

Drivers of EU plastic waste exports



Authors:

ETC experts: Åsa Romson (IVL Swedish Environmental Research Institute), Alessio D'Amato and Francesco Nicoli (SEEDS/University of Ferrara), Dirk Nelen (VITO), Susanna Paleari (IRCrES-CNR), Adrien Specker (WRFA)

EEA experts: Tobias Nielsen, Lars Fogh Mortensen



Cover design: EEA
Cover image © PhotoAlto_photographer, 2004
Layout: ETC CE

Publication Date 31 January 2024

EEA activity Circular Economy and Resource Use

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Preparation of this report has been co-funded by the European Environment Agency as part of a grant with the European Topic Centre on Circular economy and resource use (ETC CE) and expresses the views of the authors. The contents of this publication do not necessarily reflect the position or opinion of the European Commission or other institutions of the European Union. Neither the European Environment Agency nor the European Topic Centre on Circular economy and resource use is liable for any consequence stemming from the reuse of the information contained in this publication.

ETC CE coordinator: Vlaamse Instelling voor Technologisch Onderzoek (VITO)

ETC CE partners: Banson Editorial and Communications Ltd, česká informační agentura životního prostředí (CENIA), Collaborating Centre on Sustainable Consumption and Production (CSCP), Istituto Di Ricerca Sulla la Crescita Economica Sostenibile, Istituto Superiore per la Protezione e Ricerca Ambientale, IVL Swedish Environmental Research Institute, PlanMiljø, Università Degli Studi Di Ferrara (SEEDS), German Environment Agency (UBA), Teknologian Tutkimuskeskus VTT oy, Wuppertal Institut für Klima, Umwelt, Energie gGmbH, World Resources Forum Association.

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Acknowledgements

The report has been produced within the task on ‘EU plastic waste trade’ of the 2023 ETC CE work programme. Tobias Nielsen (EEA) has been the project leader, with support from Lars Mortensen (EEA), and Åsa Romson (IVL) has been the task leader, supported by main authors Alessio D’Amato and Francesco Nicolli (SEEDS/University of Ferrara), Dirk Nelen (VITO), Susanna Paleari (IRCrES-CNR) and Adrien Specker (World Resources Forum).

The authors are grateful to Nicolas Navarre (Leiden University) and experts from DG Environment for their comments that substantially improved the quality of the report, and thank Bart Ullstein (BEC) who provided careful editing of the report.

1 Introduction

In recent years international and EU regulation have decreased exports of plastic waste from the EU; nonetheless more than one million tonnes of plastic waste are exported each year, and that excludes plastic embedded in other waste streams. Transboundary shipments of plastic waste and scrap could potentially play an important role in helping to strengthen markets for recycled plastics as they can help to achieve economic efficiency through, for instance, economies of scale. However, EU exports could also contribute to global plastic pollution when recipient countries lack the capacity to treat the waste in an environmentally sound manner. As the EU moves towards a circular economy with high ambitions for environmental protection including minimising plastic pollution, it is important to analyse EU plastic waste exports and discuss the kind of drivers that are behind current trends of EU plastics waste exports.

Plastic waste is exported in different forms, both as a main product or embedded in other products (Karlsson et al., 2023). This report concentrates on the trade of separated plastic waste and scrap, while some references also are made to embedded forms of export. The export of separated plastic waste consists of plastic fractions, mostly in bulk, bales or bags which are exported for further treatment that may include additional sorting, shredding, cleaning, compounding or conversion into applications and products as recycled content. A series of regulations are in place that allow the control and monitoring of shipments of waste plastics. These exports are subject to the EU's common customs tariff, which makes use of the Combined Nomenclature (CN), the EU's eight-digit coding system, comprising the Harmonised System (HS) codes of which 3915 and its subsections cover '*waste, parings and scrap, of plastics*'. The HS system provides statistics for both trade within the EU and between the EU and the rest of the world. There is also the distinction of legal and illegal trade. While the legal plastic waste trade is tracked through mandatory reporting systems, such as commercial invoices and customs declarations, there is also an illegal trade, which remains elusive.

The exports subject to customs tariffs originate from the intention of companies to provide further treatment of the waste outside the Member State in which the waste material was generated. As waste material, these exports are also covered by the reporting system of European waste codes (European Waste Catalogue for example code 07.4 covering waste from plastic production, plastic packaging, and sorting and separation processes). EU waste statistics after year 2020 were, however, not yet available at the time of writing.

This report aims to identify and discuss key drivers of EU plastic waste export, whether they are increasing or decreasing. Even as legislation continues to develop on EU plastic waste exports, it is useful to understand what drives exports, so that implementation of further export restriction can be as impactful as possible. The report also contribute to a better understanding of the recent dynamics of the trade in waste plastics and follow up on previous reports on the trade in plastic waste (ETC/WMGE, 2019; ETC/CE, 2023). This study is written prior to the provisional political agreement to update the regulation on shipments of waste announced 17 November 2023 (European Commission, 2023).

The report is organised as follows. Section 2 introduces the EU regulation on movement of plastic waste, different categories of plastic waste and clarifies the actors involved in the external trade. It also highlights trends in EU exports according to the most recent statistics. Section 3 identifies drivers behind the export of plastics based on findings in previous reports. Five major drivers are examined and discussed in the following subsections: 1) trade bans and restrictions by third countries; 2) export procedures; 3) economic incentives; 4) infrastructure challenges; and 5) indirect consequences of the EU circular economy policy framework. Section 4 discusses policy relevant conclusions.

2 Background on regulation and current plastic waste exports

The Basel Convention ⁽¹⁾, designed to regulate the transboundary movement of hazardous wastes, has evolved to include strict regulations on plastic waste. This was partly spurred by the Chinese ban on plastic waste imports in 2018, but also, in view of efforts to transition to a circular economy, reflected a need for greater regulation of the international trade in plastic waste. Following the evolution of the Basel convention, the EU reformed its Waste Shipment Regulation (WSR) (EU, 2006b).

The shipment of plastic waste beyond the EU is a complex process which involves several actors. There are different export procedures depending on whether the plastic waste is hazardous, destined for recycling or is hard to recycle, and whether or not the destination is a member country of Organisation for Economic Co-operation and Development (OECD). This chapter gives a brief overview the WSR and the actors and procedures involved in the export of plastic waste.

The total EU export of plastic waste and scrap (HS code 3915 – Waste, parings and scrap of plastics) has declined from high of 2.5 million tonnes in 2015 to around one million tonnes in 2022. The share of plastic waste exported to non-OECD countries has also decreased significantly and 2021 it accounted for less than 20 % of the total export measured in both volume and value compared to more than 50 % in 2014, see Figure 2.3 a and b. The second part of the chapter explores recent trends in plastic waste trade.

2.1 Brief overview of EU's Waste Shipment Regulation²

The shipment of waste within and beyond the EU is regulated by the Waste Shipment Regulation (WSR) which implements the obligations of the 1989 Basel Convention as well as the provisions of the 1992 OECD Decision establishing a control system for waste shipments for recovery. The WSR shapes different procedures and control regimes for the shipment of waste depending on its destination (importing and exporting countries), characteristics (hazardous or non-hazardous waste) and final treatment (recovery or disposal) ⁽³⁾.

Regarding the shipment of plastic waste outside the EU (Figure 2.1), the Regulation '*prohibits the export of waste for disposal*', except to European Free Trade Association (EFTA) countries ⁽⁴⁾ that are party to the Basel Convention. In that case the most stringent control procedure, i.e., '*prior written notification and consent*' ⁽⁵⁾ applies with some adaptations and additions.

¹ Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, <https://www.basel.int/>

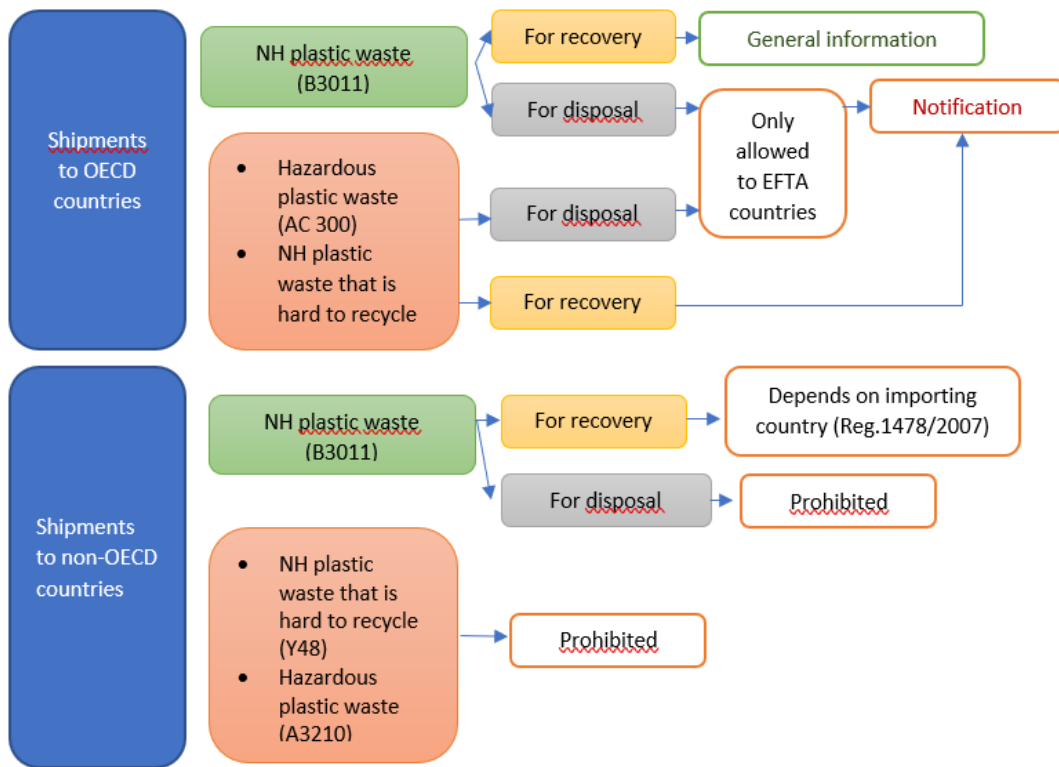
² This section covers the waste shipment regulation in force in September 2023, note the provisional political agreement to update the regulation announced by the Commission November 17 2023.

