Recycling - secondary material price indicator

Statistics Explained

Data from July 2018
Planned article update: February 2020

This article presents the indicators on volume and price for recyclables in the European Union (EU) . The purpose is to provide relevant data and to give a broader overview of the market for secondary materials. 'Secondary materials' are waste materials collected for recycling and recycled materials that can be used in manufacturing processes instead of or alongside virgin raw materials.

The indicator considers the average monthly volume of trade in secondary materials (thousand tonnes or million tonnes) and average monthly prices for secondary materials (/tonne). It is based on foreign trade statistics and monitors both the intra-EU and extra-EU cross-country trade (between Member States and with countries outside of the EU, respectively). The indicator is presented in a way similar to other market-price related indicators, such as energy import prices.

In contrast to the established steel and aluminium scrap market, observing of other materials used for consumer-related packaging (such as glass, paper and board, and plastic) is less developed. Therefore, this analysis focuses on these materials. The indicators are likely to be of interest to stakeholders concerned with long-term performance of secondary-material markets, as well as to policy makers developing recycling strategies in the Circular Economy. Both elements, trade volumes and prices, are shown within the same graphs to highlight current trends and volatility.

General overview

The data for glass, paper and board, and plastic show that the prices of recyclates have varied significantly over time. The most notable change over the last decade was a sharp reduction in secondary material prices for paper and board, and plastic during the financial crisis of 2008/2009. However, average annual figures for intra EU-28 trade suggest that the markets for most secondary materials were not substantially affected.

The data also show that, for materials which are often exported out of the EU for recycling, the price recovered after the sharp reduction seen throughout 2008. Extra EU-28 trade volumes in plastic, for example, dropped significantly for a few months in 2008/2009, but bounced back to levels higher than before 2008. The data also suggests that, during 2018, the countries receiving waste materials for recycling from the EU has changed significantly.

The following sub-sections present the price and trade volumes for glass, paper and board and plastic. The data and figures will be updated regularly on the Eurostat dedicated website on waste statistics .

Price and trade volumes

Glass

For both price and volume, annual averages of monthly prices and volumes are shown from 2004 to 2018 (the solid lines which remain constant over each year) in Figure 1. From 2014 the data is also displayed on a monthly basis (transparent line) to highlight fluctuations in the data.

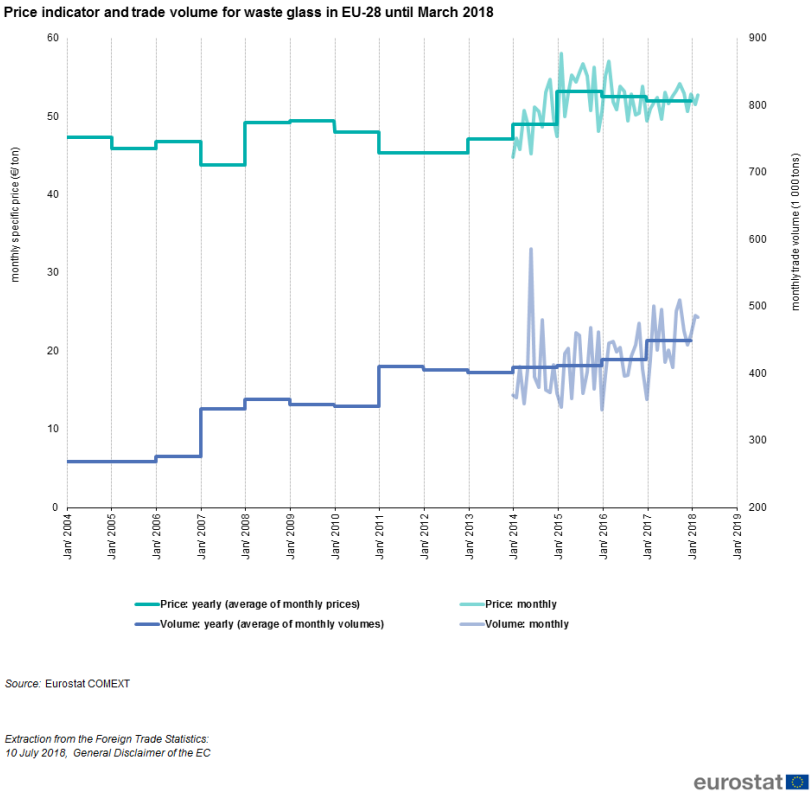

Figure 1: Price indicator and trade volume for waste glass in EU-28 until March 2018 - Source: Eurostat COMEXT

EU-28 trade in glass waste (blue line – annual average of monthly prices and volumes) shows an increase from approximately 269 000 tonnes/month in the year 2004 to 361 000 tonnes/month in 2008 and further to approximately 410 000 tonnes/month from 2011 onwards. The monthly trade data (transparent line) demonstrates the high fluctuation. The highest trading volume was observed in June 2014 with nearly 586 000 tonne, with another peak in October 2017 at almost 510 000 tonnes, before stabilising around 400 000 tonnes. The detailed data (not displayed in Figure 1) show that the cross-border trade volume is dominated by intra EU-28 trade of glass material for recycling. Extra EU-28 export trade is minor for glass (4% of exported volume).

