

REPORT 2022

WHY STEEL RECYCLES FOREVER

HOW TO COLLECT, SORT AND
RECYCLE STEEL FOR PACKAGING





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▶ ABSTRACT

APEAL, the Association of European Producers of Steel for Packaging published its first recycling report 'Good practices in separate collection, sorting and recycling of steel for packaging' in 2018.

The report's aim was two-fold. Firstly, to provide detailed information relevant to organisations and individuals wishing to learn more about a real and successful material recycling story. Secondly, to inspire stakeholders throughout the value chain to work together to boost recycling rates even further in European countries where systems are already in place.

Well received across Europe, several countries were seen to implement good practices shared by other member states, such as introducing or further optimising separate collection schemes and raising public awareness.

Indeed, the recycling rate of steel for packaging in Europe has continued to grow, reaching a new record of 84% in 2019.

The European Green Deal, in particular the new Circular Economy Action Plan and the review of the Packaging and Packaging Waste Directive, will change the packaging landscape significantly. In keeping with recent legislative evolutions, and with the objective of keeping materials in the circular loop for as long as possible, APEAL launches this follow-up report "Why steel recycles forever – How to collect, sort and recycle steel for packaging", focusing on best practices in four key areas:

- ▲ Optimised separate collection
- ▲ Collection and sorting of steel closures
- ▲ Scrap quality standards
- ▲ Design for recycling.

In line with a bold vision of "zero steel packaging to landfill by 2025", APEAL believes more can be done to boost both the quantity and the quality of steel to recycling, and that all stakeholders have a meaningful role to play in the drive for a more circular economy in Europe.



▶ CHAPTER 1: ABOUT APEAL



TATA STEEL



U. S. Steel Košice, s.r.o.
A Subsidiary of United States Steel

APEAL is the Association of European Producers of Steel for Packaging.

Founded in 1986, today APEAL unites the six producers of steel for packaging in Europe – Acciaierie d'Italia, ArcelorMittal, Liberty Liège-Dudange, Tata Steel, thyssenkrupp Rasselstein and U.S. Steel Košice.

Together, these companies employ 200,000 workers in Europe, including 15,000 directly to produce steel for packaging across 11 dedicated manufacturing sites.

APEAL is committed to working with all relevant stakeholders to ensure understanding and support for steel as a sustainable and resource efficient packaging solution, by:

- ▲ Contributing positively to the development of EU policy related to steel for packaging, particularly in the areas of packaging, waste, recovery and recycling
- ▲ Monitoring technical developments to ensure industry compliance
- ▲ Documenting, supporting and communicating the environmental, social and economic benefits of steel for packaging.

APEAL and its members are committed to working collaboratively with the European Commission, the European Parliament, the Member States and all relevant stakeholders, to achieve the ultimate aims of the European Green Deal¹, and realise our own vision of 'zero steel packaging to landfill by 2025'.

¹https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

ABOUT STEEL FOR PACKAGING

Steel is a unique packaging material, combining exceptional performance capabilities with unrivalled environmental credentials.

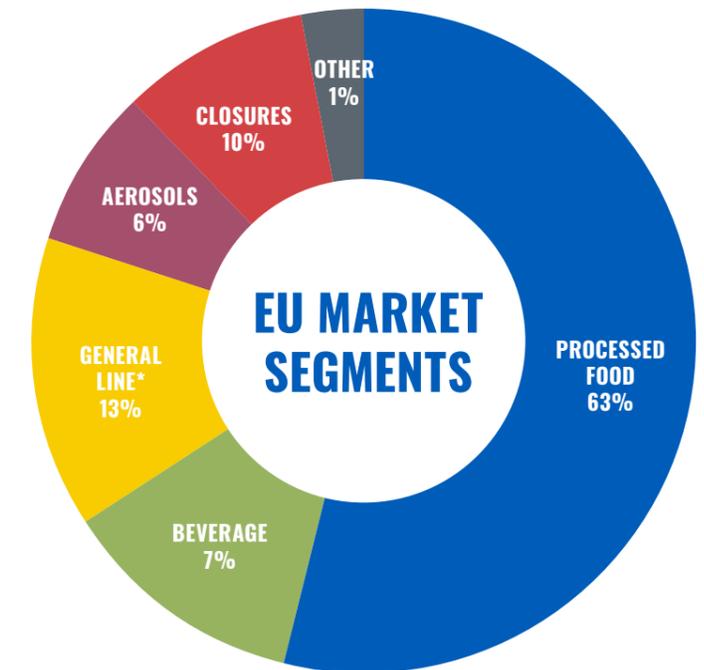
Strong, formable and long-lasting, steel offers numerous benefits for the safe packaging of a wide variety of products, including human and pet foods, beverages, personal care, household and automotive care products, industrial products and paints, giftware and promotional products. It is also widely used for hermetically closing glass jars and bottles.

Indeed, steel packaging protects products for up to five years, whilst its strength and 100% barrier against light, air and water minimises loss at every stage of the supply chain.

Circular by nature, steel recycles over and over again without loss of quality, and this potential for multiple recycling contributes to a greener future for Europe. The 500 steel plants in Europe are all recycling plants as they all use steel scrap as input material. Currently, of all steel packaging put on the market in Europe, 84% is being recycled in steel plants using it as an input to manufacture new steel products.

²APEAL press release, 1st June 2021
<https://www.apeal.org/news/steel-packaging-raises-the-bar-with-record-recycling-rate-of-84/>

▲ EU market segments



* covers a wide range of uses including personal care, household and automotive care, industrial products and paints, giftware and promotional products



INTRODUCTION

Never before has the question of sustainability been so widely debated.

Europe has moved into a decade which for the packaging industry will be shaped by every aspect of sustainability; from resource efficiency to reducing food waste and for reuse and recyclability. Underpinning all these is the global drive towards the realisation of a truly circular economy.

The European Commission has shown global leadership with its European Green Deal, proposing a resource-efficient vision for our continent and a greener future for all. As a permanent material that recycles forever, steel for packaging is a resource far too valuable to be wasted if Europe is to achieve the ultimate aims of this deal.

Successor to the 2018 report 'Good practices in separate collection, sorting and recycling of steel for packaging' this new report, 'Why Steel recycles forever – How to collect, sort and recycle steel for packaging', aims to examine the best practices that can be found across Europe.

APEAL is committed to demonstrating the tangible role steel for packaging can play to support circular design and promote sustainable practice, notably through the policies of the Circular Economy Action Plan³ (CEAP) 2.0, of which the most relevant for the packaging industry are the Waste Framework Directive⁴ (WFD: 2008/98/EC) and the Packaging and Packaging Waste directive⁵ (PPWD: 94/62/EC).

This report strives to update the information relevant to all organisations and stakeholders, both in the public and private sector, wishing to learn more about a real and successful material recycling story. The ultimate objective being to help stakeholders throughout the value chain work collaboratively to achieve APEAL's vision of zero steel packaging to landfill by 2025.

³https://ec.europa.eu/environment/strategy/circular-economy-action-plan_en

⁴https://ec.europa.eu/environment/topics/waste-and-recycling_en

⁵https://ec.europa.eu/environment/topics/waste-and-recycling/packaging-waste_en

WHY STEEL FOR PACKAGING IS A RECYCLING CHAMPION

According to the latest available data from 2019, the recycling rate for steel packaging across Europe is 84%.

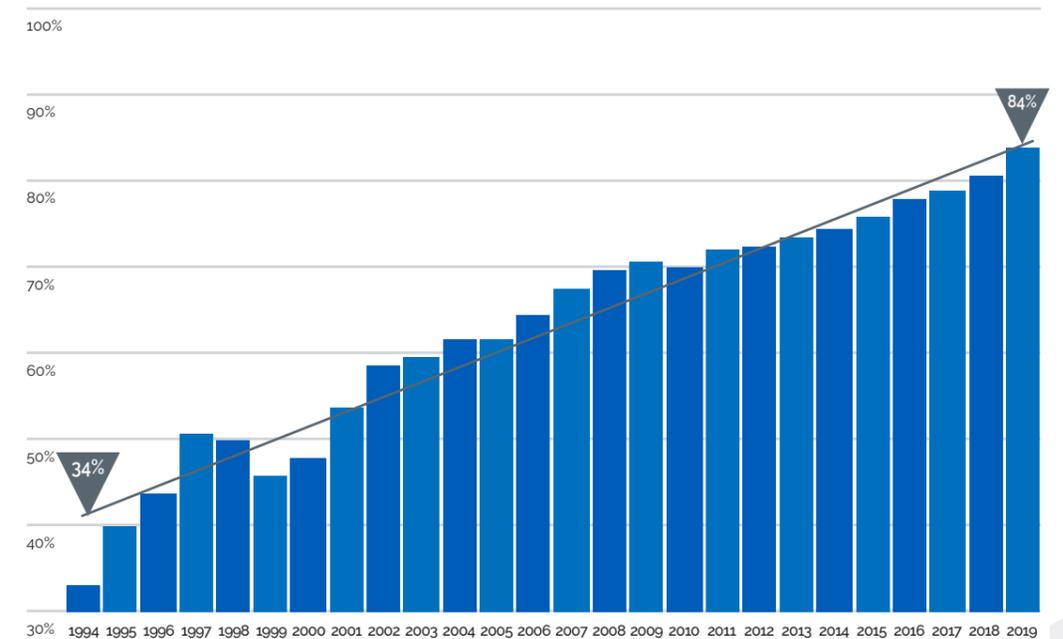
Essentially, in the last 25 years, the recycling rate of steel packaging increased by fifty percentage points, from 34% in 1994 to 84% in 2019 (see graph below).

