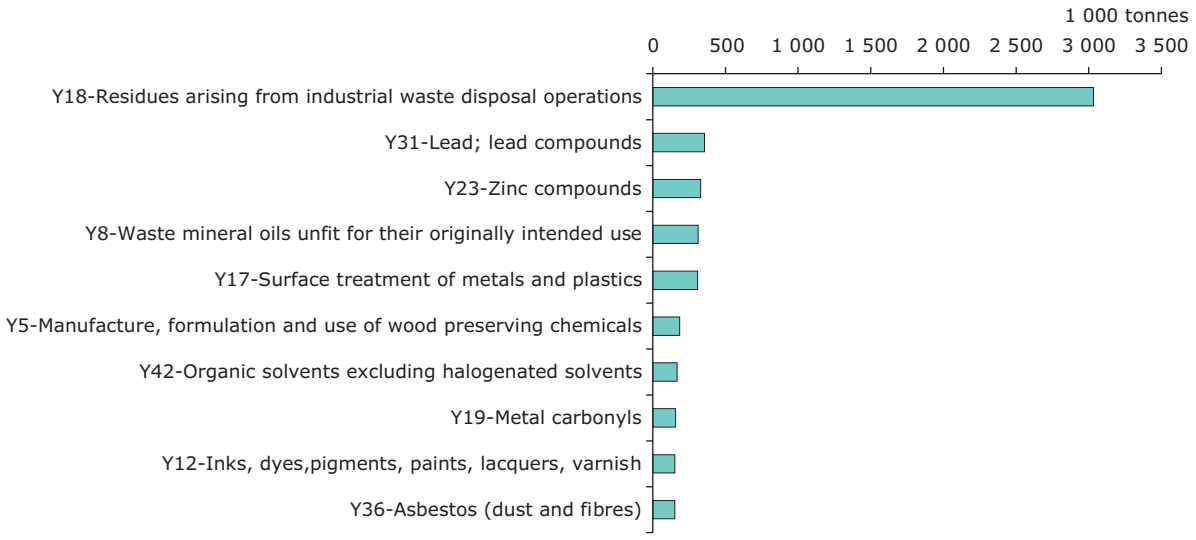
As shown in Figure 3.4, this category was followed by waste containing lead and lead compounds, waste containing zinc compounds, waste mineral oil and waste resulting from surface treatment of metals and plastics, with movements of each totalling around 300 000 tonnes.

Hazardous waste exports according to ELW categorisation

The Basel Convention's waste codes are quite general and do not reveal much information about the wastes exported and imported. EU Member States increasingly use European List of Waste (ELW) codes or national classifications to classify waste that does not fit into the Basel Convention codes (EC, 2012).

A comparison of the two reporting classifications shows very clearly that ELW reporting provides much more detailed information about the hazardous waste types. This includes specifying the process that generated the waste, the hazardous substances included in the waste and the treatment needed to handle the waste properly. For example, whereas there is only one Basel Convention code for waste from waste management activities, there are 39 different ELW codes. More information on the contrasting categorisation systems is presented in Annex 1 to this report.

Figure 3.4 Top 10 hazardous waste types by amounts exported according to 'Y-code' categorisation, 2007



Source: ETC/SCP, based on national reporting to the European Commission (Eurostat).

The Waste Shipments Regulation (EU, 2006a) requires that Member States report any notified movement of waste to the European Commission using the Basel Convention's Y-code categories. Notification procedures actually require, however, that exporters submit much more detailed information, such as ELW codes, to the relevant authorities.

In 2009, the ETC/SCP surveyed the use of ELW codes in national procedures and reporting. In response, 21 European countries confirmed that they permanently register transboundary movements of waste in their data systems according to ELW codes, and further countries were about to change their systems accordingly. A total of 12 countries already publish national data on waste movements based on the ELW.

From the 16 countries that supplied data, the ETC/SCP has gathered ELW codes for 4.7 Mt of hazardous waste exported from EU Member states and Norway in 2007. This accounted for around 60 % of the amount reported to the European Commission based on Basel Convention Y-codes.

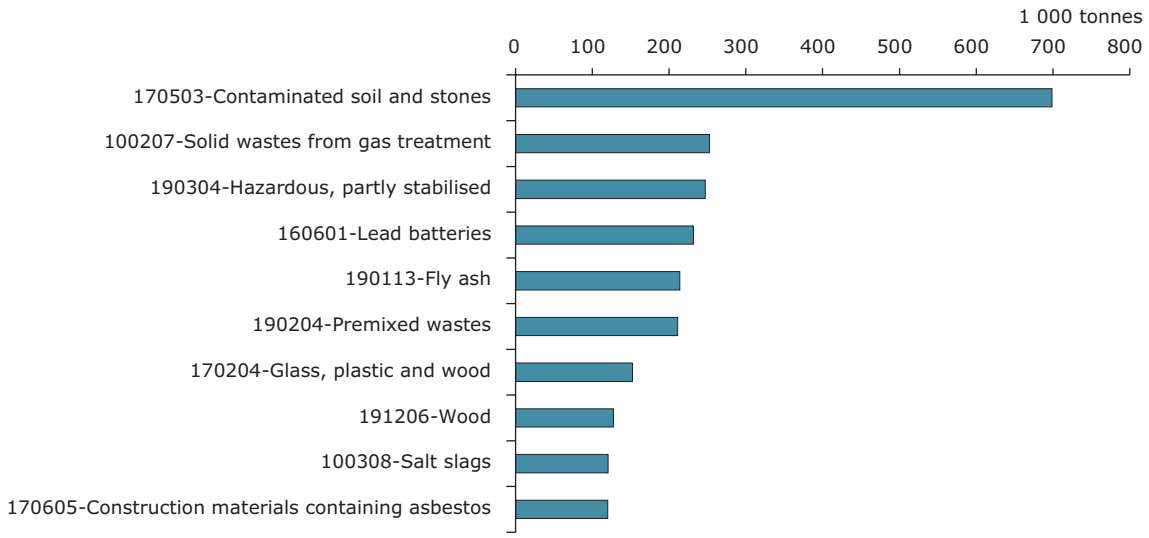
Figure 3.5 shows the 10 hazardous waste types exported in greatest quantities based on ELW code categorisation. Consistent with the data based on Y-codes (Figure 3.4), waste from waste treatment facilities (codes starting with 19) features strongly, accounting for four of the top 10 waste types, alongside waste from four other categories. The top 10 list is, however, dominated by construction and demolition waste (codes starting with 17), including contaminated soil, contaminated wood and asbestos. Contaminated soil and contaminated wood are not reflected in the list of Y-codes.