The price development of glass waste is shown in the turquoise line yearly (as an average of the monthly volumes) and monthly (in the turquoise transparent line). From 2014 onwards there is a trend to an increased price level of 45-53 /tonne. The highest monthly price was observed in February 2015 at approximately 58 /tonne and reached another peak in March 2016 at 57 /tonne and then stabilised around 53 /tonne.

Paper and board

For both series (price and volume), annual averages of monthly prices and volumes are shown from 2004 to 2018 (Figure 2). From 2014 the data is also displayed on a monthly basis to highlight fluctuations in the data (transparent lines).

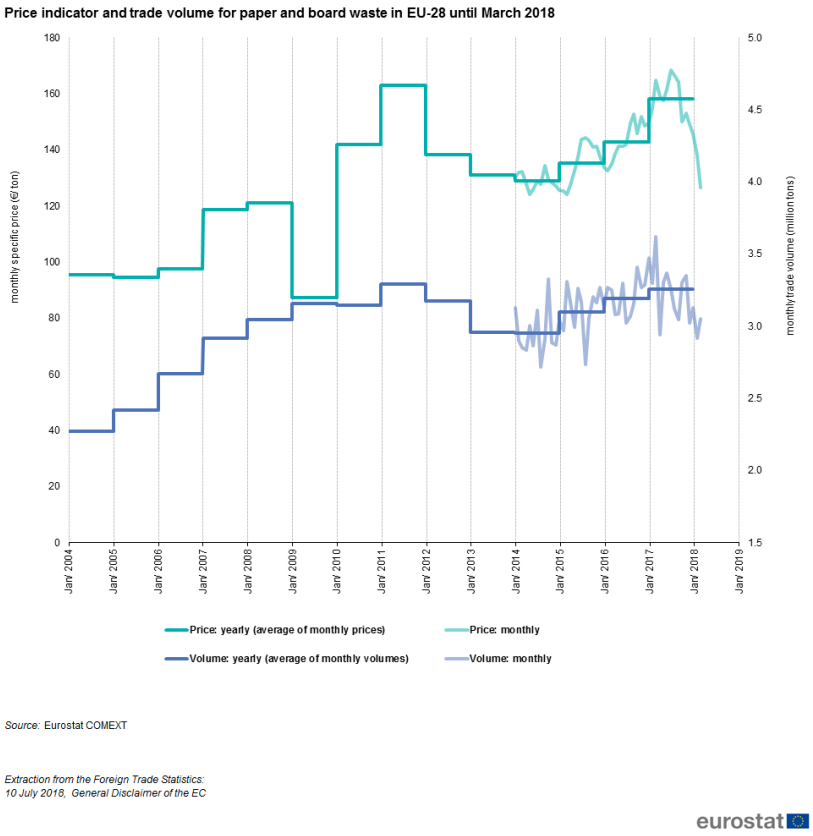

Figure 2: Price indicator and trade volume for paper and board waste in EU-28 until March 2018 - Source: Eurostat COMEXT

The traded volume (blue line) has increased constantly from 2004 to 2011 with the highest recorded traded volume in January 2011 with 3.3 million tonnes. The monthly volume (transparent blue line) shows the fluctuation around the 12 months average and reached peak in March 2017 of 3.6 million tonnes.

The price data (turquoise line) does not follow the same trend as for traded volume. During the economic crisis the average price dropped from 121 /tonne in 2008 to around 87 /tonne in 2009. In 2010 and 2011 the price recovered to 163 /tonne. For 2012 to 2016 the price is stable around 130 or 140 /tonne and peaked with 167 /tonne in August 2017. The price decreased again to 127 /tonne in March 2018.

Plastic

For both price and volume, annual averages of monthly prices and volumes are given from 2004 to 2018 (Figure 3). From 2014 the data is also displayed on a monthly basis to highlight fluctuations in the data (transparent lines).