In order to calculate these steel recycling rates in Europe, APEAL conducts an annual data collection exercise. To ensure the data collected is reliable, the methodology and data sources used by APEAL are third party reviewed, audited and certified by energy and waste specialist consultancy Eunomia.

Mirroring the methodology used by Eurostat, but focused on domestic steel recycling figures, APEAL collects data from Environmental Protection Agencies (EPA), Ministries of Environment and Extended Producer Responsibility Schemes (EPR).

For the yearly mandatory reporting on packaging to Eurostat, EU Member States were, in the past, allowed a choice between reporting the recycling of packaging as 'metals' or reporting 'steel' and 'aluminium' separately. However, with the 2018 revision of the PPWD, the European Commission has made separate reporting mandatory, alongside new recycling targets for all packaging materials to be achieved by 2025 and 2030. As such, from 2022 onwards (meaning 2020 data), ferrous metals (steel) and aluminium will be reported separately.

▲ Evolution of EU steel packaging recycling rate (1994-2019)



From 2020 onwards, the way of calculating what is included in recycling rates will be harmonised for all EU Member States and all materials. Only what enters the recycling operation, can be counted. This will exclude all packaging that is collected but cannot be recycled. Today, in some countries collected tonnages are reported as recycled tonnages. Items that are collected, but not go to the recycling operation, cannot be reported as recycled in the future.

The European Commission is creating a level playing field that records what is really recycled, rather than what is collected by issuing new rules



▲ www.youtube.com/APEALmedia

on how to correctly calculate recycling rates and defining one consistent methodology to be used by all Member States and for all packaging materials.

This can have a real impact on recycling rates for some materials. Impurities, found at collection and/or at sorting, are not recycled and should therefore not be included in the calculated recycled packaging tonnages.

This seems obvious, but up to and including 2019 data, the point at which recycling has been measured has varied from one country to another. Some European countries have been calculating at after collection, others after sorting or at the entrance of the recycling operation.

APEAL has always supported recycling statistics that measure 'real recycling', meaning the recycling rate refers to recovered materials that are actually integrated in a new material production process.

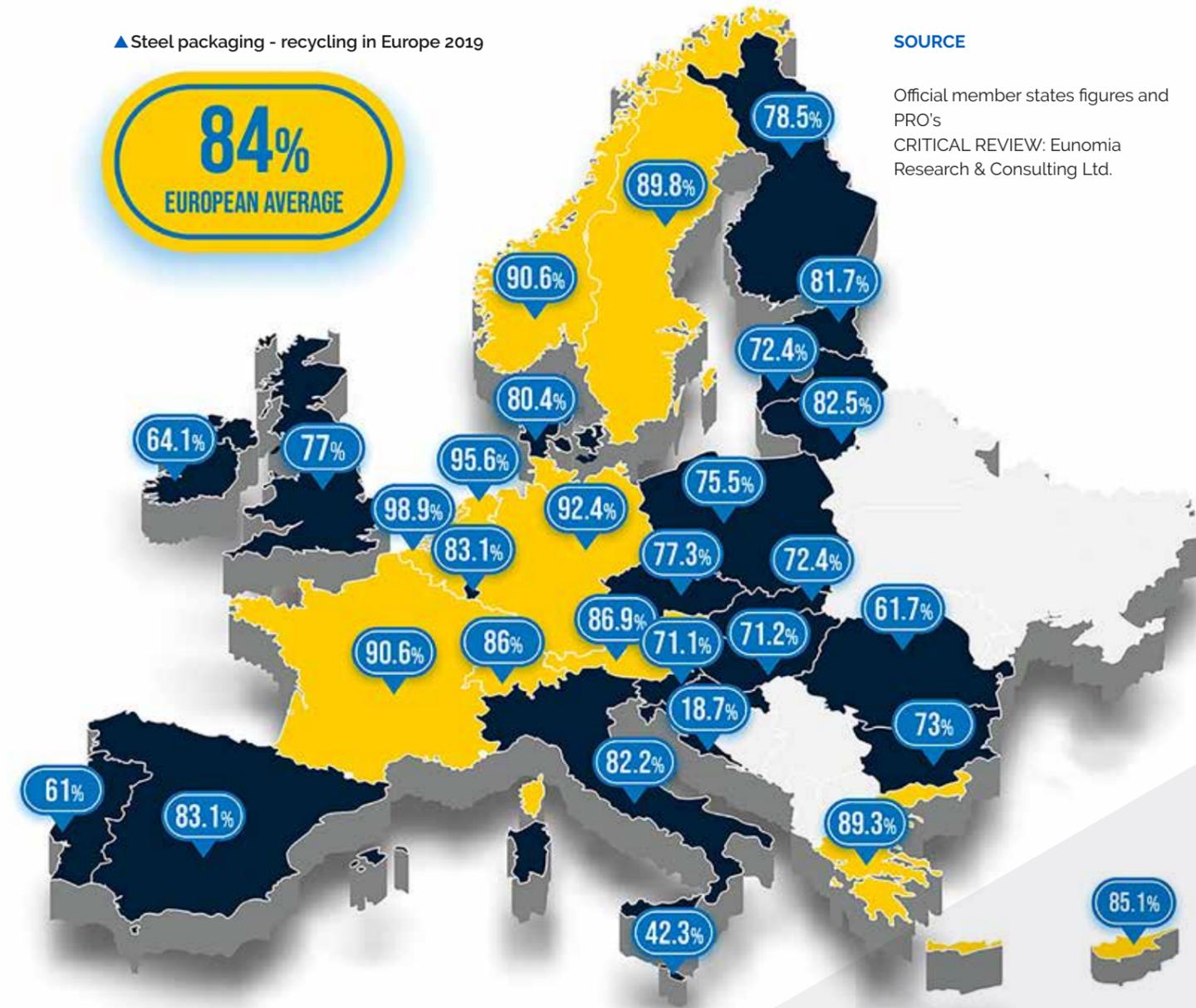
As all steel packaging returned to the steel works is effectively recycled and integrated in the production process of new steel, the APEAL recycling rate measures 'real recycling' and is the best placed packaging material for a truly circular economy.

84%
OF STEEL PACKAGING IS CURRENTLY RECYCLED IN EUROPE

APEAL SUPPORTS MEASURING REAL RECYCLING, MEANING THE ACCEPTED TONNAGES AT THE ENTRANCE OF THE RECYCLING OPERATIONS.

THIS WILL BECOME THE STANDARD FROM 2020 DATA ONWARDS (REPORTING FROM MID-2022) RESULTING IN A LEVEL PLAYING FIELD FOR ALL COUNTRIES AND ALL PACKAGING MATERIALS ACROSS EUROPE

▲ Steel packaging - recycling in Europe 2019



SOURCE

Official member states figures and PRO's
CRITICAL REVIEW: Eunomia Research & Consulting Ltd.

WHY DO SOME EU MEMBER STATES ACHIEVE HIGHER RECYCLING RATES THAN OTHERS?

The top five steel recycling countries across Europe already recycle an average of 93% between them. Such high rates are the result of further optimisation of separate collection, which delivers both higher quality and higher quantity of steel packaging waste for recycling.

▶ CHAPTER 2: WHY STEEL FOR PACKAGING FITS THE EUROPEAN GREEN DEAL

Ursula von der Leyen, President of the European Commission, described 2019's European Green Deal as 'Europe's man on the moon moment', and the scale of the challenge would certainly put its success in the history books: a climate-neutral EU by 2050.

Transforming the 27-country bloc from a high to a low-carbon economy is ambitious to say the least. To do so whilst improving quality of life and without reducing prosperity is truly ground-breaking.

One of the main building blocks of the Deal is the New Circular Economy Action Plan (CEAP), which aims to make our economy fit for a green future; strengthening our competitiveness while protecting the environment.

In March 2020, the European Commission adopted the CEAP 2.0, announcing initiatives along the entire life cycle of products.

