EUROFER
The European Steel Association

Fact Sheet

Environment

STEEL RECYCLING

STEEL'S CONTRIBUTION TO AN INTEGRATED PRODUCT POLICY

STEEL CAN BE RECYCLED OVER AND OVER AGAIN WITHOUT LOSS OF PROPERTIES.

The steel industry has been operating steel scrap recycling systems on a large scale for more than 150 years, and operates via a well-established market that has developed without any public incentive.

STEEL'S RECYCLABILITY IS DEMONSTRATED BY THE EXISTING HIGH RECYCLING RATES.

Steel is 100% recyclable and already has very high recycling rates. For steel in cars, for example, the recycling rate is above 95%.

THERE ARE ALREADY STRONG ECONOMIC INCENTIVES FOR STEEL RECYCLING.

In steel production, steel scrap substitutes primary raw materials and saves energy.

THE RECYCLING OF SCRAP IS ALREADY OPTIMISED.

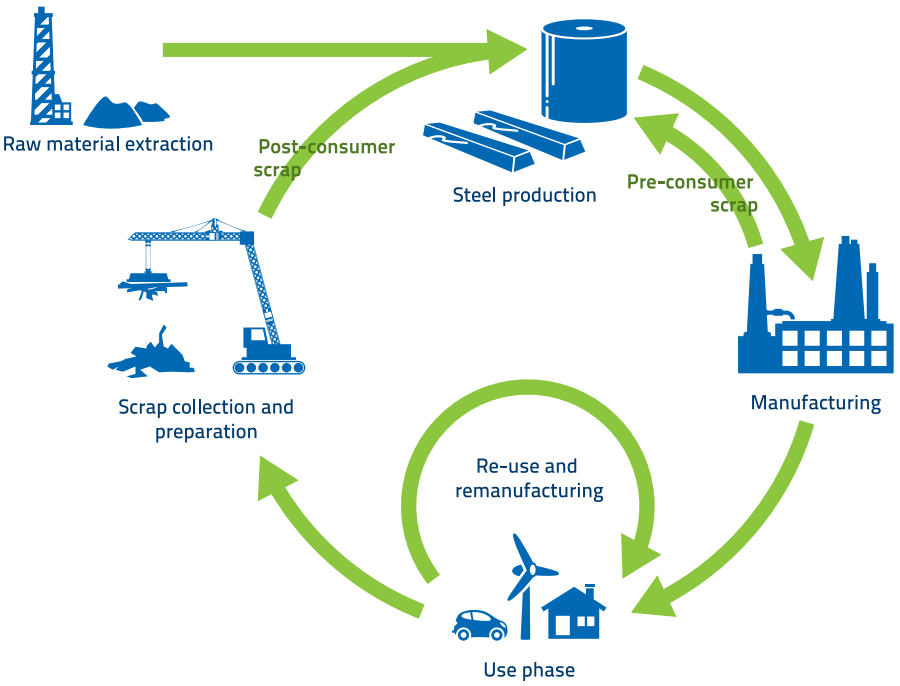
The steel recycling system is very efficient and all the steel in collected end-of-life products is recycled, irrespective of the percentage of steel in the products. The European steel industry is working to maximise the efficiency of scrap collection from all waste streams.

TOTAL STEEL DEMAND EXCEEDS THE AMOUNT OF SCRAP AVAILABLE FOR RECYCLING.

Due to the longevity of steel products in circulation, scrap availability is not rising as fast as the demand for new steel products

THE CRITERION OF MINIMUM RECYCLED CONTENT HAS NO ENVIRONMENTAL RELEVANCE FOR STEEL PRODUCTS.

Attention should be focused on improving end-of-life recycling rates. In order to facilitate re-use and recycling, environmentally optimised product design should incorporate ease of dismantling and separation of all steel components. By maximising re-use and recycling, more steel can be kept in circulation.