It is perhaps surprising that large amounts of soil and asbestos waste are shipped across borders since they are usually heavy and therefore expensive to transport. Contaminated soil is exported mainly because of a lack of treatment capacity in certain countries (ETC/SCP, 2012). Soil is cleaned or placed in a landfill, asbestos waste is usually landfilled and contaminated wood is incinerated. In countries with strong policies on renewable energy power, plants fed with biomass need large amounts of fuels, attracting wood waste from abroad (ETC/SCP, 2012).

A significant quantity of exported waste seems to derive from thermal processes such as energy generation and industrial processes, and flue-gas cleaning from the iron and steel industry. Additionally, more than 200 000 tonnes of lead batteries were shipped across borders in Europe in 2007. Countries without lead smelters in their territory export lead batteries to one of the smelters located in other parts of Europe where the lead is recycled, replacing virgin lead in the production of new lead batteries.

ETC/SCP (2009) provides more detail on the availability of ELW-based information about waste movements.

Figure 3.5 Top 10 hazardous waste types by amounts exported according to ELW code categorisation, 2007



Source: ETC/SCP, 2009, based on data from 16 countries.

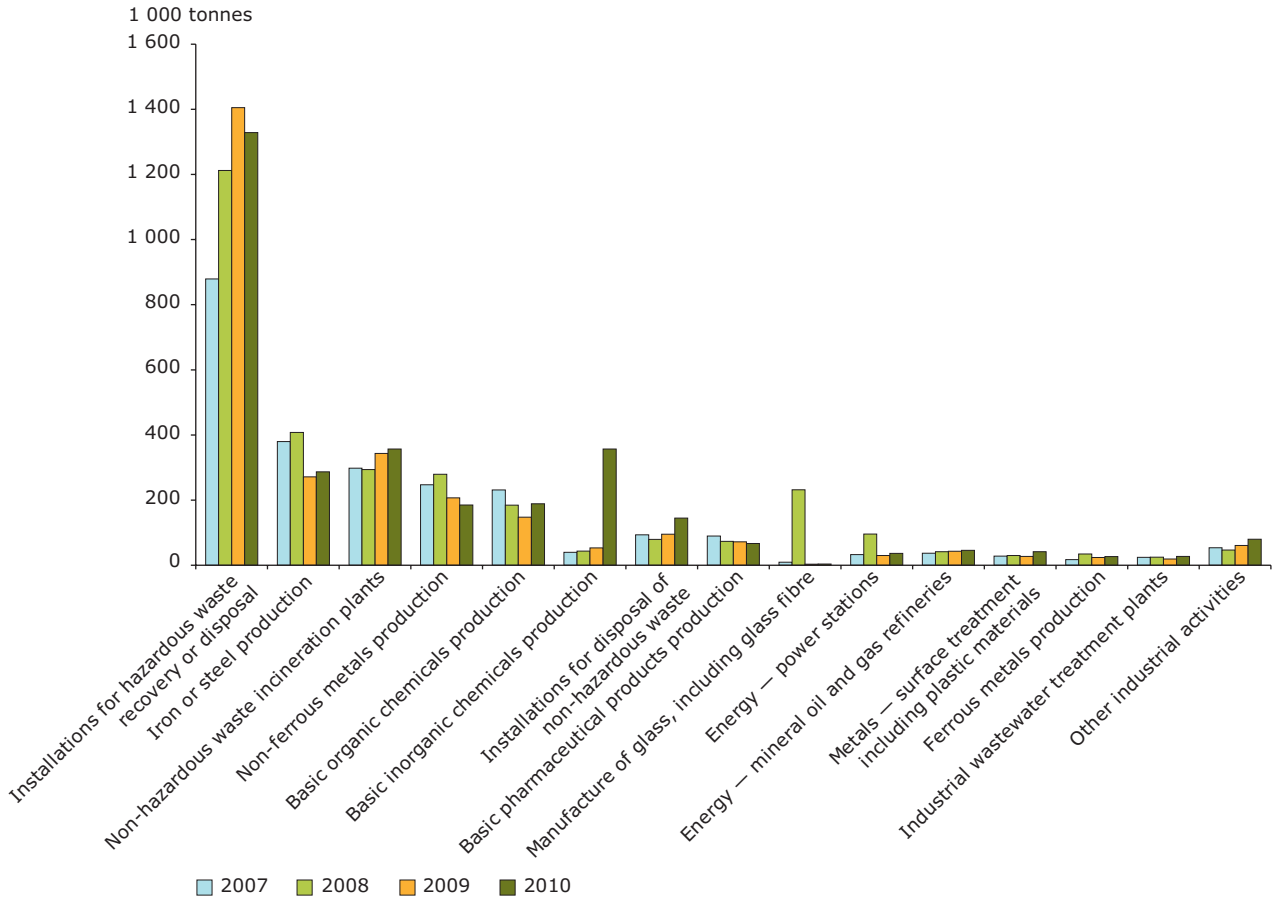
3.3 Which are the main industrial sectors exporting hazardous waste?

According to the European Pollutant Release and Transfer Register (E-PRTR) ([5]), 2.5 million tonnes of hazardous waste generated in industrial facilities subject to the Industrial Emissions Directive (EU, 2010) were exported in 2009 (Figure 3.6). This corresponds to about 34 % of the total EU hazardous waste exports.

The data presented in Figure 3.6 support the findings that waste management facilities account for the majority of exported hazardous waste reported under the E-PRTR. From 2007 to 2010, more than half of the hazardous waste exports derived from waste management facilities (hazardous waste recovery or disposal, non-hazardous waste incineration, non-hazardous waste disposal). As the construction sector is not included in the E-PRTR, the high amounts of contaminated soil and construction and demolition waste identified in the EWL data are unlikely to be included here.

Exports from facilities producing iron and steel and non-ferrous metals are the next largest categories. One reason for the dominance of waste treatment facilities may be that only very large industrial facilities are capable to organise exports themselves, whereas many smaller producers of hazardous waste deliver their waste to domestic collectors or dealers better equipped to organise exports.

Figure 3.6 Hazardous waste transfers from industrial installations to other countries, 2007–2010



Note: The large amounts of exported waste from the basic organic chemicals sector in 2010 might be a reporting mistake. The large amount of waste from the manufacture of glass in 2008 can be explained by the export of contaminated soil from the remediation of a glass factory site.

Source: EEA.

([5]) The European Pollutant Release and Transfer Register contains annual facility-level data from nine sectors covering all EU Member States plus EFTA countries and Serbia. Data are reported by individual facilities to the relevant authorities annually. The national authorities compile and check the quality of the reported data. The data are then provided to the European Commission and the European Environment Agency for compilation and dissemination.

