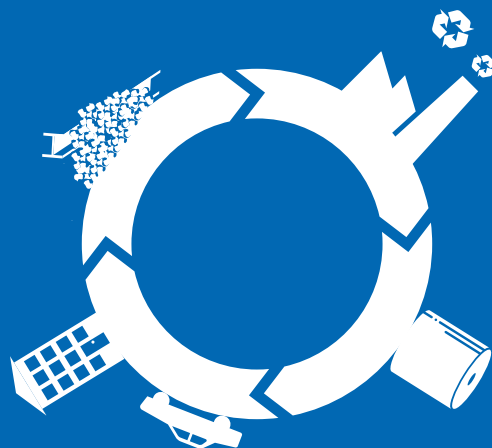
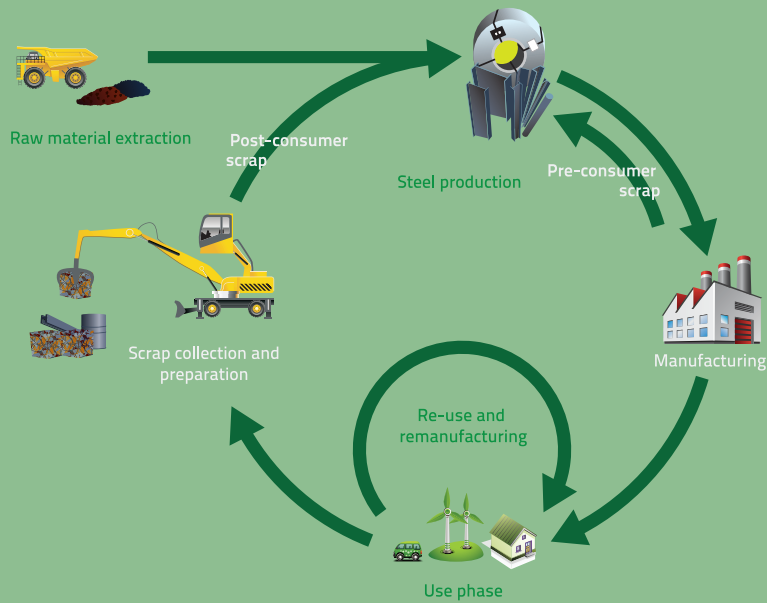


STEEL AND THE



CIRCULAR ECONOMY

THE STEEL CYCLE



STEEL IS FUNDAMENTAL TO THE CIRCULAR ECONOMY

Steel is **100% recyclable**, losing **none of its unique properties when properly processed**. The European steel industry works hard to ensure that the steel it produces can be **reused, recovered** and **recycled**: steel is a **'permanent' material**. The industry also ensures that **steel production's by-products** are put to the best possible uses.

Presently, around **half of all the steel** produced in Europe comes **from recovered 'secondary' sources**, in the form of scrap metal. Steel's in-use longevity means that there is not enough scrap to satisfy demand, so **'primary' raw iron** is still an **important input into steelmaking**. By working on cleaner, resource-efficient solutions – as well as on an ever-expanding range of steel grades – the European steel industry ensures that the average 170 million tonnes it produces every year are ever more **sustainable, useful** and **environmentally** friendly.

REDUCE



Advanced high-strength steels can help reduce vehicle weight and improve efficiency

©ThyssenKrupp

BETTER PROCESSES AND IMPROVED PRODUCT DESIGN HELP REDUCE RESOURCE USE

Energy consumption and CO₂ emissions **per tonne of steel produced have been reduced** by over 50% since 1960. Production has been completely decoupled from CO₂ emissions and energy use.

European-made, high-tech **steel can save 6 times as much CO₂** in use than is emitted in production, depending on its CO₂-mitigating application.

Using newer, higher grades of steel can help deliver **lighter, stronger parts**, improving lifetime efficiency – **mitigating CO₂ during a product's lifecycle**.

There are **thousands of different types of steel made in Europe**, each with different tailor-made properties and specific uses, all of which help improve product efficiency.

Product design should recognise the **importance of optimising material use** when designing parts or components.

