

# Aluminium – Present & Future

## Its Relevance to the Cable Industry

**Mark Zaleski**  
Managing Director  
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**EURO ALLOYS**

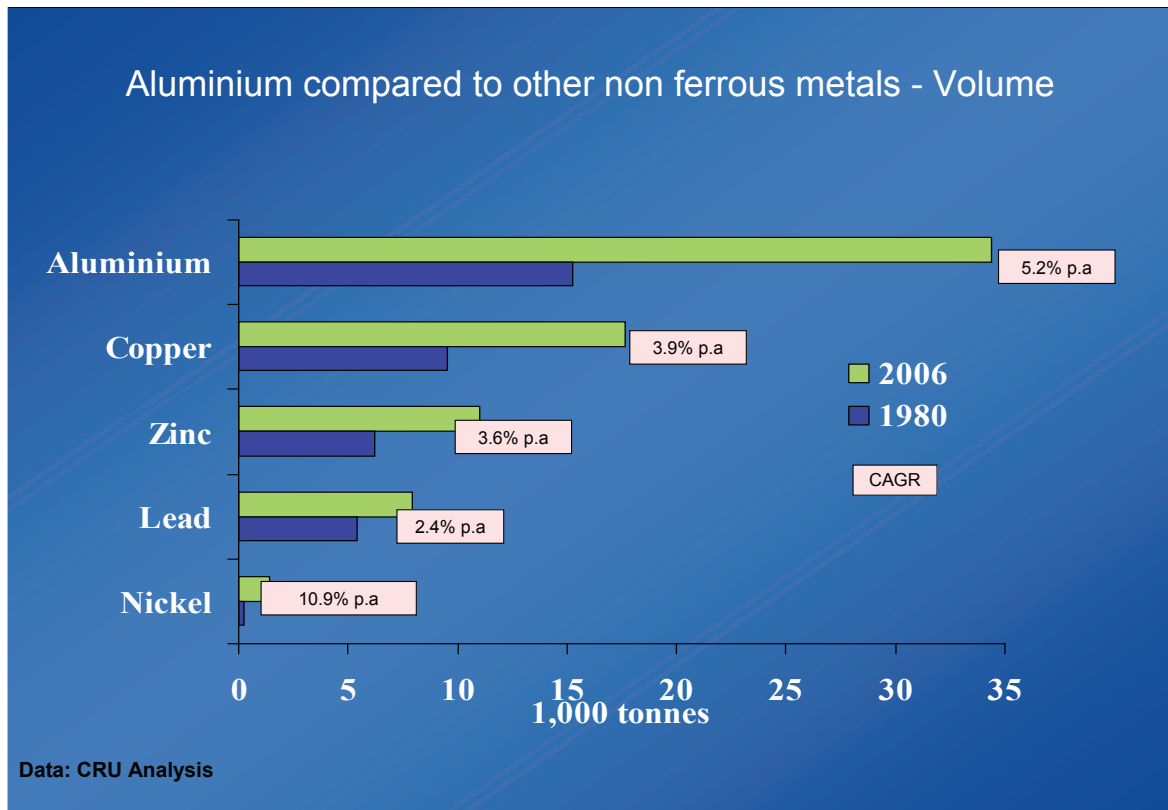
Mr. Peter Ford, Session Chairman:

Our next speaker is Mr. Mark Zaleski. He is the Managing Director of Euro Alloys, a company that was established in 1990. Euro Alloys represents aluminium rod producers in South America. For the past 10 years Mark has been involved in the aluminium trade as a specialist in the international markets. He is currently based in London. Please welcome Mark Zaleski.

Mr. Mark Zaleski:

Good morning Ladies and Gentlemen. Today I wish to speak to you about aluminium, firstly in the context of the other non-ferrous metals. By the end of my presentation you will have a helicopter view of the aluminium industry, its growth prospects in the future, its impact on the cable industry and a brief analysis of the aluminium market.

