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# Monitoring trade in plastic waste and scrap

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Peter Börkey**

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**Monitoring trade in plastic waste and scrap (2023)**

**Environment Working Paper No. 210**

By Andrew Brown (1), Frithjof Laubinger (1), Peter Börkey (1)

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## Abstract

Global trade in plastic waste and scrap declined further (2017-2021) in 2021 and preliminary data indicates a continuing trend in the first half of 2022 (January to May). The combined trade surplus of OECD Member Countries (i.e., the difference between exports and imports) continued to decrease. Less plastic waste and scrap is being exported by OECD countries to non-OECD countries, however some countries still export substantial volumes to non-OECD countries. Particularly several non-OECD south-east Asian countries remain large export destinations. At the same time, trade between OECD countries has increased. The value and composition of plastic waste and scrap exports in 2021 suggests that more high value and easy to recycle plastic waste was traded. The trade regime remains dynamic with new export destinations emerging, which deserve further monitoring.

**Keywords:** Plastics, trade, circular economy, waste management

**JEL Codes :** F18, L65, Q53, Q56

## Résumé

Le commerce mondial des déchets et débris de plastique a encore diminué (2017-2021) en 2021 et les données préliminaires indiquent que cela s'est poursuivi au premier semestre 2022 (janvier à mai). L'excédent commercial combiné des pays membres de l'OCDE (c'est-à-dire la différence entre les exportations et les importations) a continué de diminuer. Les pays de l'OCDE exportent moins de déchets et de débris de plastique vers les pays non-membres, mais certains pays exportent encore des volumes substantiels vers les pays non-membres de l'OCDE. En particulier, plusieurs pays d'Asie du Sud-Est non-membres de l'OCDE restent d'importantes destinations d'exportation. Dans le même temps, les échanges entre les pays de l'OCDE ont augmenté. La valeur et la composition des exportations de déchets et de débris de plastique en 2021 suggèrent que davantage de déchets de plastique de grande valeur et faciles à recycler ont été échangés. Le régime commercial reste dynamique avec l'émergence de nouvelles destinations d'exportation qui méritent un suivi continu.

**Mots clés :** Plastiques, commerce, économie circulaire, gestion des déchets

**Classification JEL :** F18, L65, Q53, Q56

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# Table of contents

|   |    |
|---|----|
| Abstract  | 3  |
| Résumé  | 4  |
| Acknowledgements  | 5  |
| Executive Summary   | 7  |
| 1. Background   | 8  |
| 2. Results and discussion   | 10 |
| Global developments (since 2017)  | 10 |
| Recent developments in trade by OECD Member Countries   | 13 |
| Trade value indicator developments  | 20 |
| 6-digit HS codes  | 21 |
| References  | 24 |
| Annex A. Methodology  | 26 |
| <b>Figures</b>  |    |
| Figure 2.1. Global plastic waste and scrap export destination                                     | 10 |
| Figure 2.2. Key importers of plastic waste and scrap in 2020 and 2021 globally                    | 13 |
| Figure 2.3. OECD import and export developments and their share in global trade                   | 14 |
| Figure 2.4. 2021 and 2020 exports by OECD Member Countries  | 14 |
| Figure 2.5. 2021 exports by OECD countries to OECD and non-OECD countries                         | 15 |
| Figure 2.6. Global trade flows in plastic waste and scrap in 2021                                 | 17 |
| Figure 2.7. Key destinations of OECD exports of plastic waste and scrap in 2020 and 2021          | 18 |
| Figure 2.8. 2020 and 2021 exports destined for OECD Member Countries                              | 19 |
| Figure 2.9. Trade value per weight of exports of plastic waste and scrap by OECD Member Countries | 20 |
| Figure 2.10. OECD plastic waste and scrap exports by commodity type                               | 21 |
| Figure 2.11. OECD exports of vinyl chloride polymers waste and scrap                              | 22 |
| <b>Boxes</b>  |    |
| Box 1.1. Recent policy developments   | 8  |
| Box 2.1. Timeline of global trade policy for transboundary movements of plastic waste and scrap   | 11 |
| Box 2.2. Relevant work published or underway  | 23 |

## Executive Summary

Global trade in plastic waste and scrap declined further in 2021 and preliminary data indicates a continuing trend in the first half of 2022. There was a noticeable dip in trade by weight in the first months of 2021, which partially rebounded in mid-2021, but did not return to levels seen in previous years. This is possibly due to stakeholders adjusting to the Basel trade rules that entered into force 1 January 2021.

The combined trade surplus of OECD Member Countries continued to decrease. OECD countries exported less and imported more plastic waste and scrap, suggesting that more plastic waste is being recycled domestically.

Less plastic waste and scrap is being exported by OECD countries to non-OECD countries, however some countries still export substantial volumes to non-OECD countries. The share of exports from OECD countries destined to non-OECD countries decreased from 36% in 2020 to 28% in 2021. Some OECD countries continued to export substantial volumes to non-OECD countries in 2021. In particular, these included Japan (0.56 Mt, 90% of their total exports), USA (0.26 Mt, 46%), the Netherlands (0.21 Mt, 36%), Germany (0.09 Mt, 13%) and Australia (0.08 Mt, 80%).

Trade among OECD countries has increased, but non-OECD south-east Asian countries remain large export destinations. In 2021 more plastic waste and scrap was traded regionally among EU countries and among OECD countries in North America (US, Canada and Mexico). However, non-OECD countries in Asia remain large importers. Malaysia was still the second largest export destination overall in 2021, and Viet Nam fifth. Indonesia, “other Asia nes”<sup>1</sup> and India also received substantial volumes.

The value and composition of plastic waste and scrap exports in 2021 suggests that more recyclable waste was traded. The trade value indicator (reported value divided by reported weight) of intra-OECD trade converged with the same indicator for exports from OECD Member Countries to non-Members in early 2020, suggesting a convergence in the quality of these exports. Both trade value indicators rose over the course of 2021 and the first months of 2022, which could be the result of several factors including a general increase in commodity and resin prices over this time period, but possibly also an improved quality of waste and scrap exports. As well, a higher share of waste was traded under “ethylene polymers” (HS 391510), whilst less was traded under “polymers not elsewhere classified” (HS 391590). Assuming that ethylene polymers are relatively free from contamination this would support the hypothesis of improved quality in plastic waste and scrap exports.

The trade regime remains dynamic with new export destinations emerging, which deserve further monitoring. Exports to Turkey decreased in 2021 but remain on a high level. Especially several EU Member States received substantially more volumes, including Poland, Netherlands, Belgium, Spain and France. Also, Latin American countries (OECD and non-OECD) experienced a substantial increase in imports, albeit in some cases small in absolute volumes. These include Mexico (38% increase compared to 2020 by 0.26 Mt), Honduras (+70%, 0.12 Mt), El Salvador (+47%, 0.05 Mt), Colombia (2.8-fold increase, 0.04 Mt) and Chile (4-fold increase, 0.01 Mt). Given the dynamic developments in trade flows, further monitoring is recommended.

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<sup>1</sup> Other Asia “not elsewhere specified” includes, *inter alia* exports to Chinese Taipei.



## 1. Background

Trade of plastic waste and scrap can facilitate the movement of materials to countries with a comparative advantage in recycling plastic. The economies of scale that trade enables are likely to be an essential tool for strengthening secondary plastic markets and increasing plastics circularity. However, over the past decades some export destinations experienced an influx of plastic waste and scrap that was in parts hazardous or heavily contaminated, raising concerns about the capacity of these countries to manage this waste in an environmentally sound manner (OECD, 2022<sup>[1]</sup>).

In response to growing pressures, key importers imposed trade restrictions over the course of the past decade. As of 1 January 2021, amendments to the annexes of the *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal* (the Basel Convention) and the appendices of the *OECD Decision of the Council on the Control of Transboundary Movements of Wastes Destined for Recovery Operations* (OECD/LEGAL/0266) (the OECD Decision) imposed new controls on transboundary shipments of plastic waste and scrap on a global level (Box 1.1).

