



EUROPEAN COMMISSION  
EUROSTAT

Directorate E: Sectoral and regional statistics  
E-2: Environmental Statistics and Accounts; Sustainable Development

## Country-specific notes referring to data on packaging and packaging waste

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### **Belgium**

- The main source of the Belgian statistics for data on packaging waste put on the market is an ex-extended producer responsibility scheme which is supplemented by specific questionnaires, statistics and industry declarations. Belgium additionally provides a general estimate of the market, based on surveys.
- Between 2013 and 2015, extensive audits of the national system were established to fulfil the obligations defined by law and to stimulate the recycling of industrial packaging waste. The audit caused methodological breaks in the time series between ref. years 2013 and 2015 of wooden packaging for the treatment categories, 'recycling', 'energy recovery (R1)' and 'incineration with energy recovery at waste incinerators'.
- The main reason for the increase in the recycling of plastic packaging between reference year 2013 and 2014 is that a greater amount of plastic packaging was in stock, which was recycled in 2014.

### **Bulgaria**

- Since 2004, packaging put on the market has been calculated using a statistical survey covering enterprises, which bring packaged goods, and packaging on the market combined with data from the Executive Environment Agency. Estimates are also used to calculate packaging put on the market; assessment coefficients are calculated for each packaging industry branch and not by material. Coefficients are based on the turnover of enterprises in these sectors and cover that part of the economy.
- From 2013 to 2014, reported data of recycled plastic packaging increased significantly. The main reason for this increase is that a bigger amount of recyclable plastics was in stock.
- The observed increase in recycled metal and plastics was confirmed by the EPA to be due to real increase in recycled volumes since some of the biggest recycling companies increased the recycled amounts in 2017 due to the increased amount of collected waste.

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<sup>1</sup> Document considers data submitted by the Member States until October 2020.

## **Czech Republic**

- The Ministry of the Environment acquires data on packaging and packaging waste from relevant entities and from authorized packaging companies. The values of the produced amounts of waste and the values of recycling and recovery of waste are summed up from the data sources. The calculation method has remained unchanged since 2003. No general estimates are used to improve coverage of data on packaging waste generated.
- The amount of plastic and paper & cardboard packaging 'incinerated at waste incinerators with energy recovery' fluctuated between 2011 and 2013 as one of the three Czech incinerators was reconstructed.
- From reference year 2013 to 2014, a break in the time series of wooden packaging recycling took place as the dominant wood waste processor in the Czech Republic was refocussed. Another significant accelerator of wooden packaging recycling was the development of a final sorting of bulky waste including a packaging share.
- The 2017 increase in recycling of metal packaging is caused by the extension of the collection network for steel materials and the proportion of packaging component is growing. That is important in the Czech system, because there is an integrated collection system within which both packaging and non-packaging waste are collected.
- The 2017 decline in wood packaging recycling is caused by the on-going bark beetle calamity in the Czech Republic, which causes problems with recycling of waste wood due to its excess.
- The increase of recycling of aluminium packaging is caused by significantly increased density of the collection network in relation to metal packaging within the EPR system.

## **Denmark**

- Production and foreign trade statistics are used to calculate packaging waste generated for packaging materials. In addition, wooden packaging generated is calculated using specific questionnaires & statistics. No general estimates are used to improve the coverage of data on packaging waste generated.
- The statistics of Denmark include packaging imported through private purchases of products abroad (Germany).
- In 2010, Denmark introduced a new waste database system to manage all waste streams. Denmark let the data from 2009 be representative for 2010 and consequently data for reference year 2010 were flagged as estimates, as it was decided that the quality of the reported data for reference year 2010 was not sufficient for validation.
- The decrease of reported data on waste generated from metal packaging between reference years 2013 and 2014 was due to the fact that the calculation methods for packaging and packaging waste generated were updated for the reference years from 2014 onwards. The amount of metal slags from incineration going to recycling was adjusted.
- The amount of wooden waste generated tends to fluctuate from year to year, as in Denmark the amount of wooden packaging waste depends greatly on the supply of wooden pallets, which itself varies depending on the replacement of reused wooden pallets. As the waste generation (considered as equivalent to PoM) may not take place in the same year as the recovery activity the recovery rate varies.

