REPORT 2026

Steel Ahead: Packaging for a circular future

How steel for packaging demonstrates leadership in compliance, recycling, and circularity.

STEEL FOR PACKAGING EUROPE

Contents

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Foreword

Steel for Packaging Europe (SfPE), the Association representing the European Producers of steel for packaging, has been at the forefront of tracking and advancing steel packaging recycling in Europe for more than 40 years. Since 2018, SfPE has intensified these efforts through a series of recycling reports, driving continued improvements in steel packaging recycling.

In recent years, Member States have learnt from each other and adopted best practices including the introduction or improvement of separate collection schemes and consumer engagement campaigns designed to encourage citizens to sort their packaging waste at home and on the go.

In 2023 SfPE announced a new record steel packaging recycling rate of 82%, confirming steel as the most recycled packaging material in Europe, already achieving the recycling targets set by the Packaging and Packaging Waste Regulation (PPWR).

At the same time, the Green Deal Industrial Plan – a major initiative of the European Green Deal – and the adoption of the PPWR, have profoundly altered the packaging landscape. In alignment with recent legislative developments, and with the objective of driving circularity by keeping materials in a closed material loop, SfPE launches this third report, focusing on policy initiatives and technical approaches to achieve best practice in collection, sorting and recycling operations. The report also offers an advanced and practical understanding of the Extended Producer Responsibility schemes and the significance of allocating the correct EPR fees for each material, that reflects the real cost of recycling.

By focusing on the policy structures that identify and regulate the steel for packaging environment and on technical developments in steel recycling processes, this report presents an in-depth evaluation of the current state of the steel for packaging industry, and clearly illustrates:

> In 2023 SfPE announced a **new record steel packaging recycling rate of 82%**, confirming steel as the most recycled packaging material in Europe

1. Why Steel for Packaging is the best choice to be compliant with the PPWR and Design for Recycling

2. Why it is important to optimise collecting, sorting and recycling infrastructure to achieve the highest recycling rates

3. The significance of introducing EPR fees that reflect the real cost of recycling to promote circular materials.

Conclusion

This report "Steel Ahead: Packaging for a circular future2026" offers all stakeholders the latest actionable understanding of the technological advancements and regulatory initiatives required to sustain the circularity of steel for packaging in Europe. Its dual focus aims to provide a reference document for guiding future industry practices and regulatory approaches.

Chapter 1: Steel for Packaging

An efficient and valuable packaging material

Steel is a unique packaging material that offers high performance capabilities and exceptional environmental benefits.

Strong, versatile and long-lasting, steel offers the ideal solution for the safe packaging of a wide variety of products, including containers and closures for human and pet foods and beverages, aerosols, 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.

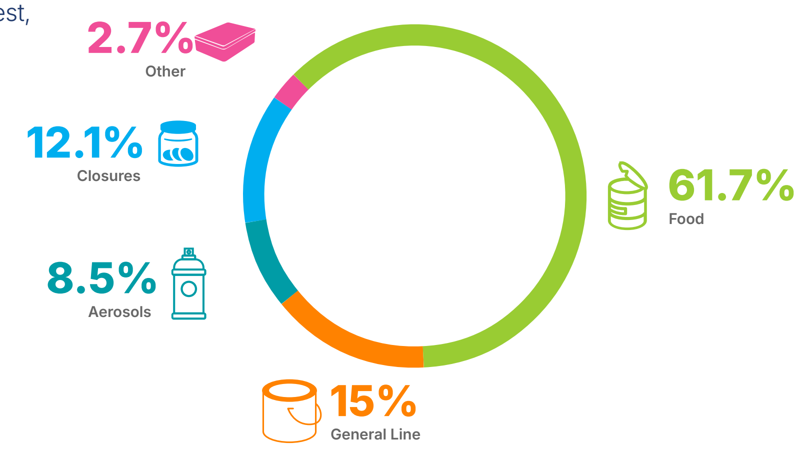
> In terms of protection, **steel is the ultimate sustainable packaging material**

Thanks to its impermeable barrier against light, water, and air, steel packaging protects its contents from farm to fork. In addition, food is typically canned within a few hours of harvest, meaning its nutritional value and flavour are retained without the need for preservatives.

Steel offers the longest shelf life of all packaging materials, protecting products for up to five years. This also makes steel cans a vital packaging format for resilience planning and preparedness. Products packed in steel do not require energy-intensive refrigeration to maintain quality even in extreme temperatures. Consequently, steel cans are high performers in severe transportation conditions and throughout the logistics chain, resulting in less product spoilage.

Steel packaging delivers multiple advantages for businesses. Steel cans can be filled quickly and efficiently, reducing food waste and improving effective operations throughout the entire supply chain. They are resistant, versatile, compact, unbreakable, tamperproof, stackable, require no secondary packaging and can be stored at ambient temperatures. And while steel already offers brand owners an optimal packaging solution, it is also constantly being improved in a number of areas including lightweighting, shaping, openability and decoration.

Steel is produced in Europe strengthens industrial and economic resilience by reducing dependency on external markets. Furthermore, steel packaging plays a crucial role in securing sustainable food supply chains within Europe, ensuring long shelf life, reducing food waste, and maintaining product safety.



A recycling champion

Steel is a permanent material that can be infinitely recycled.

Unique magnetic properties mean that steel is easy to recover from any waste stream using a magnet. Each time steel is re-melted, its properties are re-engineered to deliver the exact strength, quality or performance required.

Over 90% of the European population lives within 200 km of a steel plant, which makes recycling of all steel products practical, sustainable and local, replacing virgin raw materials with recycled steel scrap in the production of packaging, vehicles, and countless other steel applications.