This monitoring report aims to identify and assess trends in trade patterns in the context of recent policy developments. The report is part of an ongoing annual OECD monitoring exercise that aims to inform analysis of the relationship between transboundary shipments of plastic waste and scrap and plastic recycling in OECD countries. The last monitoring report was conducted in November 2021, based on data taken from 8 October 2021, and subsequently published in April 2022 (Brown, Laubinger and Börkey, 2022<sup>[2]</sup>). This third report of the series is based on data that was downloaded from UN Comtrade on 8 September 2022 and uses the same methodology than previous reports (see Annex A). UN Comtrade is a database that aggregates detailed global annual and monthly trade statistics by product and trading partner. Data is based on the Harmonised Code (HS) nomenclature, which classifies goods based on a 6-digit code system. The following HS Codes were considered for this analysis:

- HS 3915: Waste, parings and scrap, of plastics
  - HS 391510: Ethylene polymers waste, parings and scrap;
  - HS 391520: Styrene polymers waste, parings and scrap;
  - HS 391530: Vinyl chloride polymers waste, parings and scrap; and
  - HS 391590: plastics not elsewhere classified (n.e.c.), a catch-all for other material.

The report uses annual data submissions from 2017 to 2021 throughout and monthly data from January 2017 to May 2022 in the analysis of global trade patterns. Monthly data from January to May 2022 is included as 'preliminary' to acknowledge that this monthly data reporting may still have been incomplete at the date of data extraction. It provides a first assessment of the consequences of the new international controls at the level of the Basel Convention and OECD on the transboundary movements of plastic waste and scrap that entered into force on 1 January 2021 (Box 1.1).

### Box 1.1. Recent policy developments

As of 1 January 2021, new international controls on the transboundary movement of plastic waste and scrap became effective. These include:

- Amendments to Annexes II, VIII and IX to the Basel Convention controlling the transboundary movement of certain plastic waste.
- Modifications to the Appendices 3 and 4 of the OECD Decision controlling the transboundary movements of hazardous plastic waste (i.e. those covered by the new OECD entry AC300, which corresponds to new Basel entry A3210).

- For non-hazardous plastic wastes, namely those covered by new Basel entries B3011 and Y48, OECD Member Countries retain their right to control the plastic waste in question in conformity with its domestic legislation and international law.

Different controls have been adopted by OECD Member Countries for transboundary movements of non-hazardous plastic waste.<sup>2</sup> Bilateral or regional agreements or arrangements exist between United States and Canada and within the EU single-market, leaving this intraregional trade relatively unencumbered.

Other OECD Member Countries applied stricter controls. For instance, in July 2021, the Republic of Türkiye (hereafter Türkiye) announced an effective ban on the import of composite packaging (European Waste code: 15 01 05), plastic and rubber (19 12 04) and mixed packaging (15 01 06).

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<sup>2</sup> An up-to-date table of national controls is available here: <https://www.oecd.org/environment/waste/Reporting-of-controls-non-hazardous-waste.pdf>

## 2. Results and discussion

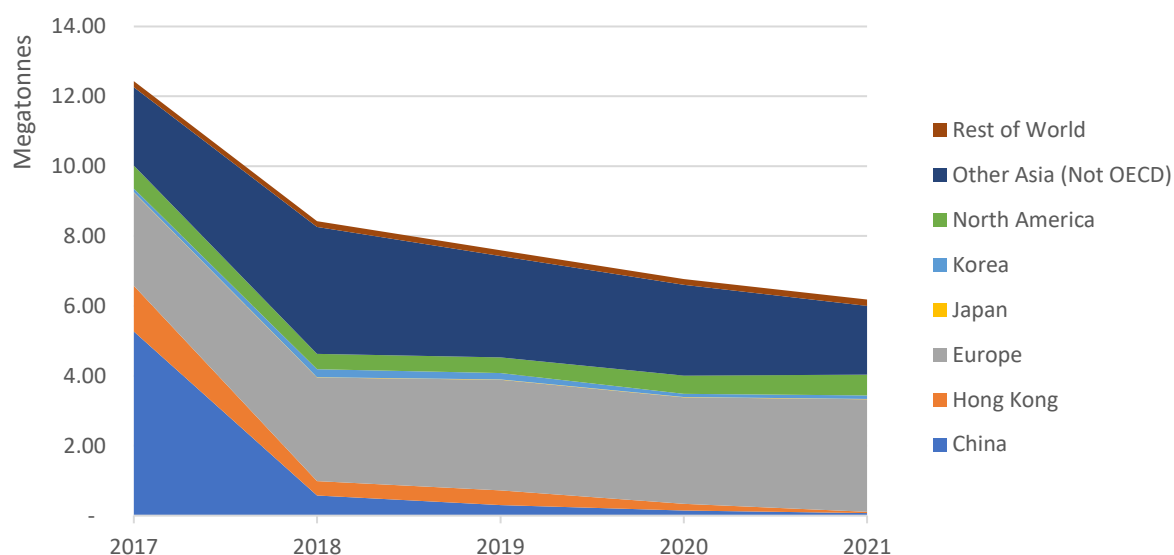
### *Global developments (since 2017)*

The (annual) reported global export weight of plastic scrap and waste fell by 50% over the past four years, from around 12.4 million metric tonnes (megatonnes, Mt) per annum in 2017 to 6.2 Mt per annum in 2021. Compared to the previous year, global trade volume declined by 8.5% (0.5 Mt) in 2021 from around 6.7 Mt in 2020.

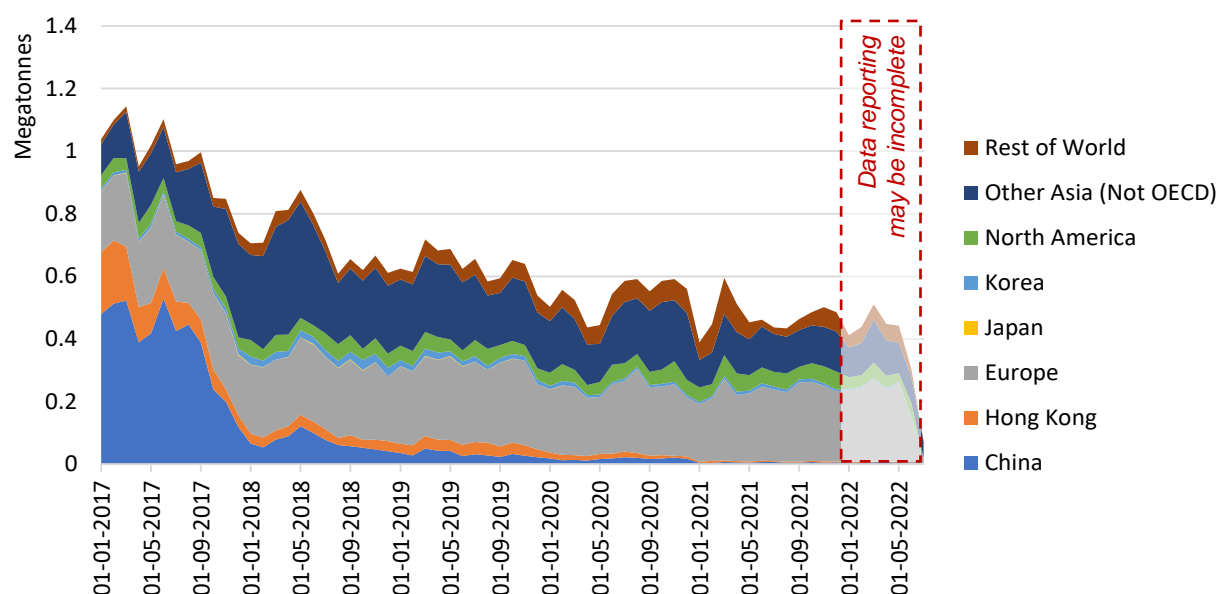
Before 2018, a large share of the annual plastic waste and scrap (HS 3915) exports were destined for the People's Republic of China (China) and Hong Kong, China. Exports to China declined substantially in 2018, triggered by tightened national import restrictions (see Box 2.1). Since then exports to China decreased further. Whilst in 2018, exports to China still made up 7% of global exported weight (0.5 Mt), it declined to roughly 1.2% in 2021 (0.07 Mt) (Figure 2.1).