3.4 Why is hazardous waste being traded?

Most exported hazardous waste is subject to recovery operations — meaning that it is recycled or used as fuel, rather than disposed of via landfilling or incineration. In the period 2001–2009, the amount of exports recovered more than doubled from 2.4 Mt to 5.2 Mt (Figure 3.7). This occurred despite a decrease in 2009 — probably the result of the economic downturn, which may have made cheaper disposal operations more attractive than recovery.

Despite the rapid growth in recovery of hazardous waste exports, the proportion exported for disposal actually increased over this period, from 20 % of total exports (0.6 Mt) in 2001 to 27 % (1.9 Mt) in 2009. Correspondingly, the proportion exported for recovery declined from 77 % to 73 %. Most of the waste exported for disposal is incinerated, which may still be advantageous for the environment if it would otherwise have been landfilled in the source country.

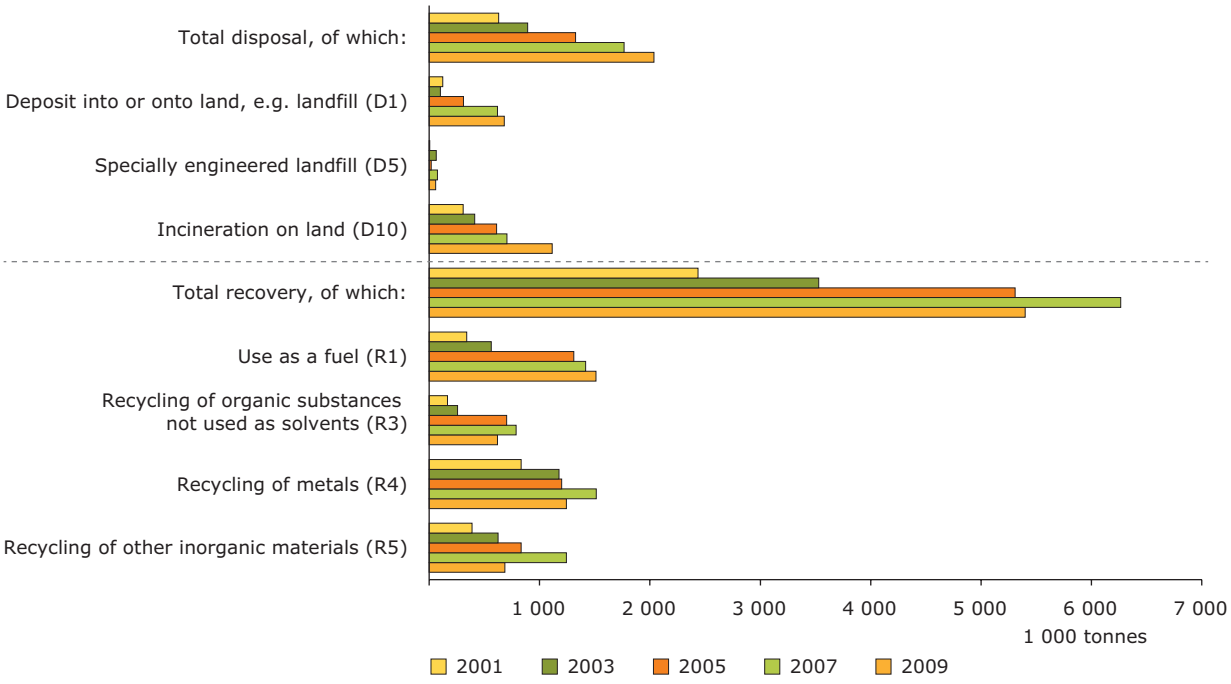
As shown in Figure 3.7, in the years 2001–2009 the main recovery operations applied to hazardous waste exported from EU Member States were use as a fuel (R1) and recycling of metals (R4). The predominant disposal operations applied to exported hazardous waste were incineration on land (D10) and deposit into or onto land (D1).

Lack of information on cross-border waste transactions makes it hard to identify drivers

It is hard to determine exactly what is driving trade in hazardous waste, and drivers vary for different waste types. Some transactions involve payment by the waste exporter, some by the waste importer, but commercial confidentiality means that no overview exists on treatment prices and the location of receiving installations at the European level.

Analysis of some selected waste types reveals that the main reason for shipping hazardous waste seems to be insufficient technology or lack of capacity in the

Figure 3.7 Treatment of hazardous waste exported from EU Member States 2001, 2003, 2005, 2007 and 2009



Source: EC (2012), based on national reporting to the European Commission (Eurostat).

exporting countries, combined with the need to feed existing treatment capacities in importing countries (ETC/SCP, 2012). The role of lower prices for recovery or disposal in the receiving country and material prices is not well known but prices are generally seen as major driving forces by countries (ETC/SCP, 2008).

The fact that most of the waste is exported to neighbouring countries indicates that transportation costs matter as well, along with the reality that facilities across a border may be closer or cheaper to reach than those within a country. The environmental impacts of transportation must also be considered as part of the overall picture.

The lack of information on cross-border transactions likewise makes it hard to explain why so much hazardous waste is exported for recovery. One plausible explanation is that recovery operations often require quite specific technologies depending on the type of waste. Economies of scale and imbalances in national industrial production structures lead to specialisation in recovery infrastructure, triggering movements of wastes across borders, as illustrated with the example of lead batteries (see Section 3.2). Contrastingly, most countries have domestic capacities for landfilling so that there is less need to export hazardous waste for disposal.

Another factor that may be influencing the amount of waste shipped for recovery is the fact that the legal framework discourages movements for disposal. The Waste Framework Directive requires EU Member States to be self-sufficient in waste disposal facilities and that if wastes are disposed of this should be done at the nearest appropriate installation. In addition, the Waste Shipment Regulation gives the competent authorities in recipient countries more options to object to shipments for disposal than for recovery. While these explanations may play a role, however, there could well be other influencing factors.

4 What are the trends and drivers of cross-border trade in non-hazardous waste?

Key points

- Non-hazardous wastes can be traded between EU Member States and imported into the EU without any prior notification procedure if they are destined for recovery (with certain exemptions for some countries during a transition period) but a notification is required if they are traded for disposal.
- Exports of non-hazardous waste from EU Member States increased enormously in the period 1999–2011. Waste plastic exports grew by a factor of five, waste precious metal exports trebled, while waste iron and steel, and copper, aluminium and nickel exports doubled.
- The growth in exports was driven by a number of factors, notably the recycling targets set in EU waste directives; imbalances in recycling infrastructure between EU Member States; high or increasing prices for secondary materials; and increasing demand for materials, especially in Asia.

Non-hazardous wastes, such as waste metals, plastics, paper and cardboard, and wood, can be traded between EU Member States and imported into the EU without any prior notification procedure if they are destined for recovery, with some exemptions for countries that have transition periods in the EU Waste Shipments Regulation. Where such wastes are traded for disposal, however, a notification is required. Similarly, depending on the waste and the destination country, specific procedures may be required to send non-hazardous wastes out of the EU.