- Denmark reported incineration of packaging for some years in the category “incineration / energy recovery R1” and for other years “Recovery - incineration with energy recovery”. Since 2014 the incineration is completely reported as “incineration / energy recovery R1” following discussion with Eurostat on the correct classification.
- The amount of paper/cardboard incinerated with energy recovery increased considerably from 2016 to 2017. According to DK authorities, the amount of paper/cardboard put on the market has increased for 2017, while the amount collected to recycling has decreased. The following reasons were identified:
  1. More and more municipalities collect several waste types in the same container. This makes it more difficult to track a specific waste type.
  2. The calculations for generated waste (PM) needs to be updated; work is in progress.

## **Germany**

- Data on packaging put on the market is obtained by a mix of methods, including data from producer responsibility organisations, productions statistics, studies and general estimates.
- Over the last years there has been a trend towards an increase of packaging waste, which can be assigned to the following factors:
  - In the recent past, long distance trade has developed quickly, leading to a higher amount of paper and cardboard packaging.
  - Consumption of corrugated board for transport packaging has increased due to changing distribution structures.
  - Demand for small filling sizes and prepacked units have risen, which consequently increased packaging consumption.
  - In addition, smaller households tend to have higher consumption levels out-of-home.
  - Final consumers in private households and in businesses are increasingly convenience-oriented. The producers meet the new consumer needs by offering increasingly differentiated, innovative products and services including the respective packaging.
- For reference year 2011 a new methodology was introduced, which influences the breakdown for certain recovery operations. Therefore, data for the treatment operation ‘energy recovery (R1)’ and ‘incineration with energy recovery at waste incinerators’ were indexed with the flag ‘B’ (=break in time series) for reference year 2011.
- Germany considers in its calculations the export of cans to Denmark by deducting the exports from the amounts put on the market.

## **Estonia**

- Data on packaging and packaging waste put on the market is based on a report on waste as well as on a study on municipal and packaging waste commissioned by the Ministry of the Environment and local governments. General estimates are used to improve data coverage.
- A break in the time series between reference years 2010 and 2011 took place for metal packaging waste generated and for the treatment category ‘material recycling’ due to a change in the assessment of quantities by responsible undertakings. The proportion of metal packaging was

estimated to be 15 % and the data on metal packaging for the reference year 2011 were indexed with the flag 'B' (=break in time series).

- From reference year 2012 to 2013, a break in the time series took place for the amounts for paper & cardboard and plastic packaging for 'energy recovery (R1)', which rose extraordinarily, as for the first time, in 2013, the recovery of municipal solid waste was incinerated in a waste incineration block.
- From reference year 2013 to 2014, a break in the time series can be observed for wooden packaging. Wooden packaging generated and wooden packaging in the category 'material recycling' increased significantly. These increases are due to the following facts:
  - Separately collected waste quantities increased.
  - Packaging waste auditing procedures were specified in the year 2014, resulting in a significant improvement in data quality.
  - In 2014 the national recovery operation 'preparing for reuse of products or their components, consisting mainly organic materials' increased. Previously, this activity was not accurately reported. The reporting on this operation affects both the volumes of generation and recycling.
- The increase in energy recovery (R1) for wooden packaging in 2017 is due to the fact that power plants are expanding their capacity for waste wood (based on power plant report).
- In 2017 for the first time Estonia reported quantities treated in the category "Incineration at waste incineration plants with energy recovery" because there is one plant classified as waste incineration plant in the country (in previous years it has been included in energy recovery (R1)). Communication whether this plant does not fulfil R1 criteria and is hence correctly placed with "Incineration at waste incineration plants with energy recovery" is on-going.
- In 2018 the large increase in the recycling of plastic packaging waste is not due to methodological changes. In particular, the reasons for the changes are as follows: opportunities of recycling have increased, some new operators have entered to the market and the largest plastic recycling plant started operating full-time in 2018
- In 2018 the increase of recycling of wooden packaging is due to one company starting to use packaging waste in the production of particle board and packaging waste recyclers who already operated in the market increased their recycling volumes.
- In 2018 the increase in generation of wooden packaging waste is not due to a change in methodology. According to waste handlers, the amounts of wood packaging waste collected separately increased.

