

# WHAT IMPACT WILL THE FORTHCOMING EUROPEAN PACKAGING REGULATION (EU-VERPACKV) AND THE GERMAN PACKAGING ACT (VERPACKG) HAVE ON THE ENVIRONMENT AND ON POTENTIAL COMPANIES AFFECTED BY THEM?

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## ABSTRACT

This article analyses the effects of the European Packaging Regulation and the amendment to the Packaging Act on the economic development of companies and highlights the benefits for the environment. The analysis shows that the Packaging Act requires manufacturers of packaging filled with goods, as well as manufacturers (distributors) who place service packaging on the market for the first time, to register with the "Central Packaging Register" and, if necessary, obtain a license to participate in the system. Retail transport packaging is only subject to registration if it is not intended for private final consumption. The draft EU Packaging Regulation provides for measures such as the restriction of hazardous substances, the compostability of tea and coffee bags and the promotion of reusable systems in order to reduce the amount of packaging waste by at least 15% by 2040. Efficient resource utilisation and high-quality recycling can save costs and recover valuable raw materials, which increases competitiveness and creates jobs. The Packaging Ordinance also helps to secure the supply of raw materials by reducing dependence on imports. This leads to an overall more sustainable economy and reduces the CO<sub>2</sub> footprint. As a result of the Packaging Act, the recycling targets for packaging made from various materials were met or exceeded in 2022. In particular, 67.5% of plastic packaging was mechanically recycled, 4.5 percentage points above the legally stipulated minimum percentage. However, there are still problems with the recyclability of composite packaging, as not all of it can be fully recycled.

**Keywords:** Packaging CO<sub>2</sub>, Registration, EU/Germany Agreement, Economy.

## INTRODUCTION

"The topic of recycling came more into focus in the 1990s as a result of the packaging regulations passed in 1991 and 1998" [my translation] (Rückwardt 2021). For nearly thirty years, the European Union has regulated the marketing, disposal, and recycling of packaging through the European Packaging Directive 94/62/EG, with the goal of promoting environmental protection. In Germany, this is implemented by the Packaging Act. However, the directive has led to problems in its implementation. The European Commission is proposing a new packaging regulation that supports the "European Green Deal" and promotes a clean and resource-efficient economy. (cf. Hesselmann, 2024).

This article analyses the European Packaging Directive 94/62/EC with the Packaging Act and the forthcoming Packaging Ordinance. It analyses which implementation measures must be observed by companies.

## METHODOLOGY

A literature review will be conducted to identify the various changes to the law. In addition, the effects and benefits are analysed. A summary of the current state of research and legislation is compiled from various sources. At the beginning, detailed research questions will be developed to define the objectives.

- a) What additions are made by the Packaging Ordinance (Packaging and Packaging Waste Regulations PPWR) to the Packaging Act (Packaging Directive 94/62/ EG)?
- b) What impact does the current Packaging Act have on companies?
- c) What are the advantages of the Packaging Act?

A matrix of terms is used to categorise and sequence the questions and to create an overview. These keywords are used to categorise the content (cf. Gilarski et al., 2020). (see Figure 1).

Conditions	EU/Germany Agreement	Economy	Registration	Packaging CO2
Synonyms	Politics	Costs	Private/entrepreneur	Advantages/disadvantages Regulation
Generic term	Parties, EU Commission, countries	Company, business relationships, Subsidies, state	Procedure, effort	Studies
Subtitle	Implementation, negotiations, regulations, changes	Specifications, delivery prices, supply chains, clauses	Duration, cycle	Waste reduction
Related terms	European Economic Area	Handel	Definitions Private/ Entrepreneur	Guidelines

**Figure 1: The vocabulary utilized in the literature search (term matrix)**

Source: own representation

In the search engines Web of Science PubMed, EconBiz, BASE and Google Scholar, the content is used with the top, bottom and associated terms (cf. Burkhardt et al. 2017).

This tool simplifies the search by filtering only by context

(cf. Durach, CF, Kembro & Wieland, 2017; Guba, 2008; Kitchenham, 2007; McManus et al., 1998).

Once the sources are identified, it is possible to extract the information on the key terms. (Gough, 2012). The sources are systematically analysed and similarities and research gaps are identified (cf. Boland et al., 2017; Briner & Denyer, 2012).

The connections between the research questions and the evaluation are discussed at the end and the results are emphasised (cf. Burkhardt et al. 2017).