**Figure 2.1. Global plastic waste and scrap export destination**

Reported annual export weight of HS 3915 (Waste, parings and scrap, of plastics) by destination type (2017-2021)



Reported monthly export weight of HS 3915 (Waste, parings and scrap, of plastics) by destination type (2017-2021 and preliminary data from January to May 2022)



Source: Authors, based on UN Comtrade data (UN Comtrade, n.d.<sup>[3]</sup>).

Monthly data shows a dip in exports during the first months of 2021, which may be due to stakeholders adjusting to the new trade regime. In the later months of 2021, trade increased, albeit at smaller amounts compared to prior years. It is likely that this decline can be partly explained by stricter controls on trade in plastic waste and scrap as a result of changes to the Basel Convention and the OECD Decision. However, external economic factors, such as supply chain disruptions related to global shipping container shortages and challenges with land based transportation have also likely affected trade and may confound analysis of the impact of Basel changes in isolation. A more detailed assessment of the impact of individual factors is outside the scope of this paper's analysis.

In the first months of 2022 exports remained stable. The decline in the most recent months in 2022 (i.e. May to July) may be partly due to as yet incomplete monthly data reporting to UN Comtrade.

### Box 2.1. Timeline of global trade policy for transboundary movements of plastic waste and scrap

Over the past decade, a number of trade policies have increasingly restricted trade in plastic scrap and waste. This has been mostly due to mounting environmental concerns related to the lack of environmentally sound management of imported plastic waste and scrap.

China, previously the largest destination for plastic waste and scrap exports, began extensively restricting imports of plastic waste and scrap in 2010 and tightened measures further in its 2013 “Green Fence” policy (Velis, 2014<sup>[4]</sup>). The 2017 “National Sword” policy restricts imports above a difficult to obtain contamination level (Wang et al., 2020<sup>[5]</sup>; Brooks, Wang and Jambeck, 2018<sup>[6]</sup>). The 2017 policy has essentially banned most plastic waste and scrap exports to China and led to indirect or ripple effects as emerging importers responded to subsequent increases in imports with their own trade restrictions. Notably, Southeast Asian states enacted import bans, including Thailand and Viet Nam (both June 2018) and Malaysia (July 2018) (Wang et al., 2020<sup>[5]</sup>).

At the 14th meeting of the Conference of the Parties (COP) to the Basel Convention, the COP adopted amendments to Annexes II, VIII and IX to the Basel Convention relating to plastic waste and scrap. The amendments control the transboundary movement of certain plastic waste and scrap and entered into effect on 1 January 2021 (Secretariat of the Basel Convention, 2019<sup>[7]</sup>).

The OECD Decision of the Council on the Control of Transboundary Movements of Wastes Destined for Recovery Operations [OECD-LEGAL-0266], which is closely interlinked with the Basel Convention, was also amended (OECD, 2020<sup>[8]</sup>). As of 1 January 2021, the following rules apply:

- Hazardous plastic waste and scrap, namely those covered by new Basel entry A3210, will be subject to the Amber control procedure under the OECD Decision and listed as new OECD entry AC300<sup>3</sup> under Appendix 4, Part II. This means that movement of such waste and scrap will be controlled pursuant to the tacit consent procedure with a consideration period of 30 days, or seven days where pre-consented facilities are concerned.
- For other plastic waste and scrap, namely those covered by new Basel entries B3011 and Y48, each OECD Member country retains its right to control the plastic waste and scrap in question in conformity with its domestic legislation and international law. Controls taken by OECD Member Countries with regards to transboundary movements of non-hazardous plastic waste and scrap are made available on the OECD website<sup>4</sup> and updated regularly.

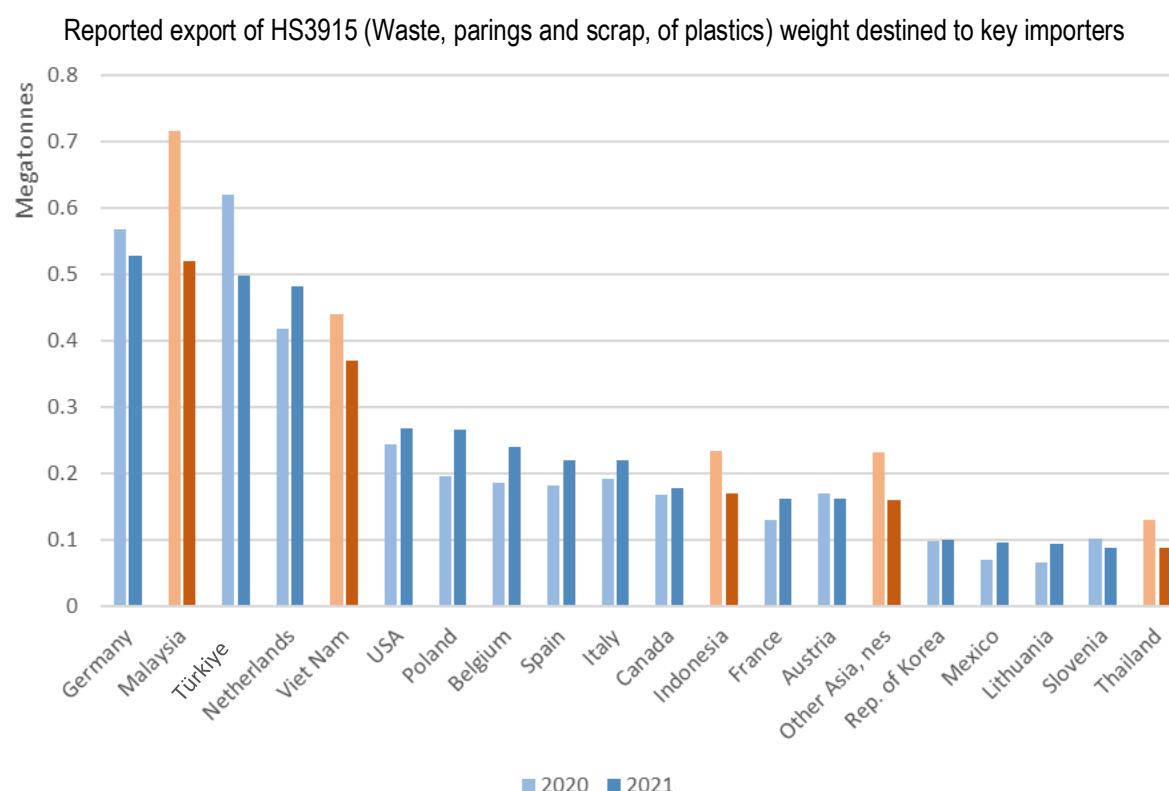
Notably, Türkiye banned the import of HS 391510 ethylene polymers waste and scrap in July 2021, but subsequently replaced the ban with an enhanced licensing system (Staub, 2021<sup>[9]</sup>).

Whilst imports by non-OECD countries declined between 2020 and 2021, several non-OECD countries remain among to top importing countries. Malaysia continues to be the second largest importer of plastic waste and scrap (after Germany), Viet Nam ranks fifth, and Indonesia, “other Asia nes [not elsewhere specified]”<sup>5</sup> and Thailand also continue to receive substantial amounts (Figure 2.2).

<sup>3</sup> The new OECD entry AC300 corresponds to Basel entry A3210. When transporting hazardous waste within the OECD, AC300 should be used.

<sup>4</sup> An up-to-date table of national controls is available here: <https://www.oecd.org/environment/waste/Reporting-of-controls-non-hazardous-waste.pdf>

<sup>5</sup> Other Asia “not elsewhere specified” includes, *inter alia* exports to Chinese Taipei.