## **Ireland**

- The methodology for estimating packaging waste put on the market was revised for 2013 data due to significant changes in the management of residual waste streams. A best estimate of packaging waste generated in Ireland is obtained by combining information about packaging waste recovered with an estimate of packaging waste in residual waste that may be either sent for recovery or disposal.
- Ireland reported a steady reduction of packaging waste generated from 2008 to 2012, which may be due to the long-term impacts of the 2008 financial crisis on the Irish economy.

- Four breaks in the time series took place between reference years 2012 and 2013, which are only partly due to increased amounts of packaging generated:
  - 2013 was the first year Ireland reported values for paper and cardboard packaging for the treatment category 'other forms of recycling'. The change is partly due to the inclusion of the tonnage of paper packaging sent for composting in 2013, which was not reported in previous years. Additionally, 2013 was the first year that the recovery of SRF (Solid Recovered Fuels) at cement kilns was split between energy recovery and recycling. This change in methodology is also valid for future reporting.
  - 2012 was the first year Ireland reported values for plastic packaging for the treatment category 'other forms of recycling'. The rise is due the following facts:
    - The tonnage of plastic packaging sent for composting in 2013 was not reported in previous years. This biodegradable portion of plastic packaging is an estimate.
    - 2013 was the first year that the recovery of SRF (solid recovered fuel) at cement kilns was split between energy recovery and recycling.
    - The tonnage of plastic packaging waste accepted by an industrial facility for recycling increased.
  - 2012 was the first year Ireland reported values for paper & cardboard packaging for the treatment category 'incineration with energy recovery at waste incinerators'. This rise is due to the significant increase of the tonnage of municipal waste being sent for energy recovery, both within Ireland and largely exported to other EU countries.
  - 2012 was the first year Ireland reported values for plastic packaging for the treatment category 'incineration with energy recovery at waste incinerators'. This is due to the significant increase in the tonnage of municipal waste being sent for energy recovery, both within Ireland and, to a greater extent, exported to other EU countries.
- Two breaks in the time series took place between reference year 2013 and 2014. An increase of reported data on paper & cardboard and plastic packaging in the category 'incineration with energy recovery at waste incinerators'. These increases can be explained by a rise in the tonnage of residual waste sent for energy recovery in 2014, in particular the increase in exports. Ireland is continuing to refine its calculation methods. The accuracy of Irish statistical methods improves with the significant increase in the number of surveys available.
- In reference year 2016 values for wooden packaging for the treatment operation 'energy recovery (R1)' increased in comparison to 2015. Most of the increase was due to the commissioning of a new biomass power plant in Northern Ireland. The plant started operation in December 2015. Another facility also had an approximately 50 % increase in the tonnage accepted for recovery. The increase going toward recovery is reflected by a decrease in tonnes recycled in 2016.
- In 2017 the generation of wooden packaging waste increased. The value is based on a detailed survey of wood recycling and recovery at pallet merchants, which allowed to estimate packaging wood waste more accurately.

## Greece

- Greece draws data on packaging waste from the annual reports submitted by the approved extended producer responsibility scheme (EPRS). The total value of packaging waste is estimated based on the quantities of packaging placed on the market by a large and representative sample of packaging producers.
- From 2015 to 2016 the quantities of plastic and paper & cardboard packaging waste sent for 'energy recovery (R1)' increased. In 2016, reported amounts of packaging waste used as refuse-derived fuel increased in particular for paper and plastic, because the downstream facilities accepting the non-recyclable fraction of collected waste to produce secondary fuel doubled from 2 facilities in 2015 to 4 facilities in 2016. What made this option attractive was a subsidy, which was abolished in mid-2017. Still for 2017 there was a further increase in paper and cardboard as well as plastic packaging waste treated by incineration/energy recovery (R1). It can be mainly attributed to one of the RDF plants responding to the increased demand of the cement industry.
- The increase in steel recycling reported in 2017 is due to not only enhanced material recycling performance but also a change in data collection. The data for 2017 are of improved reliability because it includes quantities coming from all metal scrap facilities (sampled at the input of the 3 Greek steel manufacturing facilities). In 2016 only the steel scrap output of the metal scrap collecting and sorting facilities that had a contract with PRO HERRCO was taken into consideration (flagged 'b').
- Values for wooden packaging (recycling) currently under revision for 2016 and 2017.