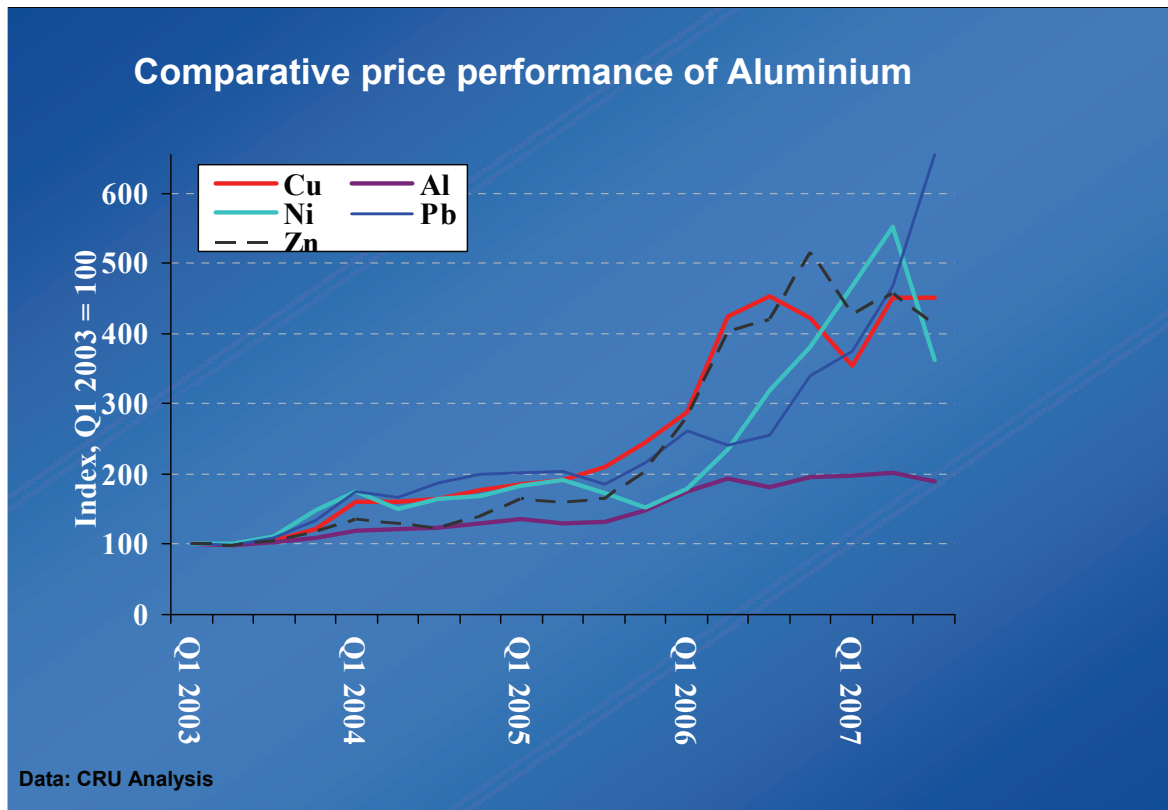
As a young man, I worked for 10 years in one of the largest aluminium trading houses, Elders Exsud, with a turnover of over \$2 billion back in 1990. The company dealt with primary aluminium in its basic ingot form, aluminium billet and aluminium rod. It is here that I learnt about international trade, the London Metal Exchange and the trading environment in general. I remember in those days how difficult it was to convince the cable industry to purchase, what was then known as exotic origins. How things have changed! In 1990, I opened Euro Alloys for Sural, C.A., the largest private aluminium semis producing company in Venezuela. Today Euro Alloys is focused on the international trade in aluminium rod and bare cable with a turnover approximating 65,000mt. Our principal market is Europe, although we trade on a worldwide basis. We mainly sell material from Venezuela and Brazil but also some from Russia and Egypt and other origins. Let's move on. So as promised, I'd like to start with a helicopter view of the aluminium industry.



Let's look at the volume in the aluminium market compared to the other non-ferrous metals.

The aluminium market is now almost as large as all the other non-ferrous metals put together, with the world production approaching 35mil tonnes. The other interesting point to note is that the size of the aluminium market is almost twice that of copper

The current annual growth rate in aluminium demand is 5.2% and predicted to go higher. It is the greatest growth of all the non-ferrous metals excluding nickel – which in volume terms is a marginal market. Having established that the volume of aluminium is so much bigger than copper, let us examine its relative price performance

