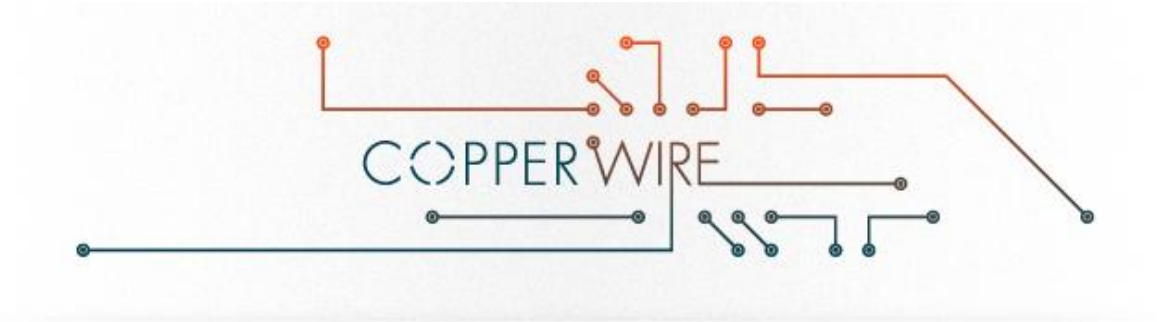


Copper Wire – Winter 2015 European Copper Institute

## Copper's Contribution to the EU's Circular Economy

The high economic value of copper metal drives the collection and recycling of copper scrap from the downstream value chain as well as from end-of-life products. Copper is also 100% recyclable, without any loss in performance, and can therefore be reintroduced again and again into the material cycle.

Recycling prolongs the use of the earth's natural resources and saves the energy otherwise consumed to process primary raw materials. Since copper recycling uses up to 85% less energy than mining production, today's global recycling rates could save up to 85 million TWh of electrical energy, equivalent to the annual residential electricity consumption of 24 million families, thereby reducing $CO_2$ emissions by 30 million tonnes per year.

Driven by society's demands for smaller products (e.g. communications and entertainment devices), plus systems that combine multiple building block raw materials, the technologies required to recycle copper and, in particular, copper alloys are becoming more complex. However, this supports new investment as well as creates jobs. The EU is the only region of the world where some copper production sites use only recycled feedstock.

Therefore, closing the material loop, by recovering copper and copper alloys from waste, is important for the copper industry, its downstream users and society at large.

Clearly, the recycling of any material needs to be carried out in compliance with EU and national legislation. However, given the complexities noted above, the challenge for the copper sector is that several other regulatory obligations are diametrically opposed to the goal of increasing recycling rates. Whilst waste legislation encourages recycling and strives to phase out landfill, other legislation seeks to further reduce industrial emissions to air, soil and water. As an example, recovering the copper and other metals from complex electronic scrap requires the combustion of the organic fraction. This requires

more electricity and generates direct $CO_2$ emissions, both of which are then penalised under the European Emission Trading Scheme.

Copper recyclers are also challenged by certain provisions within the EU's substance legislation, namely the REACH and CLP regulations. ECHA and Member State representatives are currently discussing the setting of an extremely strict specific concentration limit for lead metal. Lead has been used, for centuries, in the manufacture of copper alloys and there are probably several million tonnes of lead-containing copper alloys still in productive use across the EU. While the copper alloy industry now provides lead-free products, legislators need to agree a solution that allows this enormous "urban mining" resource to be economically re-introduced into a supply chain in ways that are safe for the environment and human health.

Finally, as demand grows across the world, competition for raw material supplies is understandably increasing. To safeguard the competitiveness of its recycling facilities, the European copper industry is highly dependent on a steady supply of raw materials. The EU and Member States need to take further steps to ensure that high-tonnage waste streams, such as electric and electronic waste and end-of-life vehicles, both containing significant amounts of copper, stay in Europe and are recycled in our state-of-the-art installations. The substandard treatment of these waste streams in developing countries is the worst environmental and health option.

Our feature article describes, in more detail, the key obstacles to copper recycling and the infographic shows, in a nutshell, copper's contribution to the EU's Circular Economy.

In addition to our regular newsletter, we have also produced a video podcast to share the views of other stakeholders in Brussels. For this edition, we invited Hugo Maria Schally, Head of Unit, Eco-innovation and Circular Economy for DG Environment, at the European Commission and Member of the European Parliament, Karl-Heinz Florenz, to express their opinions on the circular economy package. Industry's views are provided by Dirk Vandenberghe, CEO, Metallo Chimique N.V.and myself.

Yours sincerely,

**John Schonenberger**

*Chief Executive*
*European Copper Institute*

## Challenges Associated with Copper Recycling

Broadly speaking, the end-of-life treatment of metal scrap consists of three very different steps: collection, pre-processing and sorting, and physical metal recovery, with challenges arising in each.

End-of-life products, which account for around three quarters of the copper recycled each year, are collected through multiple channels, depending on their application. As examples, through stores and take-back schemes in the case of electric and electronic waste, at construction sites, when copper is extracted from demolition waste, and at dealerships and garages, in the case of end-of-life vehicles. The other quarter comes from the industrial value chain which produces articles from copper and a broad range of copper alloys. By-products from production processes, such as offcuts and shavings, are returned for recycling and, hence, reintroduced back into the material cycle.

Following collection, copper-containing scrap is delivered to sorting centres where a variety of automated and manual processes are used to separate it into various qualities. As examples, higher quality, higher value scrap is generated after the insulation is removed from old wires and cables. Lower quality, lower value scrap comes from electronic equipment such as mobile phones and personal computers. The Institute for Scrap Recycling Industry (ISRI) has named nearly fifty different copper and copper alloy scrap classifications.

At this stage, the day to day, supply/demand driven economics of the market influence the share delivered to companies, which will recover and reuse the metal within the EU, from that exported to countries with lower yield technologies and far poorer environmental and human health practices. Due to lower cost structures, tax incentives and overall demand requirements, customers based in emerging economies are generally able to pay a higher price.

Within the physical metal recovery sector, companies need to be able to handle increasingly complex mixtures of organic (plastics and greases) and inorganic (metals) materials. Their diversity and lack of information on their composition can impact yields and quality. Pure copper is infinitely recyclable. Other metals present in scrap, such as iron, aluminum, silicon and zinc, can be separated relatively easily from copper. Others, such as bismuth, antimony and arsenic, present greater challenges. The recovery of these alloy components requires many steps, which are often not performed by the mainstream copper producers (smelters) themselves.

Taking the whole recycling sector as a single block, the increasing complexity of today's products is making recycling more difficult and therefore more costly. There is need for more information on scrap types and flows in order to improve collection systems and treatment processes. Improved communication and information exchange between product designers, waste professionals and recyclers is also required so that the development of new products takes more account of end-of-life realities.