Three directives particularly relevant for the packaging sector are impacted directly by the CEAP: the Packaging and Packaging Waste Directive (PPWD 94/62/EC), the Waste Framework Directive (WFD 2008/98/EC) and the Landfill Directive (LFD 99/31/EC).

The review of the PPWD in 2018 has already led to the increase of packaging recycling targets for EU Member States, applicable for data from 2020, to be reported from 2022 onwards.

The European Commission is reviewing the requirements on packaging and packaging waste in the EU: the so-called 'Essential Requirements' of packaging (annex to the PPWD). This includes assessing how to improve packaging design to promote reuse and recycling, tackle excess packaging and reduce packaging waste.

Another area of focus is driving design for the recyclability of packaging, including considering restrictions on the use of some packaging materials for certain applications, in particular where consumer goods can be handled safely without packaging.

In order to facilitate the appropriate separation of packaging waste at source, the European Commission is assessing the feasibility of harmonising separate collection of municipal waste in the EU and introducing EU-wide labelling.

Optimising packaging and packaging waste management via Extended Producer Responsibility (EPR) schemes and setting up Packaging Recovery Organisations (PRO's), are other action points defined by the European Commission.



The idea of a circular economy is to keep resources in use for as long as possible, without relying on and depleting raw materials. The CEAP states that all packaging materials should be reusable or recyclable by 2030. However, this does not exclude that packaging can still go to landfill. Therefore, a review of the LFD is a necessary complement to that of the PPWD and WFD, including the possibility of landfill taxes to discourage the practice.

Multiple recycling is key to this process, as will be the increased use of permanent materials whose inherent properties do not change, regardless of the number of times they go through a recycling process.



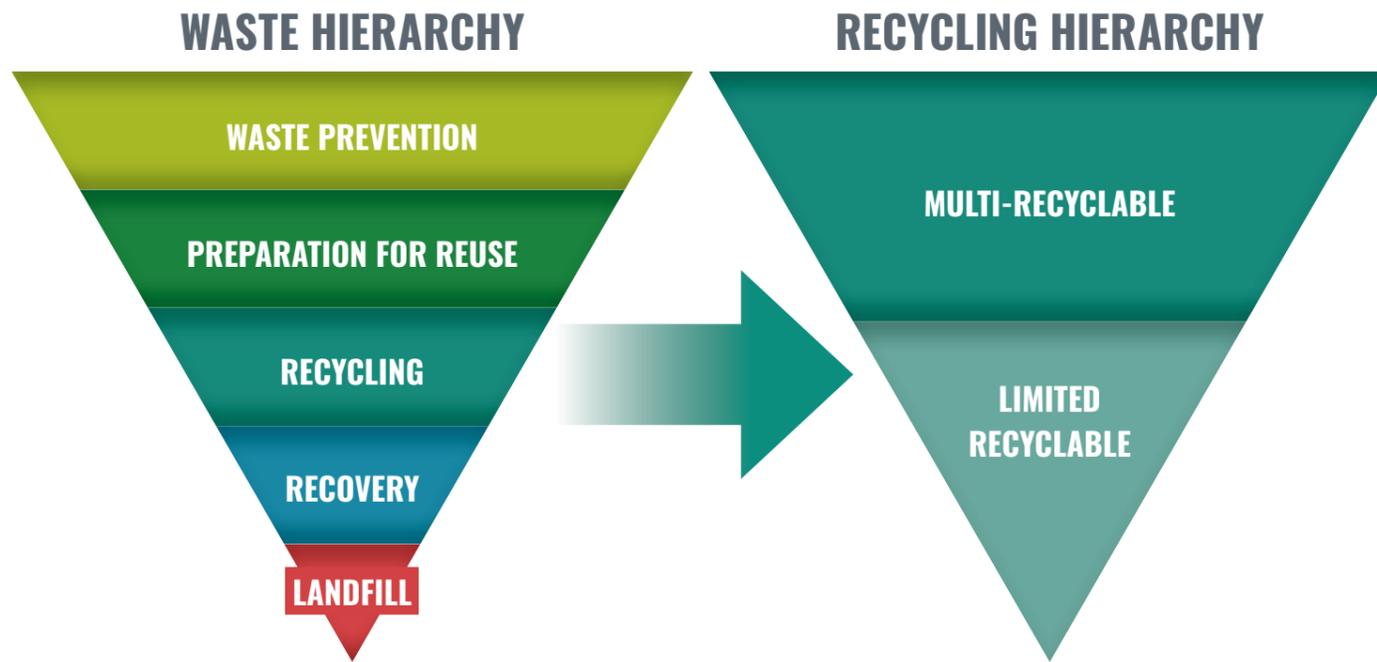
▶ View full report at: https://ec.europa.eu/environment/strategy/circular-economy-action-plan_en

75%
OF STEEL PRODUCTS
EVER MADE ARE
STILL IN USE TODAY

WHAT IS MULTIPLE RECYCLING?

For packaging, the use of permanent materials should be further promoted, as they are key to a true circular economy.

APEAL therefore recommends the introduction of the concept of a 'recycling hierarchy' that will promote circularity, high-quality scrap materials and multiple recycling:



Multi-recyclable packaging materials with the ability to retain their inherent properties after recycling and capable of replacing the same primary raw material in future applications. Multi-recyclable also means the recycling process for these materials can be repeated over and over again with high recycling yields, guaranteeing minimal amount of material loss, thus maintaining a circular material loop.

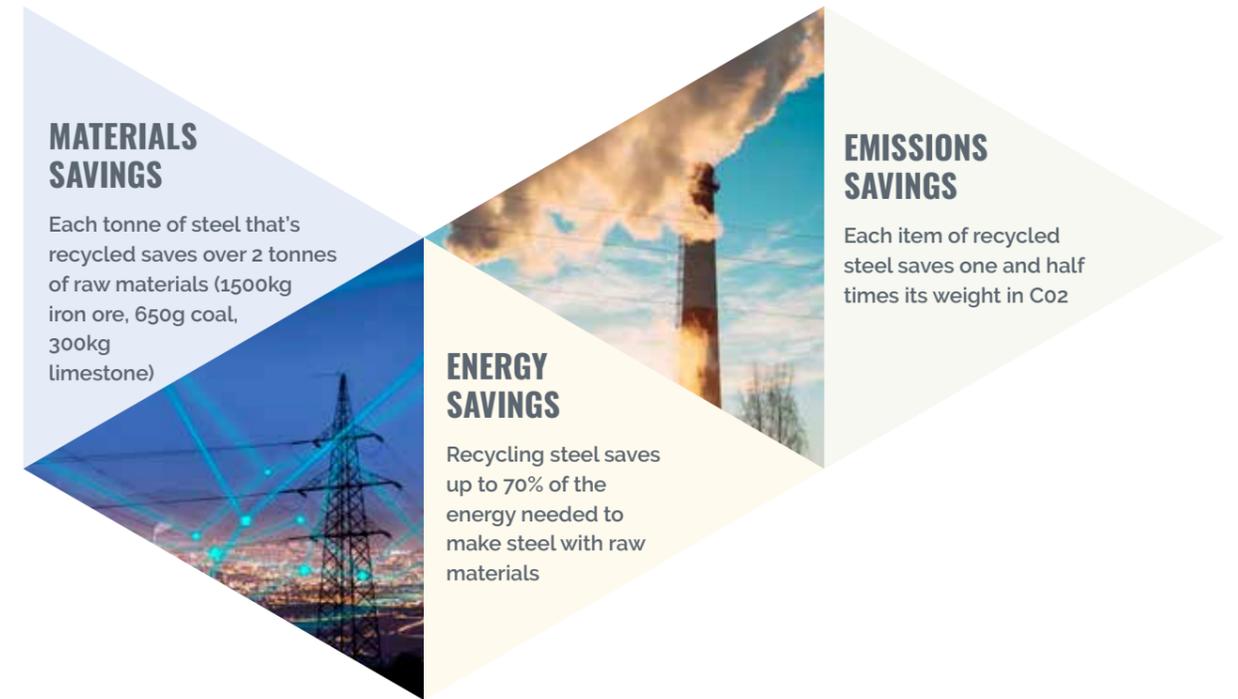
Limited recyclable packaging materials with the ability potential to be recycled only a few times with a risk of losing the intrinsic properties. The recycling process for these materials leads to a gradual degradation of the original material. The recycled material might not always substitute the primary material on a like-for-like basis, risks being down-cycled and finally leaves the circular material loop.

Making the distinction between multi-recyclable and limited recyclable packaging materials will also enable Member States and EPR Schemes to factor this distinction in the eco-modulation of EPR fees.

Some steel packaging applications, such as drums and kegs, are designed for re-use, but essentially it is the capacity of steel beverage cans, food cans, aerosols and general line formats to recycle over and over again which makes steel circular by nature and a model material for a more circular economy in Europe.

In light of the European Commission's objective that all packaging needs to be reusable or recyclable in an economically viable way by 2030, landfilling packaging should be avoided in the future.