**Figure 2.2. Key importers of plastic waste and scrap in 2020 and 2021 globally**

Note: Blue = OECD countries; Orange = non-OECD countries

Source: Authors, based on UN Comtrade data (UN Comtrade, n.d.<sup>[3]</sup>)

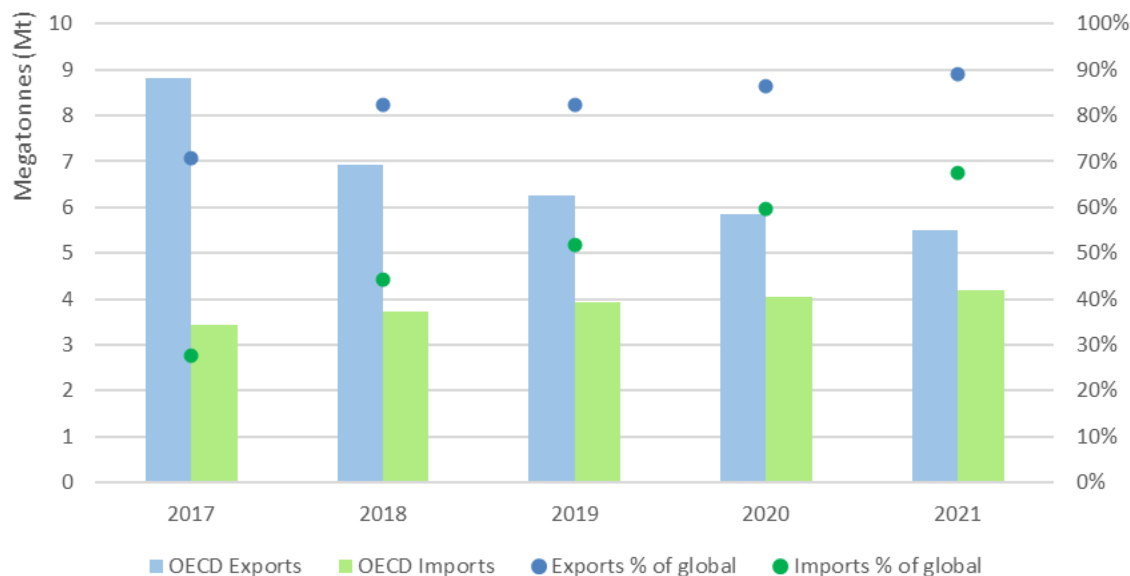
### ***Recent developments in trade by OECD Member Countries***

OECD countries were responsible for 89% of reported global exports of plastic waste and scrap in 2021. Over the past five years, OECD countries have also increasingly become important importers: in 2021, 68% of all plastic waste and scrap was imported by OECD countries (as comparison in 2017 only 28% of plastic waste was imported by OECD countries).

The OECD Member Countries in combination remain net exporters of plastic scrap and waste, but the trade surplus continues to decrease. Whilst in 2017, the trade surplus amounted to around 5.4 Mt (8.8 Mt exported and 3.4 Mt imported), in 2021 it was only 1.3 Mt (5.5 Mt exported and 4.2 Mt imported) (Figure 2.3).

**Figure 2.3. OECD import and export developments and their share in global trade**

Annual import and export of HS 3915 (Waste, parings and scrap, of plastics) reported by OECD member states (raw weight and share of global weight)



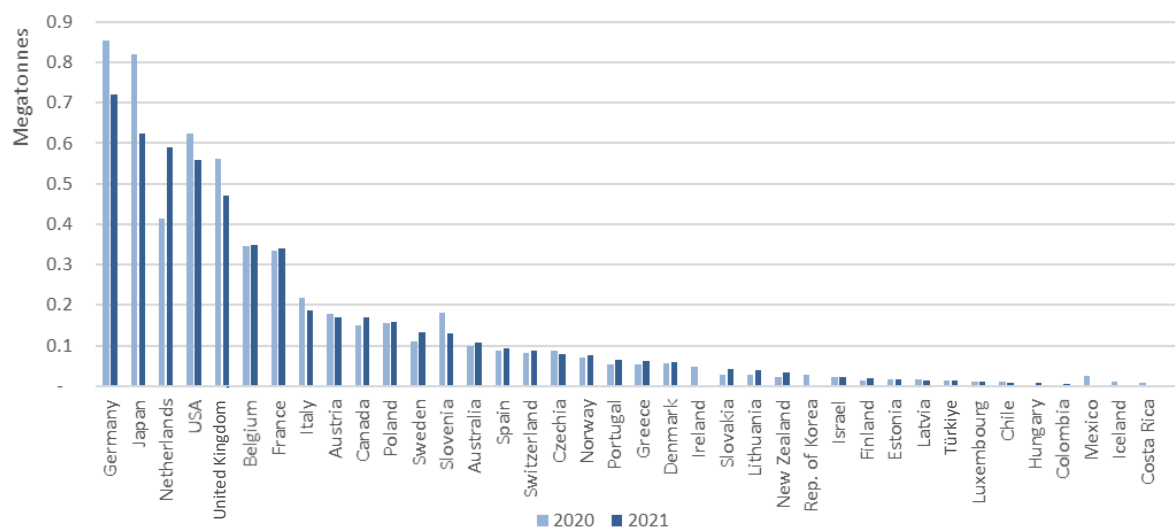
Source: Authors, based on UN Comtrade data (UN Comtrade, n.d.<sup>[3]</sup>).

### Exports by OECD countries

Overall exports of OECD countries reduced by 6% between 2020 and 2021 from 5.8 Mt to 5.5 Mt. In 2021, the four largest OECD exporters were Germany, the Netherlands, Japan, and the United States. Whilst most OECD countries exported less in 2021 compared to 2020, the Netherlands stands out and increased exports notably (Figure 2.4).

**Figure 2.4. 2021 and 2020 exports by OECD Member Countries**

Reported annual export weight of HS 3915 (Waste, parings and scrap, of plastics) by OECD Member Country

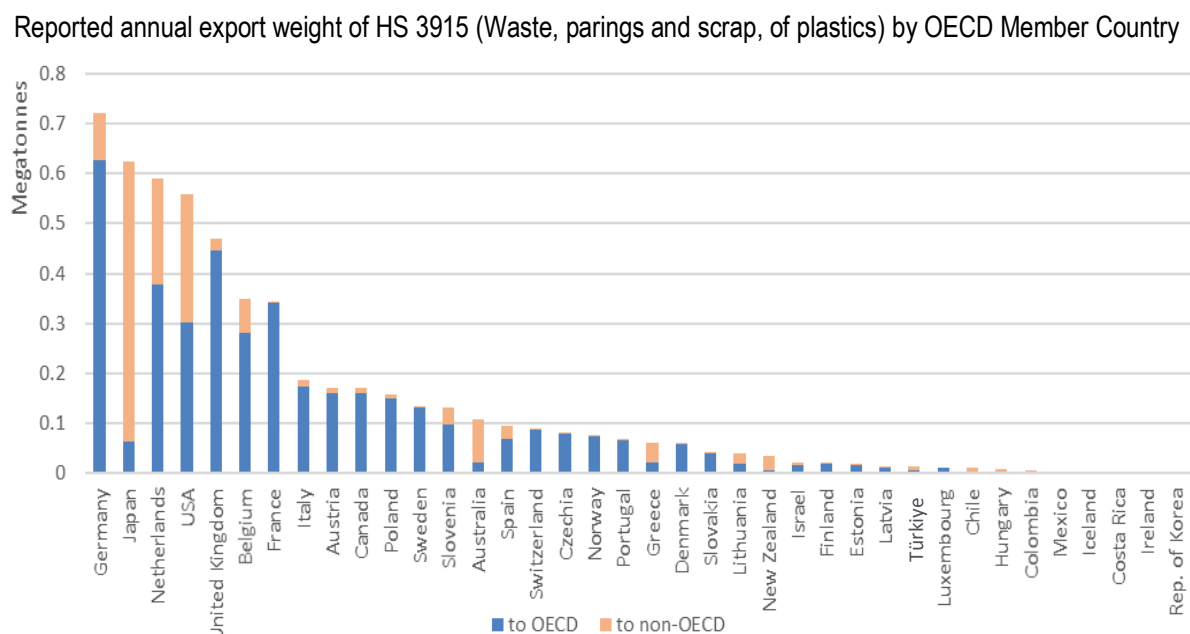


Note: UN Comtrade has not yet published annual export data from Ireland, South Korea and Costa Rica in 2021.