## Spain

- Spain has established an extended producer responsibility scheme for glass packaging. The country makes use of industry declarations to obtain data on packaging waste generated for plastic, cardboard & paper, metal, other and wooden packaging. No general estimates are used to improve coverage of data on packaging waste generated.
- Between reference years 2014 and 2016, values for glass packaging in the treatment category 'other recycling' fluctuated. Data for 2014 and 2016 include data from five waste treatment plants, while data for 2015 includes data from four waste treatment plants. In Spain, the reported data in this treatment category includes glass from glass packaging waste present in waste incineration bottom ashes, which are recovered and used for construction purposes.
- The amounts reported for glass packaging within the treatment category "other recovery" between 2011 and 2016 are attributable to packaging glass waste used in landfills (in the construction of the slopes) considering it as material recovery but not as recycling. As it is not accountable towards recycling Ecovidrio, the Spanish Extended Producer Responsibility scheme, has ceased to characterize and certify this flow. Therefore, the value is not statistically known any more but this does not mean that packaging glass waste is not used in landfill construction any longer.
- Between reference years 2014 and 2016 values for paper & cardboard packaging in the treatment category 'incineration with energy recovery at waste incinerators' fluctuated strongly. 2014 and 2016 data include household, commercial and industrial paper & cardboard packaging waste, while 2015 data only includes paper & cardboard packaging waste from households.
- In reference year 2016, plastic increased for the category 'energy recovery (R1)' in comparison to 2015. This increase is due to the increase of waste co-incineration in cement plants. The increase continued in 2017.

## **France**

- Data on packaging waste generated is based on industry declarations, production & foreign trade statistics and specific statistics. No general estimates are used to improve coverage of the data on packaging waste generated.
- For the reference year 2010, France reports a significant decline in steel waste generation, which is explained by better utilization of steel packaging and reduced consumption.
- In the category 'incineration with energy recovery at waste incinerators', paper and cardboard packaging increased between 2013 and 2014. This is due to the rise in paper and cardboard packaging waste generation, which can be explained by a rise in the quantities of imported cardboard packaging and increased internet sales.

## **Croatia**

- Data for packaging waste generated is obtained by an extended producer responsibility scheme. No general estimates are used to improve coverage of data on packaging waste generated.

## **Italy**

- The main data source for estimating the quantities of packaging placed on the market is the National Packaging Consortium. This authority validates the data by cross-referencing different information flows, such as sector studies, single declaration forms, processed data on the separate collection of waste (obtained from the replies of public and private bodies to dedicated questionnaires) and targeted surveys of plants.

## **Cyprus**

- Data reported for packaging and packaging waste put on the market includes information from various sources. Data is submitted by the producers in the context of the extended producer responsibility scheme and gained by industry declarations. Quantities of packaging put on the market from various sources, not reported by the above reporting schemes, are estimated.

## **Latvia**

- Data on waste generated derives from an extended producer responsibility scheme, industry declarations and waste analyses. General estimates are also used to improve coverage of data.
- In 2014, the amendments to the Natural Resources Tax Law came into force, which also included changes in the natural resources tax rates for packaging. The increased rates were differentiated depending on the type of packaging materials.
- In 2014, plastic packaging waste in the category 'material recycling' increased. In contrast, 'recovery other than energy recovery' decreased by almost the same amount. The market for plastic packaging fluctuates significantly in Latvia, as sorted packaging waste is sent to companies who offer the highest price.
- Fluctuations for the different treatment options for wooden packaging can be observed over the years. The fluctuation for reference year 2014 can partially be explained through the amendments to the Natural Resources Tax Law, which came into force in 2014. Concerning the treatment of wood in general, treatment depends on the quality of materials and market demands in a particular moment (refurbished pallets, mulch, fuel or anything else), and on the current price.

- The increase in plastic waste generation in 2018 is due to the State Environmental Service of the Republic of Latvia terminating the contract with the EPR scheme company in the 4th quarter of 2017. As a result, the contractors of the mentioned EPR scheme company had to enter into an agreement with other EPR scheme companies to continue being part of the EPR packaging and packaging waste management system (in total there are 6 such EPR scheme companies in Latvia). Because of the EPR scheme company change, there was a slight delay for some of the contractors in reporting on generated amounts of plastic packaging waste; reporting at the beginning of 2018 rather than at the end of 2017.

