

# 10 Economics from Copper Ore to Final Application

## 10.1 The Value Chain of Copper

Copper goes through a series of steps, before it is mounted into the devices for its final use. As the copper industry is splitted into different specialized companies concentrating mainly on a fraction of the whole value chain, there are intermediate products, which are sold to the subsequent fraction of the value chain. There are only a few companies which are active in all links of the chain. But even in these companies capacities in the different links do not have the same capacities so that these companies sell intermediate products to third parties, which also may be competitor for the subsequent step. Examples are Freeport McRoan who produces wire rod and some semis, but sells also cathodes as the cathode production is much bigger than their semi production. Another example is Aurubis, which is active in the whole value chain from copper concentrate to semis, but the capacities of the semi production is smaller than the production of the first use of copper cathode products. So Aurubis sells shapes also to semi fabricators. This is a different situation in the aluminum industry, which is much more integrated than the copper industry as all big aluminum producers are integrated from the mine to the products. So a big aluminum company like Alcoa or Hydro Aluminum not only mines the raw material bauxite, but also produce aluminum foils for packaging of food.

In an expanded sense also the recycling of end-of-life copper products is a part of the value chain of copper.

### 10.1.1 Revenues in the Value Chain of Copper

Starting with the copper deposit the first step is recovering the ore. But copper ore is not a tradable product, as it contains only 0.3-2 % copper. So it does not make sense to bring the material to other locations. Therefore, the added value of mined copper cannot be calculated. The first tradable product with a market price is copper concentrate with a copper content of about 20-30%.