

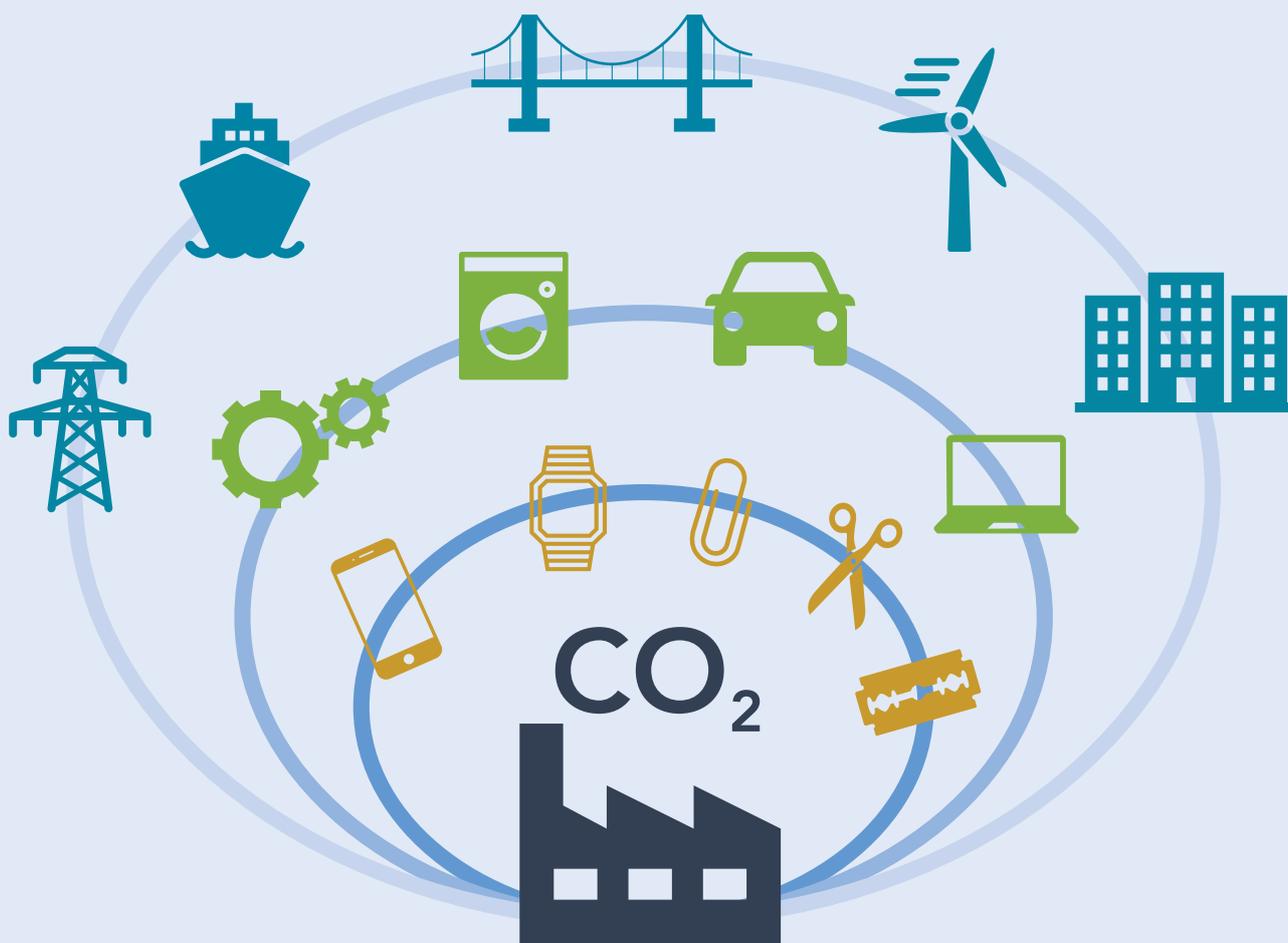
# Metal Recycling Factsheet



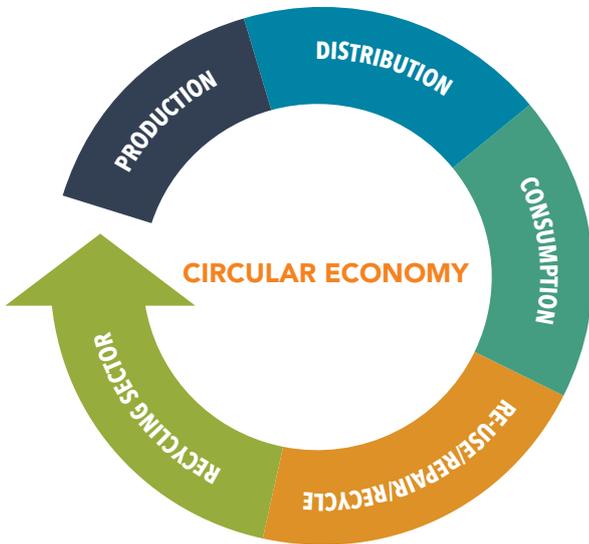
# METAL RECYCLING INDUSTRY

Metals are broadly present in a variety of goods with both short and long term use (i.e., steel bars in our houses, bridges, and turbines, copper cables for communication, railway tracks, kitchen equipment, cars, etc.).

EU economic growth is deeply linked to the use of metals with metal supply widely depending on metal scrap. Scrap metals from recycling compete globally on commodity markets, hence the need to ensure both a well-functioning internal market for metal recyclers and unhampered access to international markets.



# Metals & Circular Economy



Results of the growing metal demand on a linear economy are:

- Declining ore grades.
- Resource scarcity and price hikes.
- Environmental impacts (air and water pollution, land degradation, biodiversity loss).

Despite historical metal reuse, there is an increasing need to move towards a more efficient circular economy model.