## Lithuania

- Data on packaging waste generated is obtained by industry declarations. No general estimates are used to improve coverage of data of packaging waste generated.
- The break in the time series from 2013 to 2014 in the category 'material recycling' for wooden packaging took place because in 2013 one of the biggest biodegradable waste recycling companies terminated its activity. In 2014, the company recommenced its activity.
- In 2016 values for plastic and wooden packaging treated in the category 'material recycling' increased. In general, Lithuania improved its existing packaging waste collecting system. In particular the following background is responsible for the increases:
  - Plastic packaging waste: In 2016, the global system for the collection of packaging waste was partly replaced with a deposit and return system. As result, collecting as well recycling increased.
  - Wooden packaging waste: The amount of recycled wooden packaging waste depends on production volumes of one producer, which is the main wooden packaging waste generator in Lithuania. This producer also makes products from wooden packaging, which is attributed as recycled (please also consider note for wooden packaging waste recycling in 2017 below).
- In 2017 the volume reported for material recycling of wooden packaging waste decreased by 50%. Simultaneously the volume of wooden packaging waste reported as treated by "incineration / energy recovery R1" increased commensurately. This is sustained by a survey among wooden packaging treatment companies made in 2018. It showed that approx. 50% of the wooden packaging waste reported as recycled are actually used as fuel. The volumes were adapted accordingly (flagged "b").
- In 2017 the volume reported for material recycling of glass packaging decreased (the reported generated volume of glass packaging remained approx. constant). This was reportedly because of significant changes in the waste management system (flagged "b").
- The increase in the generation of "other packaging" in 2017 compared to 2016 is due to the inclusion of combined packaging. In 2017 for the first time, its amount could be reliably determined. Before it was included in "Paper and cardboard" since this is the major constituent material. The former allocation (with the major constituent material) is, however, correct and re-allocation for 2017 is pending.

## **Luxembourg**

- Since 2003, the reporting system in Luxembourg has referred to data on packaging waste arising and not to data on packaging waste put on the market. Data on packaging waste arising is based on analyses of the respective treatment paths and estimates.
- In 2014, wooden packaging treated in the category 'material recycling' decreased, while simultaneously an increase in the category 'energy recovery (R1)' occurred. This is because since 2014 a new plant is in operation. Nearly 80% - 90% of waste wood is recovered in Luxembourg and is therefore no longer exported.

## **Hungary**

- Figures on packaging waste generated derive mainly from an extended producer responsibility scheme and additionally on specific questionnaires and waste statistics. To improve coverage of data on packaging and packaging waste put on the market, estimates are also applied.
- In 2016, treated paper & cardboard packaging in the category 'energy recovery (R1)' increased as the establishment of systems for the mechanical and biological sorting of mixed municipal waste has accelerated since 2014, and new facilities were put into operation. From these facilities, a large part of packaging waste is sorted into the light fraction (refuse derived fuel, RDF) to be incinerated, so the amount of RDF has also increased.
- In 2014, wooden packaging waste generated decreased, as in 2014 data was based on other methods than in previous years.
- Between 2013 and 2015 plastic packaging waste treated in the category 'incineration with energy recovery' declined. The reason is that there is only one mixed municipal waste incineration plant in Hungary, which assesses the quantity of the waste streams from the mixed municipal waste. This facility changed the way of examination in 2014 and used bigger samples, which caused a change in packaging waste share. Furthermore, the door-to-door collection system was introduced in 2014. Both changes caused the reduction of the plastic packaging waste in the mixed municipal waste resulting in a decline in the plastic packaging waste incinerated.
- Amounts for material recycling of glass packaging fluctuated between 2014 and 2016, as one of the processing facilities collected and stored significant amount of glass waste in 2014. This facility recycled those amounts just in 2015, which caused this increase for reference year 2015.