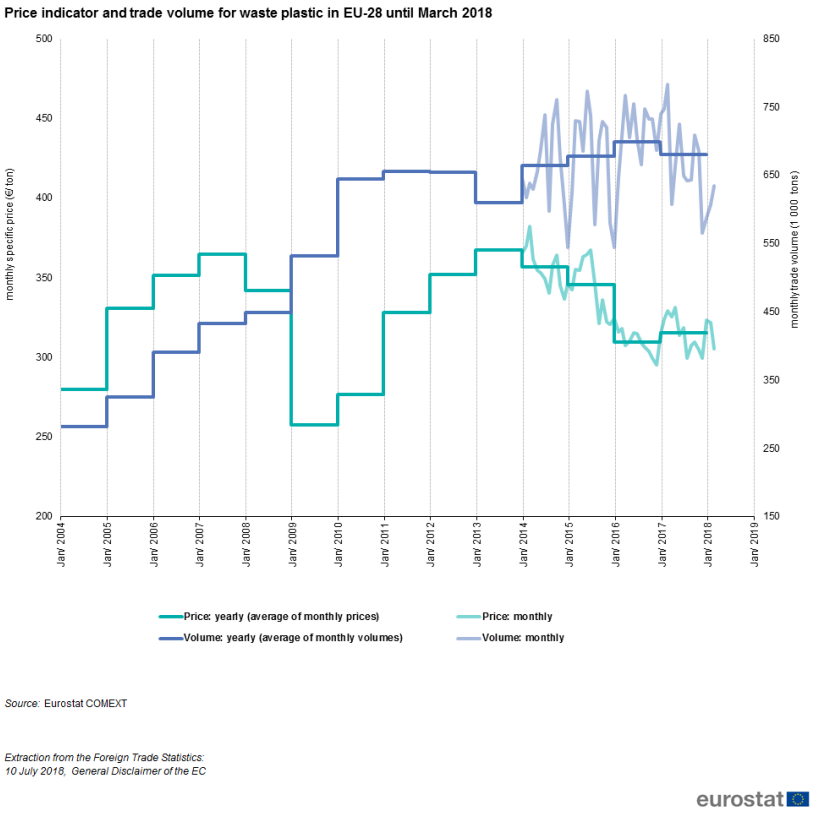

Figure 3: Price indicator and trade volume for waste plastic in EU-28 until March 2018 - Source: Eurostat COMEXT

The traded volume (blue line) saw a decline in 2013 to 610 000 tonnes/month, followed by years of increase with the highest recorded annual trade volume of 700 000 tonnes in 2016. 2013 saw a decline in annual trade volume to 610 000 tonnes/month, followed by years of increase with the highest recorded annual trade volume of 700 000 tonnes in 2016. Within a year the volatility is also significant. For 2015, the monthly average for the whole year is 678 000 tons. A spike was observed in March 2017 of approximately 784 000 tonnes, while the lowest volume for that year was in December 2017, with 566 000 tonnes. In March 2018 the traded volume stood at 635 000 tonnes.

The price of plastic waste depends, on one hand, on the supply and demand of plastic waste material, and, on the other hand, on the crude oil price, which strongly influences the price of the virgin (primary) material. The indicator (turquoise line) shows an increase in the price of plastic waste between 2004 and 2007 to levels above 365 /tonne. The indicator shows a sharp decline down to 234 /tonne in March 2009. Afterwards, the price recovered, with the exception of March 2010, when the lowest price in the decade (220 /tonne) was observed (monthly data in transparent turquoise line). By 2013, the price recovered to the price level of 2007 with around 370 /tonne, since then the price is again continuously decreasing to an average level of 315 /tonne in 2017. In March 2018 the price stood at 306 /tonne.

Development of prices for low and high quality secondary materials - paper

For paper and plastic more than one foreign trade statistics code is used for the calculation of the price indicator. The different codes describe secondary materials, which may include industrial residues of high quality or separately collected waste. Figure 4 illustrates the difference in price and the corresponding development over time. As an example, the trade positions of paper waste with the highest (code 47072000) and lowest (code 47079010) price were chosen.

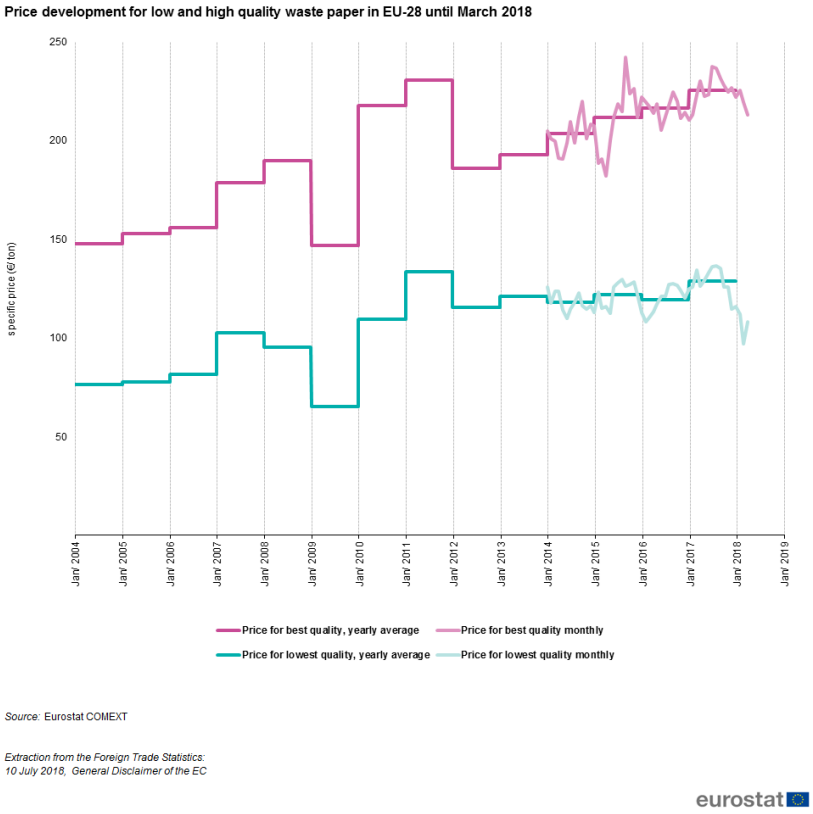

Figure 4: Price development for low and high quality waste paper in EU-28 until March 2018 - Source: Eurostat COMEXT

The difference in price between the lowest and highest quality remains fairly constant. In other words, both prices appear to develop in parallel. The observation of trade volumes gives a similar picture. Therefore, it is reasonable to calculate only one price indicator for paper.