Source: Authors, based on UN Comtrade data (UN Comtrade, n.d.<sup>[3]</sup>).

The share of exports by OECD countries to non-OECD countries decreased from 36% of all OECD exports in 2020 to 28% in 2021. The OECD countries that exported the most to non-OECD countries in 2021 were: Japan (0.56 Mt, 90% of their total exports), USA (0.26 Mt, 46%), the Netherlands (0.21 Mt, 36%), Germany (0.09 Mt, 13%) and Australia (0.08 Mt, 80%) (Figure 2.5).

**Figure 2.5. 2021 exports by OECD countries to OECD and non-OECD countries**



Source: Authors, based on UN Comtrade data (UN Comtrade, n.d.<sup>[3]</sup>).

Trade flow developments in 2021 for major OECD exporters include:

- **Germany:** Most of Germany's exports were destined to the Netherlands, followed by Türkiye and Poland. Malaysia ranks 4<sup>th</sup> as export destination. 13% of Germany's plastic waste and scrap was exported to non-OECD countries. Overall Germany exported roughly 0.72 Mt in 2021 (compared to 0.85 Mt in 2020).
- **The Netherlands:** Belgium and Germany are its two major export destinations, but 36% of Dutch exports were also destined to non-OECD countries, including in decreasing order: Indonesia, Viet Nam, Malaysia. The Netherlands is the only OECD country that substantially increased exports of plastic waste and scrap between 2020 and 2021, from 0.41 Mt to 0.63 Mt. In particular exports to Viet Nam, Malaysia and "other Asia nes"<sup>6</sup> increased sharply, whilst exports to Türkiye halved from 2020 to 2021.
- **Japan:** Japan's export destinations are mostly other countries in Asia, of which a substantial share is destined to non-OECD Asian countries. Key export destinations include in decreasing order of weight traded: Malaysia, Viet Nam, "other Asia nes", Republic of Korea and Thailand. Around 90% of Japan's exports in 2021 were to non-OECD countries. Overall Japan exported 0.62 Mt in 2021 (compared to 0.82 Mt in 2020).
- **The United States:** Most of US exports were destined to its neighbours Canada and Mexico. 46% of exports in 2021 were to non-OECD countries, most notably to Malaysia, India, Indonesia and El

<sup>6</sup> Other Asia "not elsewhere specified" includes, *inter alia* exports to Chinese Taipei.



Salvador. Compared to 2020, especially exports to Mexico and India increased substantially. Overall the United States exported 0.56 Mt in 2021 (compared to 0.62 Mt in 2020).

- The United Kingdom: Türkiye remains the largest export destination. Other key partners include, in decreasing order: the Netherlands, Poland, Spain, Germany, Belgium, and Italy. Exports to Malaysia, which used to be a large export destination in 2020 decreased substantially. In 2021 only 5% of UK exports were to non-OECD countries. Overall the UK exported roughly 0.47 Mt in 2021 (compared to 0.56 Mt in 2020).

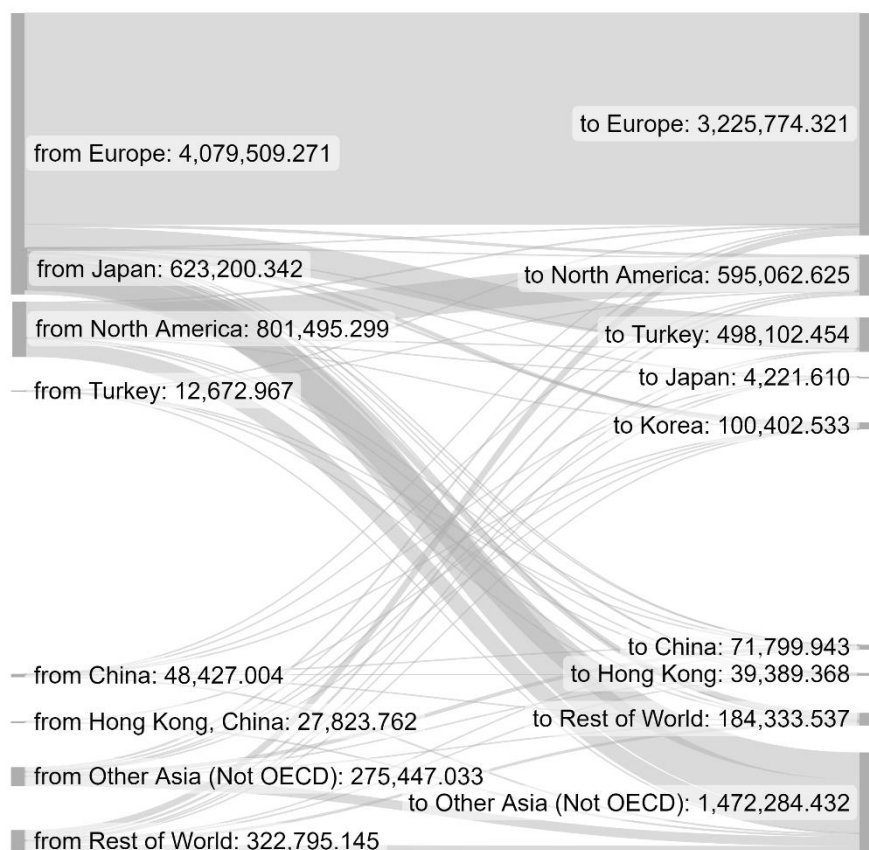
Overall, more plastic waste and scrap was traded regionally among OECD countries, in particular among EU countries and OECD countries in North America (US, Canada and Mexico). The Basel controls that entered into force beginning 2021 seem to have impacted trade to non-OECD countries, whilst some bilateral and regional trade agreements among OECD countries facilitated regional trade. Article 11 agreements or arrangements<sup>7</sup> currently facilitate trade of certain non-hazardous plastic waste and scrap between the United States and Canada and among EU Member States. The relatively lower transport costs for regional trade may also help to explain in part why regional trade was more prevalent than inter-regional trade (Figure 2.6).

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<sup>7</sup> Article 11 of the Basel Convention allows parties to enter into bilateral, multilateral, or regional agreements or arrangements regarding transboundary movement of hazardous wastes or other wastes with Parties or non-Parties provided that such agreements or arrangements do not derogate from the environmentally sound management of these wastes as required by the Convention.

**Figure 2.6. Global trade flows in plastic waste and scrap in 2021**

Annual reported export weight (tonnes) of HS 3915 (Waste, parings and scrap, of plastics) by destination type in 2021



*Note:* Flows depict movement from exporters (reporters) on the left to export destination (reported partner) on the right, separated by OECD (top) and non-OECD (bottom) export flows. The width depicts the traded export weight.