Index of crude steel production, specific energy consumption and specific CO₂ emissions compared to 1960 (=100)



REUSE



Steels products are durable and can easily be reused or remanufactured

©ArcelorMittal

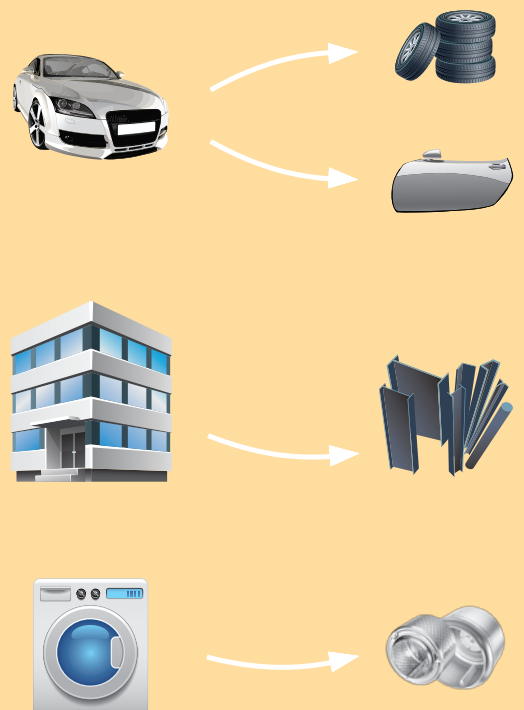
STEEL PRODUCTS ARE LONG-LASTING AND CAN BE EASILY PUT BACK INTO SERVICE

In products made of different materials, **the steel components are often the most versatile.**

Steel elements such as construction beams, cladding, automotive parts, household equipment and fastenings can be **used, reused and remanufactured** without the need to enter back into the production cycle.

Remanufacturing helps **moderate the need to produce new parts**, saving millions of tonnes of CO₂ annually on 'primary' production.

Requirements on durability, re-use, reparability, dismantling and recyclability **should be part of product design.** This will help ensure parts are **easier and more cost-effective** to reuse.



RECYCLE



Scrap ready for recycling

©Jernkontoret

MATERIAL RECOVERY AND STEEL RECYCLING UNDERPIN THE CIRCULAR ECONOMY

Steel is separated from other materials and reclaimed from waste before being reprocessed. This is called **material recovery**.

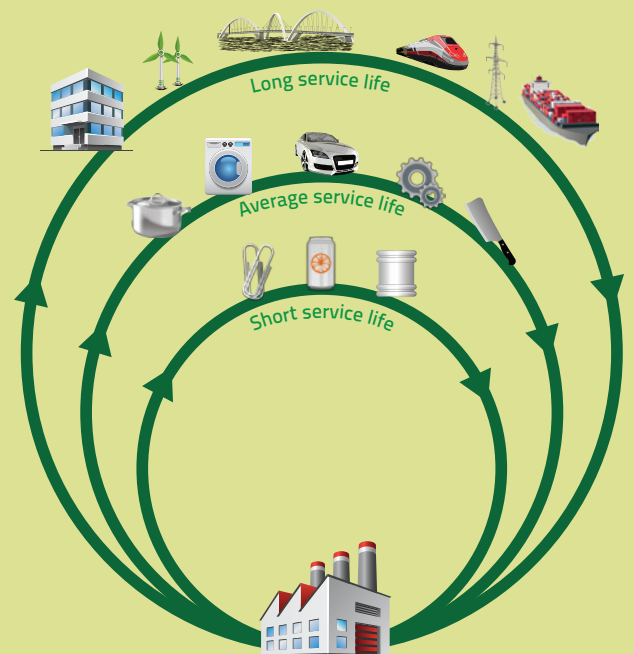
Recycling happens after material recovery.

Continued recycling is essential to keeping **scrap in a constant loop** inside the European economy.

There is not enough scrap available to satisfy world demand. Rising demand past 2050 means that **primary steel production** will also continue to **play an important role**.

Existing **EU waste rules do not actually promote material recycling** inside the EU. Around 20% of scrap from Europe – a strategic 'secondary' resource – is exported onto international markets.

Primary and secondary **steel production routes are complementary and interdependent**. Both have fundamental roles in the circular economy.