Price indicator and trade flows

Trends in material prices and trade flows can give some additional information about the recycling economy.

Glass

Glass is a heavy and low-cost material. Hence the trade volume is low in comparison to the overall recycling volume. In addition, most trade takes place between neighbouring countries, and thus extra-EU-28 export volumes are also low.

For paper and plastic, the data show a more complex picture.

Paper

Figure 5 shows the trade volume of paper waste in EU-28 according to trade flows. For paper, the intra-EU-28 trade volume increased from 10 million tonnes in 2004 up to 13 million tonnes in 2010 and 2011. In 2013, the intra EU-28 trade volume decreased to 12 million tonnes and remained at this level until 2015.

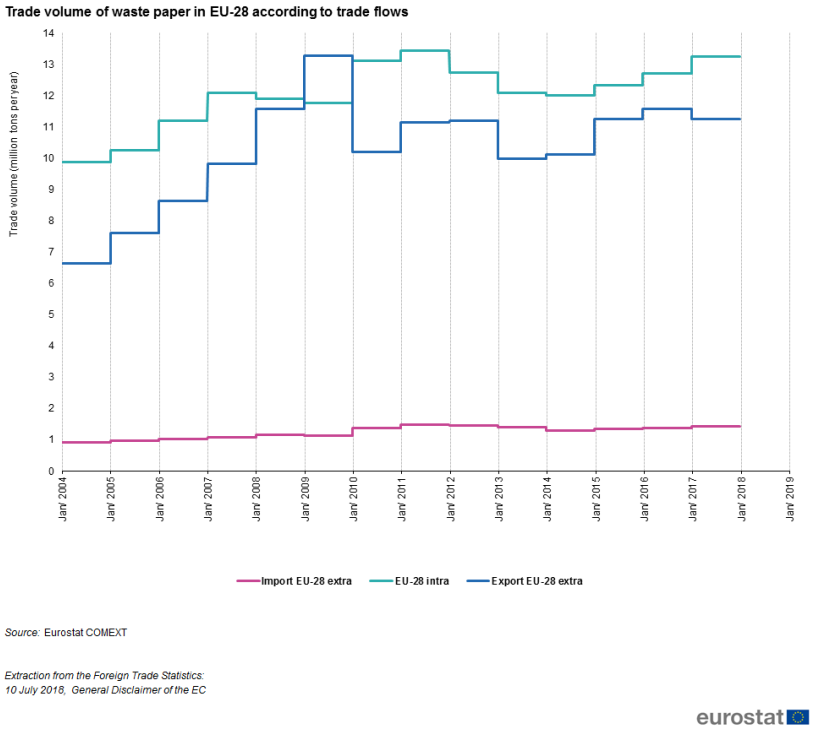

Figure 5: Trade volume of waste paper in EU-28 according to trade flows - Source: Eurostat COMEXT

The extra EU-28 imports are small and stable, but the extra EU-28 exports exhibit strong growth – from 7 million tonnes/year in 2004 to more than 13 million tonnes/year in 2009. In the subsequent years the extra-EU exports dropped to a level between 10 and 11 million tonnes/year in the period 2010 - 2015. When compared with the amount of paper separately collected in the EU-28 (Waste Statistics Regulation: 46 million tonnes in 2014), the indicator shows that extra EU-28 exports account for more than 20 % of this volume.

The price indicator on paper waste in EU-28 according to trade flows is shown in Figure 6. Until 2005, the extra EU-28 imports showed significantly higher prices than the average. This might be due to a higher quality which is needed inside the EU-28. Since then, the prices of all three categories have shown similar characteristics. Due to the inclusion of transport costs, import prices tend to be higher than export prices. Taking this effect into account, the price, and therefore the quality, appears to be of a similar level. Therefore, it is reasonable to conclude that the qualities of imported and exported secondary paper material are quite similar.