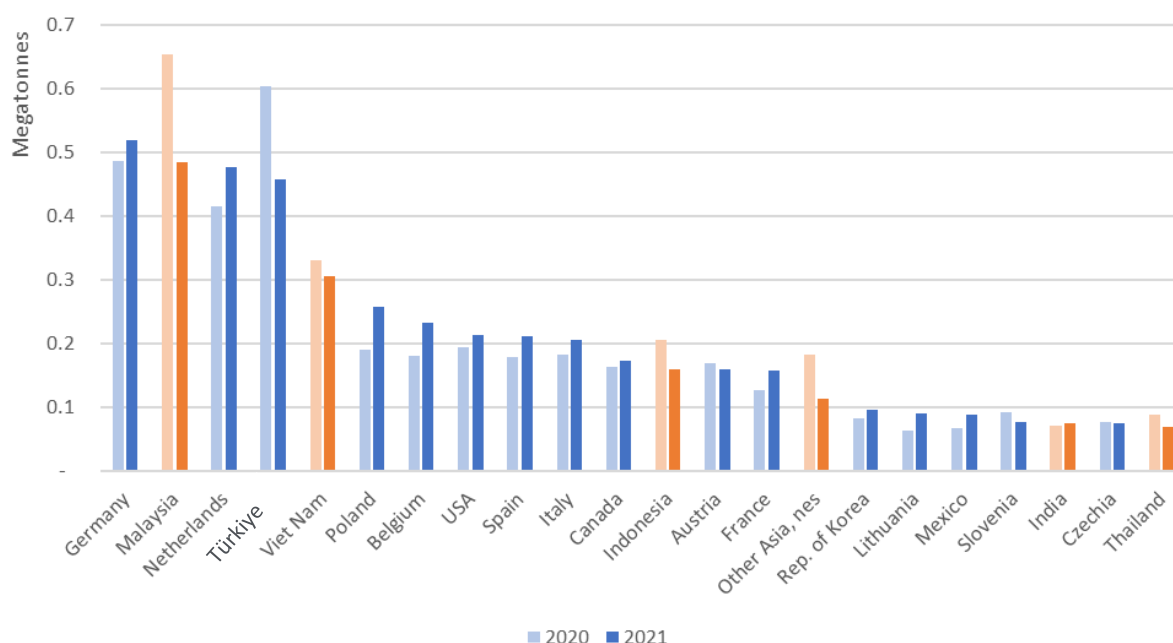
*Source:* Authors, based on UN Comtrade data (UN Comtrade, n.d.<sup>[3]</sup>).

However, non-OECD countries in Asia remain large importers. Malaysia was still the second largest export destination globally in 2021, and Viet Nam fifth. Indonesia, “other Asia nes”<sup>8</sup>, India and Thailand also received substantial volumes from OECD countries (Figure 2.7).

<sup>8</sup> Other Asia “not elsewhere specified” includes, *inter alia* exports to Chinese Taipei.

**Figure 2.7. Key destinations of OECD exports of plastic waste and scrap in 2020 and 2021**

Note: **Blue** = OECD countries; **Orange** = non-OECD countries



Source: Authors, based on UN Comtrade data (UN Comtrade, n.d.<sup>[3]</sup>).

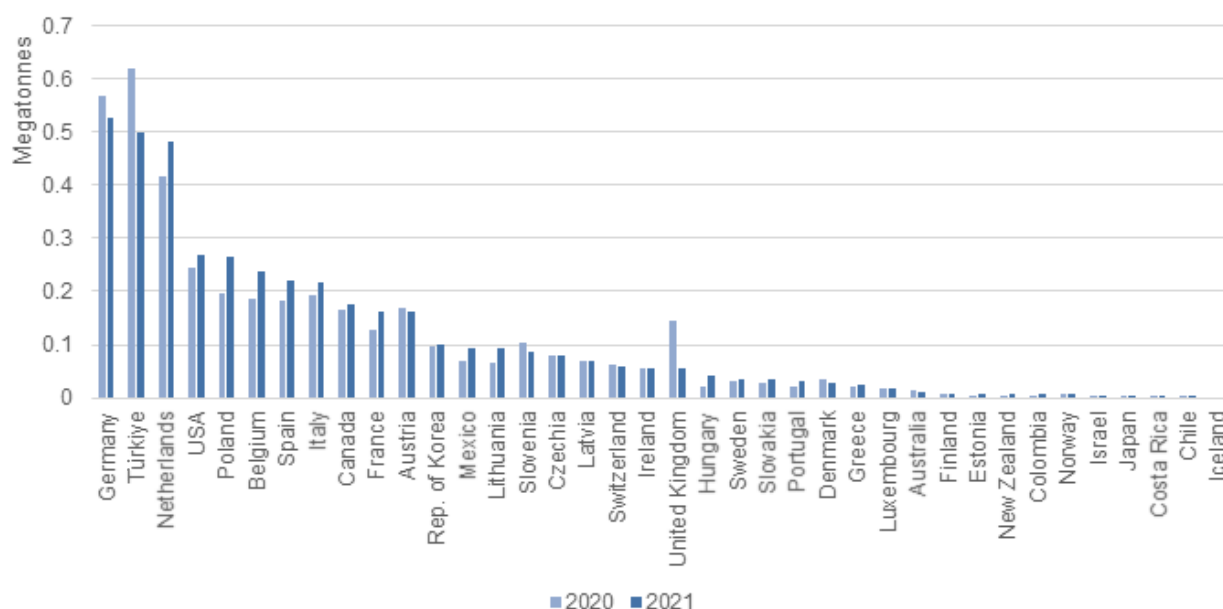
### *Imports by OECD countries*

Overall imports by OECD countries increased by 3.6% between 2020 and 2021. The four largest OECD importers in 2021 were Germany, Türkiye, the Netherlands, and the United States (Figure 2.8).

Some of these imports and (re-)exports may be attributed to transshipments, i.e. where a country merely serves as a transit station before waste is exported to its final destination. For instance, Hong Kong has traditionally been such an entrepôt, with a high share of imports being re-exported to mainland China (see Box 2.1). Also some of the exports of Belgium, The Netherlands and Germany are likely transshipments due to their large ports and central location in Europe.

**Figure 2.8. 2020 and 2021 exports destined for OECD Member Countries**

Reported annual export weight of HS 3915 (Waste, parings and scrap, of plastics) by OECD Member Country as export destination



Note: Data reflects the sum of reported 2020 and 2021 annual export data by all reporters (both OECD Member Countries and non-OECD countries) categorised by each OECD member country as the partner and export destination.

Source: Authors, based on UN Comtrade data (UN Comtrade, n.d.<sup>[3]</sup>).

Imports by Türkiye reduced over the past year, whilst imports by many EU countries (Poland, the Netherlands, Belgium and Spain) increased.<sup>9</sup> Outside of the group of EU countries, Mexico's imports increased notably by 38%. Whilst absolute volumes are relatively low, imports have also risen sharply for other OECD South American countries, notably Chile (4-fold increase from 0.0003 Mt to 0.0013Mt) and Colombia (factor of 2.8 from 0.002 Mt to 0.005 Mt).

Trade flow developments in 2021 for major OECD importers include:

- **Germany:** Germany replaced Türkiye as the top importing OECD country in 2021. It is an export destination for numerous European states. Key exporters to Germany remain its neighbours the Netherlands, Poland, Switzerland, Belgium and Sweden. Overall exports to Germany amounted to roughly 0.53, compared to 0.57 Mt in 2020.
- **Türkiye:** Exports to Türkiye declined in 2021, but the country remains second highest importing OECD member country. Türkiye imported waste from a number of countries, in particular from the United Kingdom, Germany, Belgium, Spain, Slovenia and The Netherlands. Exports to Türkiye declined dramatically from March to July 2021, likely linked to tightening import restrictions. But imports increased again later in the year. Overall exports to Türkiye amounted to roughly 0.5 Mt in 2021, compared to 0.62 Mt in 2020.
- **The Netherlands:** Key exporters to the Netherlands include Germany, Belgium, and the United Kingdom. Overall exports to The Netherlands increased to 0.48 Mt in 2021, compared to 0.41 Mt in 2020.

<sup>9</sup> Note in this context also Figure 2.2 showing *all* major importers: Malaysia ranks 2<sup>nd</sup> globally after Germany and before Türkiye, and Viet Nam ranks 5<sup>th</sup> after the Netherlands and before USA.