RETAIN



Slag is a by-product that helps save on resources in other sectors

©Ovako

STEEL'S BY-PRODUCTS HELP SAVE ON NATURAL RESOURCES IN OTHER INDUSTRIES

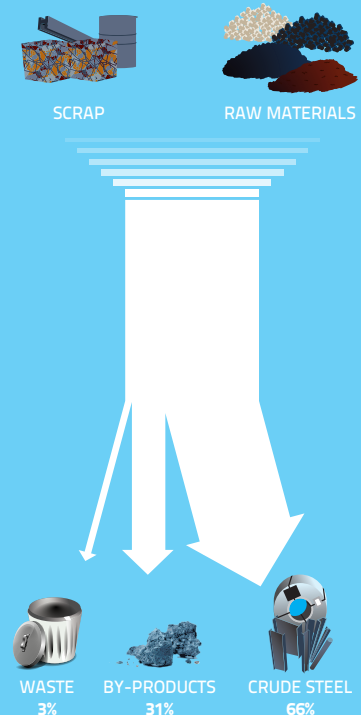
Steelmaking also results in useful by-products – such as process gases and ferrous slag – which substitute for natural resources in other sectors and contribute to resource efficiency.

Process gases are used for electricity generation for industrial and domestic applications, replacing fossil fuels and natural gases.

Ferrous **slag is used in a range of applications** (e.g civil engineering, fertiliser and cement production etc), saving millions of tonnes of natural resources annually.

Existing **criteria on by-products in the Waste Framework Directive** should be put into practice to incentivise the use of industrially 'co-generated' by-products.

Steel production is an almost closed-loop system. Only a tiny share of what emerges from production can be assessed as waste.



EUROFER based on worldsteel calculations

POLICY RECOMMENDATIONS

REDUCE

Primary and secondary raw materials are integral and interdependent parts of **EU raw materials** policy. **A level playing field for the supply and use of raw materials** and inputs is a prerequisite for reducing waste volumes.

Steel helps **mitigate product lifecycle emissions**. EU policy needs to recognise that advanced CO₂-mitigating steel products have a **net positive effect on overall emissions** during a product's whole lifecycle.

A lifecycle approach should be embedded into product design policy and standards.

REUSE

The EU legal framework for product policy must recognise the concept of the **'permanent' material**, providing the right incentives to foster their proper use.

Extended producer responsibility and the Ecodesign Directive should include **measures to encourage the use of these permanent materials** and to introduce durability, reparability, dismantling and recyclability requirements into products' design. **Steel is a uniquely flexible material**, in this regard.

RECOGNITION OF THE CENTRAL ROLE OF STEEL IN THE CIRCULAR ECONOMY SHOULD BE COVERED IN LEGISLATION

RECYCLE

The recycling definition in the Waste Directive should be changed to make it more adherent with the **aspirations of the Circular Economy**: keeping **recyclable materials in a constant loop** within European society.

Improving the **recycling definition** would acknowledge the **recyclable properties of permanent materials** such as steel.

EU regulation should avoid being contradictory or excessively restrictive, particularly (e.g. when dealing with chemicals in waste). Waste rules should ultimately foster recovery and recycling.