RECYCLING SAVES PRIMARY RESOURCES AND REDUCES CO₂ EMISSIONS



"In order to ensure that all packaging on the EU market is reusable or recyclable in an economically - viable way by 2030, the Commission will review Directive 94/62/EC²⁷ to reinforce the mandatory essential requirements for packaging to be allowed on the EU market and consider other measures, with a focus on:

1. reducing (over)packaging and packaging waste, including by setting targets and other waste prevention measures
2. driving design for re-use and recyclability of packaging, including considering restrictions on the use of some packaging materials for certain applications, in particular where alternative reusable products or systems are possible or consumer goods can be handled safely without packaging
3. considering reducing the complexity of packaging materials, including the number of materials and polymers used."

CEAP 11.03.2020⁶

⁶new circular economy action plan, 11.03.2020.
<https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52020DC0098&from=EN>

▶ CHAPTER 3: OPTIMISED SEPARATE COLLECTION AND SORTING

MANDATORY RECYCLING TARGETS AND SETTING-UP OF SEPARATE WASTE COLLECTION SCHEMES

In general terms, municipal waste, which includes packaging waste, can be sorted, recycled, incinerated or landfilled. In case of incineration, ferrous scrap can be extracted from the bottom ashes for recycling. A range of environmental targets have been defined by EU Member States,

including targets for the recycling of municipal waste (through the WFD⁷) and material-specific recycling targets (through the PPWD⁸). In 2018, the WFD and PPWD were both updated and higher recycling targets were fixed for both municipal and packaging waste.

▲ Packaging recycling targets

Packaging and Packaging Waste Directive	PPWD 2004	PPWD 2018	PPWD 2018
Packaging material/ Due date recycling targets	2008 ⁽¹⁾	2025 ⁽²⁾	2030 ⁽²⁾
Ferrous metals		70.0%	80.0%
Aluminium		50.0%	55.0%
Metals (Ferrous metals + aluminium)	50.0%		
Glass	60.0%	70.0%	75.0%
Plastics	22.5%	50.0%	55.0%
Paper and cardboard	60.0%	75.0%	85.0%
Wood	15.0%	25.0%	30.0%
Overall	55-80%	65.0%	70.0%

⁽¹⁾ In PPWD of 2004, no split recycling targets defined for ferrous metals and aluminium

⁽²⁾ In PPWD of 2018, split recycling targets defined for ferrous metals and aluminium

To strengthen waste recycling, the WFD foresees that Member States take measures to ensure the producer of the product has extended producer responsibility (EPR). EPR is defined as "a set of measures taken by Member States to ensure that producers of products bear financial responsibility or financial and organisational responsibility for the management of the waste stage of a product's life cycle"⁹.

For packaging waste in particular, Member States that haven't yet implemented EPR, are forced to ensure EPR is introduced no later than 2024¹⁰. One of the measures put in place, not only to reach the recycling targets, but also to promote high-quantity and high-quality recycling, is the mandatory setting-up of separate collection schemes for distinct materials and/or product categories, such as paper, plastic, glass, and metals¹¹.

⁷ Waste Frame Directive (WFD) 2018/851: Article 11, 2.

⁸ Packaging & Packaging Waste Directive (PPWD) 2018/852: Article 6.

⁹ WFD: Article 3, 21 and article 8, 1 ;

¹⁰ PPWD : Article 7.2.

¹¹ WFD : Article 10.2 + article 11, 1.

HOW SEPARATE COLLECTION SCHEMES ARE ORGANISED IN EUROPE

In the WFD, separate collection is described as "a collection via which a waste stream is kept separately by type and nature to facilitate a specific treatment"¹². But no European legal framework currently defines how this should be organised.

In its role supporting the European Commission's Directorate General for the Environment (DG ENV) on waste and Circular Economy, the Joint Research Centre (JRC) launched its 'Separate collection of municipal waste: Development of a harmonised EU model' in May 2021. It aims to

have a final report by the end of 2022. The study will assess the development of a harmonised EU model, enabling a more circular and sustainable management of material resources.

But for now, while the principle of separate collection is the same across Europe, no two Member States have implemented it in the same way. Implementation even varies between regions and/or municipalities in several countries, depending on criteria such as geography, urbanism and logistics.

AN EXAMPLE FROM SLOVAKIA



Municipalities can be driving forces for further optimising separate collection and increasing recycling rates, as can be demonstrated by this example in Slovakia. Here the recycling rate of steel packaging rose from 40% in 2010 to 72% in 2019 and separate waste collection is one of the essential pillars of the country's modern integrated waste management system.

Under current legislation in Slovakia, citizens are obliged to sort waste and the municipality is obliged to provide a suitable system for collection and sorting.

The system focuses on strict separation of mixed municipal waste from sorted municipal waste components (paper, plastics, glass, steel and aluminium packaging, multilayer composite materials). Separate collection containers must be colour-coded according to national legislation.

Several collection options are possible for steel packaging, depending on local criteria such as population density. The collection of biodegradable municipal waste, and the voluntary introduction of textile waste collection, complements this mandatory system.

The choice of suitable collection containers depends on cities and municipalities. To support the functionality of collecting sorted components of municipal waste, some municipalities have voluntarily introduced a system of mixed municipal waste collection in the form of weighing collection containers directly at export, while the collection containers are marked with a bar code. In such cases, citizens are financially motivated, as sorted components of municipal waste are not charged, unlike mixed municipal waste.

The system of separate collection of individual components of municipal waste is provided by individual cities and municipalities through organisations of producer responsibilities, with which they must have concluded contracts. The industrial and business sector ensures the separate collection of individual components of municipal waste directly through contracts with authorised entities operating in waste management. The aim of such a system of separate collection is to transform the produced waste into a valuable input raw material for further recovery into new products and thus contribute to the circular economy.

¹² WFD: Article 3, 11.

WHY OPTIMISED SEPARATE COLLECTION OF STEEL PACKAGING WASTE IS THE PREFERRED ROUTE

APEAL believes that when it comes to recyclable waste, separate collection is the preferred route.

Steel packaging waste is collected, sorted, and treated in various ways across Europe. As previously mentioned, 84% is currently recycled across Europe, the highest recycling rate of all household packaging materials.

However, the way a household's steel packaging waste is collected and sorted has a direct impact on the material's recycling rate performance in that country. It also has an important impact on the quality of the steel packaging scrap sent to recycling and its contribution to the production of new steel.

If all post-consumer steel packaging waste were to be collected as a mono waste stream it would be of a very high quality, as the steel would not be contaminated with other non-magnetic materials. However, in practice, and in most cases due to the assumed high cost, this is not feasible.

Steel packaging waste is therefore usually collected co-mingled with other packaging materials, from which it can be easily separated due to its magnetic properties. However, co-mingled separate collection scenarios carry a risk of cross-contamination. For example, when rigid and flexible plastics are included in a co-mingled collection that also includes metals, the quality of the steel fraction that leaves the sorting plant may be inferior as citizens might squeeze in plastics, paper or cardboard inside the steel packaging. For this reason, information campaigns should advise consumers not to place packaging items made of different materials inside one another in order to ensure good quality sorting.

How steel packaging is collected in any area is a decision taken by stakeholders and depends on the responsibilities and the authorities of the different stakeholders. In some Member States, the municipalities decide how the household waste is collected, while in other Member States a collaborative decision is made between the municipality, public authorities, waste operators and/or brand owners and retailers and possibly the recyclers, packaging and packaging material producers too.

▲ EU waste hierarchy



Source: European Commission : https://ec.europa.eu/environment/topics/waste-and-recycling/waste-framework-directive_en: "Preventing waste is the preferred option and sending waste to landfill should be the last resort."

Analysing the different co-mingled separate collection scenarios for high-quality input of steel packaging waste to recycling, one needs to conclude that there is no one-size-fits all solution. Not all countries have the same conditions: some benefit from well-functioning separate collection schemes whereas for others this still needs to be developed. The same applies to recycling markets. When considering the options, countries should always factor quantity and quality into the recycling operation as a key indicator, as this guarantees high-quality recycling. For example, the collection system that is put in place, is vital.

Ideally, harmonised separate collection should be organised at a European level, hence the JRC project previously mentioned. In practice, any initiative to harmonise collection systems must take account of regional and local circumstances. Therefore, emphasis on infrastructure harmonisation would be more effective if done at national level to deliver the quantity and quality of scrap materials to reach targets.

Steel scrap is a vital resource for the production of new steel. As such, the best way forward is to further promote optimised separate collection routes that guarantee high-quality input into steel recycling operations, and the steel for packaging industry aims to further improve this.

Both the steel for packaging industry and the authorities (European and national) support measures to divert steel packaging from the less preferred routes of waste treatment, particularly landfill.