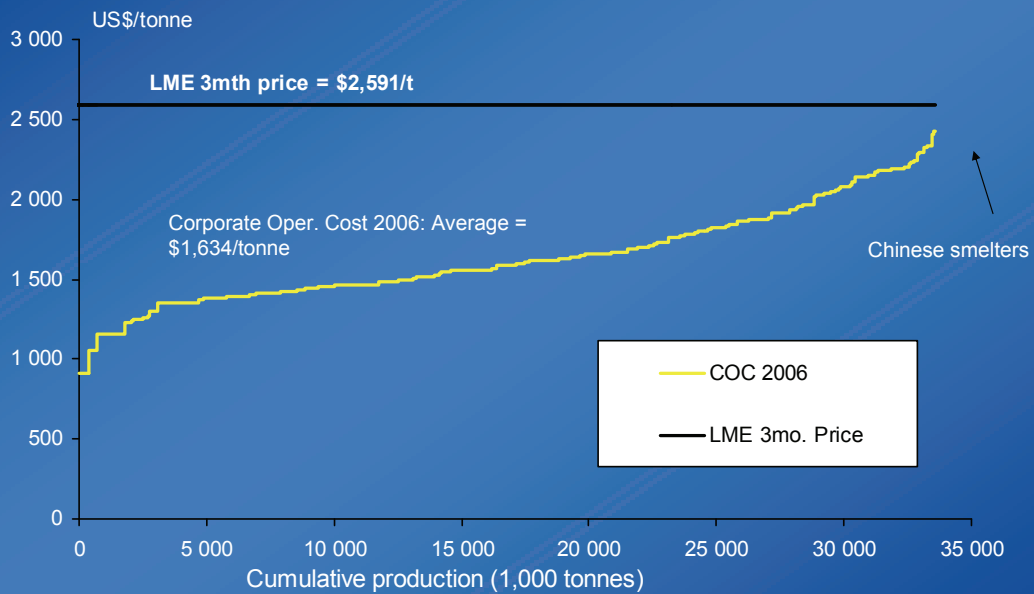


This chart will look at the percentage increase in price of copper and aluminium – and the other non-ferrous metals.

As you know, the price of copper has risen by 4 ½ times in the last four years. Whereas the price of aluminium has only doubled in the last four years.

It is interesting to note that the price performance of the other metals, nickel, lead, zinc are all pretty similar to copper. Another important feature is that historically the price of both lead and zinc has been below that of aluminium. But now, the reverse is true and aluminium is the cheapest. Given aluminium's relative price underperformance – is it profitable to produce it?

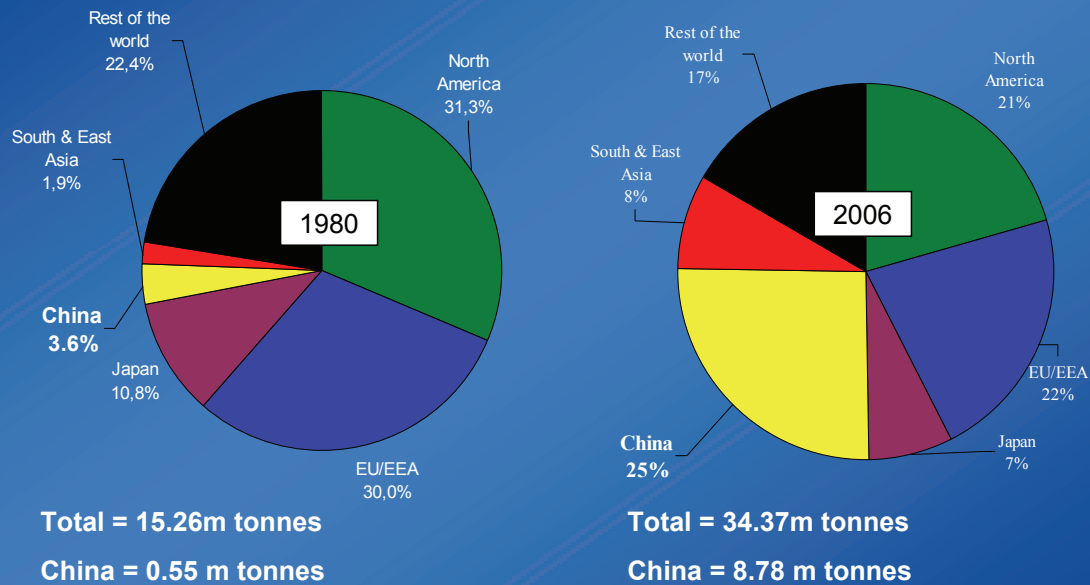
## Corporate operating cost schedule for 2006 (nominal US\$/t)



Data: CRU Analysis

Here is the operating cost to produce aluminium. The cheapest smelters – shown on the left of the chart - have a cost of only about \$1,000 per metric tonne (pmt). The average production cost is about \$1,600 pmt. And some Chinese smelters are at the very high end of the production cost curve - shown on the right - approaching \$2,500 pmt. Nevertheless, we can generalise that, almost all smelters are profitable at the current price level of \$2,500 pmt. So let's move on and look at the demand.