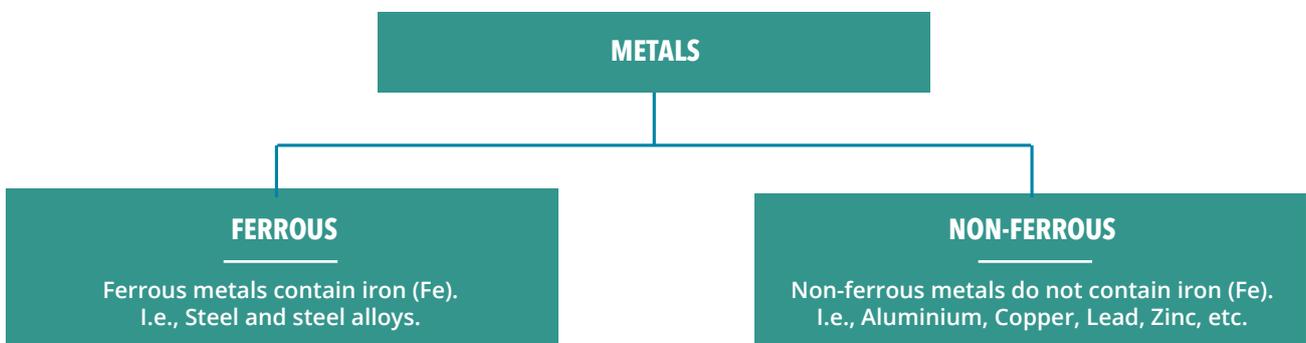
Thanks to their unique properties, **metals can be indefinitely recycled**. At their end-of-life (EoL) stage, products made of metals can be re-processed via mechanical treatment and re-introduced to the production process to make new metals. As a result, value chains are already largely circular, despite room for improvement.

**Metal recycling** closes the loop within the production process, therefore reducing the amount of waste that goes into landfill and the amount of primary raw materials required.



# Metals Scrap Recycling Industry in the EU

Common metals, that are conventionally used in household and industrial applications, can be divided into two main groups:



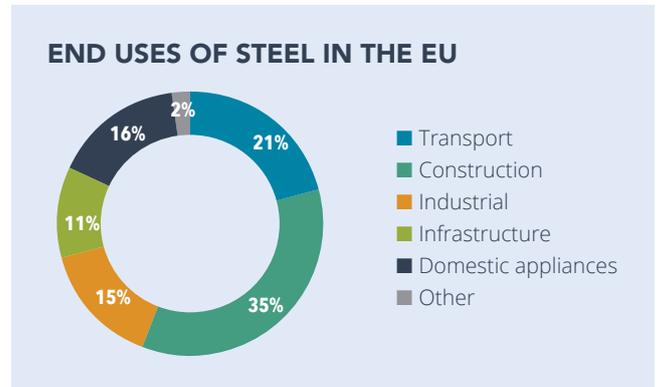
Steel, an iron alloy containing less than 2% of carbon (highly ductile), is by far the most used metal in the world. Followed by aluminium and copper, and other non-ferrous metals such as lead, zinc, nickel, titanium, cobalt, chromium and specialty and precious metals.