³ The WSR defines recovery and disposal operations based on the Waste Framework Directive (EU, 2008), so that recovery includes energy recovery and disposal operations include incineration without energy recovery.

⁴ Iceland, Liechtenstein, Norway and Switzerland

⁵ For further information on the 'prior written notification and consent procedure' see Figure 5.

Figure 2.1 Waste Shipment Regulation provisions on the shipment of plastic waste from the EU to third countries



Note: NH= non-hazardous.

The entry Y48 covers plastic waste, including mixtures of such waste, with the exception of plastic waste covered by the entries A3210 and B3011. Therefore, entry Y48 is applicable in case a consignment of plastic waste cannot be classified under entry B3011, including because it is not destined for recycling, or does not fall under entry A3210 because it does not exhibit a hazardous characteristic.

Source: EC (2020) and EU (2006b)

When *plastic waste is shipped for recovery to OECD countries*, the provisions that regulate intra-EU shipments also apply, i.e., the shipment of hazardous waste is subject to strict prior written notification and consent. Non-hazardous waste is subject to the more easily managed general information requirements, with specific adaptations and additions. Under the 2020 amendment to the WSR (EC, 2020), the export of non-hazardous hard-to recycle plastic waste to OECD countries is now subject to the prior written notification and consent procedure.

As far as the shipment of *non-hazardous plastic waste for recovery to non-OECD countries* is concerned, the European Commission must send a written request to each non-OECD country seeking confirmation in writing that non-hazardous waste may be exported for recovery in that country and under which control procedure, if any (Art. 37 of the WSR). Non-OECD countries' replies have been published within the Commission Implementing Regulation No 1418/2007 (EC, 2007), which, however, is not regularly updated and is not able to immediately reflect policy changes. This issue is addressed by the ongoing revision of the WSR. Finally, the *export of hazardous plastic waste for recovery to non-OECD countries is prohibited*, as well as the export of non-hazardous hard-to recycle plastic waste (EC, 2020).

The provisions on the export to OECD and non-OECD countries of hazardous plastic waste and plastic waste that is hard to recycle, such as some thermoset plastics and fluoropolymers, were introduced by an amendment to the WSR in 2020 (EC, 2020) and entered into force on 1 January 2021.

This means that, apart from shipments to EFTA countries, only the following flows of plastic waste can be legally exported from EU:

- non-hazardous plastic waste for recovery (B3011) can be exported to OECD countries under general information requirements and to non-OECD countries only if there is confirmation to the European Commission’s request;
- hazardous plastic waste (AC300) or non-hazardous plastic waste that is hard to recycle (Y48) can be exported for recovery only to OECD countries with prior written consent.

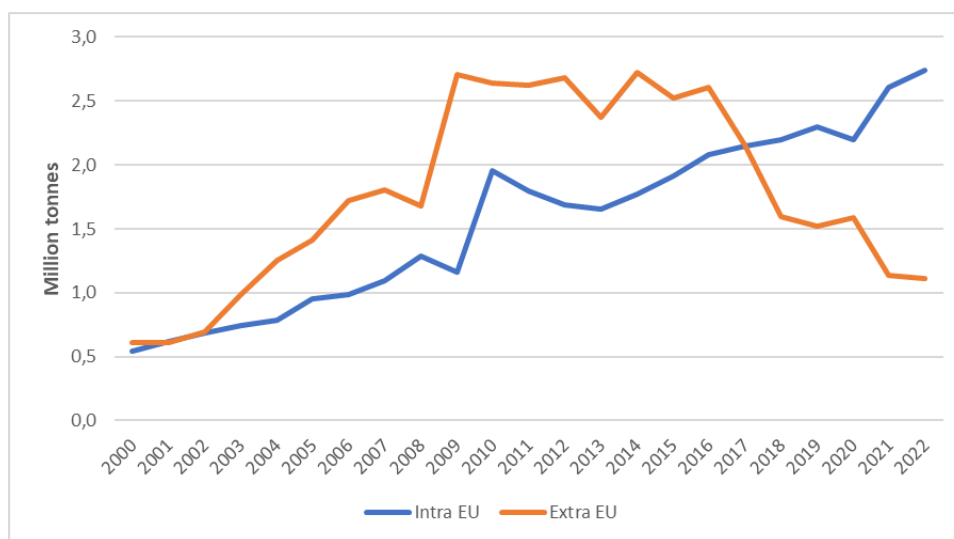
2.2 Key trends in plastic waste exports

This section analyses the key trends in plastic waste exports shown in the HS code 3915 – Waste, parings and scrap of plastics trade statistics. This trade code is composed, in its subcategories, of several plastic materials including polymers of ethylene, polymers of styrene, polymers of vinyl chloride, polyethylene terephthalate (PET). Other plastics are grouped into a residual category.

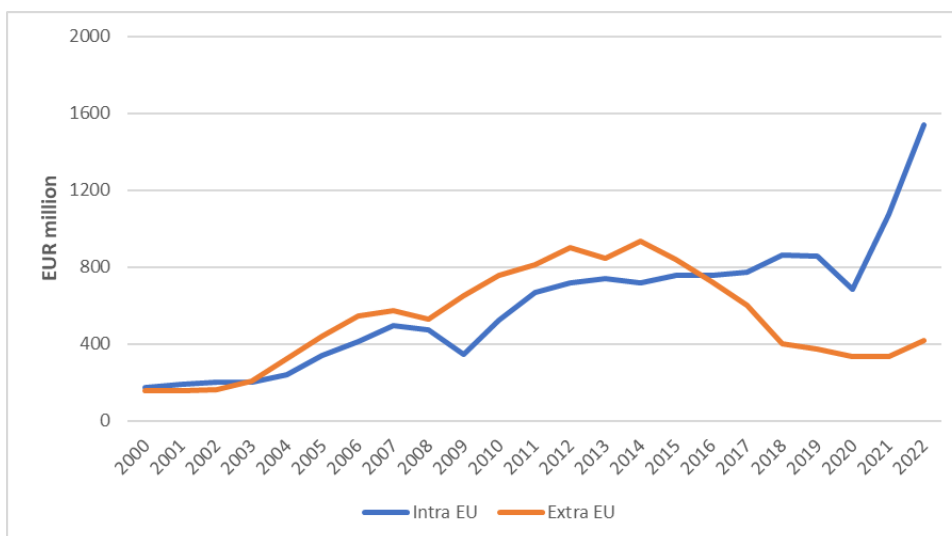
2.2.1 Volume and value of plastic waste export

Trends in plastic waste export have changed significantly in recent years (ETC/CE, 2023). Figure 2.2 shows annual data over the last two decades. Figure 2.2a shows that after 2016, the extra-EU27 trade volumes have decreased, in part due to the 2021 changes in the Basel Convention on the trade in waste plastic. In contrast, the intra-EU27 trade steadily increased throughout the period. The total value of the trade (Figure 2.2b) lower part) follows a similar pattern, although the value of the extra-EU27 trade started to fall earlier, after 2014, and seems to have recovering slightly in 2022.

Figure 2.2 a) Volume of extra- and intra-EU exports of plastic waste, EU, 2000–2022, million tonnes



b) Value of extra- and intra-EU exports of plastic waste, EU, 2000–2022, EUR million



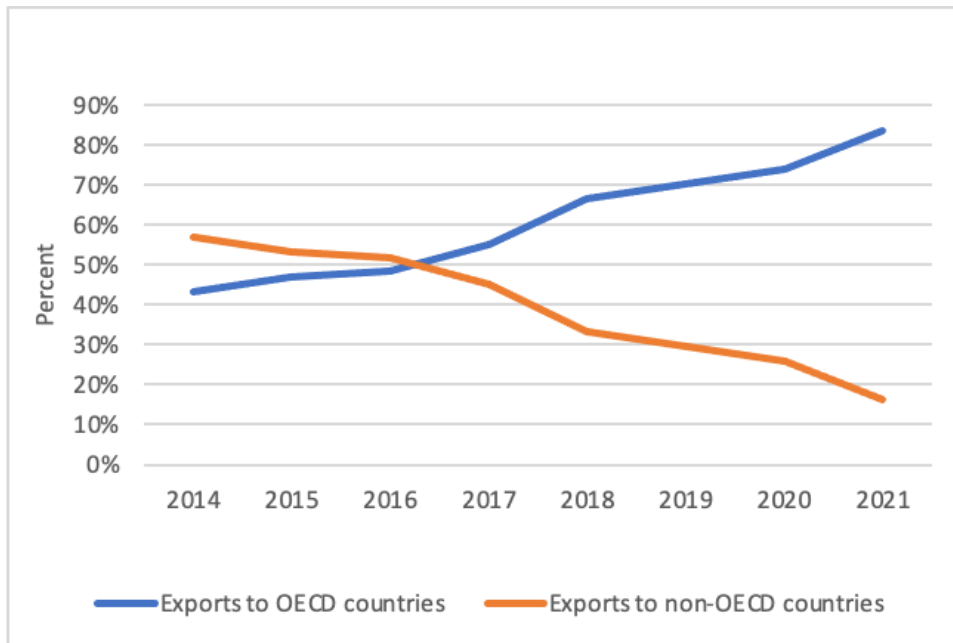
Source: Eurostat trade data – HS code 3915

Note that in the most recent years intra-EU trade is greater than extra-EU trade. This is a confirmation of a general trend that has been triggered by relevant changes in trade-related policies including the waste export bans.