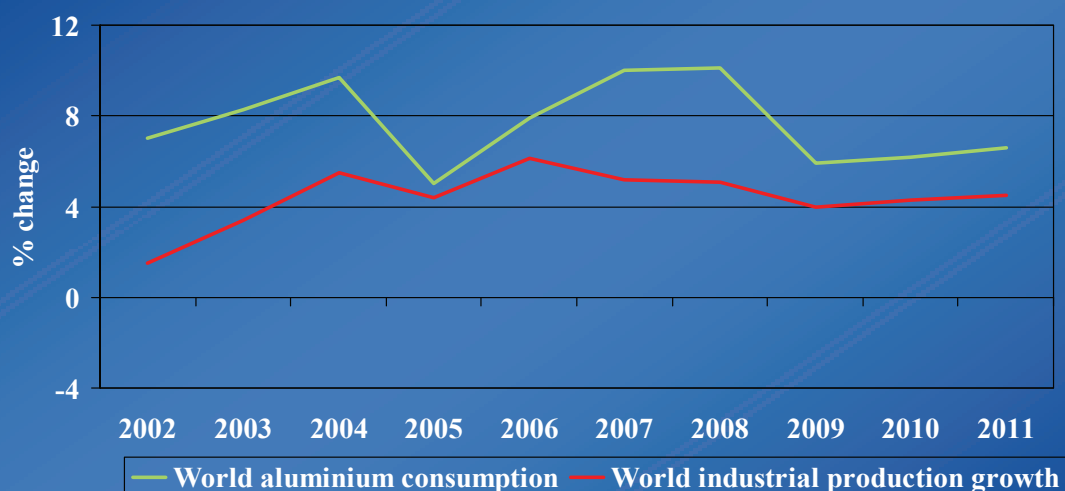
## World Primary Demand



Data: CRU Analysis

The world demand for primary aluminium in 1980 was 15 million tonnes. Chinese demand for aluminium at that time was only ½ million tonnes. And China represented 3.6% of the world aluminium demand. Now let's move to the present. Primary aluminium demand in 2006 was 34.5 million tonnes. Chinese demand in 2006 was 8.8 million tonnes. China now accounts for a massive 25% of the world aluminium demand. The interesting point is that aluminium demand has easily doubled in that time frame. What is startling is that Chinese demand has grown as much as 16 times in 26 years, as you can see from the yellow sectors. So what is the future of aluminium demand?

## Aluminium Demand Levels



Total primary 2006 = 34.37m tonnes

Total primary 2011 = 49.9m tonnes

Growth 2006-2011 at 7.7% per annum, or 45%

Data: CRU Analysis

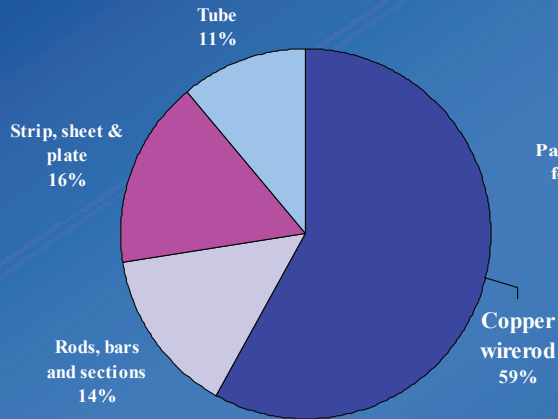
This chart shows the historical and future rates of growth for aluminium – in green – and total industrial production – in red.

CRU, the well-known research company, has projected a demand growth rate of 7.7% per annum between 2006 and 2011 for aluminium. This large growth rate will be mainly driven by China and the growth in aluminium demand will be greater than world industrial production growth. This demand will be met by a variety of expansions both brown fields and green fields. So we can conclude that the growth of the aluminium market will continue at a fast pace.

Now that we've established the helicopter view of the aluminium market in general. Let's compare the end usage market for aluminium and copper and get a little more specific.