### The Packaging Act in Germany and the EU

The German Packaging Act (VerpackG) is the German implementation of the Packaging Directive (94/62/EC). It came into force in 2019, was amended in 2021 and 2023 and only applies in

Germany, as each country has its own legislation. (cf. Hesselmann, 2024). The Single-Use Plastics Directive and the Waste Directive's draft law was modified to the Packaging Act and put into effect (cf. Landbell, n.d).

The "Central Agency Packaging Register" was founded when the Packaging Act came into force. It is a private legal foundation and takes over the sovereign tasks previously performed by the Chamber of Industry and Commerce. Its tasks include keeping a packaging register, checking volume flow records and determining the system participation obligation for packaging (Schulze, 2019: p. 11). This primarily serves to protect the environment and create fair and transparent competition between market participants (cf. Helmold/Terry 2016). Not only packaging subject to system participation that accumulates as waste at the end consumer, but also all packaging filled with goods must be registered since July 2022 (cf. Landbell n.d; Certify n.d).

In January 2023, the latest amendment made it mandatory for restaurants, bistros and cafés to offer reusable packaging. In addition to disposable packaging made of plastic or with plastic components, providers of food and beverages must offer a reusable alternative. This also applies to disposable takeaway cups, regardless of the packaging. (§ 33, § 34 VerpackG2). Large companies are obliged to provide reusable packaging in the company. Small businesses with a sales area of up to 80 square metres (including freely accessible seating and lounge areas) and fewer than five employees must be able to fill containers they have brought with them (LIFE n.d.). The packaging regulation planned by the EU is intended to improve the existing directive and apply equally to all countries. It is intended to promote a clean economy. On 24 April 2024, the EU Parliament approved the Packaging Regulation (cf. EUWID 2024).

The main aim of the EU proposal is to combat the increase in packaging waste and achieve a reduction of at least 15 per cent by 2040 compared to 2018 in the EU. The regulation aims to set reusable quotas, require tea and coffee bags to be compostable, make the labelling of packaging materials mandatory, increase the proportion of recycled material and make manufacturers responsible for disposal and recycling. Other measures include the restriction of hazardous substances and the ban on deceptive packaging, as well as the goal of making 40% of packaging in the catering industry reusable. (cf. Hesselmann 2024; ecoinstant 2024; Deutsche Recycling n.d). The implementation of the EU Packaging Regulation is expected to take 18 months and could be delayed by the European elections in June 2024. Companies should already be addressing the issue now, as there will be a large number of requirements in the form of documentation (cf. Wagner 2024).

To cut down on waste, the European Commission declared in 2020 that by 2030, all packaging must be recyclable or reusable. The decision on the action plan for this cycle was announced by the Parliament in 2021. In 2023, the Commission presented its first proposal for a possible new packaging regulation in the EU to achieve zero net greenhouse gas emissions by 2050 and decouple economic growth from resource use. (cf. Hesselmann 2024; Kreutzer, 2023; Deutscher Bundestag 2023).

The European Commission's Green Deal strategy pursues the goal that all packaging placed on the EU market should be economically viable by 2030 (cf. Boße et al. 2021: p. 8; Höppner 2023). This target was supplemented by further measures in the new Circular Economy Action Plan. These

include the decarbonisation of greenhouse gas emissions, the promotion of renewable energies, the reduction of energy consumption, the promotion of rail transport and inland waterway transport. In particular, however, the requirements for the recyclability and reusability of packaging are to be tightened (cf. Kreuzer, 2023; EUR-Lex 2019).

As each country has its own laws, it is important to implement a European circular economy. The carbon footprint must be reduced and this can only be achieved through a functioning packaging waste management system. Through an international comparison of responsibilities for prevention, collection, recycling and recovery in Germany, France, the UK, the Netherlands, Portugal, Denmark, Spain and Italy, conducted by Foggia/Beccarello 2022 in "An Overview of Packaging Waste Models in Some European Countries", it was found that obstacles to the development of the European market arise when different rules for packaging disposal apply in the respective countries (cf. Foggia/Beccarello 2022).

**Economic impact:**

A circular economy, which incorporates product recycling and reuse to reduce the use of natural resources, is necessary for environmental protection (cf. Hesse/Clausen 2023).