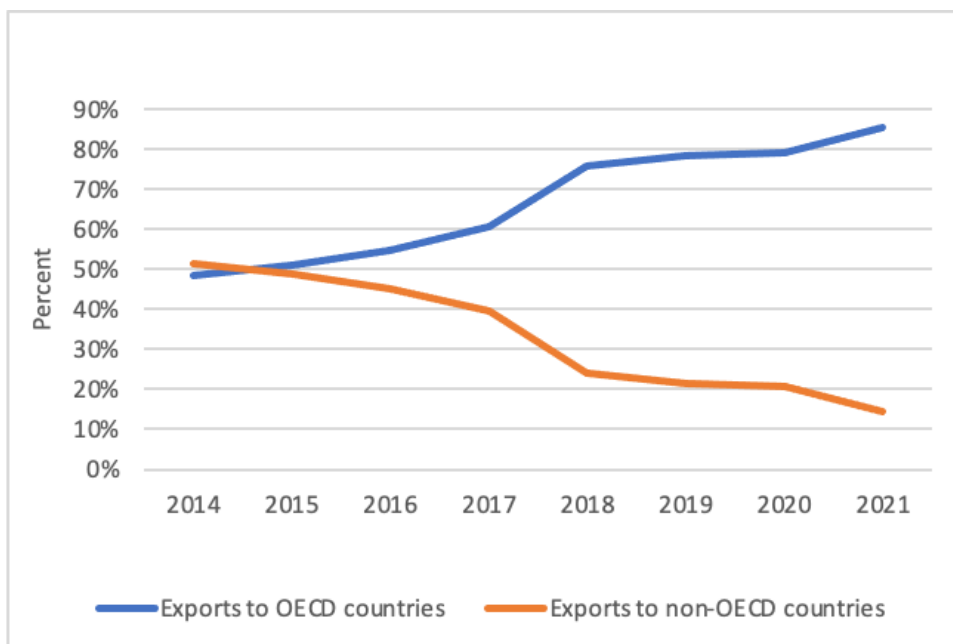
2.2.2 Plastic waste export destinations

Figure 2.3a to c focus on export destinations. In particular, Figure 2.3 a and b illustrate the distribution and relative trends of overall plastic waste exports from the EU-27 to OECD and non-OECD nations. When focusing solely on weight, the proportion of plastic waste exports to OECD countries saw a substantial rise, climbing from approximately 40 % in 2014 to roughly 80 % in 2021. As a result, the volume of plastic waste flowing from the EU-27 to non-EU OECD countries dwindled to 20 % during the corresponding period. When examining the monetary value of the exported waste, a comparable pattern emerges, but the discrepancy between OECD and non-OECD countries is narrower in 2014 and more pronounced in 2021. One plausible explanation revolves around the notion that the quality of waste sent to OECD countries (measured by average value) increased in contrast to that dispatched to non-OECD countries. When focusing on selected extra-EU destinations, some heterogeneity across countries in terms of quantities can be identified. Destinations such as Malaysia and Türkiye both experienced some notable decrease since the year 2000, as shown in Figure 2.3 c.

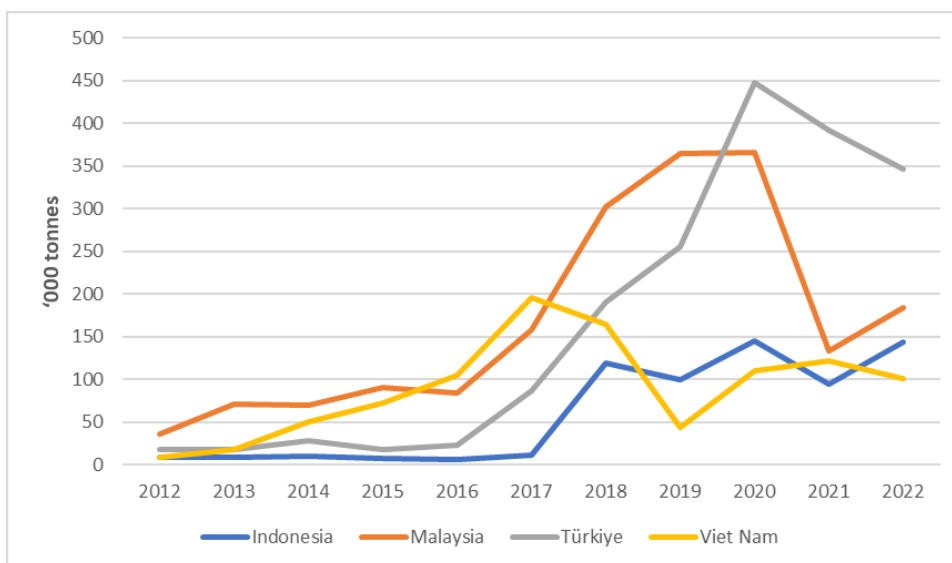
Figure 2.3 a) Export of plastic waste to OECD and non-OECD countries, per cent of total weight



b) Export of plastic waste to OECD and non-OECD countries, per cent of total value



c) Volume of extra-EU exports of waste plastic, selected countries, 2012–2022, '000 tonnes



Source: Eurostat trade data – HS code 3915

In summary, in recent years, partly due to the amendment of the Basel Convention, the flow of plastic waste shipments has changed, favouring intra-EU over extra-EU flows and generating a reduction in many of the historical extra-EU trading partners. Other impacts may well include macroeconomic impacts on plastic production, impacts from COVID-19 epidemic on the overall economy, production capacity and trade supply chains (with ports being 'backlogged' in 2021 and 2022).

3 Drivers of EU plastic waste exports

3.1 Introduction to drivers

Economics have been singled out as the most important drivers of EU waste trade in general. These are, however, hard to rank and there is clear interplay between such different drivers as economic; regulatory; technical; geographic; and environmental ones (Trinomics, 2021).

In the ETC CE 2/2023 report *The Fate of Plastic Waste* (ETC/CE, 2023) four main drivers of EU export of plastic waste were identified – infrastructural aspects; economic drivers; differences in legislation, classification and administrative practice; and multilateral trade bans. The infrastructural aspects, including recycling capacity, were highlighted as among the more important drivers of the export of plastic waste due to the mismatch between the development of separate collection in EU Member States and recycling capacity. Economic drivers are a combination of gate-fee differentials and transport costs and are also identified as a major driver of extra-EU exports of plastics waste, to which this report adds the pull effects in importing countries. Differences in the classification, legislation and administrative practices across EU Member States and trade actors may also be a reason for some extra-EU trade, while multilateral trade bans are, of course, a major barrier of export plastic waste from the EU. The current report adds a fifth driver to that analysis, the EU circular economy policy reforms, and discusses how various regulatory reforms may have an impact on exports.

In analysing key drivers of the export of plastic waste, one needs to keep in mind that, for all the waste detailed in the statistics, waste holders work to comply with the law as illegal exports are not covered by the data. In the case of plastic waste for recycling, a suitable recovery facility must be found, either within or outside the country of origin. If the facility is located outside the EU, whether that country imposes any restrictions on the import of the waste in question needs to be checked. Once the options are clear, factors, such as transport costs and the value of the waste, will determine where it finally goes for recovery.

Box 3.1 Illegal shipment of plastic waste

Illegal shipments of plastic waste between EU countries and from EU Member States to third countries is an issue of growing concern. Relevant examples include the export of plastic waste to Southeast Asia and of waste electrical and electronic waste (WEEE) and end-of-life vehicles (ELVs) to West Africa. According to Interpol, the restrictions on the import of plastic waste recently established by some Asian countries have led to a steep increase in illegal shipments. In particular, the redirection of plastic waste exports to other South and Southeast Asian countries, as well as to Central and Eastern European countries, following the adoption of trade restrictions, did not compensate for the volume that used to be sent to China prior to the introduction of the ban in January 2018. In emerging Asian importing countries, the lack of enforcement capacity has almost certainly allowed illegal recycling facilities to thrive, profiting by circumventing license and environmentally sound treatment costs. It has also probably led, due to poor local waste collection and sorting systems, to an increase in accidental and deliberately set waste fires and illicit landfills, especially of the domestically produced plastic waste, which is often of lesser quality than imported waste. Moreover, it is possible that other destinations of illegal shipments are being found in Africa and Latin America. Some African countries already receive large quantities of plastic soon-to-be-waste material embedded in illegally imported electronic waste.

The EU illegally exports both plastic waste subject to written notification and consent and green-listed plastic waste (*) to third countries. Indeed, the European Union Network for the Implementation and Enforcement of Environmental Law (IMPEL) LIFE SWEAP shows that in the EU between 2018 and June 2020 WEEE (14%), plastics (13%), and ELVs and car parts (9%) were among the waste streams most commonly detected in shipment violations. In many cases WEEE and ELVs are subject to the notification procedure, but so far plastics are mostly shipped as green-listed waste under the general information requirements. Of a total of 2 586 violations related to all types of waste recorded in the between 2018 and June 2020,

administrative violations accounted for 18 %; more serious offences for 34 %; and shipments subject to export bans for 22 %.

Illegality occurs along the whole supply chain and involves a variety of participants, such as waste brokers, shipping agents and importers in the destination countries. The main methods used to smuggle plastic waste are similar to those found in trafficking of other waste streams and includes misdeclaration, for example, declaring waste as raw materials, hazardous waste as non-hazardous waste or contaminated waste as non-contaminated waste; concealment, i.e., hiding illegal plastic waste behind a layer of clean, baled plastics or other materials in case the shipping container is opened for routine inspection; and transshipment, i.e., shipping plastic waste on a circuitous route using a series of ports and, potentially, carriers to mask the country of origin, the shipper and consignee, or final destination.

The plastic waste market entails revenues, especially from energy recovery and recycling, and processing costs, notably infrastructure and labour costs, as well as taxation, such as taxes imposed on incineration and landfilling in some countries. Plastic waste crime often consists of the effort to reduce/circumvent these costs, while benefiting from the revenues. EU and/or national policies affecting such costs and revenues can impact the business opportunity represented by the different types of illegal practices.