Once produced, steel is an eternal source for future generations

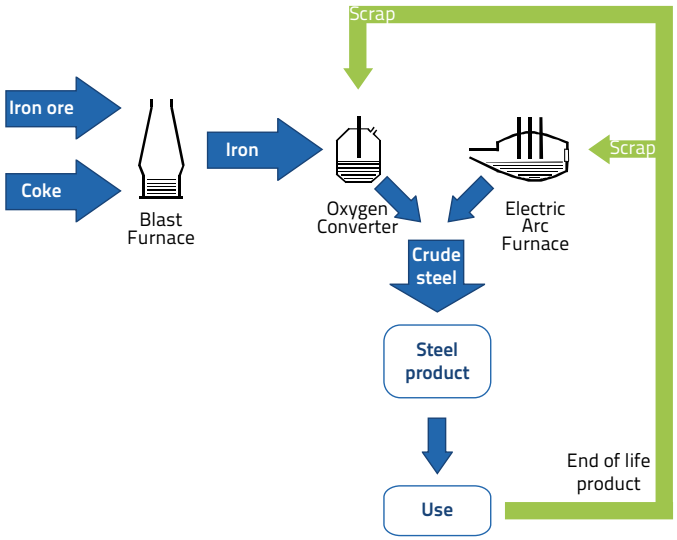
Environment

STEEL RECYCLING

STEEL PRODUCTION ROUTES

- Iron ore based production: hot metal is produced by reduction of iron oxide in a blast furnace, followed by refining it to steel in a basic oxygen furnace. In the refining process, excess heat is produced which allows steel scrap to be added to the melt.
- Scrap based production: steel scrap melted in an electric arc Furnace, sometimes followed by refining. Highly alloyed steel grades like stainless steel and tool steels are generally made from scrap. Alloying elements, such as chromium and nickel, are contained in the type of scrap used as well added to the melt from external sources.

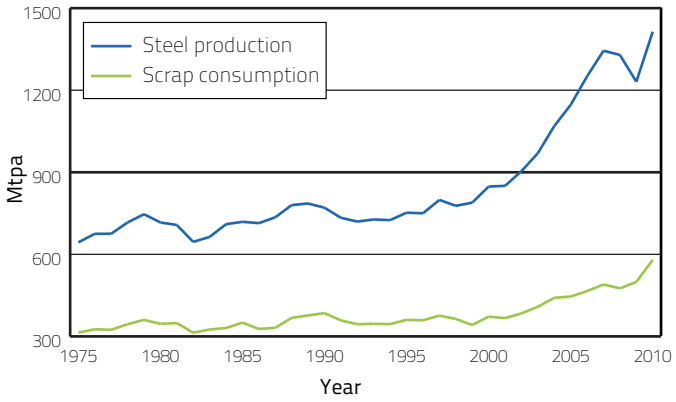
The choice of the production route is determined by a global market in which the steel industry makes the best use of the iron resources i.e. iron



STEEL RECYCLING

Both production routes use steel scrap as a secondary raw material. Steel scrap is sorted in categories according to the alloying elements it contains to ensure the best use of the resources. The use of scrap as a raw material does not change the properties of the steel products, thus steel can theoretically be recycled infinitely without any 'downgrading'.

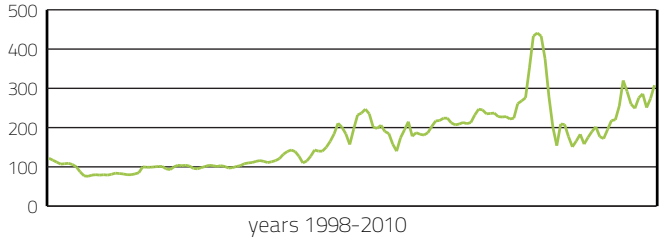
The increasing demand for steel, in conjunction with the long service life of an average steel product, means that for the foreseeable future, the total demand for steel cannot be satisfied solely by recycling of available scrap. In 2010 the total amount of scrap used for European steelmaking was 96 million tonnes and total European steel production was 173 million tonnes. These recycling figures should be used for sustainability assessment schemes, such as LEED, since the differentiation of recycled content between individual products makes no sense.



Global steel production vs. scrap consumption
Source: worldsteel association

STEEL SCRAP MARKET

The steel recycling system is very efficient and all the steel in collected end-of-life products is recycled, irrespective of the percentage of steel in the products. Products that are easy to disassemble, with easily separated steel parts, have a greater potential to be recycled. The magnetic properties of steel make it very easy and economic to separate from other materials for recycling. Steel scrap, including new scrap from the steel making process, scrap from the manufacturing industry and post-consumer scrap, e.g. end of life products, represents an important and much desired raw material for the steel industry. However, with steel consumption continuing to grow in conjunction with the long service life of an average steel product, current demand for steel scrap cannot be satisfied.



Shredded Scrap: Price EU Market (€/t)

There has always been a strong economic incentive to recycle steel scrap

PRODUCT DESIGN ▪ DESIGN FOR RECYCLING

An important design criterion is the potential for material-to-material recycling at the end-of-life. As steel at the end-of-life can be recycled back into new steel products without loss of properties, it can be classed as being in a closed material loop. This means that steel can be recycled over and over again, which saves resources for future generations and reduces environmental burdens overall.