Over **90% of the European population lives within 200 km of a steel plant**, which makes recycling of all steel products practical, sustainable and local

How Steel for Packaging contributes to the low-carbon and resource-based economy

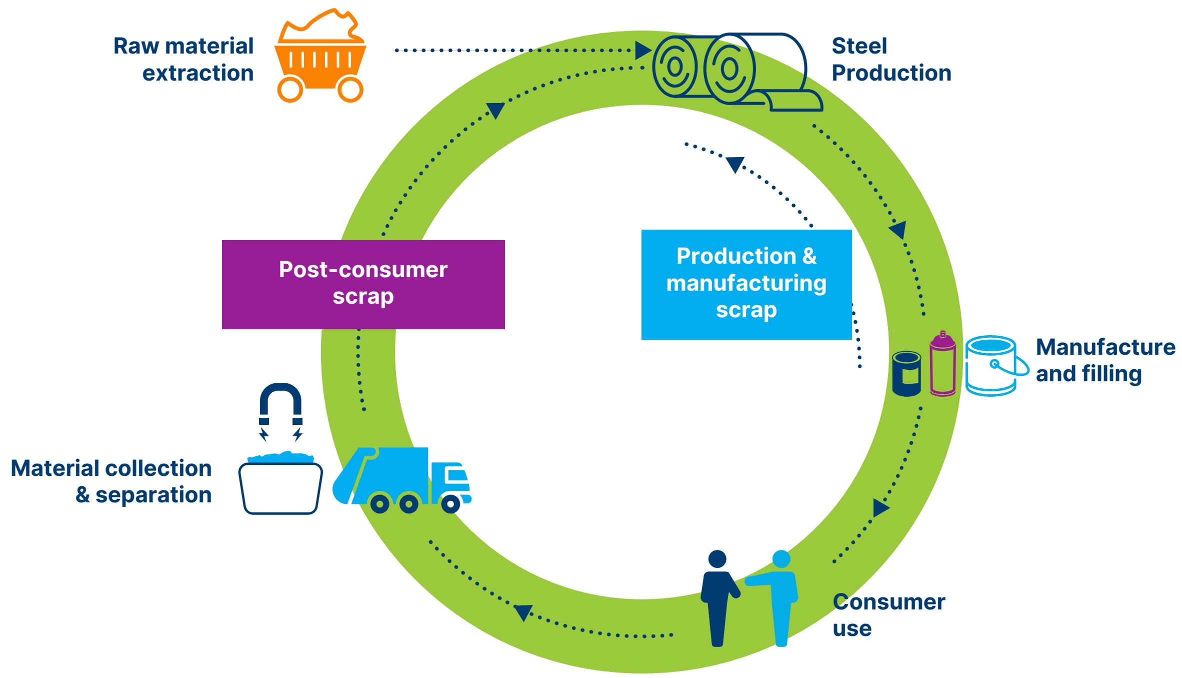
The European steel industry, a proven leader in recyclability and circularity, is undergoing a transformative shift in primary production processes to achieve carbon neutrality by 2050.

Through high recycling rates and high-quality material recovery, steel for packaging supports resource-based frameworks that align with a truly circular economy while reducing Europe's dependency on imports. With ambitious CO2 emissions reduction targets set for 2030, this industry-wide transformation is set to ensure steel remains a cornerstone of a low-carbon and circular economy.

As a permanent material, steel is a key enabler of a resource-efficient economy because it can be recycled over and over again without losing its intrinsic properties into a range of new steel products – a bicycle frame, a car part or even another item of steel packaging – enabling a closed material loop. The European Union (EU) needs secondary raw materials for its sustainability commitments. A modernised EU waste framework is a necessary step towards establishing a resource-based framework that supports the transition to a low carbon economy.

Recycling contributes to preserving primary resources and reducing CO2 emissions. Recycling steel saves up to 70% of the energy needed to make steel with raw materials. In addition, one tonne of recycled steel saves over 1.5 tonnes of CO2 emissions and over 2 tonnes of raw materials. In 2022, over 2.8 million tonnes of packaging steel were recycled in Europe, saving over 4.2 million tonnes of CO2.

Steel is a permanent material that can be **infinitely recycled** in a closed material loop.



Chapter 2: PPWR compliance

Introduction to the Packaging and Packaging Waste Regulation (PPWR)

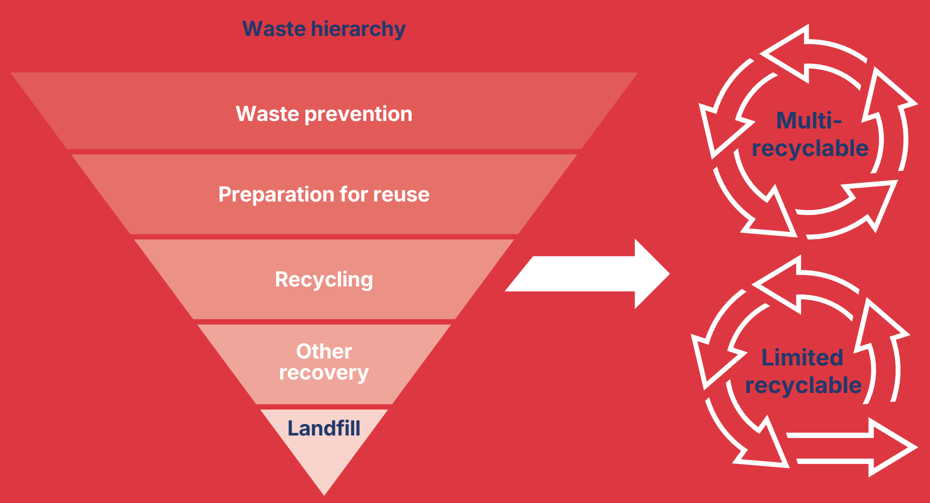
The Packaging and Packaging Waste Regulation (PPWR), adopted in 2024, replaces Directive 94/62/EC and supports the European Green Deal and Circular Economy Action Plan. It aims to ensure all packaging placed on the EU market is recyclable by 2030 and recycled at scale by 2035.

A key change is the shift from a Directive to a Regulation. Unlike Directives, which require national transposition, Regulations apply directly across all EU Member States. This ensures more uniform rules on packaging and packaging waste, reduces national discrepancies, and strengthens the EU's commitment to a harmonised circular economy.

The Waste Framework Directive (WFD) complements this framework by establishing core principles such as the waste hierarchy and Extended Producer Responsibility (EPR). Its focus on high-quality recycling and materials with established recycling loops highlights the role of permanent materials like steel in a circular economy.

Maintaining the integrity of the EU Single Market is also crucial for the packaging sector. Improving recyclability and separate collection systems helps prevent market fragmentation, reduce environmental impacts, and support harmonised sustainability targets.

Increasing recycling rates in packaging materials directly supports the integrity of the EU Single Market by promoting resource efficiency, reducing environmental impact, and fostering a level playing field through harmonized performance targets. For steel for packaging, higher recycling rates enhance material circularity and strengthen the internal market for secondary raw materials.



SfPE views the PPWR as a significant and positive step toward achieving a truly circular economy in Europe. It strongly supports the Regulation's emphasis on enhancing the collection and recycling of valuable packaging resources. SfPE welcomed the adoption of stricter recyclability requirements, recognising their role in driving innovation and improving the sustainability performance of packaging across the EU. Notably, SfPE actively contributed to the development of the Design for Recycling criteria, bringing forward industry expertise to ensure that steel is adequately recognised for its inherent recyclability. SfPE is particularly pleased to see that many of the principles it has long advocated have been reflected in the final requirement, marking a key moment where policy and technical evidence align to deliver meaningful environmental progress.