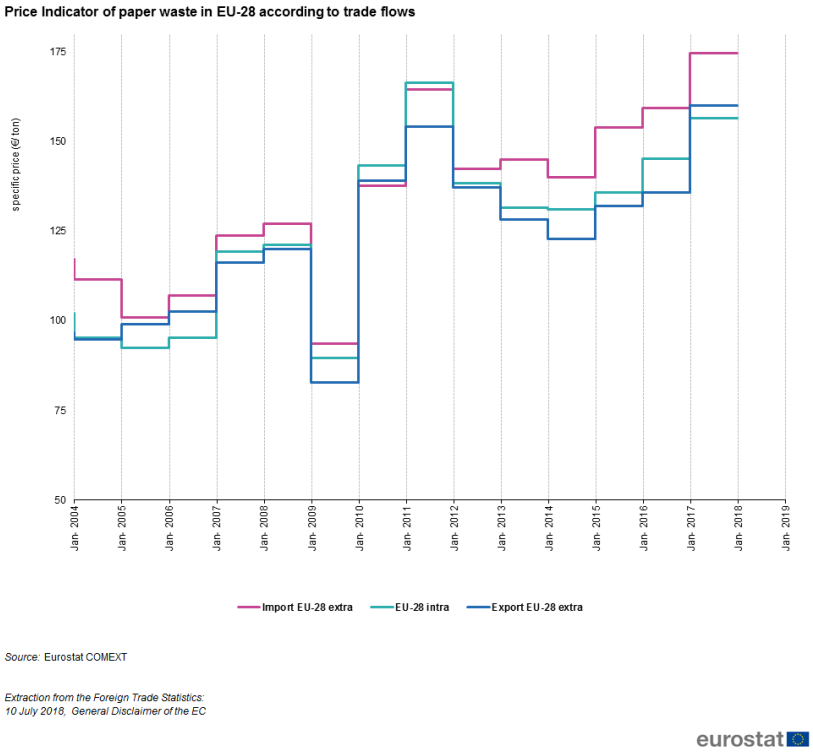

Figure 6: Price Indicator of paper waste in EU-28 according to trade flows - Source: Eurostat COMEXT

Plastic

The characteristic of the trade flows for plastic is shown in Figure 7. The trend looks similar to that for paper (see Figure 5 above).

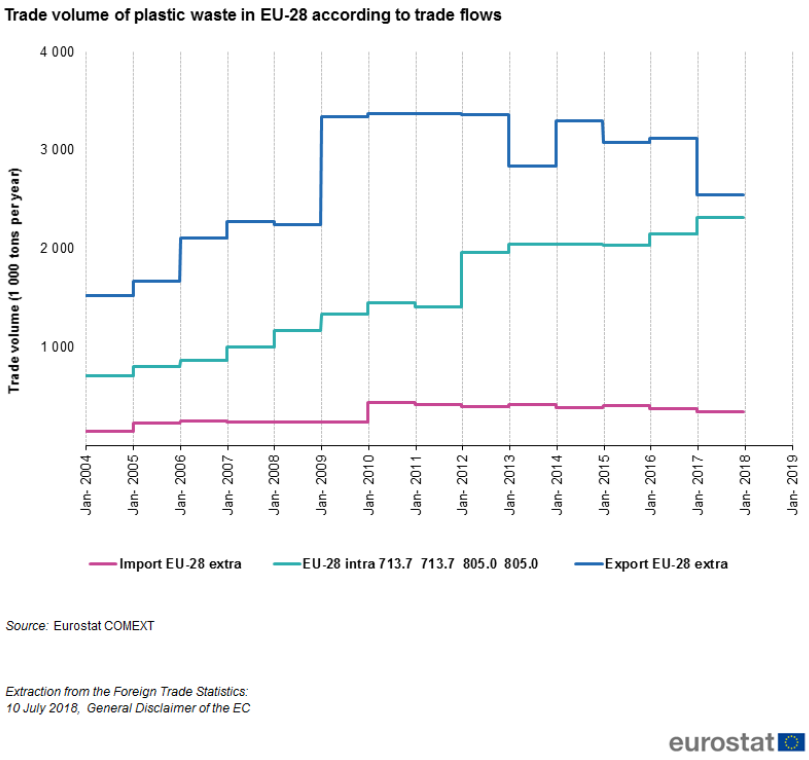

Figure 7: Trade volume of plastic waste in EU-28 according to trade flows - Source: Eurostat COMEXT

The extra EU-28 imports amounted to approximately 144 000 tonnes in the year 2004 and rose to a maximum of 437 000 tonnes in 2010 and was stable for the period 2011 - 2015 (between 385 000 and 412 000 tonnes per year). The intra EU-28 trade started at approximately 865 000 tonnes in 2004 and increased to approximately 2.6 million tonnes in 2017. The extra EU-28 exports rose from 1.5 million tonnes in 2004 to approximately 3.4 million tonnes in 2010, an increase of 122 %. The separately collected plastic waste accounted for 11.6 million tonnes in 2004 and 17 million tonnes in 2014 (WStatR). So a substantial part of the collected plastic waste was exported.

The development of the specific price according to trade flows of plastic waste in the EU-28 is shown in Figure 8. The characteristic is different to the example of paper. The higher price (430 /tonne in 2007) seen in the intra EU-28 suggests that the quality of this material was higher than that imported to, or exported from, the EU. In contrast, the extra EU-28 imports reflect the lower-price and quality of the material (107 /tonne in 2010). The specific price of the extra EU-28 exports ranged between the extra EU-28 import price and the intra EU-28 price.