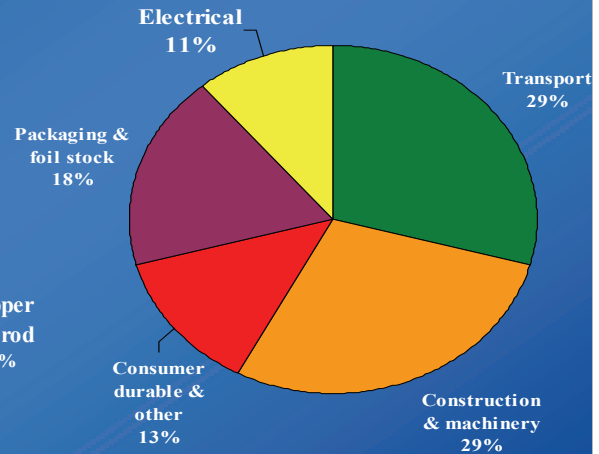
## Aluminium and copper end-use sectors in 2006

### Copper consumption



Total = 22.5m tonnes

### Aluminium semis consumption



Total = 46.9m tonnes,

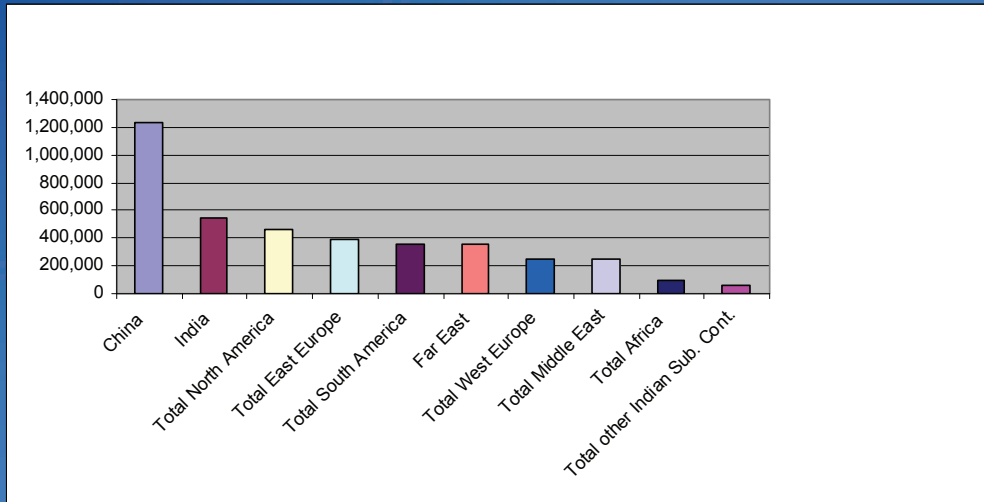
Wire & cable = 10%

Data: CRU

The main aluminium markets are construction, machinery and transport. CRU estimates aluminium production in wire & cable at about 4.7 million tonnes. Within this figure secondary aluminium is included. My own research suggests that primary aluminium consumption in wire & cable is lower at about 3.55 million tonnes. This figure could eventually be increased by a marginal amount of secondary consumption within the wire & cable field or possibly an additional consumption in China. Nevertheless, I prefer to state 3.55 million tonnes as the correct world consumption figure. The share of electrical application is therefore 10 to 11% of world primary aluminium production.

As you know, the majority of copper is used to produce copper wire rod. Whereas aluminium is relatively unimportant in the electrical field. The consumption of copper in the electrical field is all important. To summarize therefore, about 3.55 million tonnes of primary aluminium is used in wire and cables whereas about 13.3 million tonnes of copper is used in wire and cable.