Furthermore, it commends the Regulation's clear focus on promoting the separate collection of packaging waste, which is essential for maintaining high-quality recycling. SfPE also supports the establishment of transparent and proportionate Extended Producer Responsibility (EPR) fees, which should fairly reflect the net costs of collecting, sorting, and recycling packaging materials. Packaging materials should cover their own costs in these processes, thereby avoiding cross-subsidisation, whereby a material pays part of the costs generated by another material, and ensuring a more effective and equitable packaging waste management system.

Why steel is the perfect choice

The European Commission is tasked with adopting a Delegated Act to establish detailed criteria for Design for Recycling and to define the recyclability performance grades by January 1, 2028.

Steel for packaging, known for its inherent recyclability, is well-positioned to meet the higher recyclability grades A and Band has consistently demonstrated high recycling rates in Europe. In 2023, 82% of steel packaging placed on the market was 'really recycled' This performance positions steel packaging within Grades A and B under the PPWR criteria.

All steel packaging formats, such as food cans, are free from complex multi-layer components, making them more compatible with the technical and practical criteria of recyclability. These characteristics not only align with the design for recycling principles emphasised in the PPWR but also demonstrate steel's ability to consistently meet the recyclability thresholds for the highest performance grades. This positions steel as a key material in the transition to more sustainable, circular packaging solutions within the EU market.

Recyclability Performance Grades

Assessment Criteria

The recyclability performance grade of packaging is determined based on several factors:

- **Collection and sorting:** packaging should be compatible with existing collection and sorting systems, allowing it to be effectively separated into appropriate waste streams and not hinder the recycling of other streams.
- **Design for Recycling:** the design of packaging, including individual components of packaging, that ensures the recyclability of the packaging with established collection, sorting and recycling processes proven in an operational environment.
- **Recyclability:** the compatibility of packaging with the management and processing of waste by design, based on separate collection, sorting in separate streams, recycling at scale and the use of recycled materials to replace primary raw materials.
- **High-quality recycling:** any recycling process which produces recycled materials that are of equivalent quality to the original materials, based on preserved technical characteristics, and that are used as a substitute to primary raw materials for packaging or other applications where the quality of the recycled material is retained.

Article 6 – Design for Recycling (DfR) and recyclability

As part of the implementation of the Delegated Act of the PPWR, establishing clear and robust DfR and recyclability criteria is essential to ensure a harmonised, circular economy across the EU. DfR guidelines specific to steel packaging formats play a crucial role in optimising the collection, sorting, and reprocessing phases of recycling, thereby maintaining the inherent material value of steel throughout multiple life cycles and preventing any downgrading or downcycling of the material. These guidelines must be science-based and reflect real-world recycling conditions, considering technical recyclability and the effective recyclability of steel for packaging in existing infrastructure. The development of standardised definitions for both DfR and recyclability is critical to drive accountability within the packaging industry, making producers responsible not only for the end-of-life phase of packaging but also for its overall circular performance. These definitions should reflect recyclability in practice, ensuring packaging placed on the market contributes to a closed material loop

Under PPWR, a recyclability performance grading system has been established to assess and categorise packaging based on its recyclability. This system is designed to promote the design of packaging that is more easily recyclable, thereby supporting the EU's circular economy objectives. Importantly, the assessment considers not only the theoretical recyclability grades but also whether the packaging is recycled at scale, with full implementation expected by 2035.

Article 7 – Recycled content

There are no mandatory recycled content targets specifically applicable to steel for packaging under Article 7. SfPE maintains that recycled steel packaging is not reintroduced exclusively into the production of new steel packaging. Instead, it is utilised across a broad range of steel products, reflecting the versatility and value of steel scrap. Steel is ideal for a closed material loop because it can be recycled indefinitely. This closed material loop minimises waste and reduces the need to extract virgin materials by continuously recycling and reusing materials with no loss in their inherent properties. With regard to the review clause foreseen by 2032, the steel for packaging sector remains confident that the European Commission will implement this provision with due consideration to the unique properties and circularity of steel and its contribution to a wider recycling system. In the steel for packaging industry, the recycling process follows the proximity principle, ensuring that steel scrap is efficiently delivered to nearby steel plants maximising sustainability and reinforcing a highly efficient, circular production chain.

Article 10 – Packaging minimisation

Article 10 aims to combat over-packaging by establishing requirements on the size, weight, and volume of packaging in proportion to the product it contains. This approach is designed to reduce unnecessary material use and lower the volume of packaging waste entering the waste stream. The steel for packaging industry has made significant strides in this area. Over the past 40 years, the thickness of a standard 3-piece food can has been reduced from 0.20 mm to 0.14 mm. Moreover, the latest generation of steel cans is now 46% lighter compared to those produced four decades ago, reflecting the industry's ongoing commitment to material efficiency and sustainability.

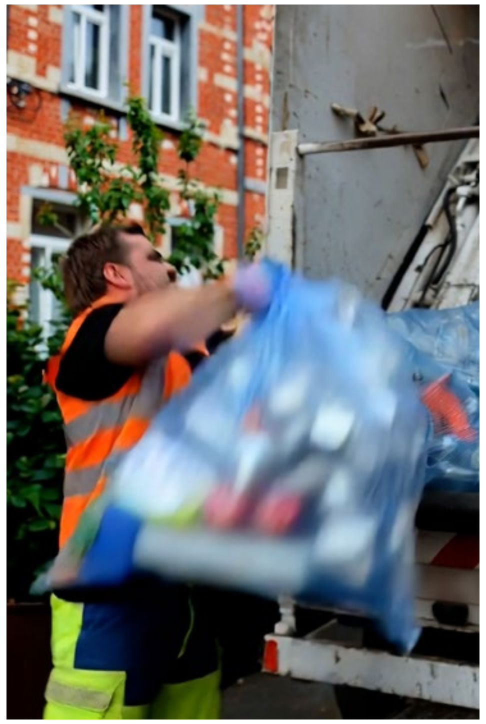
the latest generation of steel cans is **now 46% lighter**

Chapter 3: PPWR: From regulation to impact

The PPWR presents a unique opportunity to advance the circular economy and translate it into tangible outcomes. In the case of packaging steel, our objective is to realise the vision of a fully closed material loop. Achieving this requires further optimisation across the entire recycling value chain. SfPE emphasises that the consumer represents the starting point and a critical factor, followed by well-designed collection systems, efficient sorting facilities, and the maximisation of recycling streams to approach a near-100% recycling rate for steel for packaging.