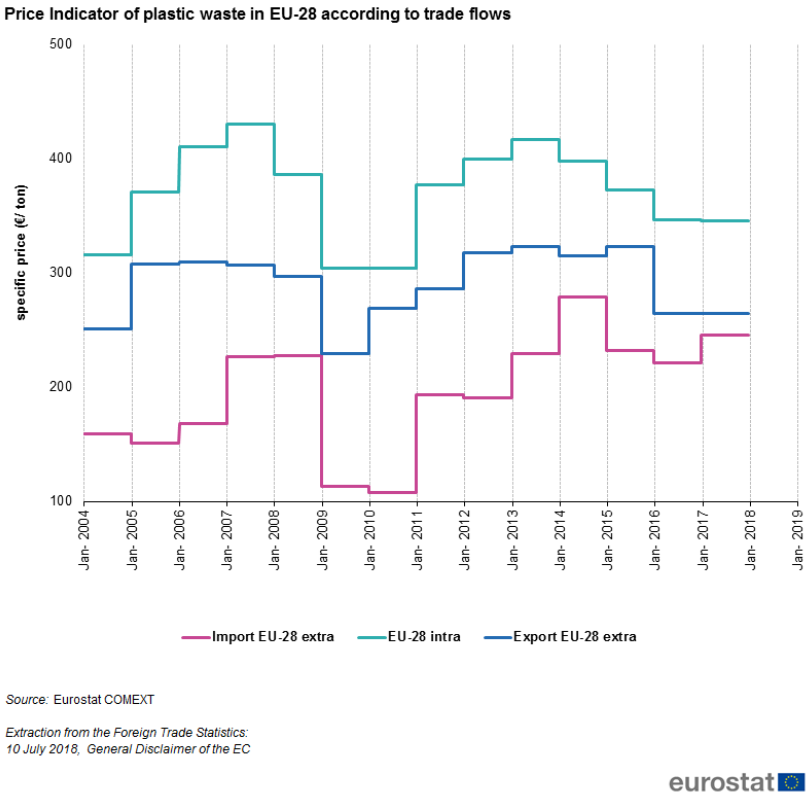

Figure 8: Price Indicator of plastic waste in EU-28 according to trade flows - Source: Eurostat COMEXT

Developments in international trade flows

Policy changes on both sides, by the exporting countries or by the receiving countries, can lead to significant changes in the flows of material destined for recycling.

China has filed a notification with the World Trade Organisation (WTO) that it intends to ban four classes and 24 kinds of solid waste by the end of 2017, including all plastic scrap, unsorted waste paper, certain metal recycling residues, textiles and all unsorted waste or scrap. Additionally, the ban has led to a large drop in prices for recyclable goods, such as mixed paper.

In January 2017, China received 885 135 tonnes of paper for recycling from the EU, but in January 2018 only 286 520 tonnes, a decrease of 68 %. As shown in Figure 9, the flows have shifted significantly towards Vietnam (+302 %), Thailand (+219 %), India (+170 %), Indonesia (+129 %) among others.

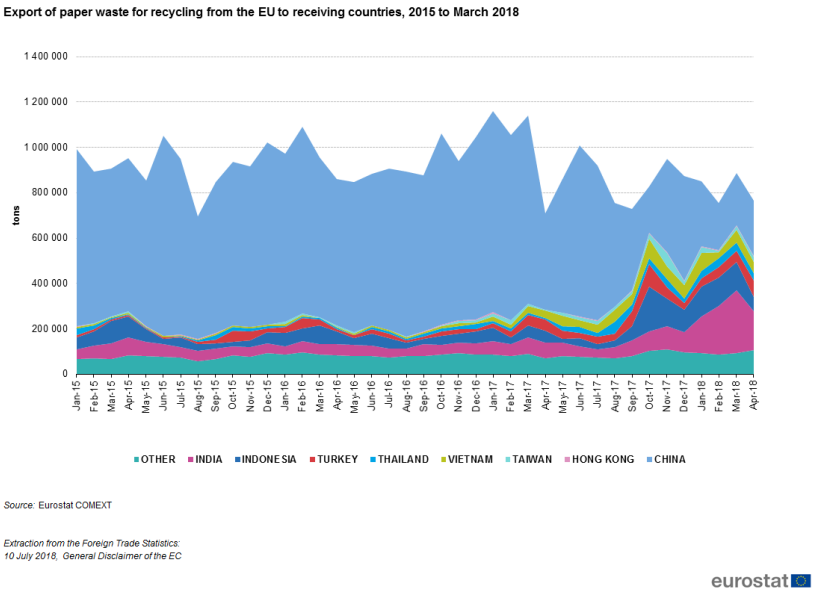

Figure 9: Export of paper waste for recycling from the EU to receiving countries, 2015 to March 2018 - Source: Eurostat COMEXT

In January 2017, China received 164 861 tonnes and Hong Kong 79 326 tonnes of plastic material for recycling from the EU. In January 2018, China received only 7 442 tonnes and Hong Kong 13 897 tonnes. The decrease of waste volumes is 95 % for China and 82 % for Hong Kong.