The value of raw material trade (imports plus exports) between the European Union and the rest of the world has nearly tripled since 2002. More exports than imports have increased. The EU's imports remain higher than its exports. As a result, there was a 35.5 billion euro trade deficit in 2021 (cf. Europarl 2023: p. 3). Product recycling lowers price swings, particularly for vital raw materials like electric motors and batteries (cf. Hesse/Clausen 2023).

Manufacturers, importers, retailers and online retailers who act as initial distributors of B2C packaging subject to system participation must participate in a dual system for take-back and recovery. Initial distributors (manufacturers) and subsequent distributors (retailers) of B2B packaging are obliged to take back similar packaging waste free of charge and recycle it properly. This now also applies to reusable packaging. End consumers must be informed of this (cf. Hohmann 2022).

The (dual) systems charge license fees for packaging based on weight quantities and material fractions put on the market, provided that the packager participates in the system. The initial distributors of B2B packaging, as well as any subsequent distributors where necessary, are responsible for financing the retrieval and return of the corresponding packaging waste from appropriate disposal companies (cf. Hesselmann 2024).

Fees are charged for mandatory participation in dual systems, the costs of which are broken down into collection costs (yellow bin), sorting costs (lightweight packaging), recycling costs (other recycling facilities), waste counselling (municipal tariffs), security services and other costs such as administrative costs. A price comparison of the dual systems can be useful. The best-known dual system is the "Green Dot", which offers the registration service, among other things (cf. Söllig n.d.; ZSVR n.d.). For the licensing of packaging, all packaging must be included and the quantities calculated. The packaging weights can be determined with the help of sales volumes and online databases. (cf. Lizenzero n.d.; Bueren/ Crowder 2024).

The circular economy brings benefits not only for environmental protection, but also for the economy. On the one hand, competitiveness is increased as costs can be reduced through the economical use of resources and valuable raw materials remain in the economic cycle through high-quality recycling. In macroeconomic terms, this leads to more employment through innovation. Secondly, the supply of raw materials is secured as dependence on imports is reduced (cf. Kehl/Riousset 2024; Europarl 2023).

Product stewards who fail to fulfil their obligations under waste legislation can face various legal consequences, including sanctions from the authorities and competition law claims from competitors. The options for enforcing fines depend on whether the manufacturer is based in Germany, an EU member state or a third country. The Federal Environment Agency study 190/2020 shows that German authorities can sanction EU free riders, while this is only possible for third-country free riders if an international treaty exists (cf. Hermann et al. 2020).

### **Registration**

To achieve the environmental targets, measures such as the obligation to register and provide evidence of the amount of transport packaging placed on the market, taken back and recycled are planned. From 1 July 2022, manufacturers and initial distributors will be required to register with the "LUCID" register, which is provided by the Central Agency Packaging Register (cf. Kreutzer, 2023). After registration, it is checked whether there is an obligation to participate in dual systems. The licensing of dual systems and "LUCID" fulfil different tasks. The dual systems ensure a functioning circular economy, while LUCID serves as a public register and control body for compliance with the Packaging Act. (cf. Lizenzero n.d).

Packaging is classified as follows: transport packaging, packaging containing hazardous materials, packaging subject to system participation, packaging not subject to system participation, and reusable packaging (cf. Söllig n.d.)

### **Packaging subject to system participation**

Packaging that accumulates at the end of the consumer's life and is subject to system participation obligations in the business-to-consumer (B2C) sector require licensing with a dual system that guarantees the recycling and take-back of packaging waste across the country. To this end, registration must first be carried out in order to obtain a registration number. In addition, a data report of the packaging quantities is required, whereby at least the following data must be provided: 1. registration number 2. material type and mass of the packaging involved 3. name of the system with which the system participation was undertaken 4. period for which the system participation was undertaken (cf. Kempkes/Bruckschen 2022: p. 462; Section 10 VerpackG).

If certain quantity thresholds for packaging are exceeded (80 tonnes of glass, 50 tonnes of paper/paperboard/cardboard, 30 tonnes of lightweight packaging per year), manufacturers must submit an annual declaration of completeness (VE) by 15 May (cf. Händlerbund n.d; ZSVR n.d; ihk-muenchen 2022). In addition, manufacturers and downstream distributors of reusable packaging are obliged to take back and recycle packaging in accordance with Section 15 VerpackG (cf. Kreutzer, 2023).

Packaging subject to system participation includes sales packaging, secondary packaging, service packaging (bread roll bags) and shipping packaging.