In an ideal scenario, and where technically and economically feasible, moving up in the waste hierarchy is preferred (see EU waste hierarchy graph above). However, in a true circular economy, one should not only look at the top levels of the waste hierarchy, but also at the lowest level. One of the goals of the CEAP 2.0 is for all packaging to be recyclable or reusable by 2030¹³. Diverting all recyclable packaging from landfill should therefore be phased out through a revision of the LFD (e.g. further introducing gradually increased landfill taxes).

¹³ https://ec.europa.eu/commission/presscorner/detail/en/qanda_20_419

CHAPTER 3

ALTERNATIVE ROUTES OF STEEL PACKAGING WASTE TREATMENT

With an 84% recycling rate across Europe it's clear the majority of steel packaging waste is already being separately collected, sorted, and sent to recycling plants as high-quality input for making new steel products.

However, even if it is only a minor part⁴⁴, some steel packaging waste in Europe is still ending up in household residual waste due to the absence of well-organised separate collection, infrastructure and/or citizens sorting at home. This residual waste fraction is then either incinerated or landfilled.

When it comes to alternative routes, incineration of residual waste is preferred as it has a lower impact on global warming when compared to the methane emissions of landfill sites and the loss of valuable and recyclable material.

When steel packaging waste is treated by incineration, one of the following three practices is used



1. Pre-treatment of the residual waste prior to incineration, a process in which the steel packaging waste is separated using magnets
2. Incineration and bottom ash treatment process via magnets to recover the ferrous bottom ashes that are mainly composed of steel packaging waste
3. Incineration and no post-treatment of the steel packaging waste (occurring in only a few cases and ending up being land- or backfilled).

In cases 1 and 2, if the separated steel packaging waste follows one or more treatment phases it is then used as an input for recycling operators, replacing virgin material in the manufacture of new steel products.

The quality of steel recovered from incineration depends not only on the successful separation of steel from bottom ash, but also on separating steel from other non-magnetic metals such as aluminium or copper. Ultimately, it remains the responsibility of public authorities to give correct sorting instructions to citizens, along with a suitable collecting scheme, and for the citizen to behave responsibly in sorting their steel products. If steel for packaging is put solely into the residual waste bin, the quality of the steel scrap will be high.

⁴⁴ EUROSTAT: Link: Packaging waste by waste management operations (see annex)



Urban mining of landfilled municipal waste is not yet common practice in Europe, but should it become technically and economically feasible, valuable steel packaging waste from landfill could potentially be recovered.

But without further treatment of the landfilled waste, this valuable steel packaging is lost forever.

That way any material that keeps its inherent properties after numerous recycling trips should be kept in the circular material loop.

In addition, landfilling in general results in the loss of valuable raw materials, requires large quantities of land and impacts the surrounding environment.

By announcing its vision of zero steel packaging to landfill by 2025, the steel for packaging industry represented by APEAL is calling for landfilling of post-consumed steel packaging to be phased out.

Several countries across Europe are already taking legislative measures to reduce the quantity of recyclable material that ends up in landfill. Such measures include increased landfill taxes over time, increased recycling targets for packaging and the introduction of mandatory separate collection schemes for household waste.

The steel for packaging industry promotes this last measure of mandatory separate collection. However, as a shared responsibility between local and central authorities, brand owners and retailers, packaging recovery organisations, companies organising collection, sorting and/or recycling and consumers, all must assume their designated responsibilities for this route to be efficient.

THE ROLE OF CONSUMERS IN ACHIEVING HIGH-QUALITY RECYCLING

Recycling of steel packaging is more efficient when citizens sort properly at home and dispose of packaging separately and correctly when consuming out-of-home.

Encouraging consumers to properly sort their waste at home, leading to high-quantities and high-qualities of sorted packaging waste, is based on two pillars.

Firstly, the necessary infrastructure is needed, so packaging waste can be sorted into the relevant fractions. Secondly, awareness raising campaigns are vital to inform citizens how to properly sort their packaging waste. Steel packaging is easy to sort: simply empty the packaging and put it in the correct collection bin, thereby keeping steel well separated from other materials.

1) Available adequate structures for source separation by authorities, businesses and schools:

Authorities, both central and local, need to foresee the necessary infrastructure, allowing citizens to sort and put their steel packaging waste in the right container and/or bags, not only for steel packaging waste generated at home, but also that which is generated on-the-go. Therefore, not only are bins on streets needed for residual waste, but also bins for recyclable packaging waste. Steel packaging waste is also generated at work, in public places, private facilities open to the public, and in schools. It is therefore necessary to provide the right infrastructure in all these spaces too, ideally using the same sorting disposal system as at home.

2) Clear, easy-to-understand sorting instructions and awareness raising campaigns to mobilise citizens to sort their steel packaging waste:

To increase the collection, sorting and recycling of steel packaging waste, it is necessary to define harmonised, clear, and easy-to-understand sorting instructions. These instructions need to be communicated at national, regional and local level via awareness raising campaigns. These campaigns are a prerequisite to increase citizen participation. In many European countries, authorities and Extended Producer Responsibility schemes closely collaborate in setting up these campaigns.

AN EXAMPLE OF PUBLIC ADVICE FROM THE “WASTE SEPARATION WORKS” INITIATIVE IN GERMANY¹⁵

The yellow bag / yellow bin is only for:
 used and completely empty packaging which is not made of paper, cardboard, carton or glass. Please separate different packaging components. The items do not need to be rinsed.

For example:

- Aluminium, tin and plastic foil
- Pharmaceutical blister packs
- Butter wrappers
- Refrigerator and vacuum pans
- Carpet bags and foil
- Wool and vegetable bags
- Wool or plastic
- Ice cream packaging
- ESD material from shipping
- packaging made of aluminium
- such as bubble wrap
- of thermal insulation
- Insulation
- Styrofoam
- Plastic food containers and foil

The yellow bag / yellow bin is not for:
 Packaging made of paper, cardboard, carton or glass, and all waste that is not packaging.

For example:

- Old clothes
- Refrigerator (including refrigerator parts)
- Car radiator glass
- Styrofoam
- CDs and floppy disks
- ink cartridges
- Disposable razors
- Electrical appliances
- Leftover food
- Flammable liquids
- Lighters
- Balls of foil, DVDs and video cassettes
- Light bulbs and energy saving bulbs
- Batteries
- Wood waste
- Sanitary products
- Car filter
- Ceramic products
- Children's toys
- Sequestered plastic elements
- Pots
- Packaging with non-recyclable material
- Paper tissues
- Paper and cardboard
- Plastic, foaming materials
- Perforated films
- Residual and organic waste
- Stoves
- Tyres
- Paper/covers from insulating panels
- Multi-layer
- Refrigerator
- Refrigerator
- Cupcake liners
- etc.

There may be regional variations (e.g. recycling fees). More details are available from your local authority. Scan the QR code or visit www.muelltrennung-wirkt.de for your responsible contact person.

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¹⁵ <https://www.muelltrennung-wirkt.de/downloads>



APEAL believes optimised separate collection of steel packaging waste is the best way to guarantee high-quantity and high-quality input to recycling and supports initiatives to:

- ▲ Promote source separation in general
- ▲ Promote separate packaging waste collection
- ▲ Promote recovery of ferrous bottom ashes for any quantities, however small, of steel packaging waste being incinerated
- ▲ Encourage diverting steel packaging from landfill.

“APEAL believes we should not only ensure that all packaging put on the market is either reusable or recyclable by 2030 but also ensure that no recyclable packaging materials, like steel for packaging, go to landfill. A holistic approach is needed to tackle both waste prevention (the top of the waste hierarchy) but also the ‘bottom’ being disposal or landfill. Steel for packaging can help society move towards an efficient and circular economy.

It is a valuable resource and should not be wasted. By phasing-out landfill of recyclable packaging waste, steel for packaging waste, which has well-established market, will be used to produce new steel products. Closing the loop for steel packaging is only possible if landfill is phased out which is already the case in a number of Member States. For these reasons, APEAL would welcome a commitment that the review of the PPWD should be complemented by a review of the Landfill Directive (LFD) aiming at accelerating the phase-out of landfill of recyclable packaging waste (via e.g., gradually increased landfill taxes).”¹⁶

¹⁶ Extracted from APEAL position paper on the review of the PPWD, dated 08/07/21



▶ CHAPTER 4: COLLECTION AND SORTING OF STEEL CAPS, LIDS AND CLOSURES

APEAL's recycling data includes all items of steel packaging recycled in Europe, from beverage and food cans to aerosols and closures, by which term we also mean steel caps and lids.

However, there are several regions in Europe where APEAL is aware that the collection and recycling of closures in particular can be optimised.

On the one hand, there is low awareness among consumers about how to sort steel closures, caused by a lack of harmonised and clear sorting instructions. On the other, inadequate sorting techniques in several sorting facilities result in these facilities not being able to capture the closures that are sorted and collected.