As shown in figure 10 the flows have shifted significantly, towards Thailand, Malaysia, Vietnam, India, Indonesia, Turkey and others. As result, the waste volumes to Asia (especially to South-east Asia) increased as followed: 1 132 % in Thailand, 401 % in Turkey, 367 % in Taiwan, 356 % in Malaysia, 168 % in India and 159 % in Indonesia.

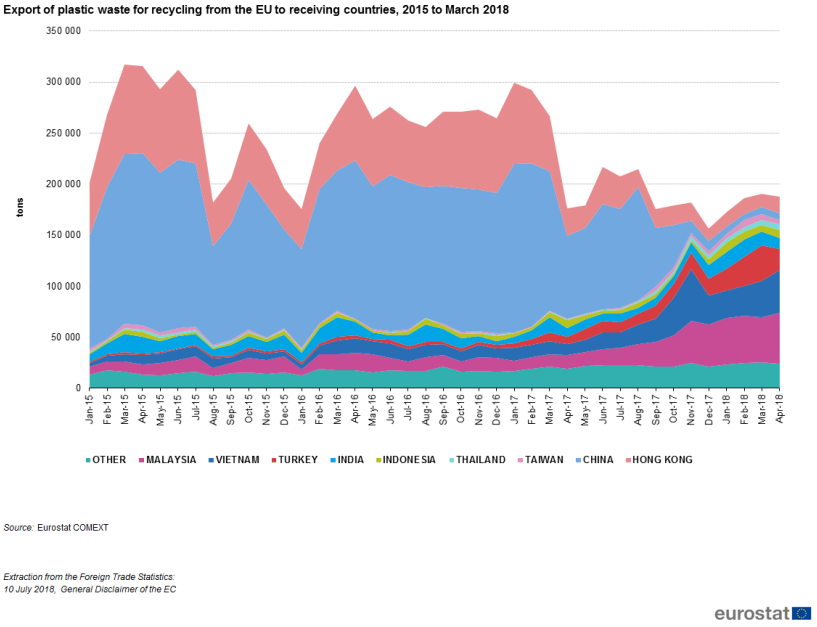

Figure 10: Export of plastic waste for recycling from the EU to receiving countries, 2015 to March 2018 - Source: Eurostat COMEXT

Conclusions

The trade figures allow some valuable insights for the implementation of the European thematic strategies on resources and on waste prevention and recycling. Assessing the foreign trade data with the same methodology by country of origin and destination would provide an even more detailed insight.

The European market has a big trade surplus and the intra EU-28 trade is developing well.

On 1 January 2018, China's import ban for certain waste material came into effect. As a result, EU exports have almost halved. The remaining exports have shifted to other countries.

Source data for tables and graphs

- Price indicator (July 2018) - tables and figures

Data sources and availability

Foreign trade statistics constitute the only data source for the presented indicators. The following paragraphs detail the codes in foreign trade statistics considered for the indicators.

Glass waste

Glass waste is reported in foreign trade statistics under one code 70010010 (see Table 1). Please take note that the code 'glass cullets' also contains some industrial material.

Codes in Foreign Trade Statistics for glass waste

Proposed indicator	Price indicator and trade volume of waste glass
FTS item No	**70010010:** CULLET AND OTHER WASTE AND SCRAP OF GLASS (EXCL. GLASS IN THE FORM OF POWDER, GRANULES OR FLAKES)
FTS - reporting	Import (intra + extra) + exports (intra + extra)
Units	€/tonnes; 1 000 tonnes (monthly traded)
Geographical coverage	EU-28
Time coverage	Monthly from January 2002

eurostat

Table 1: Codes in Foreign Trade Statistics for glass waste

Paper waste

Paper waste is reported in foreign trade statistics under six codes (see Table 2). It reports three fractions of mostly industrial waste (47071000, 47072000, 47073090) and three fractions covering waste paper collected and sorted. As all fractions are covered by the Waste Statistics Regulation we take all six codes into account for the indicator.

Codes in Foreign Trade Statistics for paper waste

Proposed indicator	Price indicator and trade volume of waste paper
FTS codes	**47071000:** RECOVERED "WASTE AND SCRAP" PAPER OR PAPERBOARD OF UNBLEACHED KRAFT PAPER, CORRUGATED PAPER OR CORRUGATED PAPERBOARD
	47072000: RECOVERED "WASTE AND SCRAP" PAPER OR PAPERBOARD MADE MAINLY OF BLEACHED CHEMICAL PULP, NOT COLOURED IN THE MASS
	47073010: OLD AND UNSOLD NEWSPAPERS AND MAGAZINES, TELEPHONE DIRECTORIES, BROCHURES AND PRINTED ADVERTISING MATERIAL
	47073090: "WASTE AND SCRAP" OF PAPER OR PAPERBOARD MADE MAINLY OF MECHANICAL PULP
	47079010: UNSORTED, RECOVERED "WASTE AND SCRAP" PAPER OR PAPERBOARD
	47079090: SORTED, RECOVERED "WASTE AND SCRAP" PAPER OR PAPERBOARD
FTS - reporting	Import (intra + extra) + exports (intra + extra)
Units	€/tonnes; 1000000 tonnes (monthly traded)
Geographical coverage	EU-28
Time coverage	monthly from January 2002

eurostat

Table 2: Codes in Foreign Trade Statistics for paper waste

Plastic waste

Plastic waste is reported in foreign trade statistics under nine items from 2000-2003, under six positions from 2004-2009 and five positions from 2010 onwards (see Table 3 and 4). In 2004 the nomenclature changed and some codes were combined. In 2010 two codes were merged to one new code. Table 3 shows the years in which data is reported under which code. Number 5 and 7 in the table are combined to the new position #6. Additionally the positions 10, 11, 12 are combined to the new position 9. In 2010 the codes #6 and 9 are merged to #8.

