The concept of sustainability is one of the current priorities in EU policy. On 16th July 2008, the European Commission presented the Sustainable Consumption and Production and Sustainable Industrial Policy (SCP/SIP) Action Plan. It includes a series of proposals that will contribute to improving the environmental performance of products and to increasing the demand for more sustainable goods and production technologies. The Construction Products Directive and upcoming Regulation have the same goals for the building sector.

Throughout the past decades, the copper industry has made outstanding progress in both its environmental and energy performance. The innovation of the industry’s engineers helped to develop processes that are still in use today and are considered to represent the “Best Available Technologies” in the EU.

ENERGY EFFICIENCY
The key breakthrough was to exploit the chemical energy content of the copper ore feed, thus avoiding the need for externally produced energy to melt the metal content of the ore. In fact, this “flash smelting” process results in an excess of energy that can be used elsewhere on the production site, or to feed the district heating grid of a nearby city. At the same time, the sulphur dioxide released through smelting the feed is captured to produce a commercially valuable by-product, sulphuric acid. This has made an important contribution towards the reduction of acid rain across Europe.

The engineers also continued to improve the ability to separate out the many different metal containing compounds that exist in naturally occurring ores. Today’s processes can refine the valuable components in copper ores, such as gold and silver, as well as collect the various dusts and scale for recycling on site, or through specialised treatment operations managed by third parties. The remaining inert materials are then used in road construction.

LIMITING EMISSIONS
In the 70’s and 80’s, the need to meet ever tighter environmental limits has required companies to make multi-million investment in equipment to reduce emissions to water and air. Local and national authorities have played an important role in setting site permit conditions that achieve an appropriate balance between safeguarding the local environment and maintaining local investment and employment.

More recently, the new EU wide framework directives on air, soil, water and sediment have resulted in a much more intense focus on the emissions from both production and materials in use. The setting of safe limits for chemicals, including metals, requires the use of the right methodologies and the interpretation of a massive amount of scientific data. All of this is complex and time-consuming. Under the pressure to be seen to be providing citizens with an increasingly risk free environment, the tendency is, therefore, much more towards increased simplicity resulting in the setting of future limits that are arithmetically lower than those in the past. With no disrespect to the officials charged with managing this effort, there is insufficient understanding of the consequences of such an approach.

Stakeholders need to place more emphasis on carrying out proper cost/benefit analyses before lowering limit values, particularly for naturally occurring elements, such as copper, where natural background levels and the risk of mineral deficiency in humans and plants need to be taken into account. For example, in the case of copper production, the climate damaging CO₂ emissions from the energy required to operate additional cleaning and filtering equipment, to further reduce emissions, would actually outweigh the benefits achieved.

MAJOR COPPER INDUSTRY INVESTMENT
To assist regulators in their work, over the past eight years the copper industry has made a multi-million € investment in developing a comprehensive risk assessment for the manufacture, use and end of life of copper containing products. It has been extensively reviewed and then approved by the Commission and Member States. It will now form the backbone of the industry’s obligations under the new REACH legislation. The assessment concluded that the existing regulatory framework is sufficient to ensure that copper causes no risks to the environment or to humans in its current applications.
Copper’s use in architecture is extremely sustainable. External applications have outstanding life-spans, often measured in centuries. At their eventual end of life, the copper can be recycled again and again, without any loss in performance, with the recycling process only requiring around 20% of the energy needed to extract and process primary metal. Currently, around 40% of Europe’s annual copper demand is sourced via recycling. The industry’s risk assessment also identified that architectural copper contributes less than 1% of the diffuse emissions from copper products in the EU. Even then, research shows that this small amount is very quickly bound to inert compounds and complexes, such as concrete, in the vicinity of a building.

As we have seen, another important sustainable consideration for copper is the way in which the mineral extracted from the earth’s crust gives up its energy in the smelting process. The challenge facing both industry and policy makers is how to incorporate these clear benefits into the myriad of eco-design tools, sustainability assessments, socio-economic analysis linked to substitution and life cycle assessments that exist. Long life and endless recyclability are certainly not sufficiently incorporated into the indicators currently under development and this needs to be addressed. Of particular importance for Copper Forum readers, through the efforts of its national Copper Development Associations, the industry is continuing to support national regulators in, for example, environmental product declarations. Our European life cycle inventory data [http://www.kupfer-institut.de/lifecycle/](http://www.kupfer-institut.de/lifecycle/) has been in place since 2003 and has been accepted into the EU database.

So, the answer to our original question “Is copper in architecture sustainable?” – is most definitely yes. In architecture, copper delivers long life spans, is indefinitely recyclable and comes from an industry that has clearly demonstrated its ability to operate within the EU’s challenging regulatory framework.