Collection systems

Achieving as high recycling rates as possible for steel packaging starts with securing high collection rates. Across Europe, each Member State operates its own collection system, reflecting differences in policy frameworks, infrastructure, and public engagement. These variations provide an opportunity to evaluate and compare performance in order to understand how effectively different approaches capture steel packaging. Assessing the collection stage is therefore essential to identifying strengths, limitations, and areas for improvement. This chapter explores the factors that influence collection effectiveness and considers how system design can help maximise material recovery and quality.



Comparison of collection systems

Multi-Bin systems for steel packaging collection

+ Multi-Bin systems combine multiple packaging materials within the same collection stream. This approach enables integrated management of different materials and allows for more efficient use of collection vehicles through shared routes. It can also simplify waste management for municipalities with limited infrastructure or resources, reducing the need for multiple separate collection schemes.

− However, these systems present certain challenges. In dense urban areas, space constraints for multiple or large bins can limit practicality. Communicating correct sorting practices to households can also be complex, with confusion over bin colours or accepted materials leading to higher contamination rates. Most importantly, the mixing of materials can compromise the quality of collected steel fractions, requiring additional sorting.

Potential improvements

- Strengthening sorting guidelines and providing clear instructions to help reduce contamination and improve the quality of collected materials.
- Harmonising bin design and labelling across Member States to further support consistent citizen understanding and compliance.

Which collection system represents the best practice for steel packaging?

The assessment of different collection systems highlights that no single model can be universally applied across all Member States. Instead, the most effective approach for steel packaging collection draws on the complementary strengths of each system to achieve high collection rates and high material quality.

Door-to-door separate collection systems have proven effective in securing strong citizen participation and ensuring a high degree of source separation. Their convenience and proximity contribute to reduced contamination levels and higher-quality steel fractions entering the recycling stream. Bring systems, by contrast, demonstrate advantages in terms of cost-efficiency and flexibility, enabling households to deposit packaging materials at their convenience while concentrating recovery efforts at strategically located collection points. Meanwhile, multi-bin systems facilitate integrated management of different packaging materials, allowing municipalities to optimise logistics and resource use.

By combining the accessibility and quality outcomes of door-to-door systems, the cost-effectiveness and flexibility of bring systems, and the efficiency of multi-bin systems, Member States can enhance performance in line with the objectives of the Packaging and Packaging Waste Regulation (PPWR). Such a blended approach supports the overarching EU ambition to increase collection rates, improve material circularity, and ensure that all steel packaging is effectively recovered and reintroduced into the production cycle.

Chapter 3: PPWR: From regulation to impact

Door-to-Door collection

+ The door-to-door separate collection system offers several advantages for capturing lightweight packaging, including steel. Its convenience encourages high household participation.

− However, the design aspect also faces challenges. Material entanglement, such as plastics or paper placed inside steel packaging, can hinder sorting and reduce material purity. Operational costs are typically higher due to labour-intensive logistics and frequent collection rounds. The door-to-door collection system also relies heavily on public awareness and compliance with collection schedules, and space limitations in households can restrict participation.

Potential improvements

- Use of digital tracking and route optimisation technologies can help reduce collection costs and improve logistical performance.
- Incentive-based schemes such as pricing mechanisms linked to the cost of designated collection bags to motivate households to separate materials correctly. Care should be taken to ensure that residual waste is not disposed of in lower-cost packaging waste bags, maintaining the integrity of source separation.

Bring systems

+ Bring systems rely on designated collection points where citizens deposit their used packaging materials. This approach can be cost-efficient, as it reduces the frequency and logistical demands of household collections. It also offers flexibility, allowing households to dispose of packaging at their convenience while enabling concentrated recovery at centralised locations.

− However, participation rates in bring systems are generally low, as they depend on active citizen engagement and the proximity of collection facilities. In rural or remote areas, long travel distances can discourage participation and limit collection volumes. Additionally, when bring points are not regularly monitored, there is a higher risk of contamination or improper disposal. Accessibility can also be a concern for less mobile populations, who may find it difficult to reach designated sites.

Potential improvements

- Increased accessibility through the installation of strategically located collection points, within convenient reach of both urban and rural populations.
- Regular monitoring and maintenance of containers to maintain cleanliness and reduce contamination.
- Effective management of container overflow, through timely collection schedules and responsive logistics, to further enhance system performance and public confidence in the service.

Co-mingled collection of packaging waste

+ While dedicated containers facilitate efficient source separation and result in low contamination levels, co-mingled collection offers great convenience for consumers by allowing all packaging materials to be disposed of together in a single bin or bag.

− However, this approach often leads to quality challenges. Issues such as nesting and lower sorting efficiency can occur, for example flexible materials may be incorrectly captured within the steel stream during magnetic separation. Additionally, material entanglement, such as plastics or paper placed inside steel packaging, can hinder effective sorting and reduce the purity of recovered materials, ultimately impacting recycling progress.

Potential improvements

- Co-mingled collection can be improved through enhanced consumer education on proper disposal practices, including addressing nesting issues and providing clear sorting guidelines
- Managing the presence of materials such as flexible packaging to help improve the overall quality of the collected streams.

Opportunities for progress in sorting systems

Steel's magnetic properties are one of its most valuable advantages, setting it apart from all other packaging materials.

As a ferrous metal, steel is attracted to magnets, which allows for efficient and selective separation from mixed waste streams. This property is particularly beneficial in sorting facilities, where overband magnets can automatically extract steel packaging from both household and industrial waste flows. The reliability, simplicity and favourable cost profile of magnetic separation helps to ensure high recovery rates. Furthermore, the cost of overband magnets is lower compared to optical sorting equipment. A quality control step is applied after the overband and before the press to sort the flow and manage issues such as nested items.

Maximising the volume of steel packaging recovered

While household sorting remains the first critical step, the role of sorting centres in capturing steel fractions, and particularly small-sized items like closures, is vital.

Overband magnets remain the cornerstone of steel sorting. An example of recent optimisation has been the targeted installation of a second overband magnet on small size packaging. Traditionally, small steel items such as crown corks would fall through the early-stage mechanical screening equipment, like trommels, and be erroneously diverted into the residual waste stream. These residual flows were often treated as non-recyclable and incinerated. However, by equipping these flows with dedicated overband systems, sorting centres recover small steel items from waste streams that would have previously been discarded.

This effective upgrade is allowing for higher recovery rates of steel packaging items, particularly closures, without requiring major overhauls to existing infrastructure.

