

## **COPPER, A KEY PLAYER IN ECO-CONSTRUCTION**

**The home of the future will be both ecological and “smart” as the upward pressure on oil prices together with the European institutional framework encourages designers and builders to rethink energy efficiency in the home. Copper plays a key role in this process.**

### **Copper improves energy efficiency**

Copper has excellent electrical conductivity so that means that very energy efficient installations and appliances can be built with copper. The efficiency of domestic appliances has been dramatically increased in recent years by paying attention to the thermal design and efficiency. To meet the demand for even higher efficiencies in appliances such as washing machines, dryers and fridges, designers can optimise the copper content of the motors. Appliance designers are encouraged to consider the energy consumption of their products following the issuing of the European Parliament's 2005 framework directive on eco-design requirements for energy-using products.<sup>1</sup>

### **“Smart” homes and energy savings**

Smart homes, wired with copper, offer many opportunities for the intelligent control of the domestic environment by, for example, controlling lighting and heating according to occupancy, closing shutters to improve thermal insulation and scheduling electrical demand. Intelligent scheduling of electrical demand according to the available supply, if applied on a large scale, would reduce losses in the electricity distribution system, reduce the need for additional capacity, make best use of renewable resources and allow traditional generation at optimum efficiency. It has been estimated that this could lead to significant electricity savings of between 25% and 35%<sup>2</sup>.

### **A European framework for energy efficiency in construction**

Energy consumed at home accounts for over a quarter of the electricity generated in Europe<sup>3</sup> and this consumption is growing by 1% per annum. Buildings, homes and offices, actually account for 40% of the total energy consumed in the European Union. Eco-construction has to be the way forward and the European Directive on the “Energy Performance of Buildings” (2002/91/EC), due to come into force in member states in January 2006, aims to promote improvements in the energy performance of buildings to reduce energy consumption.

### **Copper aiding renewable energy**

The excellent thermal conductivity of copper piping, together with its high corrosion resistance, makes copper the material of choice for the development of innovative heating systems such as low temperature heating tiles. Combined with a water heating system (such as a condensing boiler or heat pump), low temperature tiles optimise energy usage. The thermal conductivity of copper is exploited in solar panels for water

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<sup>1</sup> Directive 2005/32/EC on eco-design of energy using products

<sup>2</sup> Source: EDF

<sup>3</sup> 664,645 GWh out of a total of 2,306,363 GWh - Source: European Energy Agency

heating and its electrical conductivity in photovoltaic panels for electricity generation. Copper is also the favoured material for the piping of thermal pits of geothermal energy.

### **The recycling benefit of copper**

A major benefit of specifying copper as a construction material is that it fits into a global environmental approach covering the whole lifecycle of a building, from design through application to recycling. Extremely durable, 100% recyclable with no loss of performance or restriction in use, copper can be used, recycled and reused indefinitely. The recycling industry is efficient and well organised. In 2004, 41% of Europe's copper demand, some 2 million metric tonnes, was met from recycling.

### **Other applications of copper in the home**

Copper is used in the home for a whole series of applications, including water supply systems, where its ease of installation, its mechanical properties, corrosion resistance and the fact that it is impervious to leached petrochemicals or solvents, helps to ensure a safe water supply. In addition to its proven service record, many studies have shown that copper reduces the proliferation of bacteria in water supply systems.

Finally, architects and designers appreciate the ecological and aesthetic properties of copper which provide them with a durable material available in a palette of colours ranging from orange-red, through warm brown to the almond green finish. The use of copper in design is becoming increasingly popular, not only for roofing and facades, but also for heating, lighting and table accessories.

### **About the European Copper Institute:**

*The European Copper Institute is a joint venture between the world's mining companies (represented by the International Copper Association, Ltd.) and the European copper industry. Its mission is to promote copper's benefits to modern society across Europe through its Brussels office and its network of eleven Copper Development Associations. [www.eurocopper.org](http://www.eurocopper.org)*

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