RETAIN

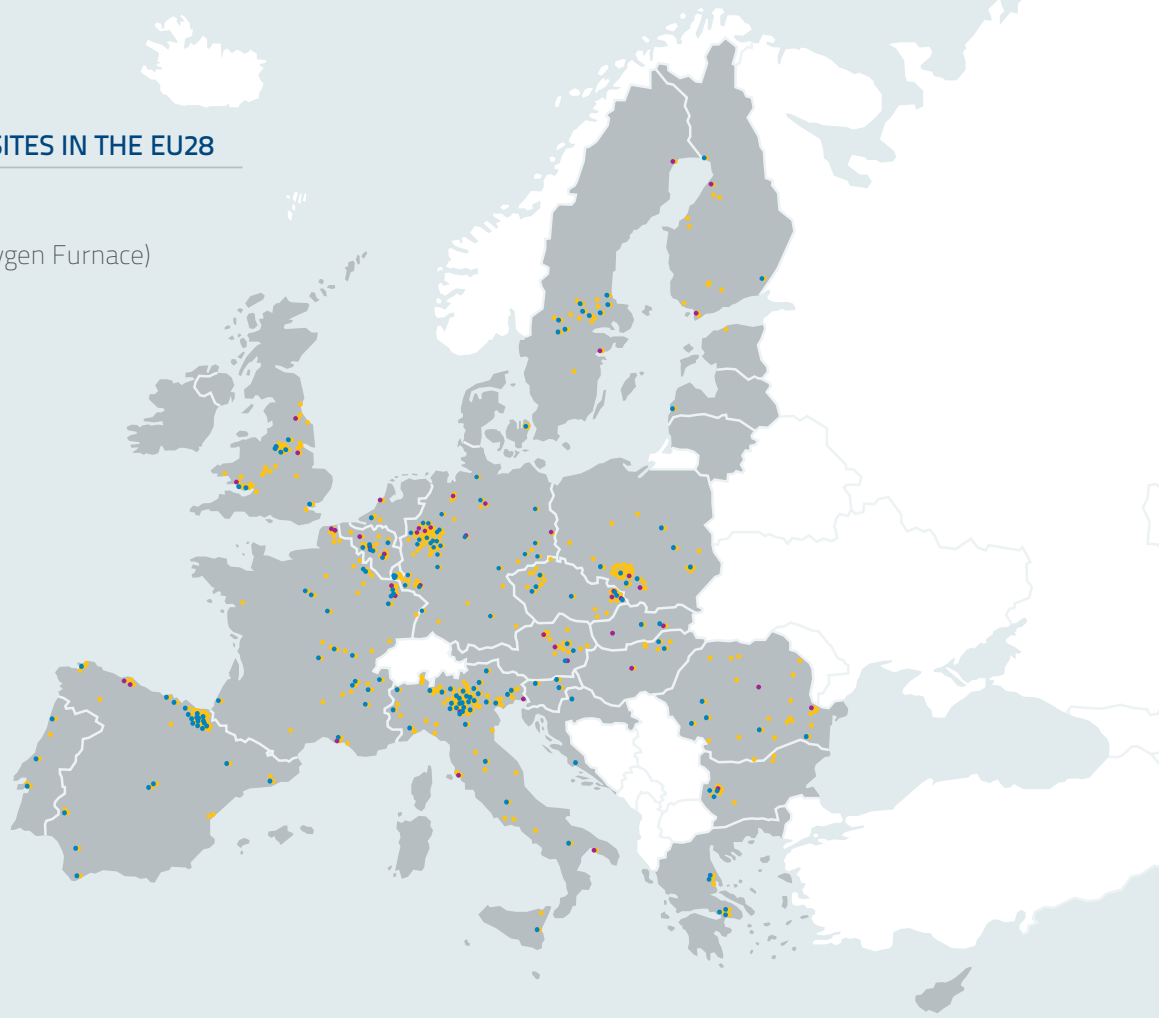
Industrially co-generated ferrous slags and process gases have a range of economically viable and sustainable end uses. An EU legal framework should be established **to grant 'by-product' status** to these materials.

To reduce landfilling as much as possible, a **sustainability-based approach** to waste streams is needed.

Waste management principles should be properly implemented across the EU and streamlined via **harmonised definitions** and methodologies.

STEEL INDUSTRY PRODUCTION SITES IN THE EU28

- Primary steelmaking
(Blast Furnace and/or Blast Oxygen Furnace)
- Secondary steelmaking
(Electric Arc Furnace)
- Processing of steel



ABOUT THE EUROPEAN STEEL INDUSTRY

The European steel industry is a world leader in innovation and environmental sustainability. It has a turnover of around €170 billion and directly employs **330 thousand highly-skilled people**, producing on average **170 million tonnes of steel per year**. More than **500 steel production sites** across **24 EU Member States** provide direct and indirect employment to millions more European citizens. Closely integrated with Europe's manufacturing and construction industries, steel is the backbone for development, growth and employment in Europe.

Steel is the most versatile industrial material in the world. The thousands of different grades and types of steel developed by the industry make the modern world possible. **Steel is 100% recyclable** and therefore is a fundamental part of the circular economy. As a basic engineering material, steel is also an essential factor in the development and deployment of **innovative, CO₂-mitigating technologies**, improving **resource efficiency** and fostering **sustainable development** in Europe.

ABOUT EUROFER

The European Steel Association (EUROFER) represents almost **100% of EU steel production**. Founded in 1976, EUROFER's headquarters is located in Brussels. It is the voice of the European steel industry to policy makers, civil society and relevant stakeholders.

EUROFER's members are steel companies and national steel federations based throughout the EU. The national steel federations and major steel companies of Switzerland and Turkey are also associate members.