Some countries have taken further steps by developing dedicated sorting lines or modules for small steel items, improving traceability and boosting the overall recycling performance for steel packaging.

By maximising material retention at multiple points in the sorting line, facilities can divert more steel packaging from residual waste streams and reintegrate it into the recycling loop, reinforcing resource efficiency in line with sustainability best practices.

Maximising quality in the sorting process

Quality control checkpoints and automated monitoring systems have become more common, helping facilities to better detect contamination from non-ferrous materials and other packaging types within the steel output.

The quality of the steel fraction exiting the sorting facility plays a crucial role in determining whether additional post-treatment steps are required before the material can be accepted by steel plants for recycling. If the sorted steel contains impurities such as non-ferrous metals, plastics or paper beyond the allowable threshold set by the receiving steel plant, supplementary treatment is necessary. One common method is shredding, which serves a dual purpose: it facilitates easier handling and melting and it also allows for further purification by separating residual contaminants.

While technological improvements and increased awareness have significantly enhanced the efficiency of steel packaging sorting, sorting centres still face persistent challenges. Co-mingled collection poses a significant challenge in the drive to achieve cleaner steel streams. This challenge is exacerbated by the changing composition of waste flows, more plastic films and small rigid containers, more cardboard and less paper, increased aluminum and plastic flexibles, and various non-packaging items being placed in selective collection bins.

Pre-treatment prior to incineration

In cases where steel packaging ends up in residual waste streams destined for incineration, state-of-the-art pre-treatment technologies play a critical role in maximising recycling potential. These systems are designed to extract recyclable steel packaging using magnetic separation, before the waste reaches the incineration stage. By recovering materials at this earlier point, the resulting input for recycling can often be higher and better quality.

In cases where steel packaging ending up in residual waste doesn't undergo pre-treatment, the recovery from incineration bottom ash is also a method deployed effectively to maximise recovery rates.

This combination of pre- and post-incineration recovery enhances material purity, and supports higher recycling rates, since nothing will be lost, even when it ends in the wrong bin.

Achieving high-quality recycling

Steel packaging is a permanent material that can be infinitely recycled without any loss of its inherent properties. As such, the primary challenges in recycling steel packaging do not relate to the material itself, but to the quantity, the quality and the consistency of scrap inputs, which are influenced by collection, sorting, and pre-treatment practices.

From source to scrap: the impact of collection and sorting

While the recyclability of steel is unaffected by collection or sorting methods, these stages determine the quality and quantity of steel packaging scrap for recycling. The cleanliness and density of the steel scrap bundles are all critical parameters, each directly shaped by the efficiency and design of upstream processes. Source-separated collection schemes, particularly mono-material streams, continue to yield the highest quality outputs, minimising the risk of contamination from non-magnetic and non-packaging materials. Nonetheless, consumer behaviour remains a critical variable. Cross-contamination in steel packaging collection is often a result of other materials such as plastics sticking to, or nesting within steel packaging. This can lead to higher levels of impurities.

Post-sorting quality control and supplementary treatment

In many cases, post-sorting treatments, such as shredding, are required to meet the minimum input specifications for steelworks. These steps help dislodge remaining non-ferrous materials, remove residues, and ensure bundle homogeneity. The quality of the steel scrap bundles depends on the sorting infrastructure and settings, the presence of manual quality control or automated pollutant-ejection systems and post-sorting shredding.Regular maintenance and periodic calibration of equipment, including overbands and presses, are essential to maintain recovery efficiency across varying input qualities.

Establishing and enforcing scrap standards

The development and enforcement of steel scrap standards is now critical. These standards define the technical thresholds for contaminants, moisture content, and bundle density, allowing steel plants to operate at maximum efficiency with the lowest environmental impact. Current best practice includes specifying maximum impurity content (plastics, aluminium, wood, cardboard), and moisture levels which is particularly important in mixed or outdoor storage contexts, and density thresholds which correlate with energy efficiency during melting. Scrap quality requirements may vary between countries and steel recycling facilities, but a unified European approach underpinned by standards set by recyclers can help increase transparency, traceability, and circularity.

Towards a resilient and high-performance recycling

To align with the evolving demands of the circular economy, Steel for Packaging Europe (SfPE) recommends reinforcing quality standards across recycling. This includes the harmonisation of collection systems, with a preference for source-separated or mono-stream approaches. It also involves investing in high-precision sorting technologies and designing facilities that can adapt to the evolution in the composition of the waste flows to be sorted.

Record-high recycling rate brings steel packaging closer to full circularity

82% of all steel packaging placed on the market in 2023 was really recycled, meaning it entered actual recycling operations, and was not merely collected. This reinforces steel packaging's status as the most widely recycled packaging material in Europe and demonstrates compliance with the stringent recyclability criteria defined under the Packaging and Packaging Waste Regulation (PPWR). The record recycling rate represents a two-percentage-point increase from 2022 and highlights the vital contribution of steel scrap in the sustainable production of new steel products. This recycling process reduces both energy consumption and emissions, aligning with broader EU sustainability goals. The sector plays a critical role in helping EU Member States achieve their circular economy objectives, not only by conserving resources and lowering emissions, but also by supporting food security and waste prevention. The rise in recycling rates, based on real recycling at the point of entry into operations rather than collected volumes, reflects the industry's commitment to closing the material loop. All recovered steel packaging is transformed into new steel products without quality loss. These can range from infrastructure components such as trains or wind turbines to new steel packaging, illustrating steel's compatibility with the EU's circular economy vision.

Conclusion

The capacity of steel packaging to be recycled is well established. However, to fully leverage its circular potential, the quality of collected and sorted scrap must be further optimised. The steel industry, policymakers, waste operators, and citizens each play a crucial role in this chain.

SfPE continues to advocate for the establishment of clear, enforceable standards, investments in technological innovation, and broad-based awareness efforts to ensure that steel scrap used in recycling operations meets the highest quality requirements. Only then can the full environmental and economic benefits of permanent materials like steel be realised.

Activating consumer engagement

Effective steel packaging recycling begins with well-informed and active consumer participation. Proper sorting at household level is essential to ensure that steel packaging is placed in the correct recycling stream. Clear labelling, public awareness campaigns, and convenient access to separate collection systems whether through curbside bins or designated drop-off points are critical to encouraging correct disposal behaviour. In addition, the design and sizing of collection containers, as well as the frequency of their collection, should be aligned with the actual volume and type of waste generated by households. This alignment helps prevent steel packaging from becoming entangled with plastics or mixed in with paper and cardboard, thereby safeguarding the quality of the recovered materials. When consumers correctly separate steel packaging from residual waste, it significantly enhances the quality and quantity of material available for recycling, reducing contamination and supporting a more circular economy.