This chapter focuses mainly on trade in waste plastics and waste metals to illustrate how non-hazardous wastes are increasingly regarded as valuable resources that are traded globally in a similar manner to virgin materials.

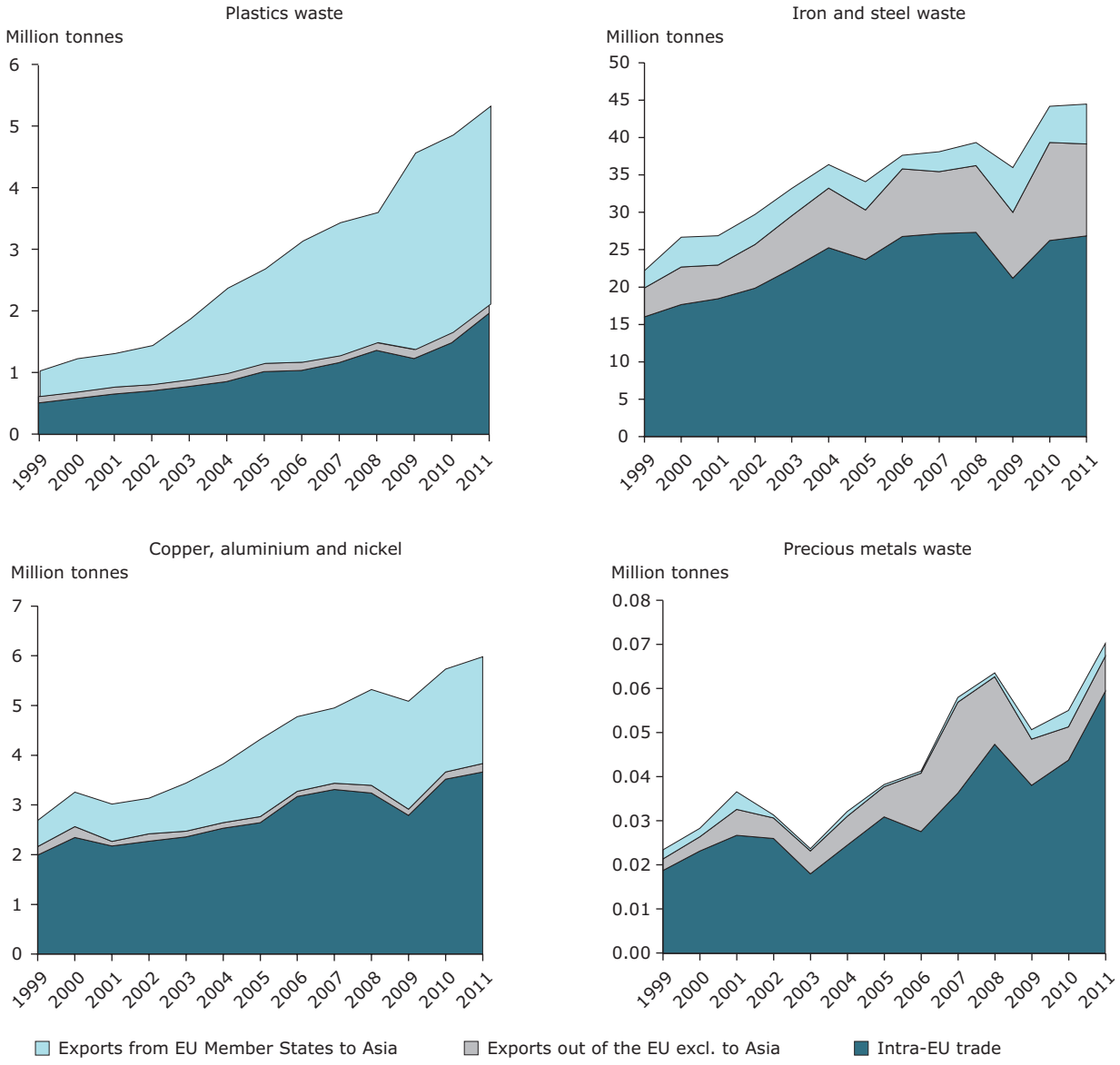
4.1 How much non-hazardous waste is moving across EU borders?

Like hazardous waste, movements of non-hazardous waste, such as plastics, metals and paper, have increased considerably in the last decade, with an increase in exports from the EU to the Far East, particularly China. Non-hazardous waste exports declined somewhat in 2008/2009 during the economic downturn but picked up again and exceeded the pre-2009 levels in 2011 (Figure 4.1).

Using four sample waste streams, Figure 4.1 shows that total EU non-hazardous waste exports increased hugely in the period 1999–2011. Total exports from EU Member States increased by a factor of five for waste plastics and trebled for waste precious metals; they doubled for iron and steel, and for copper, aluminium and nickel. Since 2003, EU Member States have exported more plastic waste to Asia than within the EU. Contrastingly, iron and steel, and precious metal wastes are primarily traded between EU Member States.

Trade in waste wood has likewise increased steeply. Since 2003, EU imports of waste wood have exceeded exports. Imports of waste wood are primarily driven by the large demand of the particle board industry for wood material, especially in Italy, as well as by an increasing demand of biomass-fuelled power plants. Driven by policies for renewable energies and landfill bans for wood, biomass-based power plants seek fuel wood from sources outside national borders. Energy production from solid biomass grew by more than 50 % between 1995 and 2008, resulting in competition for waste wood across Europe (ETC/SCP, 2012).

Figure 4.1 Exports of waste plastics and selected waste metals from EU Member States, 1999–2011



Source: Compiled by ETC/SCP based on Eurostat, 2012b.

4.2 Why is non-hazardous waste being traded?

EU recycling requirements have boosted the supply of recyclables

In the last 10–15 years the EU has adopted several directives requiring Member States to recycle a minimum percentage of certain waste types, thereby increasing recycling rates. Key policies have included the Packaging and Packaging Waste Directive (EU, 1994), the Directive on End-of-life Vehicles (EU, 2000) and the Directive on Waste Electrical and Electronic Equipment (EU, 2002 and 2012), as well as the recycling targets for household waste and construction and demolition waste in the revised Waste Framework Directive (EU, 2008).

These requirements have incentivised exports and imports of waste, since recycling usually requires specific recycling infrastructure such as sorting plants, and a critical quantity of waste to make recycling profitable. In addition, recycling requires that the waste material can be used as a production

input. Neither the recycling infrastructure nor the relevant industrial production facilities exist in all European countries, thus triggering exports of these wastes for recycling purposes.