There are multiple barriers to transparency and accountability, and many factors that facilitate illegal activities. For instance, the complexity of the plastic value chain and of plastic waste shipment, as well as the lack of reliable waste data, often make traceability and control of plastic waste difficult for investigating officers; many countries do not invest adequate human and financial resources to prevent and control illegal waste trade activities; there is generally no proper coordination/collaboration between monitoring and enforcement authorities at the regional, national, and international levels; fines/penalties established at the national level are often modest and do not discourage actors from engaging into illegal shipments; etc.

Sources: EC (2021a) Environmental Investigation Agency (2021) Olley (2021) INTERPOL (2020) LIEF SWEAP (2020) EUROSAI (2013)

3.2 Trade bans and restrictions by third countries leads to changes in EU exports

The 2017 Chinese plastic waste import bans of much plastic waste that China enforced in 2018, which was later followed by various Asian countries the following years, redirected much of the EU export of plastic waste (ETC/CE, 2023). Prior to these import bans was the current picture that a substantial share of plastic waste is traded from high-income countries to developing ones (Wen et al., 2021). This is consistent with the pollution-haven hypothesis, which posits that high-income countries in which environmental protection is stringent tend to locate their pollution-intensive productions in low-income countries with laxer environmental regulations (Copeland and Taylor, 1994). Labour and environmental standards applied to plastic waste treatment in importing third countries are generally far from being equivalent to EU ones, which often results in increased negative impacts on communities, public health and the environment. In turn, these impacts are behind the recent import bans/restrictions introduced by many Asian countries.

China was the main importing country of plastic waste and the largest plastic producer in the world, when it in 2017 decided to ban the import of 24 types of solid waste, including certain types of household plastic. The import ban came into force in January 2018 and was extended in the same year to post-industrial polyethylene (PE), PET, polystyrene (PS), polyvinyl chloride (PVC) and other scrap plastic, while the import of WEEE has been banned since 2000 (ETC/WMGGE, 2019). Since 2018, China was no longer the leading importer of plastic waste, and the Hong Kong Special Administrative Region was no longer a key global transit point.

Following the Chinese ban, several South and Southeast Asian countries recorded significant increases in plastic waste imports and started introducing import bans and restrictions (ETC/CE, 2023).

- *Indonesia* banned plastic waste imports in 2018 (Retamal et al., 2020).
- *Viet Nam* stopped issuing plastic recycling import licenses in June 2018. In 2019, the country took long-term steps to cut back on plastic waste imports with the announcement of Decree No. 40/2019 that will take effect in 2025. The decree includes the following provisions: 1) only 80 % of feedstock is

allowed to be imported by each recycler; and 2) imported feedstock is only allowed to be made into semi-finished or finished goods and not into flakes or pellets (Vietnam Environment Administration - Ministry of National Resources and Environment, 2021; World Bank, 2021).

- *Malaysia* placed restrictions on the import of plastic waste in 2018. In order to operate, importing companies must fulfil specific conditions and only homogenous and clean plastic waste may be imported. The inability to control the emergence of illegal recycling facilities and imports of contaminated plastic waste led the Malaysian government to temporarily ban all imports in from July to October 2018 through the cessation of permit issuances (Retamal et al., 2020). Malaysia is also considering the introduction of a permanent and complete ban on all plastic imports (OECD, 2022b).
- *Taiwan* proposed a set of policies to regulate imports of plastic waste including permission for businesses to import plastic waste only originating from their own overseas production processes and prioritising the purchase of domestic over foreign waste. These policies became effective in October 2018 (ETC/WMGE, 2019).
- *India* banned the import of plastic waste in 2019. In March 2022, the ban was partially lifted and the import of PET flakes/PET waste is no longer prohibited, but merely restricted (Recycling Today website, 2019).
- *Thailand* decided to reduce the import of plastic waste and to promote the use of its domestic waste by totally banning imports for 2021–2026 (Igini, 2023; OECD, 2022a).

The trade bans for plastic waste implemented since 2018 have redirected much of the EU's exports of plastic waste and these are now largely directed to OECD countries. This has further triggered export destinations to restrict plastic waste trade. After China's ban came into force, Türkiye, an OECD-member, became a major importer of global plastic waste which led its government to implement an 80 % quota, meaning that Turkish companies could only import 80 % of their capacity and that they should source the remaining 20 % from domestic sources; this was lowered to 50% in September 2020. In addition, as of 1 January 2021, the import of mixed plastic scraps and waste printed circuit boards has been banned (Bostanoğlu, 2021). In May 2021, a ban was also introduced on the import of PET, and high- and low-density polyethylene (HDPE and LDPE) plastic waste, though the ban on PET was repealed after a few days (Newsroom, 2021).

Box 3.2 Voluntary bans on the transport of plastic waste by shipping companies

Many private actors from European and global plastic value chains, such as plastic producers and recyclers, are voluntarily making commitments, which, if implemented, are expected, amongst other things, to increase plastic recycling within the EU and reduce the amount of plastic waste they export. Among these commitments, it is worth mentioning an interesting initiative involving shipping companies. In 2021, 52 environmental and social organizations, coordinated by the Basel Action Network and The Last Beach Cleanup, launched their Shipping Lines Campaign, calling on the world's largest shipping lines to pledge not to transport plastic waste from OECD to non-OECD countries plus Mexico and Türkiye. Since 1 June 2022, one of the world's largest container companies, CMA CGM, which transported about 50 000 containers filled with plastic waste every year, decided to join the campaign and is no longer transporting any plastic waste aboard its ships.

Source: ETC/CE (2023) Basel Action Network (2022) CMA CGM Group (2022)

3.3 Export procedures

One main challenge associated with the trade in plastic waste relates to the quality control and classification, as well as the presence of adequate enforcement mechanisms and procedures. The efficiency of such procedures depends to large degree on how the export works in practice; which actors are involved; and how they work with the procedures. Operating coherent export procedures can be difficult when many different actors are involved. This implies a risk for different interpretations of plastic waste which may lead to wrong classifications of exports. This section analyses who takes the decision to

export and what criteria are used to classify plastic waste, especially the distinction between green-listed (B3011) and other non-hazardous plastic waste (Y48) (Figure 2.1).

3.3.1 Many different actors may export plastic waste

Pursuant to the WSR, many different actors can assume the *role of the notifier and/or the person or entity who arranges the shipment* (the exporter). When prior written notification and consent is required, the WSR specifies that, in case of a shipment from the EU, the notifier is any natural person or body under the jurisdiction of a Member State who carries out a shipment of waste, including the persons or bodies listed below (Art. 2 par. 15):

- the original producer of the waste being moved; or
- a waste collector who has assembled the shipment, collecting small quantities of the same type of waste produced by several parties; or
- a registered dealer or broker who has been authorised by the waste producer/collector to act on his/her behalf as notifier; or
- where all of the persons/bodies specified above are unknown or insolvent, the waste holder.

The above definition also applies to the person who arranges the shipment under Article 18 on general information requirements (WSR Correspondents Guidelines n. 10 on shipments of waste pursuant to Article 18 of Regulation (EC) No 1013/2006 on shipments of waste, 2021).

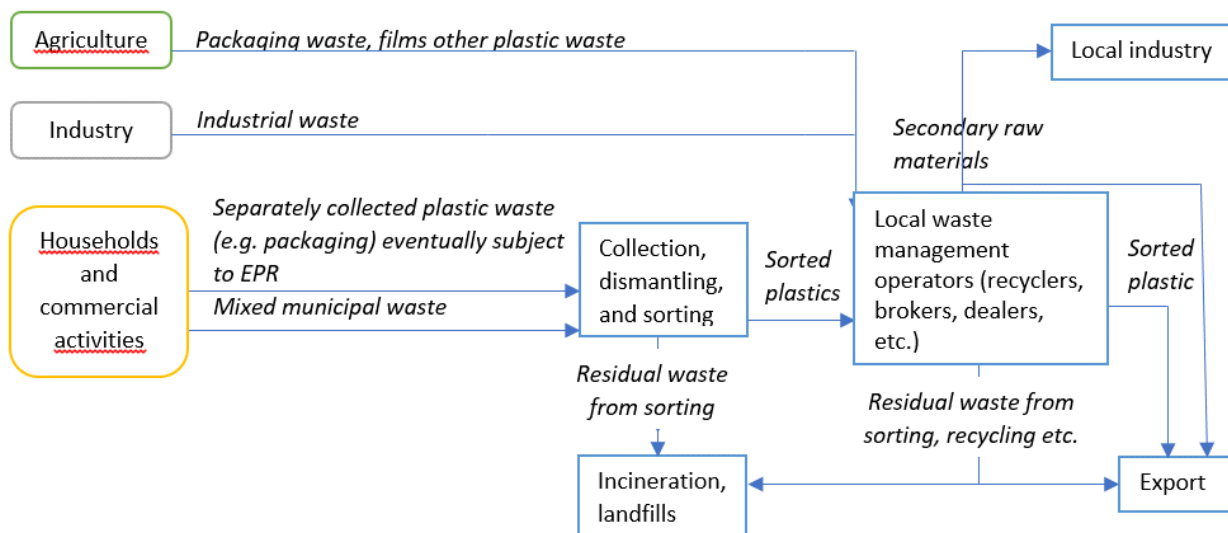
The identification of the exporter is relevant in order to address illegal shipments. Indeed, the notifier/person who arranges the shipment is obliged to take the waste back if the shipment or its recovery or disposal have not been completed as intended or if they have been effected as an illegal shipment.

The *end-of-life phase of the plastic value chain*, which starts with plastic waste generation, i.e., with the substance/object being discarded by the holder, is structured in different ways across EU Member States. In general, it is quite complex, as it involves many different actors and many different types of plastic-containing products/waste streams, including waste generated by the agricultural and industrial sectors and by households (see e.g. FundacióENT et al., 2021; Geeraerts et al., 2015).