## **Malta**

- Source of information for packaging put on the market is based on an extended producer responsibility scheme, waste statistics and estimations.
- In 2014, the amount of recycled plastic packaging rose in comparison to 2013. In addition, a decrease in the amount of glass packaging waste recycled occurred between 2013 and 2014. The reasons are as follows: Due to Malta's geographical location and small size, it is highly dependent on exports for several waste streams, including glass and plastic packaging waste. It may not always be feasible for local facilities to export such waste immediately, considering that shipments and exports of waste depend on favourable market prices.
- Malta does not possess the necessary treatment capacity to treat all waste streams generated locally, thus it relies significantly on the export of wastes. Since the current regulatory regime on exports of waste does not expressly provide authorities with details, which kind of 'other forms of recovery' was applied, no details are available on this treatment category.

## Netherlands

- The following sources of information for data on packaging waste generated are used in the Netherlands: an extended producer responsibility scheme, industry declarations and specific statistics. No general estimates are used to improve coverage of data of packaging waste generated.
- Since 2011 the main part of packaging waste treated in waste incinerators is classified in the treatment category 'incineration with energy recovery'.
- In 2014 an increase of paper & cardboard packaging waste treated in the category 'incineration with energy recovery at waste incinerators' took place, due to an improved monitoring system. The assumption was made that 95 % of all the residual waste was incinerated. Therefore also 95 % of the amount of paper put on the market minus the amount of recycling ended up in an incinerator.

## Austria

- Data on packaging waste generated derives from various sources: an extended producer responsibility scheme, specific questionnaires and waste analyses. No general estimates are used to improve coverage of the data on packaging waste generated.

## Poland

- Reported data is obtained by entrepreneurs who are placing packaging products on the market.
- Poland indicated that in 2016 plastic packaging treated in the category 'material recycling' increased due to no specific reason.

In 2018 the decrease in other recovery of wooden packaging might be linked to a law amendment. Poland prohibited PROs (producers responsibility organizations) to include recovery of wooden packaging from households to achieve their own targets for household packaging **Portugal**

- Information on packaging waste generated is provided by an extended producer responsibility scheme.
- For reference year 2014 a change in the methodology was applied for data on packaging put on the market and for data on the recycling and recovery of plastic, paper, metal, other and wooden packaging. Up to 2013, the amount of packaging put on the market only included declarations from packers/ fillers to the compliance system (The Green Dot Company), which in 2013 represented around 60 % of the total packaging put on the market. As of 2014, estimates were introduced to calculate the total figures, using the percentages from 2013.
- For wooden packaging, in the category 'material recycling' an increase from reference year 2013 to 2014 took place. Generally, the values fluctuate year by year. For wood, the recycling rate reached 130 % for the reference year 2014. It is assumed that reusable and non-reusable packaging is often mixed, which is represented by wooden pallets or wooden boxes for transporting food products. The correct separation in the recycling of reusable and non-reusable packaging is difficult to obtain.
- For paper and cardboard, plastic and wooden packaging the volumes to "incineration with energy recovery" increased in 2017 due to a change in methodology (hence flagged "b"). Previously these volumes were calculated from the volume of packaging PoM including an estimate for the share of municipal waste packaging and subtracting recycled and landfilled quantities. Since

2017 the volumes to “incineration with energy recovery” are calculated based on characterization of the waste entering the incinerators (reported by the Municipal Waste Management Systems (SGRUs)).

## **Romania**

- Romania monitors the quantity of packaging placed on the market using specific questionnaires and statistics. The National Environmental Protection Agency checks the data reported by economic operators that produce/import packaging for sale and by economic operators that produce/import packaging for the packaging of their own products and compares them with the data reported by economic operators that manufacture packaged products.