## Total World Production Capacity of Aluminium Rod - 2007



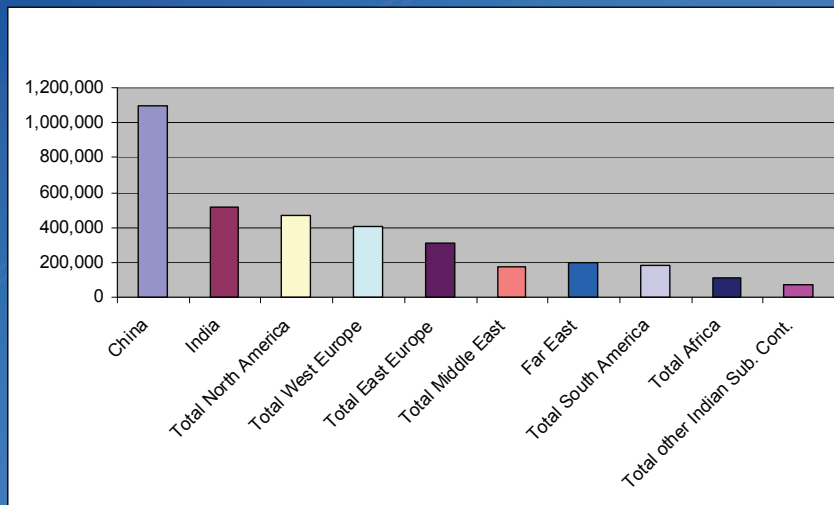
World Production Capacity  
Is about 4 Million Tonnes

Now we will take a close look at the aluminium rod market. This market has rarely been scrutinised in detail before. However, this year the market has been in shortage.

The total world aluminium rod capacity is approximately 4 million tonnes. I think that over 1.2 million tonnes is produced in China which equates to 30% of world production. The other interesting development is that India has become a major player.



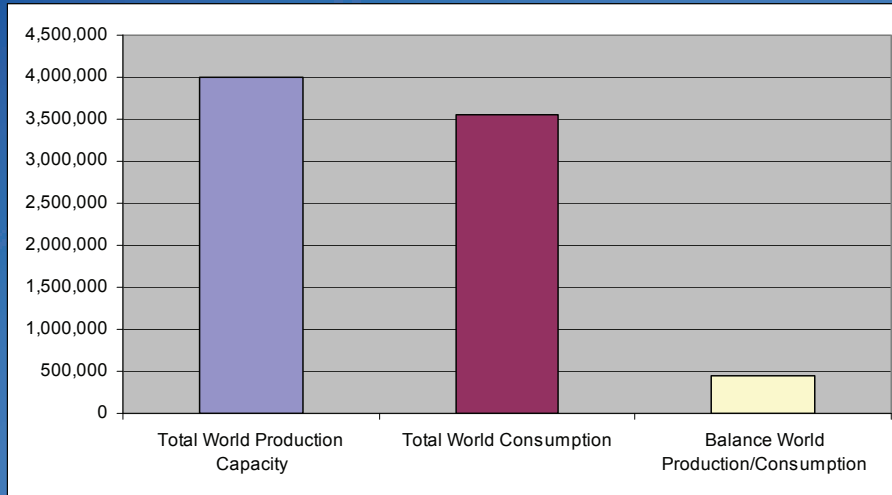
## Total World Consumption of Aluminium Rod - 2007



World Consumption  
of Aluminium Rod  
3.55 Million Tonnes

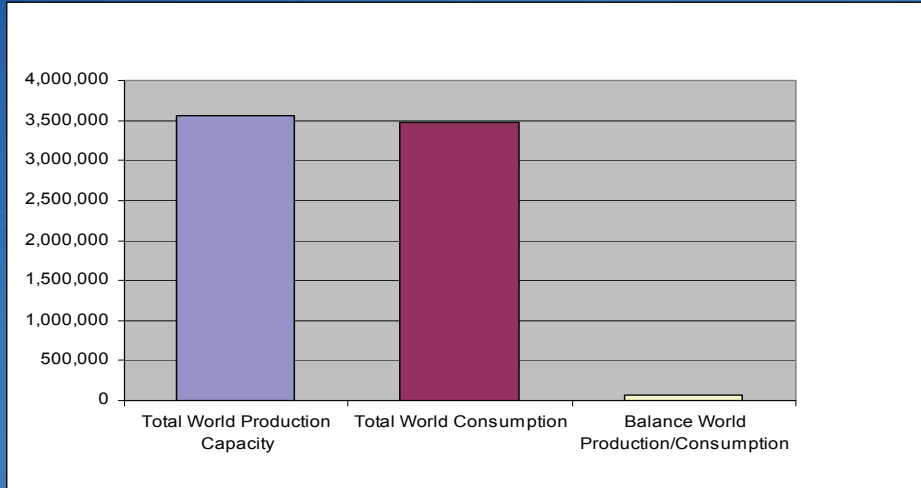
The world consumption of aluminium rod is 3.55 million tonnes and in the chart you can see the geographic distribution of this consumption.