# Steel Recycling Sector in the EU

Ferrous metals are mainly composed of iron and have magnetic properties. Amongst them, steel is the most widely used metal, in large and small appliances (i.e., cars, railways, bridges, household equipment, etc.).

## Economic importance

- Over 90% of EoL stainless steel is currently collected and recycled into new products.
- 600 million tonnes of steel scrap world-wide were used in 2017 for producing steel.
- 35.5% of global crude steel was produced from secondary raw materials in 2017. Steel scrap use (consumption) for steel making was 93.8 tonnes in the EU in 2018.
- 70% of the steel produced to-date is still in use.
- Annual savings on environmental costs by using steel scrap in the EU can achieve up to € 20 billion (2018).



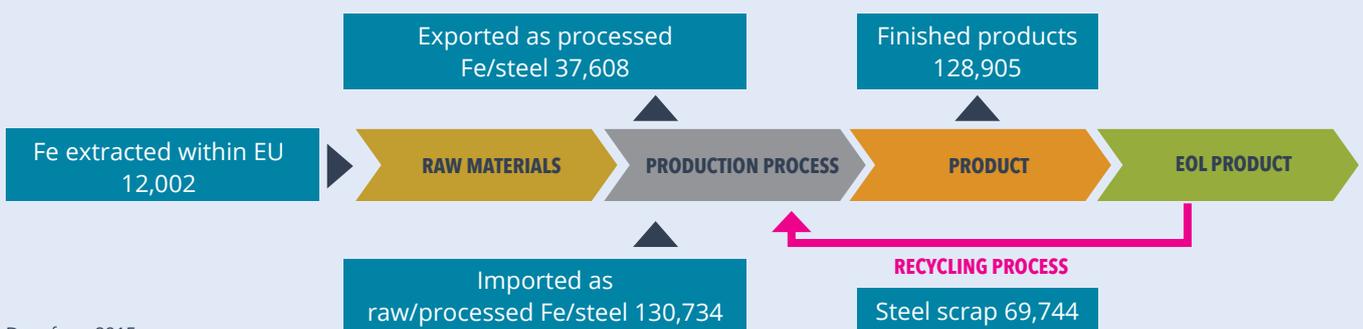
## Environmental benefits

- Using steel scrap in the production process reduces CO<sub>2</sub> emissions by 58%.
- Recycling steel saves 72% of the energy needed for primary production (i.e., 4,697 kWh per tonne).
- Recycling one tonne of steel saves 1.4 tonnes of iron ore, 0.8 tonnes of coal, 0.3 tonnes of limestone and additives, and 1.67 tonnes of CO<sub>2</sub>.
- In 2018, 157 million tonnes of CO<sub>2</sub> were saved in the EU by recycling 94 million tonnes of scrap, an equivalent amount to all automobiles circulating in France, Great Britain and Belgium.
- Using recycled steel to make new steel reduces air pollution by 86%, water use by 40%, and water pollution by 76%.

## International trade

- European steel scrap recycling collects and re-processes more than the demand for steel scrap in the EU. Hence, there is no steel scrap shortage in the EU.
- In 2018, the domestic supply of the EU-28 exceeded 112 million tonnes. This is consistently apparent year after year, showing that there is no scrap shortage in the EU.
- The largest importer of steel scrap from the EU-28 is Turkey, whose imports represent more than 50% of EU-28 steel scrap exports (11.09 million tonnes in 2018). The Turkish steel industry relies vastly on the EAF steel production route using steel scrap as main infeed.
- In 2018, European scrap recyclers exported more than 21,400 thousand tonnes and imported 2,850 thousand tonnes.
- The proportion of steel scrap used in relation to crude steel production in the EU is 56%.

## STEEL FLOW ANALYSIS IN THE EU (IN THOUSAND TONNES/YEAR)



Data from 2015

# Aluminium Recycling Sector in the EU

Aluminium is a widely popular metal due to the vast variety of its possible uses. Its superb characteristics include malleability, high strength, low density, high thermal and electrical conductivity, corrosion resistance, great recyclability, and it is non-toxic. This versatile metal can be found in car parts, window frames, doors, cans for beverages, canned goods, and much more.