## **Slovenia**

- The data for packaging waste generated was obtained by operators managing packaging and packaging waste, which are liable for environmental tax on pollution, and by operators that are not included in the common system for packaging waste management.
- Between 2012 and 2013, the amount of plastic and other packaging for the treatment category ‘energy recovery (R1)’ increased significantly:
  - Other Packaging: The collection of certain packaging waste from Slovenian households takes place in so-called eco-points. One type of container is intended for collecting mixed packaging waste, which also contains fine material and is therefore assumed to not be suitable for material recycling procedures. Hence, ‘energy recovery’ procedures are ensured for this material. Since it is not explicitly defined how to classify mixed packaging waste material after sorting, it was classified as ‘other packaging material’.
  - Plastic packaging: The amount of plastic packaging used for energy recovery reflects the situation on the market. Moreover, annual reports of the packaging waste management companies show that plastic packaging waste, which was not suitable for material recycling, was treated using energy recovery procedures.
- Between 2013 and 2014, other packaging in the treatment category ‘energy recovery (R1)’ decreased. Packaging waste management companies provided information on correct reporting on managing collected packaging waste. These instructions were considered in the annual reports on packaging waste management in 2014. Consequently, the quality of reported data since 2014 has improved.
- From reference year 2014 to 2015, the amount of plastic and other packaging within the treatment category ‘energy recovery (R1)’ decreased significantly. In order to improve the quality of data collected from the packaging waste management companies, a revised and optimized reporting form with more detailed guidelines was introduced in 2015. Changes in legislation concerning the recycling of non-hazardous waste into refused derived fuel contributed to the noted decrease.

## **Slovakia**

- Data of packaging put on the market is obtained by specific questionnaires and statistics, based on data, which derives from producer responsibility organisations and individual packaging producers.
- From 2010 to 2011 a significant increase of paper & cardboard packaging in the treatment category ‘material recycling’ took place. This can be explained by market recoveries: The increase

might be caused by an increase in the purchase price of paper and cardboard packaging waste or in the purchase price of recycled paper and cardboard.

- From 2012 and 2013, values within the treatment category 'energy recovery (R1)' increased substantially especially for plastic packaging. The increase in the amount of energy recovery from plastic packaging in the year 2013 could be affected by a legislative change which came into force on 1 January 2013. The Act on Packaging was supplemented with a provision relating to support energy recovery if it has environmental and cost-benefit advantages in comparison to material recycling.
- From reference year 2015 to 2016 the following particularities in the time series were reported: Values within the treatment category 'energy recovery (R1)' for 'other' packaging increased. Also values for metal packaging within the treatment category 'other recovery' increased. The increases might have been caused by the implementation of special provisions on waste and on the amendment of acts in 2016.
- Data for reference year 2016 reported for 'other' packaging generated is much lower than values for 'other' packaging treated. The higher amount of the packaging treated could be due to packaging produced in 2015 but treated in 2016.
- Data on 'incineration with energy recovery at waste incinerators' is not available in Slovakia.

## **Finland**

- Data source for packaging put on the market is an extended producer responsibility scheme. No estimates are used to improve coverage of the data. Finland has no producer organisation for 'other' packaging. Therefore, no data are submitted in this category for any of the treatment options.
- The recovery rate for paper & cardboard packaging for the years 2008 to 2018 is more than 100 %. The Finnish figures do not cover all the paper and cardboard packages that were put on the market. The figures only cover those forms of packaging, which are put on the market by the members of producer organisations. The amounts of waste generated from the producers with a turnover of less than 1 million Euro, internet shops, imports by private consumers and free-riders are missing. Additionally, the amounts of recovered packaging derive from recovery companies that include also packaging waste that is not included in the statistics of packaging put on the market.
- Finland reports no data for the treatment category 'energy recovery (R1)' for the materials plastic, paper & cardboard, glass and wood for the reference years from 2010 onwards. This is because some of the biggest heating plants were shut down. Some packaging waste is incinerated in small industrial plants, but there is no exact data on the amounts nor estimates. However, it has been possible to report the amount for plastic packaging within the treatment category 'energy recovery (R1)' since reference year 2015.
- For plastic packaging in the category 'incineration with energy recovery at waste incinerators' a significant increase took place between 2014 and 2015 due to an increased capacity of waste incineration. The Waste Act banned landfilling of organic waste beginning 1 January 2016. In response, new waste incineration plants with energy recovery were constructed.
- Glass packaging waste reported under "other recovery" (e.g. in 2015 and 2016) is separately collected glass which does not fulfil the quality requirements for material recycling and is used

as construction material e.g. in landfill constructions. In 2017 zero was reported for glass packaging waste under “other recovery” because all separately collected glass could be processed to material recycling.

- The increase in plastic packaging recycling in 2018 is due to collection and recycling of plastic packaging from households starting in 2016 and increasing significantly every year. A new recycling facility was started in 2016. This explains most of the increase. Further, there has been increase in the recycling of BtoB packaging due to efforts by the producers.