As illustrated in Figure 3.1, there are *several specific points at which the decision to export plastic-containing waste can be made*. This decision can be taken, for example, by waste generators in the industrial or agriculture sectors, companies or municipalities performing waste collection, waste sorting and treatment facilities, etc.

Moreover, the decision to export plastic-containing waste can be implemented directly by these actors or through the involvement of middlemen such as brokers and dealers, which increases the number of the steps within the exporting process. According to Article 3 in the Waste Framework Directive, contrary to the waste holder, the broker or dealer does not necessarily take possession of the waste. Usually, a broker arranges for other businesses' waste to be handled, transported, recovered or disposed of, while a waste dealer buys waste from other businesses to sell on or uses an agent to do so (Cnc Natural Resources Wales, 2023) . These middlemen are often not subject, at the national level, to strict monitoring and reporting requirements and this makes illegal waste exports less difficult for them than for other actors (FundacióENT et al., 2021; INTERPOL, 2020; Olley, 2021).

Figure 3.1 End-of-life phase of the plastic value chain and the role of the exporter for both intra- and extra-EU shipments



Note: EPR = extended producer responsibility

Source: (FundacióENT et al., 2021)

Once the decision to export plastic waste has been taken, and provided that the shipment is not prohibited by EU legislation, the exporter, based on the waste classification criteria listed by the WSR, identifies the control procedures to be applied and meets the related requirements. In the case of general information requirements, the shipment must be accompanied by relevant documentation (Annex VII form) and a contract regarding the recovery of the waste has to be agreed between the exporter and the consignee. Notified waste, on the other hand, is subject to a stringent and complex procedure involving several steps and many different actors (Figure 3.2). The exporter must send a notification to the authority of dispatch, providing information about the proposed waste movement. At the time of notification, a contract between the notifier and the consignee for waste recovery/disposal must be concluded and a financial guarantee established by the notifier to cover any costs in the event that the movement cannot be completed or is undertaken illegally. The procedure requires that the competent authorities of all countries concerned in the shipment, i.e., the countries of dispatch, destination and transit, give their consent to the shipment within a certain deadline before it can take place. Moreover, the facility receiving the waste must provide confirmation in writing to the notifier and the competent authorities involved that the waste has been delivered and, after treatment, that recovery or disposal has been completed. Shipments can be inspected prior to export, yet the vast majority are not (Environmental Investigation Agency, 2021).

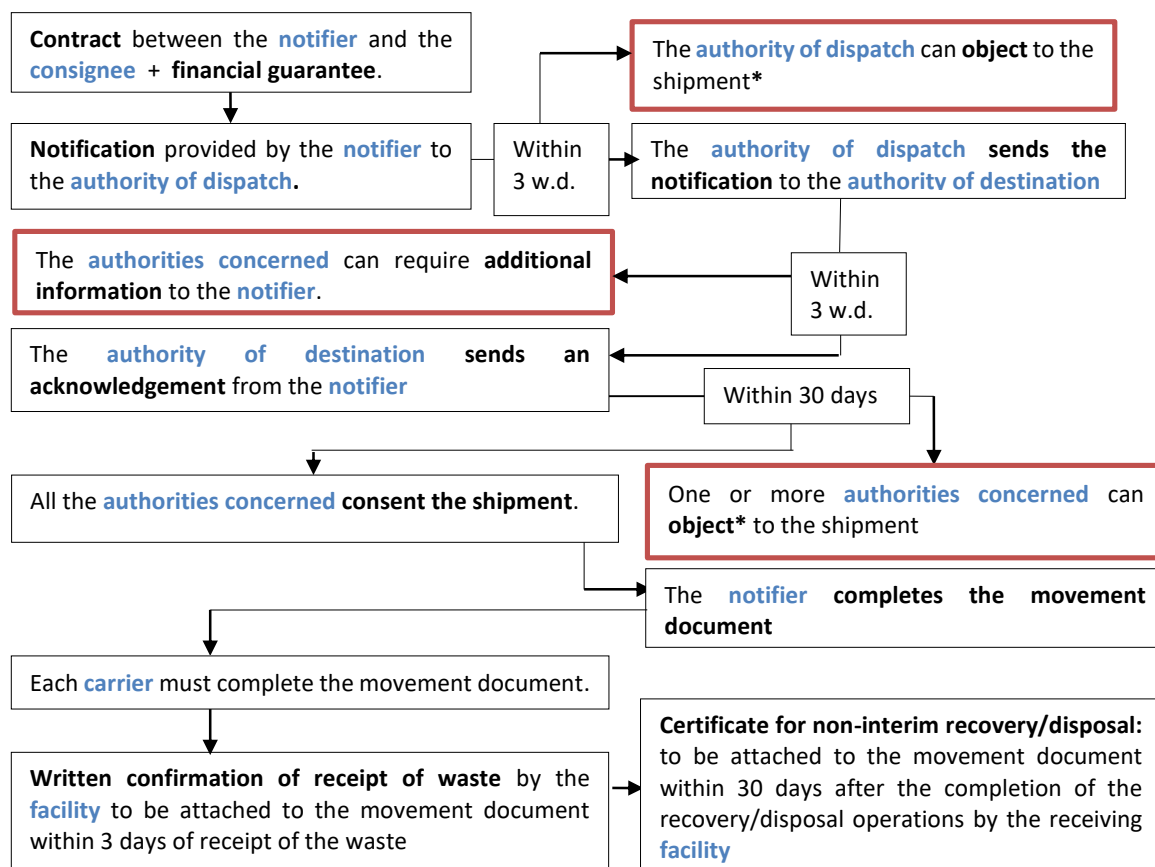
To reach its final destination, waste may be *transported* by road, rail, air, sea or inland waterways by one or more *carriers* (Article 2 par. 33), through countries of transit. Each carrier must complete the movement document. Shipment through transit countries can involve the unloading and loading of waste from one ship or carrier to another, temporary storage or re-sorting of waste, potentially mixing it with plastics from other countries. at an intermediary country.

On arrival in the destination country, plastic waste containers can again be inspected for legality and conformity with international or national specifications and restrictions, although the majority are not (Environmental Investigation Agency, 2021). Checks in the destination countries may place an uneven burden of proof on importin countries. Going through (complex) international trade agreements and finding the original export may lead to a multi-year process which potentially blocks port space and may force importing countries to still handle the waste (Khan, 2020). The *consignee*, with whom the exporter has made a contract, receives the waste from the last carrier. In line with the WSR, the consignee is the

'person or undertaking under the jurisdiction of the country of destination to whom or to which the waste is shipped for recovery or disposal' (Article 2 par. 14). The Annex VII form is used to report when the waste has been received by the importer and when it has been recovered. Similarly, for notified waste the receiving facility must attach both written confirmation of receipt of waste and the certificate for its final, i.e., non-interim, recovery or disposal to the movement document; copies of these documents must be sent to the notifier and all the competent authorities concerned.

As seen above, the chain of actors involved in the export of waste can be complex and the room for wrongful classification and illegal shipments may be expanded by this complexity.

Figure 3.2 Actors involved in the notification procedure



Note: w.k. means working days. * If, within the 30-day limit, the competent authorities consider that the problems which gave rise to their objections have been resolved, they shall immediately inform the notifier in writing. If the problems have not been resolved, the notification shall cease to be valid.

Actors involved in the notification procedure are reported in blue. Red cells correspond to steps within the procedure which may slow down it.

Source: WSR

3.3.2 Classification of plastic waste for export

Current export rules require distinguishing green-listed (B3011) from hard-to-recycle (Y48) plastic waste. The green-listed plastic waste can be traded to any OECD country for recovery without formal notification while other non-hazardous waste is subject to stricter regulation. In practice, however, it is sometimes hard to distinguish those types of plastic waste both for the trading actor and the supervising authorities.

Generally, the exporter determines the classification of the plastic waste before shipping but robust methods to distinguish green-listed waste are also important for control agencies. The classification difficulties add to the complexity of many different actors being involved, and decisions to export are also sometimes made by actors who are not in possession of the waste, as discussed above. This risks different interpretations of plastic waste regulations which can, in turn, lead to inaccurate classification and illegal exports.

A study of the practice of the Basel Convention in 2021 concluded that the green-listed plastic waste needed be well sorted but did not need to be washed, and that mixes of PE, polypropylene (PP) and/or PET are allowed provided that each is destined for separate recycling (Lassesson and Romson, 2021). The latter means that the export of a bale of plastic waste that contain two or more polymer types could be green-listed but only if it goes to a facility that can sort it. Some sorting facilities might be able to handle any mix of plastics, others might only be able to handle a mix of PET with PE or something else. Therefore, information about the sorting facility needs to be available to anyone who should distinguish between Y48 and B3011.

3.4 Economic drivers – push and pull factors

It is well established that economic incentives are important as driver for plastic waste trade (ETC/CE, 2023). Factors potentially affecting plastic waste exports are potentially triggered by incentive-based economic instruments, availability and the quality of the waste. In the following subsection, identified drivers are divided between push factors, i.e., factors affecting exports from the EU, and pull factors, namely factors driving the trade in the importing country. Relevant examples are provided, linking the analysis to the ongoing changes in EU policies.

3.4.1 Push factors of EU exports

Among the most debated tools, both in terms of abstract research and in terms of implementation at the EU level, are extended producers responsibility (EPR) mechanisms and waste taxes.