## Economic importance

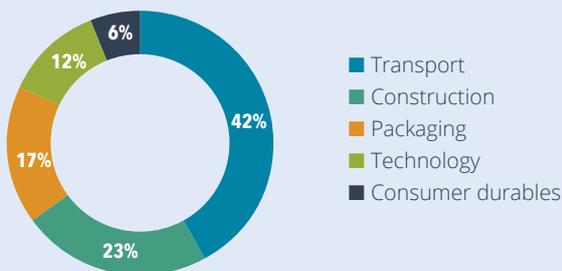
- Thanks to its endless recyclability, 75% of all aluminium ever produced is still in use today.
- > 90% of aluminium recovered from construction and transport in 2018.
- 4.9 million tonnes of aluminium were recycled in the EU in 2017.



## Environmental benefits

- By using aluminium scrap, CO<sub>2</sub> emissions can be reduced by 92% compared to raw aluminium.
- Recycling aluminium saves 95% of the energy needed for primary production.
- One tonne of recycled aluminium saves up to 8 tonnes of bauxite, 14,000 kWh of energy, and 7.6 cubic meters of landfill.

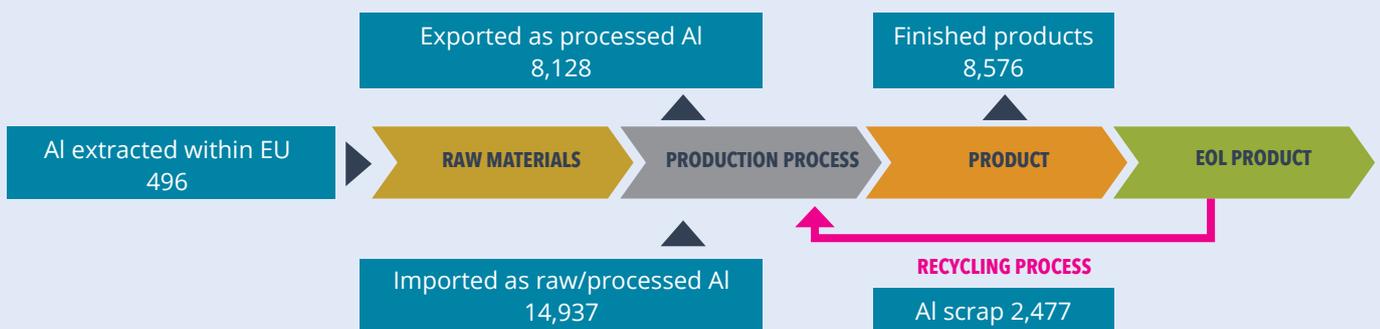
### END USES OF ALUMINIUM IN THE EU



## International trade

- In the coming decades, demand for aluminium is expected to increase by a further 50% by 2050, reaching over 9 million tonnes of scrap demand in the EU.
- Secondary aluminium production represents globally twice the production of primary aluminium. As a result, aluminium scrap from recycling is a valued commodity, traded worldwide, and the major source of total aluminium production.
- Of the total amount of aluminium scrap generated in the EU at EoL (i.e., 4,338 thousand tonnes of aluminium), about 2,986 thousand tonnes of aluminium were collected and recycled, resulting in an EoL recycling rate of 69%.
- Domestic consumption of the recycled aluminium scrap currently exported outside the EU, would reduce the current volume of primary imports in the EU by about 24%.

### ALUMINIUM FLOW ANALYSIS IN THE EU (IN THOUSAND TONNES/YEAR)



Data from 2013

## Copper Recycling Sector in the EU

Copper is the best conductor of electricity after silver. It is the third most used metal in manufacturing, used in a variety of applications such as pipes, electrical components, and electric cables. For example, a computer contains around 1.5 kg of copper, a typical home about 100 kg, and a wind turbine 5 tonnes.



### Economic importance

- 44% of EU copper demand comes from recycled sources.
- 70% of copper in EoL products is recycled.
- 90% of copper in civil infrastructure is recycled.



### Environmental benefits

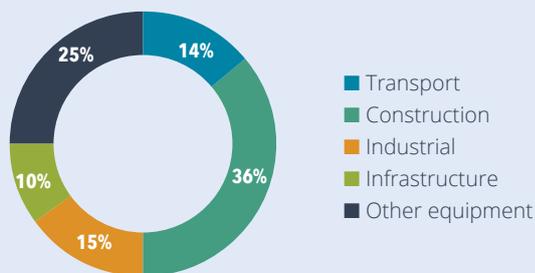
- By using copper scrap, we reduce CO<sub>2</sub> emissions by 65%.
- Recycling copper saves 85% of the energy needed for primary production.