The EU recycling requirements made increasing amounts of recyclable waste materials available on the market. For example, the amount of packaging waste recycled has increased from about 33 Mt to 46 Mt in the period 2000–2010 in EU-15 Member States. The amount of plastic packaging recycled has increased from about 2.2 Mt to 4.3 Mt, and the amount of metallic packaging from 2.4 Mt to 3.0 Mt (Eurostat, 2012a).

In the case of trade in waste wood, the main drivers appear to be European renewable energy policies (which encourage the recovery of energy from waste via incineration) and demand from the particle board industry.

Booming Asian economies have increased resource prices

EU legislative requirements have been supported by economic forces. For more than a decade the prices of raw materials have been high or increasing. For example, many metals doubled or even trebled in price between 2000 and 2010 (EEA, 2012a). Prices for virgin materials in turn affect the price of secondary raw materials reclaimed through recycling.

The booming Asian economy's demand for virgin and secondary materials grew until 2008, contributing to increased prices. While the global economic downturn reversed this trend for a period, price growth has since resumed. For example, prices for secondary waste plastics (calculated as a weighted average of a number of plastic fractions) went down in 2008 but in 2011 nearly approached their 2007 peak again (EEA, 2012a).

The opportunities for Asian economies to access European waste resources are further augmented by comparatively low transport costs for shipping goods from Europe to Asia. Many ships transport finished goods from Asia to Europe and the lower demand for cargo space on the return journey results in cheap freight rates (ETC/SCP, 2008).

Calculating the environmental impact of waste trade poses challenges

Generally speaking, it is environmentally beneficial to use recycled wastes rather than virgin materials. For example, recycling aluminium uses only 5 % of the energy required for virgin production. Recycling plastics, paper, construction materials, glass, and other metals usually has less dramatic but still significant energy savings and environmental benefits (EEA, 2012a; WRAP, 2010).

As a consequence, increasing recycling can contribute substantially to reducing energy-related emissions of CO_2 and other environmental pressures (EEA, 2011a), as well as cutting the amount of waste disposed of at landfills. In determining overall environmental pressures, however, it is also necessary to take into account specific conditions for each movement, for example emission of pollutants to the atmosphere during transport. These benefits only apply where the shipped materials are of good quality, i.e. not contaminated with hazardous waste or non-recyclable materials. Determining the environmental impacts of any particular movement of waste is therefore subject to a range of uncertainties (ETC/SCP, 2012).

4.3 What is the economic value of non-hazardous waste exports?

The value of recyclables traded between EU Member States or exported from the EU increased hugely in the period 1999–2011. As shown in Table 4.1, resource price inflation meant that the value of waste exports expanded markedly more than the amounts traded.

From 1999 to 2011, the value of annual exports of waste iron and steel increased by a factor of eight. Waste copper, aluminium and nickel exports expanded by a factor of six and waste precious metals increased by a factor of 15. The value of annual exports to Asia increased at an even greater rate.

For each of the categories of exports presented in Table 4.1, the value of exports from the EU increased from 1999 until the economic downturn started in 2008 but picked up again after 2009, reaching the highest values in the whole period in 2011.

Table 4.1 Exports of waste plastics and selected waste metals from EU Member States, 1999–2011

Type of waste	Destination of exports	Trend 1999–2011 in amounts exported		Trend 1999–2011 in the value of exports	
		Trend	Increase factor	Trend	Increase factor
Plastics	Total	↗↗	5.2	↗↗	6.6
	Out of the EU	↗↗	6.5	↗↗	8.7
	Asia	↗↗	7.7	↗↗↗	14.5
	Intra-EU	↗	3.9	↗↗	5.0
Iron and steel	Total	↗	2.0	↗↗	7.9
	Out of the EU	↗	2.9	↗↗↗	13.4
	Asia	↗	2.3	↗↗↗	13.6
	Intra-EU	↗	1.7	↗↗	6.4
Copper, aluminium and nickel	Total	↗	2.2	↗↗	5.6
	Out of the EU	↗	3.3	↗↗	8.0
	Asia	↗	4.1	↗↗↗	11.0
	Intra-EU	↗	1.8	↗	4.8
Precious metals	Total	↗	3.0	↗↗↗	15.2
	Out of the EU	↗	2.3	↗↗↗	39.0
	Asia	↗	1.4	↗↗↗	25.5
	Intra-EU	↗	3.2	↗↗	8.5

Note: Increase by factor 1 to < 5: ↗

Increase by factor 5 to < 10: ↗↗

Increase by factor ≥ 10: ↗↗↗

Source: EEA based on Eurostat, 2012b.

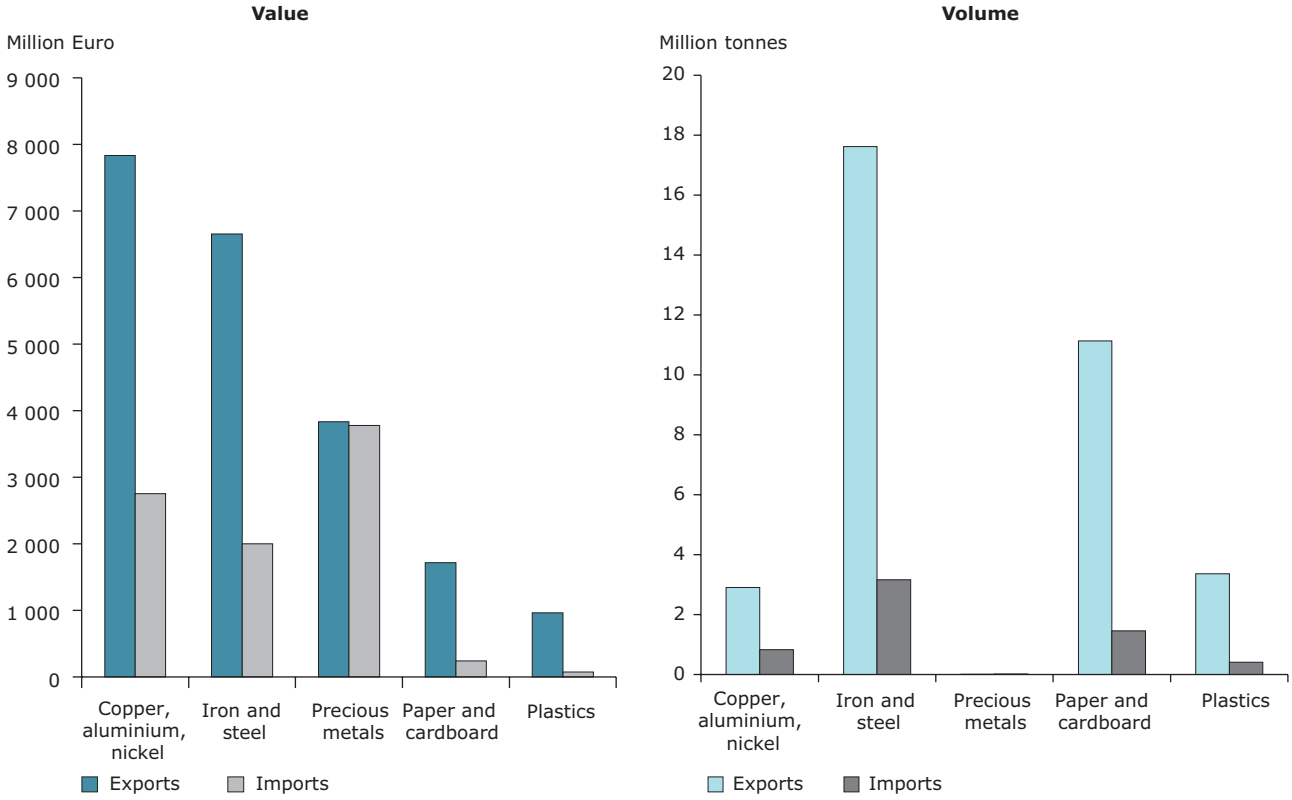
The values of imports of recyclables into the EU were more stable. The only exception was the value of imports of precious metal waste, which increased by 50 % between 2000 and 2010. EU imports were also much smaller in value than exports (Figure 4.2). In 2011, the difference was highest for plastic waste, followed by paper and cardboard. For iron and steel, as well as copper, aluminium and nickel, exports exceed imports by a factor of three. Again, the exception was precious metal waste, where the value of imports and exports were similar.