Recent literature shows the possible embedded impacts and trade-offs of EPR mechanisms. Some of these impacts may be of relevance for waste related trade. Joltreau (Joltreau, 2022) highlights the properties and potential shortcomings of EPR, which implies, broadly speaking, that producers are (financially) responsible of management of their products' waste. As a result, EPR is likely to lead to the internalization of waste management costs, encouraging the adoption by producers of eco-design practices, which may in turn lead to a reduction in waste generation and to improvements in the degree of recyclability. Lorang et al. (Lorang et al., 2022) analyse packaging EPR in five EU countries, France, Germany, Italy, Poland and Spain, and show that EPR schemes positively affect the financial and operational viability of plastic waste management and encourage higher collection and recycling rates. A evaluation of EPR schemes is beyond the scope of this report, but it is clear that EPR schemes, if properly implemented, can improve the availability of properly treated plastic polymers for recycling. On the other hand, the effect on the plastic waste trade of an EPR scheme (also as part of a broader policy mix) cannot be predicted *a priori*, and more analysis would be needed, as EPR may, at least in theory, imply both a decrease the amount of waste generated and an increase in recycling shares and quality.

Another important factor includes the different possible ways of defining recycled plastics, that may lead to different impacts in the amount of scrap plastic available for export, depending on the measure; for example, in terms of the explicit inclusion of recyclable plastic exemptions or reduction targets. More on EU circular economy measures is provided in Section 3.6.

3.4.2 Pull factors for plastic waste imports from EU countries

Firstly, in almost all importing countries, such as Malaysia, Türkiye and Viet Nam, the import of plastic waste is stimulated by domestic plastic recyclers who prefer sourcing their input plastic waste from the EU as this is of better quality than that found in their own countries. The better quality of European plastic can be explained by more rigorous sorting of types of plastics in EU Member States as well as there being smaller amounts of other materials such as metals and paper in the plastic waste. This more consistent feedstock for recyclers means their outputs are purer and can be sold at a higher price.

A second important pull factor which is noticeable in many of the extra-EU importing countries is the need for large and reliable quantities of plastic waste to recycle. Countries such as Malaysia, Türkiye and Viet Nam, to where most of EU exported plastic waste goes, lack collection schemes which makes it very difficult for local recyclers to reliably source the waste they need. For this reason, recyclers find it easier to import foreign waste which is abundant, ensuring economies of scale. This again represents an economic incentive for extra-EU countries to import plastic waste.

In general, some of those importing countries also host plastic manufacturers of global importance. Malaysia, for example, has one of the largest plastics production industries in the world which explains their need to import plastic waste in order for companies to be profitable. This situation can be seen as an additional pull factor for importing plastic waste.

However, the lack of proper waste management and plastic collection schemes only encourage local recyclers to import waste, while on the other hand this risks creating a strong dependence on imported waste, while undermining the development of domestic waste management infrastructure.

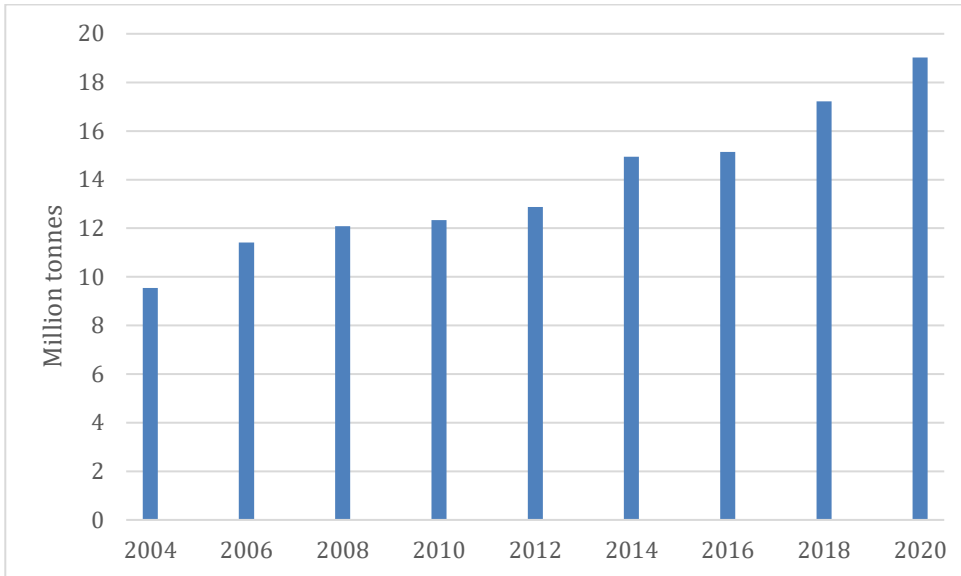
3.5 Infrastructure challenges

3.5.1 The recycling capacity gap

During the past 15 years, plastic waste generation in the EU has increased, reaching close to 20 million tonnes in 2020, see Figure 3.3 below. These numbers represent all types of plastic waste generated for all NACE activities ⁽⁶⁾ plus household plastic waste generation, but do not include textile waste, 60–70 % of which on average is plastic.

⁶ NACE activities is the classification of economic activities in the European Community (*Nomenclature statistique des activités économiques dans la Communauté Européenne*)

Figure 3.3 Generation of plastic waste in the EU, 2004-2020, million tonnes

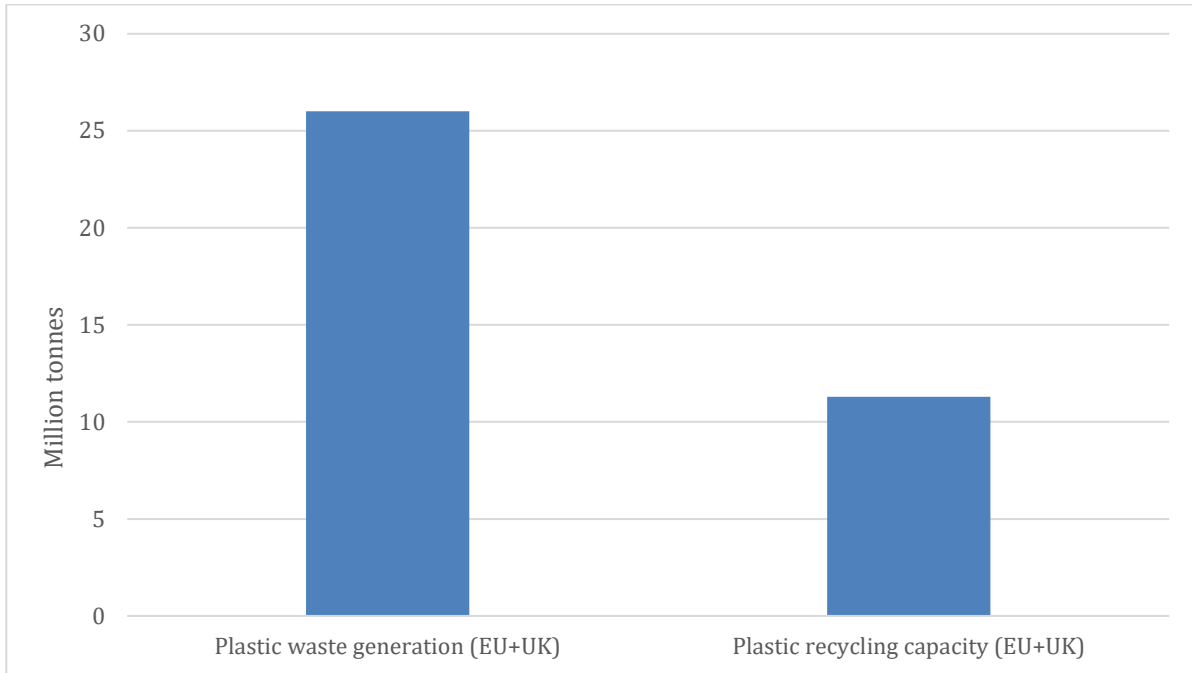


Source: Eurostat, Generation of plastic wastes (hazardous and non-hazardous), waste code W074

Despite growing amounts of plastic waste, the capacity of plastic recyclers in the EU and the United Kingdom (UK) in 2023 is less than half of the amount of waste generated annually (see Figure 3.4; this data only exists for the combination of EU and UK). The EU+UK's plastic recycling capacity is currently just above 10 million tonnes, and the growth of capacity to sort and recycle plastics is well below the growth of plastic waste generation. This can be explained by technological, regulatory and financial constraints (Whiteaker, 2023). A report from the UK parliament's Environment, Food and Rural Affairs Committee, examining the export and recycling of plastic in the UK in 2022, clearly highlighted the capacity issues for plastic recycling and consequences for export (House of Commons, 2022). Although this is a UK-study, to some extent a similar situation can be seen in EU Member States.

The European Investment Bank (2023) estimates the investment gap in the EU, in order to increase capacity by 2025 in pursuit of the aim of the EU plastic strategy of at least 10 million tonnes recycled plastic in annual use in new products in 2025, to be EUR 7-9 billion. This estimated investment need is calculated based on the additional need of 4.2 million tonnes of annual plastics sorting capacity and 3.8 million tonnes of annual recycling capacity by 2025.

Figure 3.4 Plastic waste recycling capacity, EU + United Kingdom, 2023, million tonnes



Source: Plastic Recyclers Europe (2023)

The level of plastic recycling capacity in Europe depends on the polymer type. A report assessing Belgium’s plastic waste flows highlighted that LDPE is the most exported type of plastic. This could mainly be due to a lack of capacity to treat it within Europe and because of its low value of the material. On the other hand, HDPE is mostly recycled within Europe because of well-developed treatment facilities for this type of plastic and because of its higher value (Besoli, 2022). In the case of PET, and HDPE, the current installed recycling capacity in Europe is greater than the current collected volume – 700,000 tonnes of PET were collected in Europe in 2021 while the recycling capacity was 2.9 million tonnes (Soh, 2023) . Although the disparity was mainly filled in by the import of 1.9 million tonnes from China, India and Türkiye in 2021, there is growing concern in the EU about the quality of imported plastic and whether it meets the European standards for food packaging. Additionally, to prevent imported PET, which is cheaper than PET collected in Europe, from reducing the attractiveness of European PET, it is important to continue developing collection schemes within the EU Member States, thus increasing the share of European PET that is recycled.