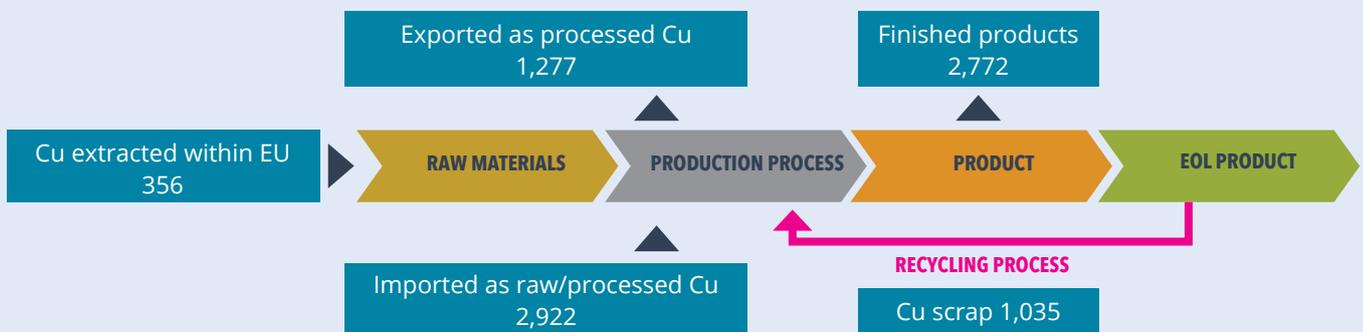
### International trade

- The modest natural deposits of copper within the EU (48,000 thousand tonnes) drive a strong reliance on recycling, otherwise imports of primary and secondary forms to meet the domestic demand would increase.
- Despite the amount of secondary copper sent to domestic processing is supplemented by imports of copper waste and scrap, in absolute terms, the EU-28 is a net-exporter of secondary copper forms.
- The EU exported 986,000 tonnes of copper scrap with a value of €1.91 billion to third countries in 2016.
- Of the total amount of copper scrap generated at EoL (i.e., 2,625 thousand tonnes of copper), about 1,603 thousand tonnes of copper (61%) were collected and recycled within the EU.

### END USES OF COPPER IN THE EU



### COPPER FLOW ANALYSIS IN THE EU (IN THOUSAND TONNES/YEAR)



## Benefits of Metal Recycling

Metals, including Critical Raw Materials, are an ideal candidate for a circular economy as they are eternally recyclable, and properly treated, secondary metals do not face downcycling or quality issues.

Since they do not lose their intrinsic properties during recycling, metals can be used and re-used multiple times, maintaining their quality and functionality.



### Socio-economic benefits

- The EU produces only about 3% of the primary raw materials required to sustain a growing demand for metals. Consequently, the EU's metal recycling value chain contributes to reduce EU's dependency on imported materials.
- Recycling of metals is labour intensive and creates a wide variety of job opportunities for skilled workers who carry out a range of functions relating to the collection and sorting of EoL products containing metals.



### Environmental benefits

- The metal recycling industry is a major contributor to both, the circular economy and climate policy, by saving primary resources, energy, and CO<sub>2</sub>. However, European policy framework has so far failed to reward the environmental benefits of metal recycling which could further boost its circularity.
- Metals recycling will reduce landfill of metals, which is not only a loss of valuable raw materials, but could also generate an impact on the environment (i.e., leaching into water courses).
- Metals recycling saves up to 20 times (i.e., between 60-95%) of the energy needed compared to the extraction of those metals from ores whilst preserving the quality. That directly impacts the costs of re-processing those metals into final products.
- Production of metals from secondary raw materials significantly reduces CO<sub>2</sub> emissions compared to their primary production (i.e., mining), and also reduces the derived impact on the water and the land. Using recycled metal instead of finite virgin ores reduces air pollution by 80%, water pollution by 76%, and water use by 40%.



### International trade

- Metal waste collected and reprocessed into scrap, compliant with industry specifications, and standards, compete on commodity markets with primary materials. Recyclers are not competing on a level playing field since the market fails to reward the environmental benefits in terms of resource, energy, and CO<sub>2</sub> savings resulting from the use of secondary materials.
- Removing the barriers affecting the internal market for recycling, resulting from complex waste shipment procedures, as well as ensuring free and fair trade of secondary raw materials, is crucial to balance supply and demand and guarantee the proper functioning of recycling markets.



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