Opportunities to improve consumer sorting

While increased awareness of how to dispose of used steel packaging correctly has significantly enhanced the efficiency of steel packaging sorting, a number of challenges remain. One key issue is material nesting which poses obstacles to achieving cleaner steel streams.

Material nesting is a behavioural challenge rooted in how consumers dispose of packaging waste. When items such as plastics, cardboard, or paper are placed inside steel packaging, the sorting process becomes significantly more complex. While magnetic separation efficiently isolates steel items from the waste stream, it does not detect or extract the non-metallic contents placed inside. As a result, these hidden contaminants remain trapped within the steel packaging and enter the recycling stream undetected. The consequence is cross-contamination, which affects both the purity of the steel output and the performance of downstream recycling operations. Further cross-contamination may also arise within the logistics chain, particularly through the compaction processes in collection vehicles and the reloading of waste at transfer stations over extended haulage routes, both of which can lead to steel packaging becoming commingled with other materials.

This observation underscores the critical importance of consumer education and clear disposal guidance. Correct sorting at the source ensuring that steel packaging is emptied and separated from other materials is still one of the most effective ways to protect the quality of recyclable steel. Without such initial separation, certain contaminations cannot be properly removed later in the process unless additional quality control measures are applied at sorting centres.

Steel packaging offers a clear advantage which helps consumers to dispose of used packaging in the best way for effective recycling. Unlike certain composite or flexible packaging types that can retain residues, steel packaging is typically easy to empty completely. This characteristic not only simplifies consumer participation in recycling but also contributes to higher material quality by reducing contamination.

The growing importance of sorting out-of-home

As more meals are consumed out-of-home, it is increasingly common for steel packaging to end up in general residual waste. Without access to clearly marked sorting bins in offices, factories or public spaces, consumers often have no choice but to dispose of cans, tins, or steel closures in general waste. To address this gap, it is essential to introduce dedicated collection and sorting infrastructure beyond the home. Public areas such as parks, transport hubs, offices, and event venues should provide clearly labelled bins that allow for easy and effective sorting of steel packaging. To facilitate correct disposal and minimise contamination, recycling bins should be placed alongside residual waste bins, ensuring users always have access to both options. Standardised colours, icons, and labelling across regions can further help users correctly identify where to dispose of different materials, even when away from home. Improving sorting opportunities in public spaces not only increases recycling rates but also helps maintain the quality and value of the steel sorted, contributing to a more circular economy. The harmonisation of colour-coding schemes between household containers and on-the-go collection systems facilitates consistent consumer behaviour in all locations, thereby reinforcing proper source separation practices.

The role of labelling and harmonised instructions in steel packaging sorting

Proper sorting of steel packaging begins with clear and consistent instructions.

A simple, easy-to-understand sorting label for metals, supported by public awareness campaigns, can help consumers correctly dispose of steel packaging like cans, aerosols, and closures. This is essential for keeping steel out of residual waste and landfills, and to make sure it can be recycled efficiently and to high quality standards.

However, problems still exist. In some places, steel is collected with flexible plastic packaging, which can lead to contamination. These materials are processed differently and mixing them can lower the cleanliness of the steel stream and increase the cost of recycling.

Steel closures, like bottle caps, are another consideration. Their small size often causes them to be captured in residual waste, where they may escape recycling processes. In some countries, people are told to leave steel caps on glass jars so they can be separated at the glass sorting plant. In other countries, closures can go directly into the steel recycling stream. As instructions differ across countries, consumers are often uncertain, so harmonised messaging is recommended to ensure correct recycling of steel closures.

To improve recycling even further, there is growing support for adding recycling labels that also show how recyclable a material is. Packaging Recyclability Performance Grades introduced under the Packaging and Packaging Waste Regulation (PPWR classify packaging as Grade A (≥95% recyclability), Grade B (≥80%), and Grade C (≥70%). Since steel is a permanent material that can be recycled again and again without losing quality, clear labelling can help consumers and producers value its long-term benefits and sort it correctly.

Chapter 4: Extended Producer Responsibility (EPR)

Why EPR is important for steel packaging

Extended Producer Responsibility (EPR) is a key principle set out in the EU's Waste Framework Directive (WFD) and further reinforced in the Packaging and Packaging Waste Regulation (PPWR). It is about ensuring that producers take responsibility for the entire life cycle of their packaging including the costs that arise once the packaging becomes waste.

For steel packaging, EPR is particularly relevant. Steel is a permanent material that can be recycled endlessly, and unlike many other materials, steel scrap has a positive value. This means that steel demonstrates strong circular performance not only through very high recycling rates, but also by keeping the overall cost of recycling low.

> Rewarding packaging that is **easier to recycle**

EPR schemes also reflect the economic dimension of circular performance, as they should take into account both the cost of recycling and the value of secondary materials. In this sense, EPR acts as an economic driver for circularity and competitiveness. Steel clearly shows superior performance compared to other packaging materials in this regard as it is easy to separate thanks to its magnetic properties and maintains a high scrap value, which further strengthens its competitiveness within a circular economy.

By requiring producers to take both financial and operational responsibility, EPR generally ensures that recycling systems are properly funded and effective. In the case of steel packaging, this approach supports the PPWR's goal of keeping materials in circulation at their highest value, while minimising the need for new raw materials.

What does a well-functioning EPR scheme look like?

The WFD and the Circular Economy Act (CEA) set the overall direction, while the PPWR provides the right foundation. But success ultimately depends on how EPR schemes are implemented by Member States.

A well-functioning EPR system must start with fair net costs for producers, ensuring that the full cost of waste management and data reporting is covered transparently. Building on this, it should reward circular performance linking fees to packaging design features such as Design for Recycling (DfR) and the use of permanent materials.

To achieve this, eco-modulation should play a key role. Across material categories, fee structures can be differentiated to incentivise more recyclable designs, for example, by rewarding packaging that is easier to recycle or made from materials with higher recycling efficiency. In this way, eco-modulation becomes a practical tool to encourage innovation and support circular and competitive product design.

Kept at this high level, such an approach ensures that EPR works as intended: driving investment in better packaging, improving recycling outcomes, and supporting Europe's transition to a real circular economy.