With the growth in waste trade, more and more people are employed in this sector. In 2008, at least 131 781 people were employed in the wholesale of waste and scrap within and between countries (Box 4.1)

Trade can sometimes result in the loss of valuable resources

While trade can often enable the reallocation of waste to locations where they can be used as a resource, in some instances it results in the loss of valuable resources. One example, discussed in Box 4.2, is the loss of platinum group metals exported from Europe in used cars to countries that lack the recycling rules and technologies to recover them.

Figure 4.2 Trade in selected waste materials to and from the EU, 2011



Source: EEA based on Eurostat (2012b).

Box 4.1 Employment in managing and trading waste

The waste management sector offers a wide variety of job opportunities, ranging from collection, sorting and handling to end processing and sales. According to recent Eurostat data, over 1 million people work in the waste management sector in the EU. Most of the work is low skilled but medium- and high-skilled jobs also exist, with different occupational conditions and wage levels.

Eurostat data indicate that employment has grown fastest in the recycling sub-sector — covering both recovery of materials and wholesale of waste and scrap. Employment increased steadily from 176 828 in 2000 to 298 680 in 2008. These figures represent minimum numbers for employment in the recycling sector, however, as some recycling-relevant activities such as collection of recyclable materials and activities enabling the use of recyclables, which occur in manufacturing facilities, are not included (EEA, 2011b).

In 2008, 131 781 people were employed in wholesale of waste and scrap alone. Although it is not possible to know what portion of these jobs is linked to cross-border waste trade, they certainly indicate the increasing economic and social importance of the waste sector.

While recycling is of great value in terms of resource conservation, in locations that lack adequate social and environmental protections it can entail dirty, undesirable and even dangerous and unhealthy work (UNEP, 2008). Chapter 5 of this report emphasises the concerns regarding human and environmental impacts arising from illegal e-waste exports.

Box 4.2 Loss of the platinum group of metals in used car exports

Where second-hand goods are exported and subsequently subject to unsuitable waste treatment, the result can be not only environmental and health impacts in the importing countries but also a considerable loss of resources. Hagelüken et al. (2005) have estimated that about 6.25 tonnes of platinum group metals are exported annually from Germany in the catalytic converters of used cars. This equals about 30 % of all the platinum group metals used for production in the country. Although most exports are to EU Member States, some 100 000 used cars are exported annually through the Hamburg port to destinations outside the EU, mainly to destinations in Africa and the Middle East.

While the EU Directive on end-of-life vehicles (EU, 2000) requires the dismantling of vehicles scrapped in the EU and the recycling of catalytic converters containing considerable amounts of the platinum group metals, it is likely that these are lost when the cars are exported as second-hand cars to countries that lack the necessary regulations and recycling capacities (Buchert et al., 2007). Production of platinum group metals results in high pressures on the environment — often outside the EU — which could be reduced considerably if these metals were recycled.

5 E-waste — threat or opportunity?

Key points

- E-waste is normally classified as hazardous and it is therefore illegal for EU Member States to export it to non-OECD countries.
- The current EU reporting system does not deliver clear data on transboundary movements of e-waste. National data suggest that the amount of legally shipped e-waste is small compared to the amounts collected.
- A substantial proportion of e-waste exports go to countries outside Europe, including West African countries, disguised as used goods. Treatment in these countries usually occurs in the informal sector, causing significant environmental pollution and health risks for local populations.
- The main challenge in e-waste management is curbing illegal shipments and making sure that e-waste is collected and properly treated within EU recycling infrastructure.

Waste electric and electronic equipment (WEEE or e-waste) is one of the most rapidly growing waste streams in Europe, driven by rapid technological development and frequent updating of devices in private homes and businesses. E-waste requires special attention because it contains both hazardous substances, such as heavy metals, and valuable materials, such as precious metals.

The EU's WEEE Directive (EU, 2002 and 2012) requires e-waste to be collected and imposes strict requirements on the treatment of this waste in the EU. There are plenty of indications, however, that a significant amount of this waste is not collected and treated according to EU standards. Instead it is exported to countries outside the EU, disguised as used goods.

WEEE is normally classified as hazardous, implying that the authorities in recipient countries must be notified before it is transported across borders, and export to non-OECD countries is prohibited by the EU's Waste Shipments Regulation (EU, 2006a). Exporting fully functional appliances to non-OECD countries is permitted but it can be difficult to discern when a used electrical or electronic item is a second-hand product or waste. There is little information and data about cross-border movements of WEEE and this has negative environmental consequences.

Information on transboundary movements of WEEE in reported data

There is no code for WEEE in the Basel Convention waste codes that are used for reporting. This means that the regular reporting on waste movements does not reveal any information about the amounts of WEEE exported and imported between EU countries and to or from countries outside the EU. However, the European List of Waste (ELW) has several codes for WEEE and its components (Table 5.1).

Using the ELW-based information provided to the ETC/SCP by 16 countries (see Chapter 3), it is possible to identify around 100 000 tonnes of e-waste that was exported legally from EU countries in 2007. Table 5.1 shows how this total breaks down into different categories. Notably, almost half of the WEEE transported across borders was not in the form of whole appliances but rather hazardous WEEE components.