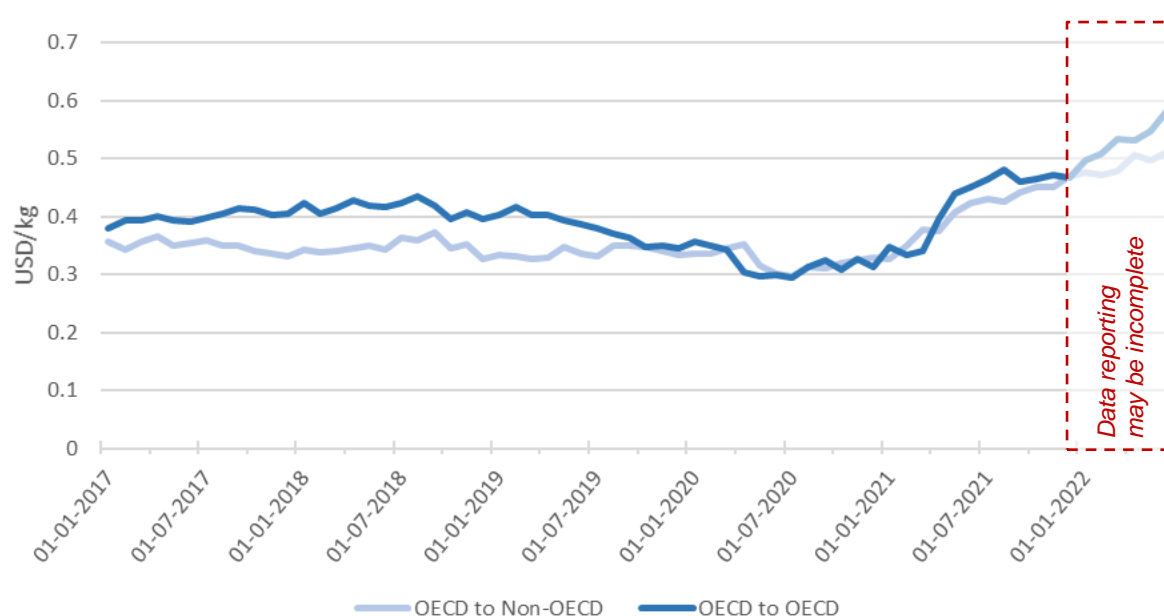
- The United States: Exports to the United States are predominantly from its regional trade partners Canada and Mexico. Overall exports to the United States increased to 0.27 Mt in 2021, compared to 0.24 Mt in 2020.

### Trade value indicator developments

The trade value indicator<sup>10</sup> (USD per kg of plastic waste and scrap) of exports between OECD Member Countries and from OECD Member Countries to non-OECD countries has converged from 2018 to 2021. Prior to 2020, the trade value indicator of plastic waste and scrap exported to non-OECD countries was noticeably smaller than the trade value indicator of intra-OECD traded waste. Since early 2020, the trade value indicators of plastic waste and scrap traded among OECD Member Countries and exported to non-OECD countries converged and since then both follow the same pattern (Figure 2.9). This increase continued over the course of 2021 and the first months of 2022 and may be due to an overall increase in commodity and resin prices over the same time period (Plastic Portal, 2022<sup>[10]</sup>).

**Figure 2.9. Trade value per weight of exports of plastic waste and scrap by OECD Member Countries**

Value (USD) per weight (kg) of trade between OECD member countries and exports to non-members (2017-2021 and preliminary data from January to May 2022)



Notes Excludes entries with no reported weight or value.

Source: Authors, based on UN Comtrade data (UN Comtrade, n.d.<sup>[3]</sup>).

<sup>10</sup> The trade value indicator is determined as follows:

$$\text{Trade value indicator} = \frac{\sum \text{Reported Value of Exports}}{\sum \text{Reported Weight of Exports}}$$

## 6-digit HS codes

The largest single polymer type of plastic waste and scrap exported by OECD Member Countries are Ethylene polymers (HS 391510), comprising polymers such as PE, HDPE, and LDPE. These polymers are commonly used to make films and plastic bags amongst other applications. Exports of ethylene polymer waste and scrap amounted to 2.6 Mt in 2021 (Figure 2.10).

Other plastic polymers not elsewhere classified (n.e.c.) (HS 391590) make up the largest share of exported plastic waste and scrap, but their volumes have declined most drastically in past years. This category includes polymers that are marketable as feedstock for recycling, including polyethylene terephthalate (PET) and polypropylene (PP), but which have not yet been assigned a specific HS categorisation. PET is commonly used to make plastic bottles for beverage containers and PP to make rigid plastic packaging. It also likely includes mixed plastic wastes (Brooks, Wang and Jambeck, 2018<sup>[6]</sup>). Exports classified as HS 391590 amounted to 2.6 Mt in 2021.

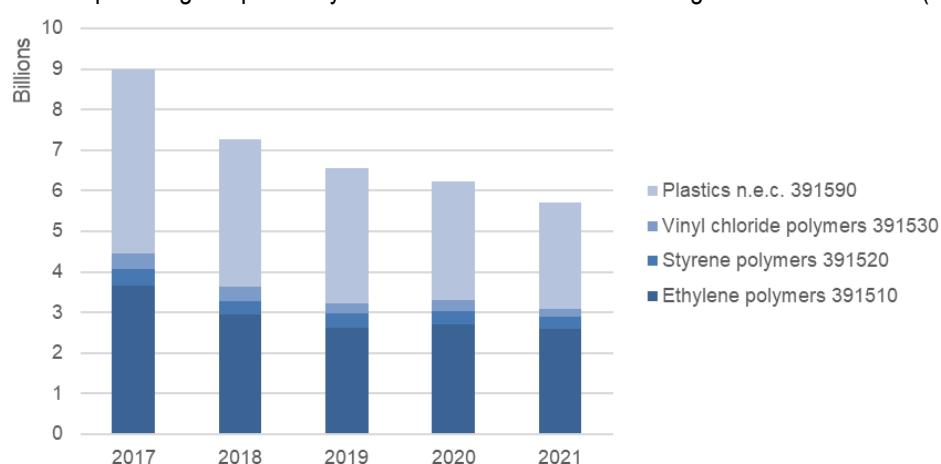
Exports of vinyl chloride polymers and styrene polymers make up smaller shares of the waste and scrap trade reported by OECD Member Countries on the 6-digit level, 0.2 Mt and 0.3 Mt respectively.

Compared to 2020, exports in 2021 by the individual sub-groups declined by 4% for ethylene polymers (HS 391510), 10% for plastic polymers not elsewhere classified (n.e.c.) (HS 391590), 17% for vinyl chloride polymers (HS 391530) and 15% for styrene polymers (HS 391520). Consequently, the share of ethylene polymers of total exports increased from 40% in 2019 to 45% in 2021, whilst the share of polymers n.e.c. decreased from 51% to 46% over the same period.

Waste and scrap from ethylene and polystyrene polymers that is almost free from contamination and destined for recycling can be traded more freely under the new trade rules. If it is assumed that the majority of plastic waste and scrap traded under “ethylene polymers” (HS 391510) is almost free from contamination<sup>11</sup>, the increased exports of ethylene polymers and concurrent lower exports of mixtures and vinyl chloride polymers, could suggest that more recyclable plastic waste and scrap are being traded. The increase in the trade value for plastic waste and scrap since 2019 would support this hypothesis. However, the contamination level of plastic waste and scrap traded under HS391510 is not known.

**Figure 2.10. OECD plastic waste and scrap exports by commodity type**

Annual reported export weight reported by OECD member countries of 6-digit codes of HS 3915 (2017-2021)



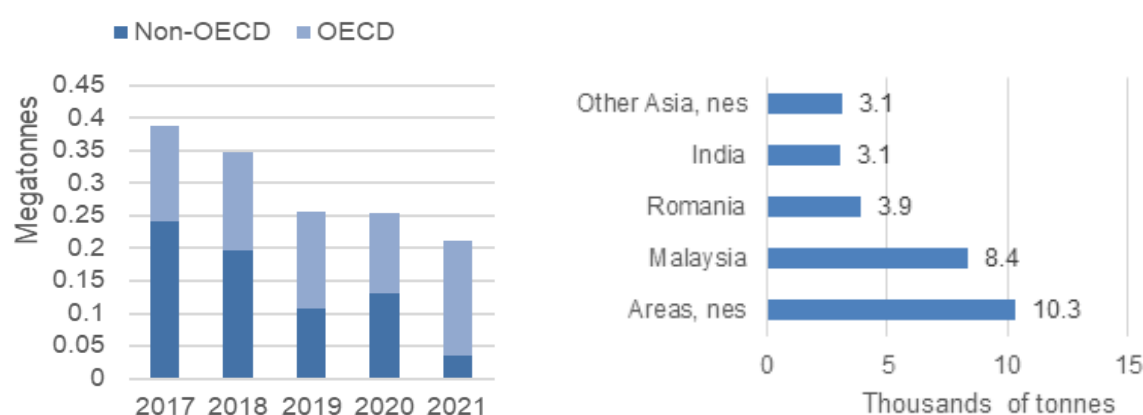
Source: Authors, based on UN Comtrade data (UN Comtrade, n.d.<sup>[3]</sup>).