WHY CLEAR SORTING INSTRUCTIONS ARE NECESSARY

As already mentioned, it is vital that consumers properly sort their waste at home and on-the-go. This is a prerequisite for high-quality recycling.

Harmonised, clear and easy-to-understand sorting instructions and awareness raising campaigns will help mobilise consumers to sort steel packaging waste. This is necessary not only at household level, but also in hotels, restaurants and cafés/bars, to ensure all recyclable waste is sorted in the right container and/or bag.

However, this does not always suffice for some specific steel packaging products, such as closures. Steel closures are the steel packaging items that are the most regularly put in the wrong waste stream and often even in the residual waste bin by citizens.

As for all items of steel packaging, sorting instructions in Europe vary from one country to another.

Some countries advise sorting steel closures in the glass bin when twisted onto glass jars and bottles, as glass processing plants claim that in this way glass breaks less and is easier to sort. In this case, if the plant is equipped with overband magnets, the steel closures can be captured for recycling.

In other countries with well-developed sorting infrastructure for closures, they can be disposed of alongside other steel packaging. This aids traceability, both in recycling process and recycling rate calculations.

Whatever the waste treatment scenario, it is important that consumers receive clear instructions, including on the glass packaging collection bins, in order for closures to be properly sorted, sorted and therefore contributing towards the recycling rates.

AN EXAMPLE OF PUBLIC ADVICE IN THE UK FROM RECYCLENOW¹⁷

WHICH METAL ITEMS CAN BE RECYCLED?

YES PLEASE

- ✓ Drink cans
- ✓ Food tins (put tin lids inside the tin)
- ✓ Biscuit/chocolate tins and their lids
- ✓ Aerosols (remove plastic caps and recycle with plastics)
- ✓ Aluminium foil, eg for baking, covering food - scrunch foil together to form a ball
- ✓ Aluminium foil trays, eg take-away trays
- ✓ Aluminium tubes, eg tomato puree - remove plastic caps

NO THANKS

- ✗ Laminated foil, eg cat food/coffee pouches that spring back when you try and scrunch them
- ✗ Crisp packets and sweet wrappers
- ✗ Metal containers for chemicals i.e white spirits, paints and engine oils
- ✗ General kitchenware, eg cutlery, pots and pans
- ✗ Any other metal items, eg kettles, irons, pipes, white goods

- ▲ Empty and rinse items - left over foods or liquids can contaminate other recyclables
- ▲ You can leave labels on - these are removed in the recycling process
- ▲ Metal lids and caps on glass containers, eg metal jam jar lids, can be left on to recycle with glass. These are different types of metal to cans/tins/aerosols and are recycled in a different way. By putting the lids/caps back on glass jars and bottles it reduces the chance of them getting lost through the sorting process.

¹⁷ <https://www.recyclenow.com/what-to-do-with/food-tins-drink-cans-0>



EXAMPLES OF COMMUNICATION CAMPAIGNS IN FRANCE TO HELP CITIZENS SORT STEEL CLOSURES ON A NATIONAL LEVEL FROM RECYCLER CITEO¹⁸

Projet Métal : recycler plus de petits emballages métalliques

The French "Projet Métal" is about all small metal packaging items, of which the largest portion of it our closures, lids and caps.

WHY CORRECT SORTING TECHNIQUES ARE NECESSARY

Many sorting facilities have trommels at the entrance of the sorting process to separate the packaging waste flows according to size.

Steel closures, being often of small size, frequently fall into 'residual waste flows'. The latter is regularly not sorted, being considered non-recyclable impurities. These residual flows are then disposed of via incineration or, in the worst case, landfilled and consequently lost for recycling.

Developments have been made in some countries to sort those steel closures in the residuals waste flows flow by adding one or several overband magnets on that specific flow. The magnetic steel closures can therefore be separated and integrated back into the major steel packaging flow issued from the sorting centres. The steel industry recommends that such a process be developed as these investments make sense in terms of quality and quantity being recovered.

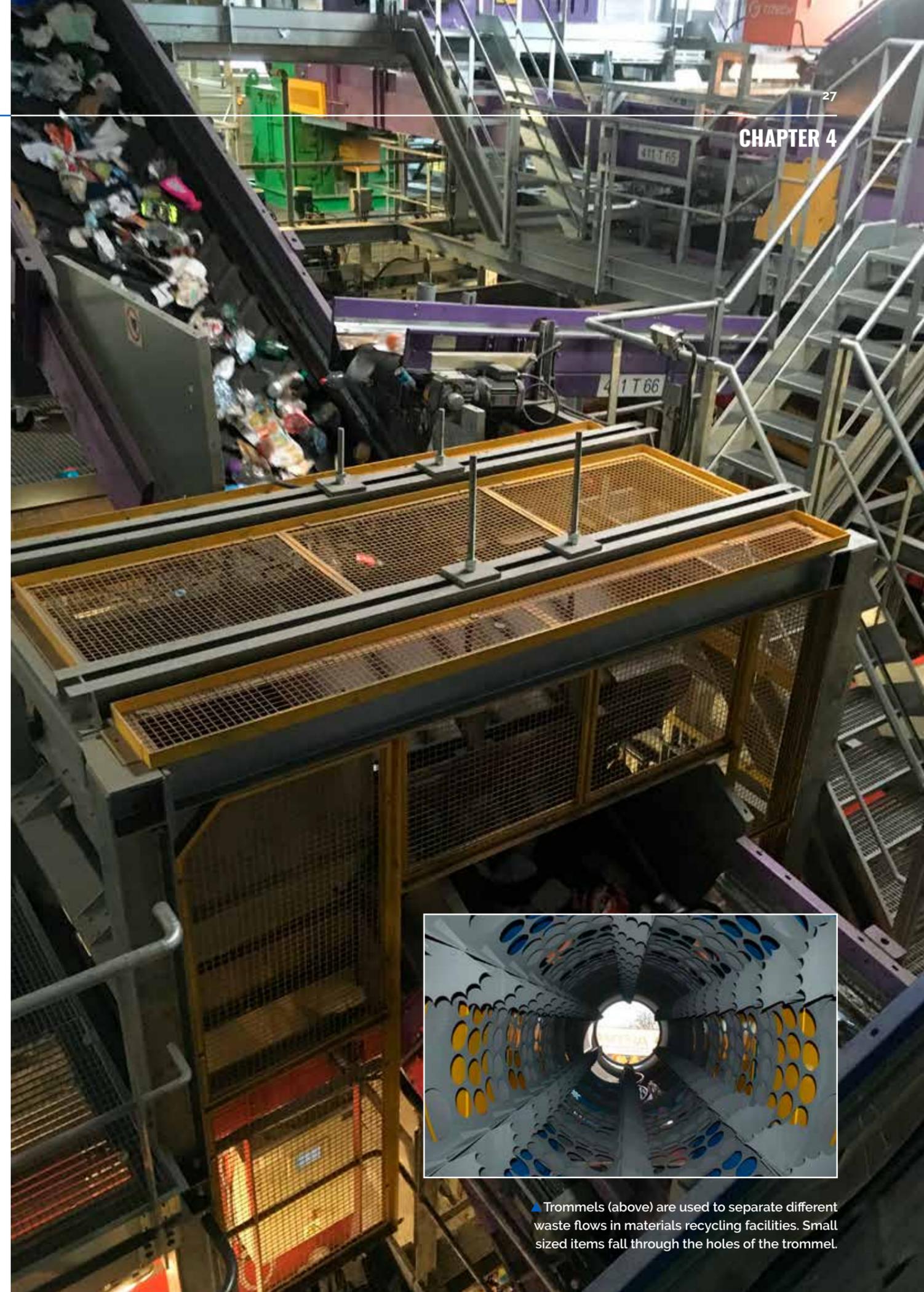
Of all possible actions, this one will truly guarantee steel closures are properly recycled.

IN A NUTSHELL

APEAL estimates the collection and sorting of steel caps, lids and closures in Europe to be below-average and recommends:

- ▲ Improving the technical infrastructure for sorting small sized steel closures in areas where it is not yet available by developing additional overband magnets for the corresponding material streams in sorting plants. Depending on the national and/or regional conditions, these streams are residuals of maximum diameter 50 or 60 mm. When not extracted at the trommel phase (see small picture), the closures are dealt with the other steel packaging and therefore captured by the magnets as all other steel packaging.
- ▲ Developing one of two collection scenarios, either
 - (1) A well-developed sorting infrastructure for closures, to dispose of closures with other steel packaging;
 - (2) In the case of twist-off-closures, to dispose them with the glass bottle or jar. These closures are saved for recycling. If twist-off-closures are disposed with the glass bottle or jar, they normally find their way into steel recycling.
- ▲ Ensure steel closures resulting from glass recycling are included in the official figures/recycling rates for steel recycling.