In the future, the availability of data can be expected to improve because the revised WEEE Directive (EU, 2012) requires Member States to report annually on WEEE exports. Countries that already collect data on waste movements based on ELW codes should be able to provide this data without much additional effort. Current ELW codes differ, however, from the categories set out in the WEEE Directive.

Table 5.1 Notified shipments of WEEE from EU-27 Member States, 2007

Amount (tonnes)	Share in total WEEE exported	Description	ELW code
49 911	48.0 %	WEEE — hazardous components removed from discarded equipment	160215
15 174	14.6 %	Discarded electrical and electronic equipment other than those mentioned in 200121 and 200123	200135
10 731	10.3 %	Fluorescent tubes and other mercury-containing waste	200121
10 221	9.8 %	Discarded equipment containing CFC	200123
9 065	8.7 %	Discarded equipment containing hazardous components other than those mentioned in 160209 to 160212	160213
8 846	8.5 %	Discarded equipment containing CFC, chlorofluorocarbon (HCFC), hydrofluorocarbon (HFC)	160211
103 948	**100 %**	**WEEE total**	

Note: The data are based on national data from 16 European countries. Exported amounts for the remaining EU Member States have been derived from reported imports from the 16 countries that provided data. Movements between those countries that did not provide data to the ETC/SCP are thus not included.

Source: ETC/SCP, 2009.

Aligning the ELW codes with the WEEE categories in the WEEE Directive would enable a better understanding of what type of WEEE is moved across borders.

WEEE is exported as used products

In 2008, 3.4 million tonnes of WEEE were collected and formally reported in the EU, whereas 10.2 million tonnes of new electric and electronic equipment was put on the market (EEA, 2012b, based on Eurostat data). No data exist about the amount of WEEE generated but considering the amounts of electric and electronic equipment marketed in previous years with an average life span of three to five years it can be assumed that around 8–10 million tonnes of WEEE were generated in 2008.

This means that there is a considerable gap between the WEEE produced and the amount collected. Some of the 'missing' WEEE might be stored in cellars and attics; some, especially smaller appliances, ends up in municipal waste. But there are clear indications that a large part of the 'missing' WEEE is exported as used products to countries outside the EU.

The EEA (2009), the ETC/SCP (2008), the Danish Environmental Protection Agency (DEPA, 2006) and the German Federal Environment Agency (UBA, 2010) have all analysed the issue of missing e-waste, as compiled by the ETC/SCP (2012). The EEA and the ETC/SCP have documented how, for example, 15 000 tonnes of colour televisions were exported from the EU to African countries in 2005 (EEA, 2009; ETC/SCP, 2008). According to EU trade statistics, these sets had an extremely low average value of EUR 28 per unit, indicating that they were used rather than new. Such old products are not always fully functional; they are likely to end up as WEEE after a short time in use. In other words, WEEE is exported as used products out of the EU and is therefore not registered as e-waste. The export of WEEE to non-OECD countries is illegal whereas the export of used goods is permitted.

Similarly, the UBA has examined the situation in Germany. It found that 1.8 million tonnes of electrical and electronic equipment were sold in Germany in 2006 and an estimated 1.3–1.5 million tonnes of WEEE were generated but just 0.8 million tonnes of WEEE were collected. Based on a detailed analysis of exports leaving Hamburg port and trade statistics for Germany it was estimated that between 93 000 and 216 000 tonnes of used electrical and electronic products were exported from Germany to non-EU countries in 2008. A significant proportion of the used goods was in a very bad condition and would have constituted WEEE. If the German

findings are extended to the EU level by a simple population extrapolation, it would mean that between 550 000 tonnes and 1 300 000 tonnes of used products/WEEE are shipped out of the EU every year. This amount would correspond to 16–38 % of the reported amounts of e-waste collected in 2008.

The German figures are broadly similar in scale to those estimated by the Danish EPA in its 2006 study. The Danish survey found that about 2 500 tonnes of used products (or WEEE) were exported from Denmark to non-OECD countries. The Danish total covered only used televisions, computers, monitors, screens, refrigerators and deep freezers. Other used electrical and electronic products (for example, mobile phones and photocopiers) should be added to this amount. If the Danish figures are extended to the EU level by a simple population extrapolation, it suggests that about 250 000 tonnes of used televisions, computers, monitors, screens, refrigerators and deep freezers are exported out of the EU each year (ETC/SCP, 2012).

West African countries seem to be important destinations for e-waste. A study by the Basel Convention Secretariat (SBC, 2011) estimates that perhaps 250 000 tonnes of WEEE are imported illegally into these countries each year (SBC, 2011). According to that study, more than 75 % of all containers filled with electric and electronic equipment reaching Nigeria come from Europe. In Ghana, 30 % of the used electric and electronic equipment imported was found to be non-functioning and thus in fact constituted WEEE.

In non-OECD countries, both imported WEEE and domestically generated WEEE are usually recycled in the informal sector in conditions that cause considerable pollution to the local environment and significant health risks for people involved and nearby (EEA, 2012c). Investigations in China and India, where large amounts of domestic and imported WEEE are recycled in the informal sector, reveal substantial pollution of the environment. For example, levels of lead, polybrominated diphenyl ethers (PBDEs) and polychlorinated and polybrominated dibenzo-p-dioxins and dibenzofurans (PCDD/Fs and PBDD/Fs) in air, dust, soil, water and sediments in WEEE recycling areas sometimes exceed the levels in other industrial or urban areas by several orders of magnitude. In Guiyu, China, a WEEE recycling area, 80 % of the children have respiratory diseases (Sepúlveda et al., 2010). In addition, valuable metals such as palladium, gold, silver, indium and germanium are lost as recycling usually focuses on extracting steel, aluminium and copper (SBC, 2011).

Europe has a moral obligation to curb illegal trade in WEEE disguised as exports of used goods. Even if illegal movements of WEEE can be completely eradicated, however, legal trade in used appliances will indirectly continue to contribute to environmental and health risk in the receiving countries outside Europe when these appliances finally turn into waste in those countries. Supporting West African and other countries in developing environmentally and socially sound recycling systems will therefore be another important task over coming years.

6 Illegal movements of waste — how big is the problem?

Key points

- Illegal waste trade is a serious crime that seems to be increasing in the EU.
- Detection and reporting of illegal movements is currently inadequate and appears to reflect only a fraction of the true levels of activity.
- Intensification and harmonisation of inspection activities across the EU are important measures needed to combat illegal movements of waste.

As the example of e-waste discussed in Chapter 5 illustrates, illegal movements of waste are notoriously hard to identify and prevent. Illegal movements are a matter of serious concern in Europe because they have several serious consequences, specifically:

- adverse effects on the environment and human health during transport and in receiving countries;
- channelling income to criminals or organised crime;
- unfair competition to law-abiding waste producers, treatment facilities and traders;
- possible loss of valuable resources if the waste is dumped or treated without respecting environmental and health protections in the receiving country;
- high future costs to address the environmental and human harm in receiving countries.