Changes in nomenclature for plastic waste

#	FTS code	2000-2003	2004-2009	2010-onward
1	39151000			
2	39152000			
3	39153000			
4	39159011			
5	39159013			
6	39159018			
7	39159019			
8	39159080			
9	39159090			
10	39159091			
11	39159093			
12	39159099			

The FTS codes are applied for the period marked in grey.
For the Label for the FTS codes please refer to Table 4.

eurostat

Table 3: Changes in nomenclature for plastic waste

Codes in Foreign Trade Statistics for plastic waste

Proposed indicator	Price indicator and trade volume of waste plastic
FTS codes	**39151000:** WASTE, PARINGS AND SCRAP, OF POLYMERS OF ETHYLENE
	39152000: WASTE, PARINGS AND SCRAP, OF POLYMERS OF STYRENE
	39153000: WASTE, PARINGS AND SCRAP, OF POLYMERS OF VINYL CHLORIDE
	39159011: WASTE, PARINGS AND SCRAP, OF POLYMERS OF PROPYLENE
	39159013: WASTE, PARINGS AND SCRAP, OF ACRYLIC POLYMERS
	39159018: WASTE, PARINGS AND SCRAP, OF ADDITION POLYMERIZATION PRODUCTS (EXCL. THAT OF POLYMERS OF ETHYLENE, STYRENE AND VINYL CHLORIDE AND PROPYLENE)
	39159019: WASTE, PARINGS AND SCRAP, OF ADDITION POLYMERIZATION PRODUCTS (EXCL. THAT OF ACRYLIC POLYMERS, POLYMERS OF ETHYLENE, STYRENE AND VINYL CHLORIDE AND PROPYLENE)
	39159080: WASTE, PARINGS AND SCRAP, OF PLASTICS (EXCL. THAT OF POLYMERS OF ETHYLENE, STYRENE, VINYL CHLORIDE AND PROPYLENE
	39159090: WASTE, PARINGS AND SCRAP, OF PLASTICS (EXCL. THAT OF ADDITION POLYMERIZATION PRODUCTS)
	39159091: WASTE, PARINGS AND SCRAP, OF EPOXIDE RESINS
	39159093: WASTE, PARINGS AND SCRAP, OF CELLULOSE AND ITS CHEMICAL DERIVATIVES
	39159099: WASTE, PARINGS AND SCRAP, OF PLASTICS (EXCL. THAT OF ADDITION POLYMERIZATION PRODUCTS, EPOXIDE RESINS, CELLULOSE AND ITS CHEMICAL DERIVATIVES)
FTS – reporting	Import (intra + extra) + exports (intra + extra)
Units	€/tonnes; 1 000 tonnes (monthly traded) acc. to Index
Time coverage	Monthly from January 2002

eurostat

Table 4: Codes in Foreign Trade Statistics for plastic waste

Context

The price indicator sums up all value (in) and volume (in tonnes) of all relevant foreign trade statistics (FTS) codes. Value over volume then gives the specific price indicator (in /tonne)

$$price\ indicator = \frac{\sum value}{\sum volume}$$

Value and volume is extracted from foreign trade statistics as intra EU-28 and extra EU-28 trade for both, import and export. The price indicator is shown as monthly data or yearly average data.

The total volume of the traded waste materials (import plus export) is shown as an additional indicator. This indicator (tonnes/month) shows the market activity and covers intra- and extra trade in EU-28. This indicator is shown as monthly data (tonnes/month) for a month or the yearly average (12 times tonnes/month).

Foreign trade statistics are published monthly, with a delay of approximately 3.5 months. The year 2004 was chosen as the starting point because reliable data for EU-28 is available from 2004 onwards.

Other articles

- Environment statistics introduced
- Waste statistics

- Municipal waste statistics
- Waste shipment statistics
- End-of-life vehicle statistics
- Waste statistics - electrical and electronic equipment

Main tables

- Waste

Database

- Waste (env_was) ,

Waste streams (env_wasst)

Dedicated section

- Waste statistics website

Publications

All publications on waste issued by Eurostat.

Legislation

- Commission Decision 2005/270/EC of 22 March 2005 establishing the formats relating to the database system pursuant to Directive 94/62/EC of the European Parliament and of the Council of 20 December 1994 on packaging and packaging waste
- Directive 2004/12/EC of the European Parliament and of the Council of 11 February 2004 on packaging and packaging waste

External links

- European Commission - Environment – Packaging waste
- European Environment Agency – Waste and material resources