Service packaging must therefore also be registered by the retailer with LUCID and thus with the Central Agency Packaging Register. Whether they need to be licenced depends on whether the upstream supplier has already taken on this task (cf. *ihk-muenchen 2022*).

Private final consumers include not only households, but also companies that generate household-like volumes, such as restaurants, hotels, retirement homes, hospitals, etc. (cf. *Söllig n.d.*).

### **Packaging not subject to system participation**

Packaging that is not subject to system participation does not usually accumulate in households or similar sources of waste generation, but in the B2B sector (industry, trade, large-scale commerce). This packaging must also be registered and may not be passed on to third parties. This includes sales packaging and secondary packaging for industry, transport packaging, reusable packaging and packaging for hazardous goods (cf. *Niehaus 2023*).

It's critical to understand the differences between sales and transport packaging because the former is used in the private sector and the latter is always produced in the commercial sector. (cf. *Söllig n.d.*). Transport packaging facilitates transport between distributors, while outer packaging is the actual sales packaging. The latter is not mandatory, but can fulfil additional functions such as marketing or additional transport protection (cf. *Kiy 2023*).

Licensing is not required, but there are other obligations such as the free take-back and recycling of packaging waste, the obligation to provide evidence of the type of material and the reporting of the amount of packaging used (cf. *Heßler 2024; Söllig n.d; DR n.d; Kreutzer, 2023*).

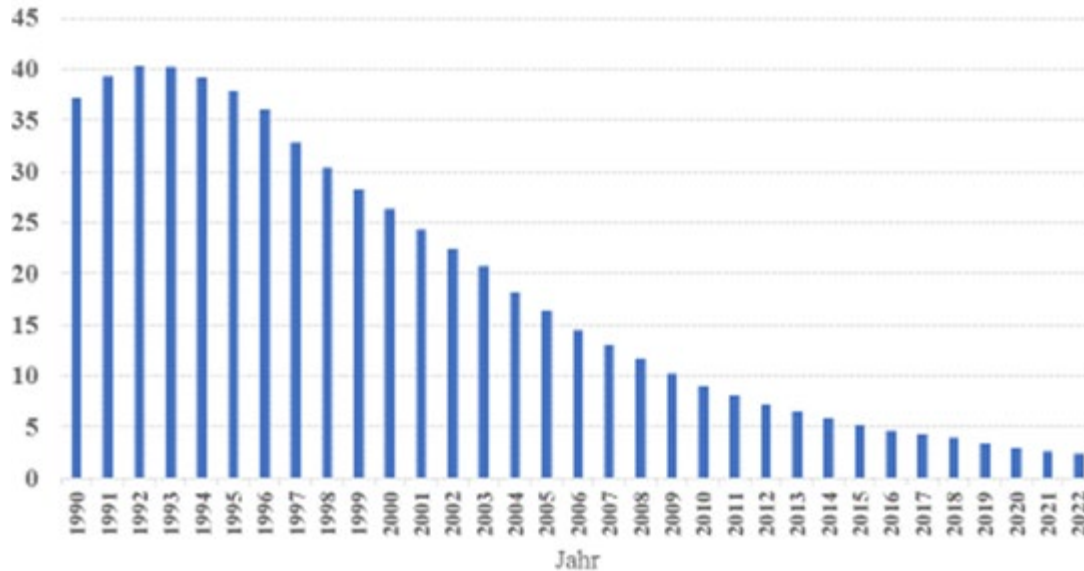
### **Packaging in relation to CO2 values**

The Packaging Act aims to improve recycling rates in EU member states and lessen the environmental impact of packaging. Specifically, 90 per cent of plastic packaging is to be recycled. Certain single-use plastic products have already been banned since 2021 (cf. *Voit 2022*). In addition to the 2-degree target, the Paris Climate Agreement defines greenhouse gas neutrality as a further central goal from 2050. From this point onwards, no more greenhouse gases (GHG), in particular CO<sub>2</sub>, should be emitted than are captured from the atmosphere by natural or technical processes. To achieve this goal, the German government has defined the target of reducing GHG emissions by up to 95% by 2050 in its Climate Action Plan 2050 (cf. *Frese et al. 2021*).