¹⁸ <https://www.citeo.com/le-mag/projet-metal-recycler-plus-de-petits-emballages-metalliques/>



▲ Trommels (above) are used to separate different waste flows in materials recycling facilities. Small sized items fall through the holes of the trommel.

▶ CHAPTER 5: HOW SCRAP STANDARDS CAN ENSURE HIGH-QUALITY INPUT TO RECYCLING

As steel is a permanent material that can be infinitely recycled, neither the collection nor the sorting processes have an impact on its inherent properties.

However, those processes do have an impact on the quality and quantity of the collected and sorted steel fraction: not only at the output of the sorting facility, but also in follow-up treatment processes.

In case of high-quality output from the sorting plant, no further treatment is needed prior to delivery to the recycling operation. The most important aspect for the steel recycling operation is that the latest step of treatment results in a quality material for recycling.

THE QUALITY OF A STEEL SCRAP BUNDLE IS AFFECTED BY THE COLLECTION AND SORTING PROCESSES APPLIED

The best quality is achieved through a mono-stream or separate collection scenario. In this scenario, only a limited amount of other non magnetic materials, resulting from incorrect separation at source, would be found in the steel fraction. For household packaging (e.g. beverage cans, food containers and aerosols) it is possible that citizens incorrectly put packaging materials other than steel in with the steel fraction. It is usually not possible for consumers to distinguish between steel and aluminium food cans or beverage cans. The latter however could perhaps be achieved by developing a collection disposal specifically for steel using logos and/or other information on the packaging.

Due to its magnetic properties, steel packaging items can easily be separated from other materials by using one or several magnets in the sorting facility.

However, after sorting, even when using magnets, it cannot be guaranteed that the steel packaging scrap bundle does not still contain impurities, such as steel products that are not packaging (for countries in which non-packaging steel is prohibited in the selective collection), plastic films and collection bags that are pinched to the steel containers.

Indeed, the quantity of other packaging materials in a steel bundle is not only linked to the collection scenario, but also to the sorting techniques applied in the sorting facility. Depending on the scenarios, the steel bundle might be contaminated by other non-ferrous packaging.

It is notable that when steel packaging is collected with a wide range of other packaging materials, the concentration of contaminants in steel bundles is higher. The more complex the collection stream, the more intensive the sorting needed as the quality will be lower. At each stage, additional sorting will be required and even a quality control at the end of the sorting process for steel, as for plastics, papers and cardboards.

In those circumstances, supplementary treatment processes, such as shredding, would then be needed to improve the quality of the steel fraction by getting rid of impurities.





Defining steel scrap standards, meaning defining minimum criteria for an optimised recycling, ensures high-quality input to the recycling operation

Impurities, such as plastics, humid cardboard and steel products that are not packaging, all have a negative impact on the recycling and manufacturing processes for making new steel products.

The steel industry needs to be efficient and productive, therefore the scrap input used in the process of making new steel products needs to be of high quality.

To ensure high-quality input to the recycling operation, minimum quality requirements or standards are needed.

It is indeed the steel plant, being the final recycler, that sets the packaging scrap quality criteria, which might also be country specific. Minimum requirements (or specifications) are defined for the maximum level of impurities (or steriles) allowed, the maximum humidity (or moisture) allowed and the density of the bundles.

Steel packaging can be recovered from different sources - incinerator bottom ashes, mechanical-biological treatment plants or separate waste collection.

In the case of separate collection, quality checks and additional treatment processes are needed at the different steps prior to entering the recycling operation.

At the first stage, consumers must sort correctly. This can be achieved by creating awareness; for example, that steel packaging must be emptied, not attached to other packaging materials, and through enforcement.

At the second stage, the sorting facilities must ensure a high-quality output, for example by using the correct dimensions of their equipment and an optimised speed of the conveyor belt, allowing manual sorting when needed. Steel packaging of different sizes are sorted out from the material stream at different parts of the sorting facility, always using overband magnetic sorting. Depending on the quality of output from the sorting facility and the requested minimum quality of the steel plant, a supplementary post-treatment step (e.g. shredding) could be needed.

IN A NUTSHELL

As high-quality input to the recycling operations is a key element in the production of new steel products, APEAL recommends minimum requirements be defined relating to the technical constraints of recycling steel packaging from separate collections, for example:

1. The presence of impurities (non magnetic materials, non packaging steel containers)
2. The humidity rate (associated with the presence of organic elements and/or storage poorly drained)
3. The low density of the packages of steel packaging (correlated to the presence of impurities).

The industry is currently working on an initiative to draft European harmonised minimum standards¹⁹.

¹⁹ Among others via CEN/TC 261/SC 4/WG 3: Packaging, Material recovery.

▶ CHAPTER 6: DESIGNING FOR RECYCLABILITY IN A CIRCULAR ECONOMY

Steel is circular by design. The unique magnetic properties of steel make it easy to sort. Steel packaging can therefore be easily recovered from waste streams and recycled repeatedly without any loss of material quality.

The inherent properties of steel do not change, no matter how many times it is recycled. A food can might become a part of a train. That train part could become a bicycle, which could become an aerosol container, then a wind turbine, which could eventually become a food can again.

Once produced, if steel packaging is properly collected and processed at the end of its useful life, it will become a valuable resource for endless production loops. Steel packaging will therefore remain at the heart of a successful circular economy.

RECYCLING KEEPS RESOURCES IN THE ECONOMY

Circular design calls for a closed loop, where resources are repurposed and do not go to waste. If Europe is to achieve its vision of moving to an efficient, waste-free and circular economy, brands need to recognise the importance of using materials that keep their inherent properties, no matter how many times they are recycled. These are permanent materials, such as steel. As brands look for innovative new ways to make their products circular by design, steel packaging has been putting circularity into practice since its invention, whilst constantly evolving to meet changing consumer needs.

Recycling one tonne of steel saves more than two tonnes of raw materials and helps reduce emissions of CO₂ and other air emissions. In fact,

each item of recycled steel packaging saves more than 1.5 times its weight in CO₂ compared to the production of new steel.

Steel packaging today is also much thinner and lighter while maintaining its strength. Over the last 30 years a three-piece food can has become 29% thinner and 46% lighter, while the weight of a steel beverage can has dropped by a third. This not only makes the production of steel packaging more resource-efficient, but reduces emissions associated with transport and waste treatment. All this means steel for packaging has a vital role to play in helping deliver a greener future for Europe and help Europe achieve its vision of an efficient and circular economy.





COMPLEX PACKAGING HINDERS RECYCLING

The complexity of multi-layer packaging components is a significant problem in the recycling of these packages.

Packaging design should always favour mono-materials, and if using several types of material is necessary, these elements should not be connected to each other.

Most materials can be recycled, but many can only go through the recycling process a finite number of times. Eventually, their quality is degraded to such an extent they cannot be processed again. This is the case for fiber-based packaging, as well as for several types of plastic packaging.

APEAL believes designing for recyclability helps to ensure every product placed on the market, can be recycled as efficiently as possible.

Steel packaging is a valuable resource which cannot be wasted if we are to achieve the objectives of the European Green Deal. APEAL will therefore continue to work with all the stakeholders, as well as the European Commission, European Parliament and Member States to realise our shared ambition of a truly circular economy.

INI-ENVI DRAFT REPORT ON CEAP 2.0: “STRESSES THE NEED TO INCREASE THE AVAILABILITY AND QUALITY OF RECYCLATES, FOCUSING ON THE ABILITY OF A MATERIAL TO RETAIN ITS INHERENT PROPERTIES AFTER RECYCLING, AND ITS ABILITY TO REPLACE PRIMARY RAW MATERIALS IN FUTURE APPLICATIONS; IN THIS CONTEXT UNDERLINES THE NEED TO STIMULATE BOTH INCREASED RECYCLABILITY IN PRODUCT DESIGN AND...”²⁰

²⁰ European Parliament resolution of 10 February 2021 on the New Circular Economy Action Plan https://www.europarl.europa.eu/doceo/document/TA-9-2021-0040_EN.html

IN A NUTSHELL

APEAL supports the efforts of the European Commission to place design for recycling and end-of-life at the heart of its circular economy strategy.

- ▲ APEAL welcomed the plenary adoption of the European Parliament’s own-initiative report on the CEAP 2.0
- ▲ APEAL welcomed the European Commission’s initiative to promote the recyclability of packaging, among others integrating strict conditions for packaging in the Essential Requirements of Packaging. For packaging, the use of permanent materials should be further promoted as they are key to a true circular economy.

▶ **CHAPTER 7: APEAL POLICY RECOMMENDATIONS**

▶ **OPTIMISED SEPARATE COLLECTION**

Guaranteeing high-quality recycling occurs when countries apply optimised separate collection and sorting scenarios for household waste, including packaging waste. The type of collection scenario depends on the countries' local circumstances.