## Aluminium Rod Apparent Balance in World Market - 2007



So, why has the market been so tight this year? Some plants in Europe even closed production for short periods due to insufficient material availability. The answer to this question is explained by “in house” production capacities. By this I mean that some cable plants have integrated aluminium rod mills irrevocably attached or linked to their cable mill. They never or only rarely sell their aluminium rod to third parties, yet their cable production is less than their aluminium rod producing capacity. In other words, these linked mills only produce the volume of aluminium rod that is required by their in house cable mill. Globally, I estimate a 860,000 tonnes “in house” capacity, yet only a 460,000 tonnes actual production. This means that 400,000 tonnes of aluminium rod capacity is unutilised.

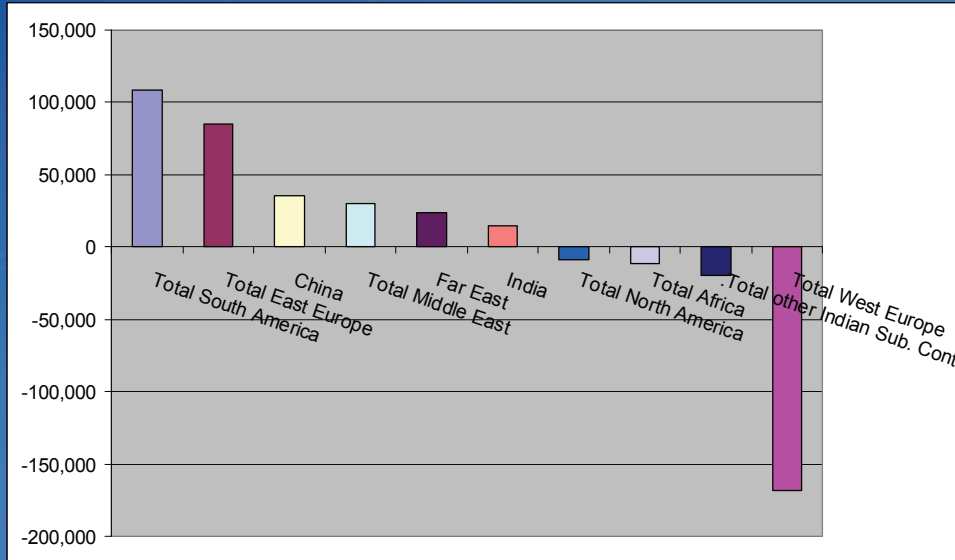
## Balance between Actual Production against Actual Consumption - 2007



This chart shows the world balance between capacity and consumption. It shows that there is almost 450,000 tonnes excess capacity. Now taking into account “in house” productions this has quite a dramatic influence on the world balance, as you can see in this chart.

Surplus production is now negligible and for practical purposes non-existent. The market is in balance and therefore subject to disruption in the event of the smallest supply chain failure.

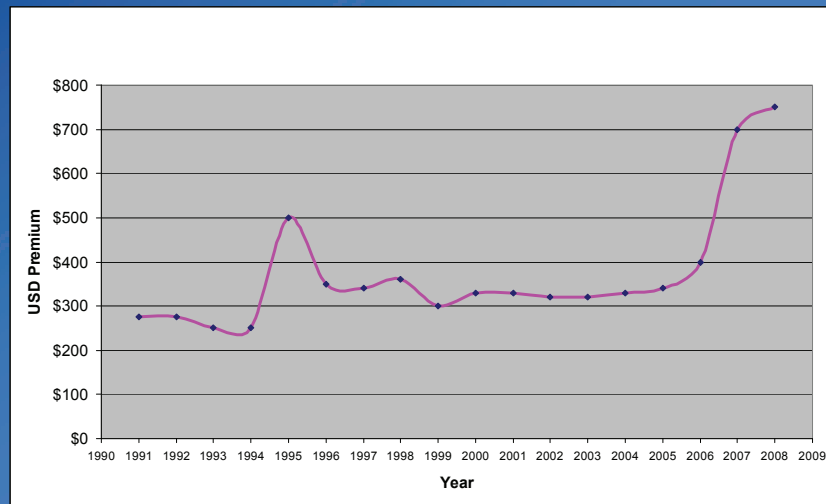
## World Balance Adjusted 2007 – By area



Now let us take a look at the geographic distribution of world balance. The most significant comment I can make is that Western Europe has a substantial shortage of 160,000 tonnes – which has to be imported, mainly from South America.