Germany is one of the largest producers and consumers of packaging in Europe. Every year, the per capita footprint of packaging waste increases. The use of single-use plastic packaging has gained increasing attention in politics, media and research as awareness of climate change, biodiversity loss and other sustainability issues has risen (cf. *Simoens 2024*). Since 1990, waste incineration capacity in Germany has more than doubled from 9.2 million tonnes to around 20.6 million tonnes in 2022. The resulting energy is used in all waste incineration plants to generate electricity, process steam and district heating. Most plants that use wet flue gas cleaning operate wastewater-free. The remaining bottom ash is mainly used in road construction. Iron and non-ferrous metals can be recovered from the slag and recycled. However, the incineration of waste

also emits considerable amounts of carbon dioxide (CO<sub>2</sub>), although a significant reduction of 27 million tonnes was achieved between 1990 and 2015 (cf. Kiy 2023).

Greenhouse gas emissions from German landfills 1990 to 2022 (see Figure 2).



**Figure 2: Greenhouse gas emissions from German landfills**

Source: Kiy 2023: p. 17

The figure is based on two key aspects of waste management. The regulations of TA-Abfall (Technical Instructions on Waste) and TA-Siedlungsabfall (Technical Instructions on Municipal Solid Waste) have led to a significant reduction in methane emissions from landfilling and mechanical-biological waste treatment as well as nitrous oxide and methane emissions from composting from approx. 41 million tonnes in 1990 to approx. 4 million tonnes in 2022. In addition, some of the landfill gas, which mainly contains methane, is captured and utilised as energy (cf. Kiy 2023).

Environmentally friendly utilisation is particularly important, whereby a distinction is made between reuse and recycling. In the case of reuse, products can be used again and again up to a certain number, e.g. in the case of reusable bottles. With recycling, on the other hand, the original product is shredded and processed into a new product by melting it down. (cf. Reichert 2024; Förtsch/Meinholz 2023).

Packaging alone has hardly any impact on the carbon footprint; even plastics can be more environmentally friendly if the product is reused, for example in the case of vegetable crates. (cf. Pacoon 2022).

For a period analysed in 2008 for the production of beverage containers, the results of the CO<sub>2</sub> emissions balance show advantages for the reusable system. Reusable products led to 61% of the emissions caused by the same quantity of disposable products (cf. Hoerr 2009).

The Packaging Act therefore decided to increase the use and promotion of reusable systems. Nevertheless, an evaluation by the Federal Environment Agency in 2021 for beverage cups showed that the following conditions must be met in order not to harm the environment. Firstly, reusable cups must be reused at least 10 to 25 times in order to have an advantage over disposable cups, as the rinsing process is crucial due to the electricity consumption, and secondly, the lids must be separated from the reusable system, as they contain a disposable component due to the polystyrene (cf. Bumbles 2022). Composite packaging still has the problem that it is not fully recyclable, as its recyclability is less than 90 per cent - unfortunately, this applies to every second packaging (cf. Umweltbundesamt 2023).

Some studies on reusable use in fast food catering have compared disposable and reusable packaging. According to these studies, reusable crockery causes around 2.8 times higher emissions (measured in CO<sub>2</sub> equivalents) than a disposable system with paper as the main raw material. The main reason for this is the durable materials used in reusable crockery. These are difficult to recycle after use. Cardboard crockery therefore performs better as it can be fully recycled. Added to this is the high water consumption when cleaning reusable crockery. Here too, the reprocessing of paper does not consume more water. (cf. Scinexx 2023).

A study by the RISE Research Institute emphasises the positive impact of cartonboard packaging on climate change and the environment: at 326 kg CO<sub>2</sub> eq/t, cartonboard is the packaging material with the lowest environmental impact, as it has absolutely low CO<sub>2</sub> values in the value chain (cf. MM 2019; Harder 2023).

All paper and cardboard products have two unique positive characteristics. They are based on the renewable raw material wood. Wood binds CO<sub>2</sub> as it grows. By recycling paper and cardboard products, the CO<sub>2</sub> remains bound and is not released back into the atmosphere (cf. MM 2019).

A circular economy is therefore essential in order to conserve resources and reduce greenhouse gas emissions, as the production processes themselves cause greenhouse gases. Interpreted in this way, a "circular economy" is the opposite of a "linear flow economy". This is characterised by a throughput of new materials that are mined, traded, processed into goods and ultimately disposed of as waste or emitted as emissions (cf. Oexele/Lammers 2022; Kusch et al. 2021).

As a result of the Packaging Act, the recycling targets for packaging made of paper, cardboard, tinfoil, aluminium and plastic were met or exceeded by the dual systems in 2022. In particular, 67.5% of plastic packaging was mechanically recycled, which is 4.5 percentage points above the legally stipulated minimum percentage (cf. Federal Environment Agency 2023).