3.5.2 Insufficient collection schemes

The European collection schemes for plastic waste are still insufficient. This is particularly the case for the non-packaging plastics, which have much lower collection rates than packaging plastics. For example, plastic in building and automotive are collected to less than a quarter of the demand for production (EEA, 2022). This can be explained firstly by the fact that non-packaging plastic items often contain a complex mix of polymer types or are combined with other materials which complicate their separation during collection; as a result they often end-up being incinerated or landfilled. Secondly, some plastics embodied in non-packaging items have a much longer lifetime and build up in homes rather than being disposed of properly (European Investment Bank, 2023).

For the case of packaging plastics, capture rates by separate collection are often high for PET bottles, but low to very low for other common packaging polymer types and product categories, such as PET trays, rigid bottles and containers from PE, PP, and PS, and PE and other films. In Belgium, for example, in 2015, collection systems captured more than 80 % of the PET bottles put on market, but only about half of the rigid PE containers, and less than 9 % of any other polymer type and packaging product category. (RDC

Environment SA, 2018). Roosen et al. (2022) calculated that in the same year, on a total of 219,000 tonnes of plastic packaging put-on-market in Belgium, less than 74,000 tonnes, only 33.6 %, were separately collected (Roosen et al., 2022). The mechanical sorting operations performed on the separately collected plastics resulted in 64,000 tonnes of baled waste plastic, sorted by polymer type and packaging product category. Just more than three-quarters, 76 %, of the bale weight corresponded to PET bottles of different colours. Figures for the Netherlands (Brouwer et al., 2018) for 2014 reveal a put-on-market figure of 341,000 tonnes, of which only 86,000 tonnes, 25 %, were separately collected, resulting in 59,500 tonnes of recycled plastics. The sorting and mechanical recycling of plastic packaging collected as part of the municipal solid waste instead of through separate collection, which represents 75 % of the put-on-market figure, only yielded 17,000 tonnes of recycled plastics. This means that less than 7 % of the plastic packaging in municipal solid waste was recycled, against almost 70 % of the plastic packaging from separate collection schemes, underscoring again separate collection is essential for achieving high recycling rates.

3.5.3 The impact of increased energy costs on recycling capacity

At the beginning of 2022, Russia's invasion of Ukraine caused an energy and raw material crisis which in turn brought significant challenges to the European plastic industry. The steep rise in energy costs has hindered the competitiveness of European plastic producers and has shown the vulnerability of the sector towards energy prices. Not only is this the case for producers, but also for recyclers, whose facilities run continuously and for whom energy amounts to 15-20 % of their total costs.

Plastics Recyclers Europe warned the energy prices increases of up to 400 % meant that companies could no longer make sufficient profits to sustain their businesses. In Italy, for example, 40 % of recycling activities were suspended because of energy prices being too high. This inevitably led to a decrease in European already limited recycling capacity (Section 3.5.1) (Packaging Europe, 2022).

In the long run, however, energy prices should not hamper recycling activities as the energy use in recycling plastics is significantly less than its production from oil-based materials (OECD, 2018).

3.6 Indirect impact on exports from EU circular economy measures

3.6.1 Various circular economy policies might have an indirect impact on exports

The EU has established a legislative framework regulating the whole plastic value chain, with a specific focus on waste management. There are several provisions addressing plastic, including market-based instruments, such as EPR schemes and the EU plastic tax; regulatory instruments, including recycling targets and minimum recycled content requirements; and voluntary instruments such as green public procurement and EU ecolabels. These impact the trade in plastics waste in different ways.

Recycling targets are a policy tool traditionally used in the EU, often in combination with EPR schemes, to foster waste recycling. They are generally set and applied to multi-material products that also contain plastic, such as WEEE, EVs and batteries. In the case of packaging, in addition to an overall recycling target, specific recycling targets for plastic packaging waste have been established. Currently, Member States can attain these by exporting collected waste for recycling within or outside the EU (see e.g. EC, 2005a, 2005b, 2005c), provided that there is sound evidence that recycling takes place under conditions that are broadly equivalent to those prescribed by EU legislation. The latter provision is, however, weakly enforced because there are no clear mechanisms to implement it (EC, 2021b). Hence, increasing targets, if coupled with a lack of recycling capacity in the EU, could result in the growth of waste shipments to extra-EU countries with capacity in excess of their domestic supply. An EU tax on Member States for non-recycled plastic could have a similar impact.

The European Commission’s 2023 Waste early warning report (EC, 2023) analysed Member States’ progress towards compliance with EU municipal waste recycling targets. The study observed that no less than 19 Member States will struggle to meet the 50 % plastic packaging waste recycling target in 2025 and concluded plastic packaging to be the most demanding packaging waste stream to recycle.

Other policy tools have, therefore, been adopted at the EU level, which, by addressing the whole plastic value chain – eco-design, supply and demand of recycled plastic – are aimed at supporting the development of a well-functioning internal EU plastic recycling market. This, indeed, could prove effective in reducing the export of plastic waste. The way these measures affect the decision to export plastic waste beyond the EU is determined not so much by single tools, but by the policy mix in place within the EU and its interaction with other economic and infrastructural drivers. For instance, policy tools that foster eco-design, such as legislation prohibiting/restricting the use of hazardous chemicals or green public procurement provisions concerning the recyclability of products, are expected to increase the amount of plastic waste available for recycling and to improve the quality of the related secondary raw materials. Collection obligations also increase the amount of plastic waste available for recycling. But, in the absence of other factors enabling recycling to take place in Europe, plastic waste can be exported and treated outside the EU. Recycled content requirements, along with green public procurement and the EU Ecolabel are mainly aimed at creating a stronger demand for recycled plastic and may support investment in recycling as a result. In theory, however, this demand can also be met by importing recycled plastic from third countries.

A list of the most important EU policy measures addressing plastic is provided in Table 3.1. This framework is currently evolving based on the 2020 Circular Economy Action Plan (European Commission, 2020), which identifies plastic and several products containing plastic – packaging, textiles, electronics and information and communications technology (ICT), vehicles, batteries, and construction and buildings) among key value chains.

Table 3.1 Selected EU legislative measures addressing plastic and their possible impact on the export of plastic waste to third countries

<i>Legislative measures</i>	<i>Examples of possible impacts on the export of plastic waste to third countries</i>	<i>Selected legislative references</i>
Legislation on chemicals (e.g., registration, evaluation, authorisation and restriction of chemicals (REACH) legislation) and prohibition to place certain plastic products/materials on the market, e.g., beverage cups and containers made of expanded polystyrene.	Removing hazardous materials from the market contributes to increasing the recyclability of plastic waste and the quality of recycled plastic. The availability of a higher amount of recyclable plastic could increase/decrease plastic waste exports, depending on other factors.*	REACH Regulation (EU, 2006c); Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE; EU, 2011); Single-Use Plastic (SUP) Directive (EU, 2019)
Further eco-design requirements related to product making. e.g., recycled content requirements for plastic bottles.	Increase the amount of plastic waste available for recycling and the quality of recycled plastic. The availability of a higher amount of recyclable plastic could increase/decrease plastic waste exports, depending on other factors.* Recycled content requirements increase the demand for recycled plastic, which may contribute to developing recycling capacity in EU, which, in turn, is important for reducing plastic exports.	Packaging and Packaging Waste (PPW) Directive (EU, 1994); SUP Directive (EU, 2019)
Provisions aimed at reducing the consumption of certain plastic products,	The availability of a greater amount of recyclable plastic could increase/decrease plastic waste exports, depending on other factors.*	PPW Directive (EU, 1994); SUP Directive (EU, 2019)

Legislative measures	Examples of possible impacts on the export of plastic waste to third countries	Selected legislative references
e.g., lightweight plastic carrier bags, cups for beverages and food containers, and substituting them with alternatives that can be more easily reused/recycled.	More plastic reuse and reductions in the use of plastics should slow down waste generation and, therefore, lower pressure for exports.	
EU Ecolabel and green public procurement criteria stimulating the demand for, and, hence, the supply of more sustainable and eco-designed plastic products, i.e., those that incorporate recycled plastic and/or are highly recyclable, etc.	The increased demand for recycled plastic may contribute to developing recycling capacity in the EU, which, in turn, is important for reducing plastic exports. The availability of a higher amount of recyclable plastic could increase/decrease plastic waste exports, depending on other factors.*	Regulation on the EU Ecolabel (EU, 2010);
Obligation to separately collect plastic waste, e.g., plastic household waste, WEEE, batteries, etc.	Increase the amount of plastic waste available for recycling. This could increase/decrease plastic waste exports, depending on other factors.*	Directive on waste batteries and accumulators (EU, 2006a); Waste Framework Directive (WFD; EU, 2008); WEEE Directive (EU, 2012); SUP Directive (EU, 2019)
Extended producer responsibility and recycling targets, which can be combined or used separately, depending on the waste stream.	Recycling targets can be met both by treating plastic waste within the EU and by exporting it to third countries for recycling.	PPW Directive (EU, 1994); ELV Directive (EU, 2000); Directive on waste batteries and accumulators (EU, 2006a); WFD (EU, 2008); WEEE Directive (EU, 2012); SUP Directive (EU, 2019)
EU plastic tax, i.e., national contribution, with a uniform rate of EUR 0.80 per kilogram, based on the amount of non-recycled plastic packaging waste, which Member States pay into the EU budget.	It is aimed at increasing the recycling of plastic packaging waste, but recycling can take place within or beyond EU borders.	Council Decision (EU, Euratom) 2020/2053 (EU and Euratom, 2020)

* These factors include, among others, the availability of recycling capacity within the EU and the cost of recycling within the EU compared treating waste in third countries, taking account, for example, of gate-fee differentials and transport cost.