<sup>11</sup> There is uncertainty about the contamination rate of ethylene polymer plastic waste traded under HS 391510 and to what extent it is conform with Basel code B3010 or would fall under Basel code Y48.

Exports of HS 391530 (vinyl chloride polymer waste and scrap) is a relatively small share of the total plastic waste and scrap exported by OECD member countries in 2021 (roughly 0.05%), but it is particular in the sense that this HS code singles out a trade flow that falls under the Basel listing Y48 and has thus become more controlled under new trade rules. Exports of HS 391530 from OECD to non-OECD countries have decreased substantially in 2021, but some trade persists. Notable OECD exporters are the Netherlands, United States and Japan and notable non-OECD receivers include Malaysia, Romania, India, and Other Asia nes (Figure 2.11). In some cases, this trade is regional, such as the 3 000 tonnes reportedly exported by the Netherlands to Romania.

**Figure 2.11. OECD exports of vinyl chloride polymers waste and scrap**

Historical exports of HS 391530 (Vinyl chloride polymers waste, parings and scrap) by destination type (left) and 2021 top non-OECD export destinations (right)



*Note:* Other Asia “not elsewhere specified” includes, inter alia exports to Chinese Taipei. The partner Areas, nes (not elsewhere specified) is used for low-value trade if the partner designation is unknown or made in error, i.e. the reporting country does not provide the UN with the details of the trading partner (UN Stats, 2021<sup>[11]</sup>). This figure is based on data that was downloaded from UN Comtrade on 18 November 2022

*Source :* (UN Comtrade, n.d.<sup>[3]</sup>)

### Box 2.2. Relevant work published or underway

The following work-products involving trade in plastic waste and scrap were released:

- *OECD's Global Plastics Outlook (GPO)*: The GPO features substantive discussions on trade in plastic waste and scrap. Part 1 takes stock of past developments and the current situation (OECD, 2022<sup>[11]</sup>), Part 2 features a modelling exercise around future projections of trade in plastic waste and scrap and policy scenario analyses (OECD, 2022<sup>[12]</sup>).
- *UNCTAD Plastics Trade Database*: In support of the Graduate Institute Geneva, UNCTAD launched a first prototype of a database that tracks trade across the life cycle of plastics (UNCTAD, 2020<sup>[13]</sup>; UNCTAD.Stat, 2022<sup>[14]</sup>).
- *Basel Action Network's Plastic Waste Trade Data*: BAN provides ongoing analysis, key messages and metrics derived from UN Comtrade and country level data (Basel Action Network, n.d.<sup>[15]</sup>).
- *WTO Informal Dialogue on Plastics Pollution and WTO Informal Dialogue Plastics (IDP)*: The IDP was established in November 2020. As of July 2022, 73 WTO members are participating in the informal dialogue. The IDP developed a Ministerial Statement, which was launched at the WTO's Twelfth Ministerial Conference (MC12) on 15 December 2021, which sets out a roadmap and identifies some key areas on which the Dialogue will focus (WTO, 2021<sup>[16]</sup>). Three workstreams were created to move technical work forward: cross-cutting issues (e.g. transparency, technical assistance); promoting trade to tackle plastic pollution; and reduction to tackle plastic pollution and circular economy for plastics (WTO, 2022<sup>[17]</sup>).
- An examination of European plastics trade five years after the introduction of Chinese trade policy (Joltreau, 2022<sup>[18]</sup>).
- Newspaper article that explores expansion in domestic recycling in North America and the role of trade policy, includes insight from representatives of the recycling industry (Pyzyk, 2022<sup>[19]</sup>).
- Journal article examining the GHG emissions savings from recycling enabled by the global plastic waste trade (Liu et al., 2021<sup>[20]</sup>).
- Journal article examining whether and how trade in plastic waste is correlated with a country's level of economic development (Bai and Givens, 2021<sup>[21]</sup>).



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## Annex A. Methodology

UN Comtrade is a database with the import and export statistics reported by UN Member States' statistical authorities. The database has information reported (annually and monthly) on the trade in waste parings and scrap of plastic. The following Harmonised Code (HS)<sup>12</sup> and its four subcategories are considered for this analysis:

- HS 3915: Waste, parings and scrap, of plastics
  - HS 391510: Ethylene polymers waste, parings and scrap;
  - HS 391520: Styrene polymers waste, parings and scrap;
  - HS 391530: Vinyl chloride polymers waste, parings and scrap; and
  - HS 391590: plastics not elsewhere classified (n.e.c.), a catch-all for other material.<sup>13</sup>

Each reported entry includes data fields on HS code, trade flow (import/export/re-import/re-export), trading partner, weight (kg), and value (USD).

The authors extracted UN Comtrade data on 8 September 2022 and conducted the following analyses:

- Data visuals of weight data:
  - Time-series:
    - export destinations (globally and by OECD member states, yearly and monthly data),
    - Imports and exports of OECD member states, and
    - Subcategories (6 digit HS codes);
  - Sankey diagram of major exporters and importer flows (for 2021)

Qualitative monitoring complements the analysis of trade patterns with updates on the trade policy context and a description of relevant literature by other organisations.

Key limitations of this approach lie in the limits of the available data. These include:

- UN Comtrade does not provide information on the ultimate destination or process used for the management of the waste (i.e. recycle, landfill, or incineration) (Brooks, Wang and Jambeck, 2018<sup>[6]</sup>). The exercise will thus only show trade flows that cannot be directly linked to the ultimate fate of the traded product or potential environmental impacts. It also does not allow to distinguish transit countries from final importers.
- UN Comtrade HS codes are not aligned with waste codes of Annexes of the Basel Convention or Appendices of the OECD Decision and therefore does not allow the authors to draw conclusions about trade flows of individual waste code categories.
- Reported data can include mistakes, omissions, and/or infrequent reporting. For example:

<sup>12</sup> The Harmonised System (HS) was developed and is updated by the World Customs Organization.

<sup>13</sup> The HS assigns specific six-digit codes for varying classifications and commodities. Countries are allowed to add longer codes to the first six digits for further classification. For instance, the United States uses a 10-digit code to classify products for export, known as a Schedule B number. HS 391590 contains the 10-digit code 3915.90.0010 for polyethylene terephthalate (PET) plastics (US Trade, 2020<sup>[23]</sup>).

- Global imports and exports statistics do not necessarily balance one another; and
- The sum of monthly data may not equal the figure reported in annual submissions;
- The sum of the four different six-digit HS codes may not equal the figure reported for the overall four-digit HS code.

To mitigate possible data issues, the authors have taken the follow actions:

- Use export weight data for all figures<sup>14</sup>;
- Exclude abnormal data entries that temporarily betray trading patterns. For example, weight data that is several orders of magnitude larger than the reporters' median entry<sup>15</sup>;
- Place preference on HS code four-digit annual data submissions; and
- Include an uncertainty caveat for the latest months considered, where monthly data reporting may still be incomplete.

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<sup>14</sup> Export data is commonly considered more complete than import data. For figures showing key importers export data with to a certain destination country was used.

<sup>15</sup> Methodology for omitting outliers is adapted from (Berthou and Emlinger, 2011<sup>[22]</sup>).