How steel packaging performs in EPR schemes compared to other materials

Steel is circular by nature, and this should be reflected by the EPR fees that parties responsible for packaging pay for the end of life of their packaging. Across the EU, several Member States modulate EPR fees by material type and recycling performance, often assigning lower fees to highly recyclable, permanent materials like steel, recognising their positive end-of-life value and contribution to circularity while ensuring these benefits are not mutualised with less recyclable materials. However, it is important to distinguish between net cost and eco-modulation. While eco-modulation provides incentives for better packaging design and recyclability, it does not address the question of fair net costs. A well-functioning EPR system for packaging therefore needs to, per packaging type, ensure both the transparent coverage of net costs of collection, sorting, and further processing to recycling, and effective eco-modulation to drive circular performance.

However, there is variation in practice under the guiding principles in PPWR and WFD. **This highlights that while the PPWR and WFD establish guiding principles such as fair net costs and rewarding circularity, Member States still vary significantly in implementation based on cost structures, infrastructure, and policy design.** However, what truly matters is the difference between materials within each Member State. For example, in Italy, fees for steel packaging are modest, whereas those for plastics can be between about 10 and 100 times higher.

Steel packaging is a perfect example of circular performance, combining material permanence, very high recyclability, and strong economic efficiency with a high positive scrap value and low costs for collection and sorting. These characteristics make steel both environmentally and economically sustainable. Such performance should be reflected in EPR fee structures, ensuring that materials like steel benefit from fair and lower fees that acknowledge their true circular and economic value. In this way, steel serves as a benchmark for EPR implementation under the PPWR, demonstrating how well-designed systems can reward genuinely circular materials.

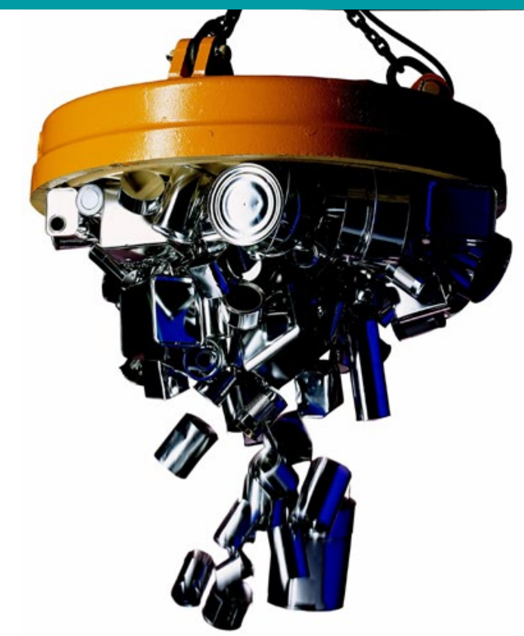
Net-cost approach of EPR fees

The net-cost approach is the principle applied in most EPR- systems across Europe to determine the level of fees paid for each packaging material. Under this approach, producers are required to cover the net cost of packaging waste management including the full operational and administrative costs of collection and sorting of packaging waste, minus the revenues generated from the sale of recyclable materials. This principle is embedded in the Waste Framework Directive, in Article 8a and in PPWR, in Article 45 par. 2 and needed to be transposed into all national laws in the Member States.

By ensuring that the revenues generated by materials with positive market value, such as steel scrap, are deducted from the gross cost of waste management, the net-cost approach provides a fair, transparent, and performance-based framework for allocating financial responsibility among materials.

How is the net-cost approach calculated in practice?

- **Gross system costs: Per packaging type, collection costs, sorting costs, and costs of further processing to recycling.**
- **Revenue deduction: Any revenues generated from the sale of sorted and processed packaging types are deducted from the gross costs.**



As steel packaging scrap can be very cost-efficiently collected and sorted from any waste stream, and considering the steel scrap having high resale prices, the real net contribution required from producers should be significantly lower compared to most other packaging types.

While the net-cost approach is harmonised under the PPWR, there are variations in implementation across Member States as some countries apply a strictly uniform methodology, ensuring comparability across materials. Others might introduce modulation factors linked to recyclability performance, environmental impact, or specific design features. For instance, in Belgium and Italy, steel packaging attracts significantly lower fees reflecting its high recyclability and positive scrap value. In contrast, Germany charges substantially higher fees for steel packaging not aligning with scrap value. These variations highlight how fee structures can differ depending on whether municipalities assume responsibility for waste collection and sorting. However, the PPWR mandates that cost allocation remains transparent, fair, and linked to real performance, underscoring the importance of aligning fees with material-specific characteristics.

Eco-modulation of EPR fees

Eco-modulation means adjusting EPR fees based on how recyclable a packaging is. This approach, promoted by EU policy, encourages producers to choose packaging that performs better for the circular economy.

By adjusting fees based on Design for Recycling (DfR) and the possibility of multiple recycling, these schemes reward producers who design packaging that can be efficiently, effectively, and endlessly recycled.

For example, packaging designed and optimised for existing recycling streams can attract lower fees. Similarly, while permanent materials such as steel have the potential to benefit from reduced fees due to their recyclability, this is not yet consistently reflected in practice. Moreover, eco-modulation should primarily address packaging design within each material stream, rewarding design choices that enhance recyclability, in addition to ensuring fair net-cost coverage.

This approach aligns economic incentives with circular economy objectives; producers are financially motivated to choose recyclable designs, which in turn enhances recycling efficiency and reduces waste. In practice, eco-modulated fees create a transparent and performance-oriented system, ensuring that packaging with higher circular potential is systematically favoured.

For steel, eco-modulation creates clear opportunities. Its permanent recyclability, closed-material loop, already well functioning and strong markets for recycled material mean it is well-placed to benefit from fair fee structures. At the same time, harmonising eco-modulation rules across EU Member States would prevent market distortions, give producers consistent incentives, and strengthen consumer confidence in recycling.

packaging designed and optimised for existing recycling streams can attract **lower fees**

Chapter 5: Policy Recommendations

Call to Action

Optimised collection, sorting, and further processing to recycling

1. Optimise separate collection systems

High-quality recycling is ensured when countries adopt optimised separate collection and sorting systems for household waste, including packaging waste. Valuable resources may be lost if packaging is disposed of in landfills or incinerated, unless efficient recovery processes are employed. Effective, material-specific separate collection is critical to the circular economy. While all materials benefit from clean, well-separated collection streams, even highly recyclable materials such as steel can see their circular potential reduced when collected together with mixed or contaminated waste.

2. Ensure pre-treatment before 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.

3. Phase out landfilling of recyclable packaging

Steel packaging should not be disposed of through landfill. In accordance with the waste hierarchy, measures should prioritise the diversion of recyclable packaging from disposal pathways, thereby accelerating the phase-out of landfilling recyclable materials. Ensuring the continued circulation of steel packaging through recycling safeguards valuable resources and strengthens the transition towards a circular economy.