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## Sweden

- To obtain data on packaging material put on the market, specific questionnaires are sent out to producer responsibility organisations fulfilling the producer responsibility obligations for their member producers. One percent of the total amount of packaging material put on the market and consisting of the materials glass, plastic, paper, metal and wood is regarded as ‘other’ and then added to the total amount. No further estimates are used to improve coverage.
- For the years 2010 to 2014, the recovery rate of wooden packaging is over 100 %. In 2010 the rate is even more than 1000 %. The reason is that the figures for wooden packaging are highly unreliable because there is an unknown number of free-riders. Additionally, values for wooden packaging are mostly based on box pallets that can be easily produced by off-market companies.
- A methodological change took place for wooden packaging generated beginning with reference year 2014. Previously, companies were asked to estimate amounts of wooden packaging put on the market. Although the estimated amounts were judged not 100% reliable, they were included into the statistics. However, it was decided not to include the estimates from 2014 onwards. Additionally, a data correction corresponding to the new methodology was made for wooden packaging generated beginning with 2010.
- Between 2015 and 2016 the Swedish government clarified for the two producer responsibility organisations how to fill in the questionnaire regarding recycling versus other forms of recycling (preparation before re-use). This resulted in a general shift from material recycling toward more ‘other forms of recycling’. In 2017 the data for wooden packaging waste were still affected by changes in reporting routines leading to large differences in statistics (hence flagged “b” also for 2017).
- For plastic packaging waste a change in reporting occurred in 2017 for the category “Recovery – incineration with energy recovery” (hence flagged “b”). In general, the reported amount of packaging waste sent to energy recovery is based on the amount reported by the producer responsibility organizations (PROs). This means that only the amount of (separately collected) packaging waste collected by the PROs is included. Moreover, because almost all separately collected plastic packaging waste is delivered to a materials recovery facility, the amount of waste sent to energy recovery is expected to be low (as seen in 2017 data). However, up until reference year 2016 the leading PRO included commercial plastic packaging, sent to energy recovery, collected by other waste management companies in their reporting. The correct scope for reporting according to Article 2 of the PPWD is under discussion.
- In terms of the packaging and packaging waste statistics, the reported amount of packaging waste sent to energy recovery is based on the amount reported by the producer responsibility organizations. This means that only the amount of separately collected packaging waste collected by the producer responsibility organizations is included.

## **United Kingdom**

- Data on packaging put on the market derives from a mix of methods that are based on the best available evidence. Estimates are applied for the different packaging materials to improve coverage of the data.
- For all packaging materials put on the market breaks in the time series took place due to an update in the respective methodology:
  - for glass the update took place in 2013,
  - for plastics in 2014,
  - and for paper & cardboard, metal and wooden packaging in 2015.
- Reported amounts for plastic and paper & cardboard packaging waste within the treatment category 'incineration with energy recovery at waste incinerators' dropped by more than one third between 2013 and 2014. The reason is that the number of accredited sites for energy recovery (R1) went up from one to two. Furthermore, the number of Energy from Waste (EFW) facilities dropped from 18 in 2013 to 11 in 2014.
- For packaging waste generated, the same data for all packaging materials was reported for 2014, 2015 and 2016, except for plastic packaging. The reason is that data on packaging generated is based on 0% growth. In 2012 and 2013 a process of assessing the waste of each stream was undertaken, which has led to new baselines for each packaging material and adjustments of the expected projected growth rates.

## **Iceland**

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## **Liechtenstein**

- In Liechtenstein, data for packaging waste generated is provided by communities and relies on data from waste treatment facilities. These data form the basis for estimates on the total amounts of packaging and packaging waste.
- Between 2014 and 2015 a significant decrease of the reported volume of wooden packaging waste generated can be observed which is due to missing data. Liechtenstein announced that the data quality for reference year 2016 would be improved. However, also for ref. year 2016 values for wooden packaging waste generated are comparably low as in 2015.
- In Liechtenstein no treatment of packaging waste takes place. All packaging waste is exported.

## **Norway**

- Figures on the generation of packaging waste are calculated by the take-back schemes based on import declarations submitted to Norwegian Customs Service. Furthermore, data is obtained by sales & delivery figures reported to the material companies by their members. The calculations are based on several in-depth studies of the market for the different packaging types.