▶ **PRE-TREATMENT PRIOR TO INCINERATION**

In case of packaging in residual waste going to incineration, state of the art pre-treatment processes, including the use of magnets, should extract the recyclable packaging prior to the residual waste being incinerated. These pre-treatment processes should provide higher-quality input to recycling compared to packaging recovered through incineration bottom ash treatment.

▶ **NO RECYCLABLE PACKAGING TO LANDFILL**

Packaging that can be recycled should be diverted from landfill. Steel packaging can be recycled over and over again and is too valuable a material to be wasted. APEAL recommends that the revision of the Packaging and Packaging Waste Directive (PPWD) is complemented by a review of the Landfill Directive (LFD) aiming to accelerate the phase-out of landfilling recyclable packaging waste.

▶ **SECOND OVERBAND IN SORTING PLANTS**

When collected together with other recyclable waste fractions, steel packaging can easily be separated using an overband magnetic separator at the sorting plant. However, in many plants the sorting process starts with a rotating trommel with holes to separate the waste packaging flows by size, meaning small items are at risk of not being separated for recycling. APEAL recommends that sorting plants install a second overband to capture small steel items, such as caps, lids and closures for recycling. Authorities could incentivise sorting plants installing these second overbands to keep valuable resources in the circular loop.

▶ **DEFINED QUALITY REQUIREMENTS**

High-quality recycling is only possible with high-quality input material to recycling operations. High-quality input can be ensured by defining quality requirements at each step of the collection, sorting and additional treatment phases before delivery to the recycling operation. APEAL recommends contractual agreements between the supplier and the customer at each processing step.

▶ **CONSUMER INVOLVEMENT**

Assuming the right conditions are in place at local government, institutional, employer and national government levels to ensure the appropriate separation of waste by the consumer, the latter will be key in reaching high-quality input into the recycling operation and for reaching high recycling rates. Co-mingled separate collection scenarios carry a risk of cross-contamination and information campaigns should inform consumers not to place packaging items inside one another in order to ensure good quality sorting. For this reason, APEAL recommends involving consumers by means of simple and easy-to-understand sorting instructions, brought via state-of-the-art and repeated communication campaigns, or enforcement to motivate and incentivise participation.

► GLOSSARY AND ABBREVIATIONS

- ▲ **Circular Economy Action Plan (CEAP).** Annex communication by the European Commission in which the steps towards the achievement of a European Circular Economy dynamic are laid down.
- ▲ **Back-filling.** recovery operation where suitable non-hazardous waste is used for purposes of reclamation in excavated areas or for engineering purposes in landscaping.
- ▲ **Bottom ash.** non-combustible residue of combustion in a furnace or incinerator.
- ▲ **Bottom ash treatment.** series of processes intended to extract valuable materials from the incineration bottom ash residue.
- ▲ **CAP.** Common Agricultural Policy.
- ▲ **Co-mingled collection.** waste collection of different materials altogether i.e. comingled collection of dry recyclables involving plastics and metals.
- ▲ **Dry recyclables.** paper, plastic, metal, glass, wood
- ▲ **Eddy current technique.** separation method for removing non-ferrous metals from a diverse stream of waste materials.
- ▲ **European Green Deal.** a set of proposals to make the EU's climate, energy, transport and taxation policies fit for reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels.
- ▲ **Essential Requirements of Packaging.** a set of criteria for packaging put on the market, related to the manufacturing and composition of packaging, to the reusable and recyclable nature of packaging and to hazardous materials to be minimised in packaging.
- ▲ **Eurostat.** statistical office of the European Union.
- ▲ **Fraction.** a group of waste according to its properties
- ▲ **Incineration.** process involving the incineration of household and similar waste for energy recuperation
- ▲ **Impurities/steriles.** foreign elements to the mono-material flow targeted.
- ▲ **Joint Research Centre.** the European Commission's science and knowledge service.
- ▲ **Landfill Directive.** European Union directive that regulates waste management of landfills
- ▲ **Landfill.** waste management strategy based on waste disposal in an area specially intended to do so.
- ▲ **Magnetic separation.** separation process in which a magnet is used to extract ferrous elements out of a waste flow. They are then separately stored.
- ▲ **Mechanical-Biological Treatment.** type of waste processing facility that combines a sorting facility with a form of biological treatment such as composting or anaerobic digestion.
- ▲ **Moisture.** amount of water present in a certain sample. Measured in %.
- ▲ **Mono waste stream.** a waste stream of only one material (e.g., steel packaging) or group of materials (e.g., metal packaging)
- ▲ **Mono-material flow.** result of the sorting operations in which the different waste materials collected comingled are separated. The flows can be of paper and cardboard, plastics, steel, beverage cartons.
- ▲ **Multi-layer packaging.** packaging consisting of two or more materials forming one packaging structure.
- ▲ **Municipal waste.** waste from households and waste from other sources, such as retail, administration, education, health services, accommodation and food services, and other services and activities, which is similar in nature and composition to waste from households.
- ▲ **Overband magnet.** separation technique using a magnet to attract magnetic materials
- ▲ **Packaging and Packaging Waste Directive.** EUROPEAN PARLIAMENT AND COUNCIL DIRECTIVE 94/62/EC of 20 December 1994 on packaging and packaging waste
- ▲ **Permanent material.** Permanent materials such as steel, glass and aluminium are classified as materials that once produced can be recycled or reused without the loss of quality, regardless of how often the material is recycled.
- ▲ **PRO.** Packaging Recovery Organisation.
- ▲ **Reporting.** communication of data arising from monitoring of a process to a national/local authority.
- ▲ **Residual waste flows.** remnant waste fraction once the dry recyclables have been taken out.
- ▲ **Scrap.** discarded waste material.
- ▲ **Separate collection.** waste is picked up by the waste collection company in different streams; often dry recyclables on one stream and residual waste in another.
- ▲ **Shredding.** to tear apart (also used in bottom ash treatment).
- ▲ **Source separation.** process by which waste is separated into different elements. It occurs when the waste is generated (i.e. when the item is no longer useable and it is discarded).
- ▲ **Steel bundle.** Compressed packaging steel scrap format for transport and storing, in which steel packaging scrap is processed with the help of a baling press that applies pressure on the materials to give them a particular shape (usually squared).
- ▲ **Steelworks.** steel making industry.
- ▲ **Trommel.** a screen curved into a cylinder in order to sort through the material put into it.
- ▲ **Urban mining.** a process via which discarded raw materials are recuperated from a city or an environment.
- ▲ **Waste Framework Directive.** DIRECTIVE 2008/98/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 19 November 2008 on waste and repealing certain Directives .

ANNEX: PACKAGING WASTE GENERATED AND TREATED

(EUROSTAT – 2018, IN KG/CAPITA)

Area/Country (kg/capita)	2018 PW Generated	2018 PW Recovery	2018 PW Recycling	2018 PW Energy recovery	2018 PW Not treated	2018 PW Not treated (%)
European Union - 27 countries (from 2020)	174	141	115	26	33	19%
European Union - 28 countries (2013-2020)	175	139	115	24	36	21%
Belgium	158	156	134	22	2	1%
Bulgaria	71	43	43	0	28	40%
Czechia	122	90	85	5	32	26%
Denmark	173	152	119	33	21	12%
Germany	227	220	156	65	7	3%
Estonia	158	137	96	41	21	13%
Ireland	208	190	131	59	18	9%
Greece	76	48	48	0	28	36%
Spain	161	120	111	9	41	26%
France	197	151	130	22	46	23%
Croatia	68	40	40	0	28	42%
Italy	211	164	140	24	47	22%
Cyprus	87	61	61	0	26	30%
Latvia	134	86	75	11	48	36%
Lithuania	127	87	77	10	40	31%
Luxembourg	224	211	159	52	13	6%
Hungary	138	76	63	13	62	45%
Malta	147	52	52	0	94	64%
Netherlands	181	156	128	28	25	14%
Austria	160	151	105	46	9	6%
Poland	144	91	84	7	53	37%
Portugal	173	115	100	16	58	33%
Romania	80	48	47	2	32	40%
Slovenia	115	101	78	23	14	12%
Slovakia	102	71	68	3	32	31%
Finland	128	147	88	59	N/A	N/A
Sweden	133	94	93	1	39	29%
Iceland	149	94	70	24	55	37%
Liechtenstein	175	162	119	43	13	7%
Norway	161	152	83	69	9	6%
United Kingdom	178	122	111	11	57	32%

^{Waste} generated, recovered, recycled and not treated or landfilled (the latter deducted by APEAL, being generated minus recovery)

²⁰¹⁸ (or 2017, in case of no data 2017)



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APEAL – the Association of European Producers of Steel for Packaging – unites the six producers of steel for packaging in Europe. Founded in 1986, APEAL represents:



TATA STEEL



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