Chapter 5: Policy Recommendations

Consumer engagement

4. Implement Design for Recycling and recycling performance labelling

In the context of steel packaging, we recommend that the industry fully embrace and operationalise the framework for recyclability performance grading, anchored in robust Design for Recycling (DfR) criteria. Given that steel packaging formats already achieve grades A or B, it is important that the methodology recognises and rewards materials with proven recycling performance and established closed-loop systems. Mentioning the grade on the packed product should help the consumer to choose the right packaging.

5. Strengthen consumer information and participation

While co-mingled collection models can simplify logistics, they pose a significant risk of cross contamination. Clear, consistent, and accessible messaging should therefore guide consumers not to place packaging items inside one another and to avoid mixing materials so as to preserve material purity for steel packaging and facilitate efficient sorting. To this end, engaging consumers through simple, unambiguous sorting instructions, delivered via modern and multi-channel communication campaigns is essential. Additionally, complementary incentive structures and targeted enforcement can help sustain compliance and foster broad participation.

EPR fee modulation based on real costs and recyclability

6. Apply the net cost in EPR-fee calculation

General requirements for EPR should foster the harmonisation of EPR governing principles. Transparent, proportional and non-discriminatory EPR-fees, applying the net-cost principle, being (1) covering the costs of collecting, sorting and further processing to recycling, and (2) considering the financial value of the steel scrap to be recycled.

7. Promote recyclability through eco-modulated EPR-fees

EPR fee structures should reflect the benefits of materials that are highly recyclable, lead to high quality recycling and can be recycled multiple times. Eco-modulation of fees should reflect these circular economy features through reduced fees for such materials.

STEEL FOR PACKAGING EUROPE

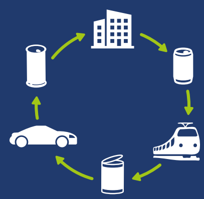
Established in 1986, we represent the five major European producers of steel for packaging operating 11 dedicated manufacturing sites.

Acciaierie d'Italia · ArcelorMittal · TATA STEEL · thyssenkrupp · U. S. Steel Košice

82%
the most recycled packaging material in Europe with 82% recycled in 2022

unique magnetic properties make steel **easy and economical** to separate from any waste stream

all primary steel plants across Europe use **steel scrap** as a cooling agent for new steel



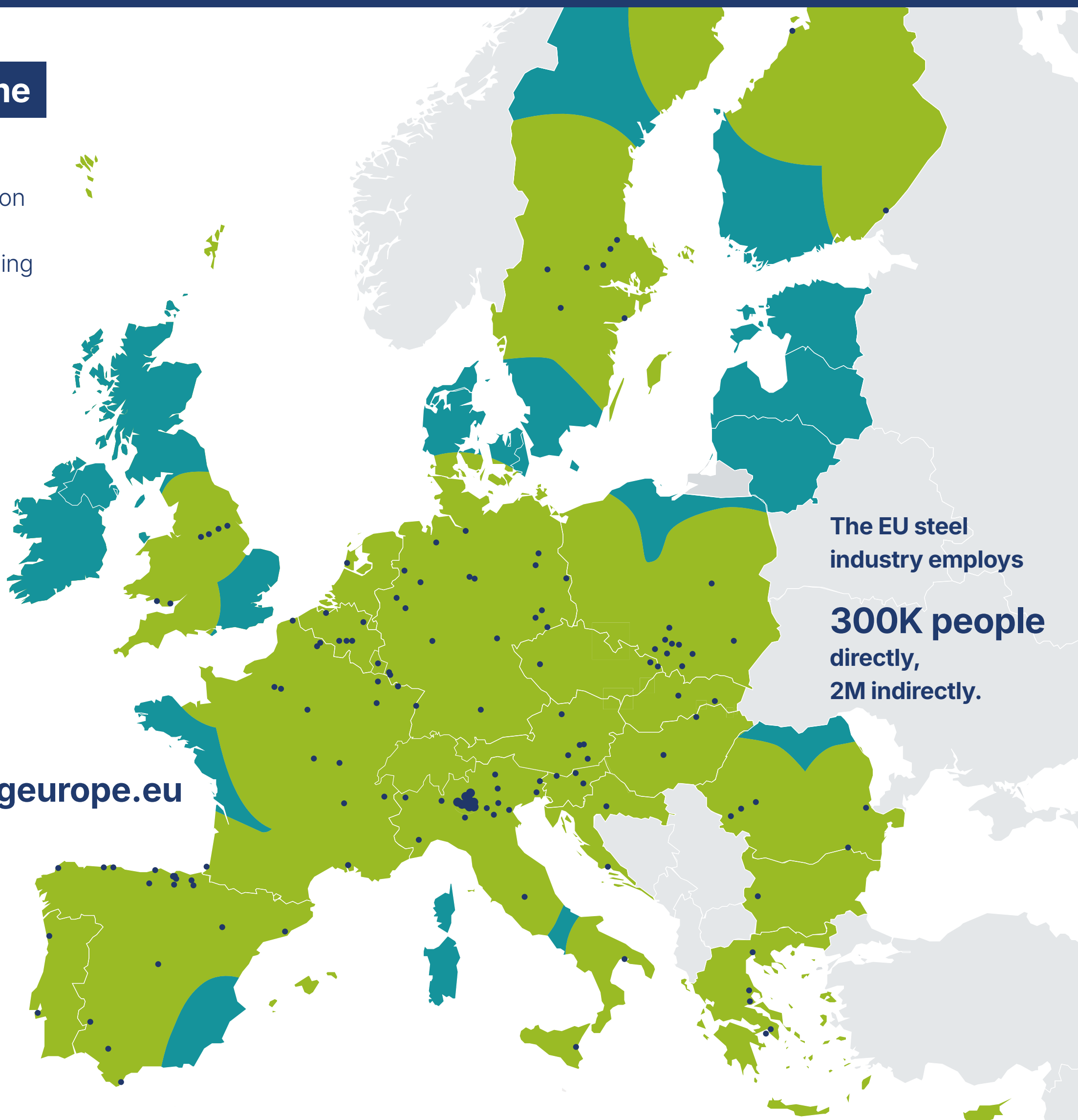
100% of recycled steel is used in a closed material loop

Recycling close to home

Over 90% of the European population lives within 200 km of a steel recycling plant, which makes recycling practical, sustainable and local.

STEEL PLANT NETWORK

- Steel plant = Recycling plant
- Area within 200 km of a steel recycling plant
- Area further than 200 km from a steel recycling plant



The EU steel industry employs

300K people directly, 2M indirectly.

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