Illegal trade in waste can arise when higher profits are expected compared to legal options of recycling or disposal, combined with regulatory or enforcement failure. The overall growth in international trade also enhances the opportunities for illegal trade. In some cases, waste might be labelled as exports for recycling but is in fact illegally disposed of ('sham recycling'); with the growing amount of exports for recycling, it seems that this type of illegal activity has also increased.

The use of economic instruments to discourage waste disposal, such as landfill taxes, can incentivise illegal shipments if they are not accompanied by efforts to build up other waste management options (OECD, 2012)

The nature of illegal waste trade means that it will never be possible to get an accurate picture of all activities. Clearly, the number of cases detected depends not only on the amount of illegal activities but also on the inspection frequency and strategy.

EU Member States must report instances of illegal movements to the European Commission and during 2007–2009 around 400 cases were reported. Some may have been reported twice — by both the exporting country and the importing country. Half concerned transactions to or from countries outside the EU. Germany, the Netherlands, Belgium, the United Kingdom and Austria accounted for 70 % of the reported cases (EC, 2012). Seven Member States did not report at all, and the remainder reported that they did not detect any illegal shipments. This indicates that the 400 cases represent only a part of the true number.

Europol has identified an increase in the volume of illegal waste movements across borders, which has become one of the fastest growing areas of organised crime. The main routes of illegal movements are from southern to south-eastern Europe and the western Balkans. Illegal waste trade is often facilitated through cooperation with established sectors such as import and export firms, metal recycling and financial services. Corruption also

plays a role, for example laboratories issuing false certificates. WEEE and end-of-life vehicles are sent to West Africa, often in combined shipments, via ports in north-western Europe (Europol, 2011).

During a coordinated inspection campaign throughout 2008–2011 involving 22 European countries, the European Union Network for the Implementation and Enforcement of Environmental Law (IMPEL) found that 19 % of inspected shipments were in violation of the EU Waste Shipments Regulation. Of those, 37 % were illegal shipments. The inspections were targeted, so this number is not necessarily representative for all shipments (IMPEL, 2011). IMPEL is continuing to run and plan further cooperation, training and inspection activities to combat illegal waste shipments.

In 2011, the European Commission consulted stakeholders and the public on possible EU legislative criteria and requirements for waste shipment inspections (EC, 2011a). The responses largely demonstrated the need for measures to strengthen inspection at the EU level, including ensuring the traceability of waste, providing guidance to help customs officials differentiate between used goods and waste, and improving coordination of waste shipment enforcement at EU level (EC, 2011b). The Commission is currently assessing the impacts of possible future legislative and non-legislative measures to curb illegal movements of waste (EC, 2012).

In addition to improving inspection activities, an evaluation of the potential impacts and drivers of illegal waste trade cases could give valuable insights into how and where the drivers could be tackled directly, for example where to improve governance and regulations (OECD, 2012).

It could also be worthwhile to explore new technologies to track movements of waste across borders. For example, Taiwan recently introduced better control of hazardous waste movements within the country and across its borders. Enterprises transporting hazardous waste have to install GPS equipment on their trucks, enabling real-time tracking of waste movements (EPA, 2012). Learning from this experience might represent another option to prevent illegal activities.

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Annex 1 Comparison of Basel Convention Y-codes and European List of Waste codes

Using the example of waste from waste treatment plants, Table A.1 illustrates the difference in level of detail between the Basel Convention waste codes (Y-codes) and the waste codes of the European List of Wastes (ELW).

Table A.1 Difference in level of detail between the Basel Convention Y-codes and the waste codes of the European List of Wastes (ELW)

Reporting based on Basel codes	Reporting based on the ELW code	
Code	**Code**	**Name**
Y-18	19	Waste management facilities
Residues arising from industrial waste disposal operations	**1901 Wastes from incineration or pyrolysis of waste**	
	190105	Filter cake from gas treatment
	190106	Aqueous liquid wastes from gas treatment
	190107	Solid wastes from gas treatment
	190110	Spent activated carbon from flue-gas treatment
	190111	Bottom ash and slag containing dangerous substances
	190113	Fly ash containing dangerous substances
	190115	Boiler dust containing dangerous substances
	190117	Pyrolysis wastes containing dangerous substances
	1902 Wastes from physico-chemical treatments of waste	
	190204	Premixed wastes composed of at least one hazardous waste
	190205	Sludges from physico-chemical treatment
	190207	Oil and concentrates from separation
	190208	Liquid combustible wastes containing dangerous substances
	190209	Solid combustible wastes containing dangerous substances
	190211	Other wastes containing dangerous substances
	1903 Stabilised/solidified wastes	
	190304	Wastes marked as hazardous, partly stabilised
	190306	Wastes marked as hazardous, solidified
	1904 Vitrified waste and wastes from vitrification	
	190402	Fly ash and other flue-gas treatment wastes
	190403	Non-vitrified solid phase
	1907 Landfill leachate	
	190702	Landfill leachate containing dangerous substances

Reporting based on Basel codes	Reporting based on the ELW code	
Code	**Code**	**Name**
	1908 Wastes from wastewater treatment plants not otherwise specified	
	190806	Saturated or spent ion exchange resins
	190807	Solutions and sludges from regeneration of ion exchangers
	190808	Membrane system waste containing heavy metals
	190810	Grease and oil mixture from oil/water separation other than those mentioned in19 08 09
	190811	Sludges from biological treatment of industrial wastewater
	190813	Sludges from other treatment of industrial wastewater
	1910 Wastes from shredding of metal-containing wastes	
	191003	Fluff-light fraction and dust containing dangerous substances
	191005	Other fractions containing dangerous substances
	1911 Wastes from oil regeneration	
	191101	Spent filter clays
	191102	Acid tars
	191103	Aqueous liquid wastes
	191104	Wastes from cleaning of fuel with bases
	191105	Sludges from on-site effluent treatment containing dangerous substances
	191107	Wastes from flue-gas cleaning
	1912 Wastes from the mechanical treatment of waste	
	191206	Wood containing dangerous substances
	191211	Other wastes (including mixtures of materials) from mechanical treatment of waste of waste containing dangerous substances
	1913 Wastes from soil and groundwater remediation	
	191301	Solid wastes from soil remediation containing dangerous substances
	191303	Sludges from soil remediation containing dangerous substances
	191305	Sludges from groundwater remediation containing dangerous substances
	191307	Aqueous liquid wastes and aqueous concentrates from groundwater remediation containing dangerous substances

Source: ETC/SCP, 2009.

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