Source: EU legislation

Box 3.3 PET shows transitions take time and involve the waste trade

According to the Directive 94/62/EC on packaging and packaging waste, the EU prescribes that no later than 31 December 2025 a minimum of 65 % of all packaging waste by weight must be recycled, and 50 % of plastic packaging. By 2030, the latter percentage is increased to a minimum of 55 % by weight. In Europe, plastic waste is commonly associated with packaging waste, and more specifically with PET bottles. Specific regulations have been proposed and approved with respect to PET bottles – Directive (EU) 2019/904 on the reduction of the impact of certain plastic products on the environment, better known as the SUP Directive, requires Member States to ensure that PET beverage bottles incorporate at least 25 % recycled plastic by 2025 and 30 % by 2030.

The prospect of mandatory recycled content requirements has drastically changed the recycled PET market. While most of the recycled PET originates from collected food grade PET bottles, only an estimated 29 % of recycled PET is destined to closed-loop bottle-to-bottle recycling, resulting in an estimated inferred recycled content in PET bottles of 17 % in 2020. The amount of food grade recycled PET for bottle production required to comply with these 2025 recycled content targets exceeds current supply (Eunomia, 2022; Eunomia and Zero Waste Europe, 2022).

The current mechanical PET-recycling capacity in the EU mainly targets the production of food-grade recycled PET for bottle production and the necessary infrastructure and mechanical technologies are well developed in several Member States. The capacity for processing other polymers present in separately collected plastic packaging waste falls short of plastic packaging waste generation, while the recycling infrastructure and technologies for polyester-containing textiles are still in the early stages of development (Eunomia, 2022).

Kahlert and Bening (2022) demonstrated that the pledged volume for recycled PET (rPET) to be used in the EU in 2025 amounts to 2.1 million tonnes, which would require the annual recycling growth rate to double in the coming years as compared to 2014–2018. The imbalance between the demand for recycled bottle-grade PET on the one side and the supply of PET bottle waste feedstock on the other has driven the bottled-water industry to demand '*proportionate, fair access to the material*' from the European Commission by being granted a '*right of first refusal*'. This way, PET bottles collected through EPR and deposit return schemes would be reserved for recycling into new food grade bottles. The European Commission, however, rejected the sector's call in 2023, arguing that the proposed right of first refusal risked causing distortions of the market for secondary materials (Euractiv, 2023).

From the above, it can be concluded that two trends reinforce each other in increasing the supply of packaging plastics for which there is insufficient recycling capacity and market demand with the EU. The first trend, of an excess demand for recycled bottle-grade PET, resulted in high prices being paid for recycled PET. At the same time recyclers in the EU were faced with limited availability of collected waste feedstocks, and with operational hurdles and logistical challenges for sourcing and processing this feedstock (Chemanalyst, 2023) . The second trend consists of the cherry-picking of PET bottles from the supply of separately collected plastic packaging waste, leaving the considerable volumes of non-bottle packaging without demand and processing capacity. Export of these leftover packaging plastics to non-EU countries might then constitute the only viable outlet.

3.6.2 EU policies may also impact the export of plastic embedded in used products

In addition to the trade in sorted, baled, or bagged plastic waste and scrap that is exported for further treatment abroad, the EU exports considerable volumes of plastics that are either part of used products that have not been dismantled, shredded or sorted into separate material fractions, or that constitute an impurity within other recyclable waste streams. These embedded plastics might be released as recycling residues or valueless mixed-material fractions in the country of destination, where appropriate treatment,

disposal or recovery facilities may not be available, resulting in important quantities of EU-sourced plastics being released into the local environment.

The main product categories involved in this include EEE, ELVs and textiles. Additionally, waste-material fractions with a significant plastic content that is not targeted in the supposed material recycling processes in the importing country belong to this category. Examples of the latter include paper, cardboard and discarded clothing.

These types of export are subject to the waste shipment regulations and the products are covered by HS-statistics but often the HS-codes outside 3915 only distinguish plastic from non-plastic products with no reference to the amount of plastic or type of polymer in the products. Hence, it is challenging to analyse these exports or estimate the content and type of plastics. Action to improve the traceability of plastic products in the HS-system has been proposed for some building products, amongst others (Boberg et al., 2021).

The main driver of this type of export is the economic benefit associated to second-hand product sales or derived from the value of the non-plastic content in targeted material fractions. Potential economic beneficiaries may include the generator, collector or sorter, the trader or broker, and the receiving party of waste materials and of product components or whole products for reuse or repair abroad.

EU directives and regulations have been an important driver of the (separate) collection and subsequent recycling of discarded products. Although few of these products consist entirely of plastics, many of them have a significant plastic content. The fact that plastic and plastic-containing products are (separately) collected and offered for recycling, generates a ready supply of potentially recyclable plastics. By weight, ELVs are the second most relevant plastic-containing product category that is collected and recycled in the EU, plastic packaging being the first. This lack of regulation and trade statistics on embedded plastic waste also has implications for waste exports.

4 Key findings

Global trade in plastic waste and scrap has been steadily declining in recent years due to tighter regulations governing the movement of plastic waste under the Basel Convention, escalating shipping costs, and disruptions in global supply chains (Monitoring trade in plastic waste and scrap, 2022). Exports from the EU have diminished, from a peak of 2.5 million tonnes in 2015 to approximately one million tonnes in 2022. The export destinations have also changed and less than 20 % is now exported to non-OECD countries. The largest exporting OECD destination is Türkiye, and large non-OECD destinations include Indonesia and Malaysia.

Nonetheless, large amounts of plastic waste are exported risking contributing to worldwide plastic pollution and understanding the drivers behind the trade is crucial to reducing that risk. Decision on whether or not to export plastic waste are largely affected by regulatory, economic and infrastructural factors.

The key driver for the export of separated plastic waste for recovery is economic, as waste dealers seek the best price for recycling. Increased production of plastic waste coupled with under-developed infrastructure and capacity for recycling within the EU is a key driver for plastic waste export. Currently, the growth of European capacity to sort and recycle plastics lags behind the growth in generated plastic waste. This can be explained by technological, regulatory, and financial constraints.

There are also pull-factors in importing countries. Domestic plastic recyclers in the major importing countries prefer sourcing plastic waste from the EU as it provides reliable large quantities and plastic waste from the EU is of better quality. This situation risks creating a strong dependence on imported waste in those countries, undermining the development of domestic waste management infrastructure in the importing countries.

Table 4.1 Drivers of and barriers to the waste trade

Type of driver or barrier to export of plastic waste	Impact on exports (green- fewer exports; yellow – neutral, or hard to assess; red – more exports)	Comments
1) Trade bans and restrictions by third countries		Regulation and bans affecting export to non-OECD countries have been shown to have a significant impact on legal trade.
2) Export procedures		Enforcement of export procedures is difficult due to the complex chain of actors, and it is often hard to identify the waste, which may drive incorrect or illegal trade.
3) Economic drivers (both push and pull factors)		There are economic reasons to sometimes export plastic waste for recycling. The combination of several push and pull factors may drive an increase or a decrease in exports.
4) Infrastructure challenges		There is currently a great imbalance in the EU between the generation of plastic waste and management infrastructures, this gap may lead to an increase in exports.
5) Indirect consequences of the EU circular economy policy framework		The circular economy framework is among the factors supporting the functioning of secondary raw materials markets. A better intra-EU market may reduce extra-EU trade, but more circular waste management may increase the availability of materials to be exported.

Source: Development based on tables in (ETC/CE, 2023; ETC/WMGE, 2019)

The ongoing transformation to a more circular use of plastic in the EU could impact the external waste trade as part of the flow of secondary raw material. While the export of plastic waste in general carries a high risk of adding to plastic pollution, some exports may be part of an effective chain for recycled plastic as a substitute for virgin oil-based plastic. Increasing EU waste targets could result in the growth of waste shipments to extra-EU countries if there is a lack of recycling capacity in the EU and third countries choose to import. However, EU policy reforms creating a stronger demand for recycled plastic may support EU investment in recycling capacity and counteract exports, although this demand could also be met by EU Member States importing recycled plastic from third countries.

The various export drivers interact. As the case of PET bottles shows, two trends reinforce each other in increasing the supply of packaging plastics for which there is insufficient recycling capacity and market demand within the EU. The excess demand for recycled bottle-grade PET resulted in high prices being paid for rPET. At the same time recyclers in the EU were faced with limited availability of collected waste feedstock, and with operational hurdles and logistical challenges for sourcing and processing it. The second trend consists of the cherry-picking of PET bottles from the supply of separately collected plastic packaging waste, leaving little or no demand or processing capacity for considerable volumes of non-bottle packaging. Exports of these leftover packaging plastics to non-EU countries might then constitute the only viable way out.

To disincentivise the plastic waste trade, the EU should strengthen its efforts to balance its recycling capacity with plastic waste production. In analysing the EU export of plastic waste, this report also echoes a conclusion of the ETC-CE report on the need of comparable data on the waste trade and waste management practices (ETC/CE, 2023). More detailed and reliable analyses need detailed data that examines the role of trade in waste management practices.

5 List of abbreviations

CEAP	Circular Economy Action Plan
CN	Combined Nomenclature
EEA	European Environment Agency
ELV	end-of-life vehicle
EU	European Union
EEE	electrical and electronic equipment
EFTA	European Free Trade Association
EPR	extended producer responsibility
EWC	European Waste Catalogue
HDPE	high-density polyethylene
HS	Harmonised System
ICT	information and communications technology
i.e.	<i>id est</i> (that is)
IMPEL	European Union Network for the Implementation and Enforcement of Environmental Law
LDPE	low-density polyethylene
NACE	<i>Nomenclature statistique des activités économiques dans la Communauté Européenne</i> (statistical classification of economic activities' in the European Community)
OECD	Organisation for Economic Co-operation and Development
PE	polyethylene
PET	polyethylene terephthalate
PP	polypropylene
PPW	packaging and packaging waste
PS	polystyrene
PVC	polyvinyl chloride
REACH	registration, evaluation, authorisation and restriction of chemicals
rPET	recycled polyethylene terephthalate (PET)
SUP	single-use plastic
UK	United Kingdom
WEEE	waste electrical and electronic equipment
WFD	Waste Framework Directive
WSR	Waste Shipment Regulation

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