## **RESULTS AND CONCLUSION**

In the final part, the three questions are taken up again:

- a) What additions are made by the Packaging Ordinance (Packaging and Packaging Waste Regulations PPWR) to the Packaging Act (Packaging Directive 94/62/ EG)?
- b) What impact does the current Packaging Act have on companies?
- c) What are the advantages of the Packaging Act?



Re a) In future, a regulation on packaging and packaging waste is to replace the current EU Packaging Directive in order to imply a clean economy.

On 24.04.24, the EU Parliament approved the Packaging Regulation.

However, the main aim of the draft is to counteract the steady increase in packaging waste. The primary goal is to reduce packaging waste in the EU by at least 15 per cent by 2040 compared to 2018. The regulation aims to improve the recyclability of packaging, set binding reusable quotas and achieve a minimum proportion of recycled material in packaging. Similar to the existing directive, the new regulation obliges online retailers and other companies to take responsibility for the disposal and recycling of packaging waste as part of extended producer responsibility. The EU Packaging Regulation is intended to limit hazardous substances, regulate the compostability of tea and coffee bags, label packaging materials and define information requirements for the refilling of packaging. A further EU target is for 40% of packaging in the catering industry to be recyclable by 2040.

It is estimated that it will take 18 months to implement the EU Packaging Regulation. Nevertheless, it makes sense for companies to get to grips with it now, as there will be a large number of requirements in the form of documentation.

Re b) Manufacturers, distributors and importers of packaging must register with the Central Packaging Register (ZSVR at LUNA). If the packaging is supplied to private final consumers or comparable sources of waste generation, such as retirement homes, they are subject to system participation and must be licensed with a so-called system operator (dual system). The packaging that must be registered with a dual system can be found in the catalogue of packaging subject to system participation.

Packaging intended for trade or industry (B2B) must be registered with the Central Agency Packaging Register, but not with the system operator. The packaging must be taken back in the B2B sector, but can also remain with the customer, depending on the contract design, so that the customer bears the costs and responsibility for disposal. A declaration of completeness must be drawn up if certain quantity thresholds for packaging are exceeded (80 tonnes of glass, 50 tonnes of paper/cardboard/cardboard, 30 tonnes of lightweight packaging per year).

Fulfilment service providers and operators of electronic marketplaces must check the contractually bound manufacturers with regard to their obligations under the Packaging Act.

Service packaging, such as the bread roll bag from the bakery, must be registered with LUCID by the retailer. Whether they also have to be licenced depends on whether the upstream supplier has already taken on this task.

Re c) The sole aim of the Directive and the Regulation is to promote the circular economy in order to conserve resources and reduce CO<sub>2</sub> levels. Greenhouse gases are thus to be reduced.

Methane emissions from landfills and mechanical-biological waste treatment as well as nitrous oxide and methane emissions from composting have fallen significantly since 1990 from approx. 41 million tonnes to approx. 4 million tonnes in 2022.

However, packaging only has an indirect impact on the CO<sub>2</sub> balance. It is important to recycle the materials in an environmentally friendly way. Studies show that reusable systems, especially in the catering industry, are not always more environmentally friendly than disposable systems. It depends on how often the product can be reused. Electricity and water consumption also play a significant role in reuse.

Within the value chain, cartonboard has the lowest environmental impact at 326 kg CO<sub>2</sub> eq/t, as it is made from wood. Wood binds CO<sub>2</sub> during growth and does not release any CO<sub>2</sub> into the atmosphere during recycling.

As a result of the Packaging Act, the statutory targets for the recycling of packaging made of paper/paperboard/cardboard, tinplate, aluminium and plastic were achieved and in some cases even exceeded by the dual systems in 2022. The actual feed rate for mechanical recycling achieved for plastic packaging was 67.5%, which is 4.5% points above the current statutory minimum percentage - four years earlier, the figures were still well below 50%. Composite packaging still has the problem that not everything can be recycled, as recyclability is below 90 per cent, which is unfortunately still the case for every second item of packaging.

The Packaging Act helps to increase competitiveness, as costs can be saved through the efficient use of resources and valuable raw materials can be returned to the economic cycle through high-quality recycling. Overall, this leads to more employment in the German economy as innovations stimulate economic growth. In addition, the supply of raw materials is secured as the dependency on imports is reduced and thus the dependency on raw materials decreases.

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