This shortage of aluminium rod in Western Europe makes it a potentially volatile market area. What about the premium levels?

## Premium Analysis DDP Europe



This slide shows the development of premiums of aluminium rod in Europe since 1990.

Historically, the market premium level has typically been above \$300. The sudden premium movement in 1995 resulted from the closure of the Hydro Aardal mill and supply disruption caused when switching supply into the Hydro Karmoy mill. This disruption was caused by initial technical difficulties when starting the reconditioned mill in Karmoy.

The upward movement in 2005 was caused by the following factors:

- A steady closure of production capacities in Europe caused by uninteresting price levels between 1985 and 2005.
- A poor market perception of the future. Simply, the market was unable to wait any longer for the long promised and long awaited grid refurbishment to begin in earnest.

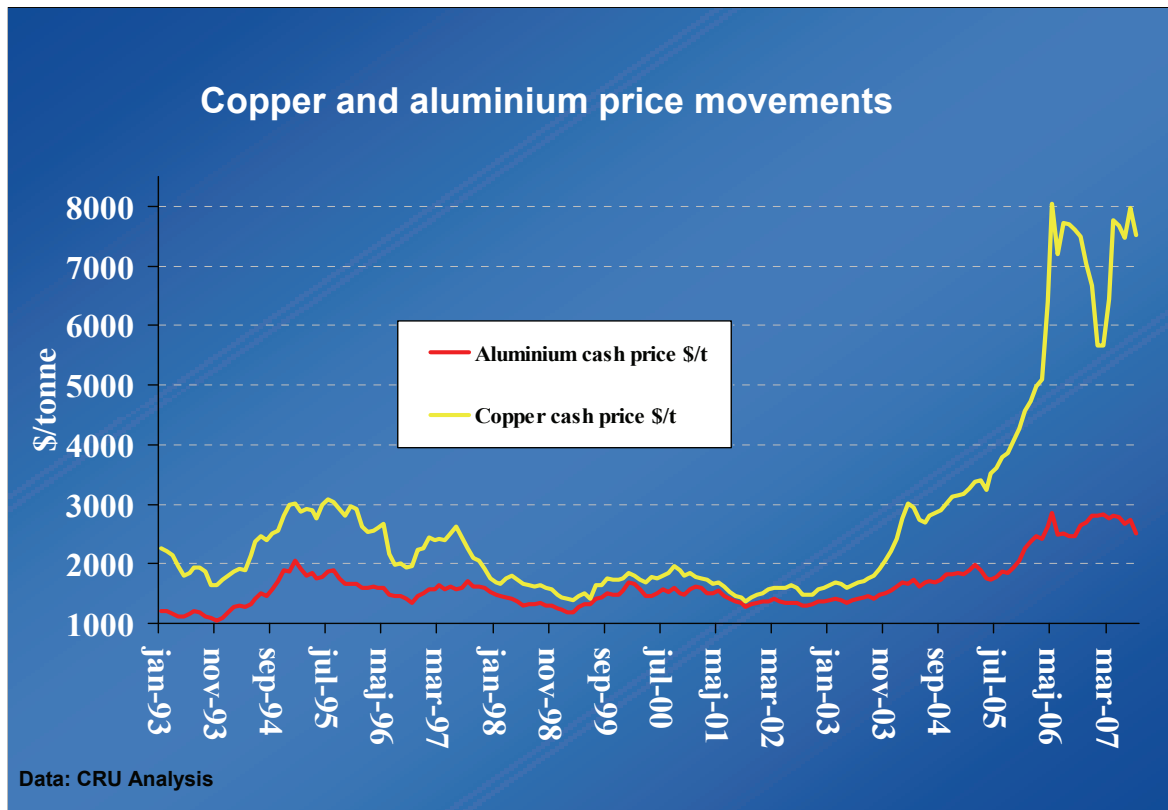
- Perhaps unexpectedly a sudden pick up in demand occurred during 2005.

Demand increased by possibly a further 15% in 2006 and another 15% in 2007.

This was because the long-awaited grid improvements came into effect – as a result of the well publicised black outs in Europe and elsewhere during the early part of this century.

- Simultaneously many other parts of the world started to refurbish their grids and in the case of the developing world to build new grids.

These continuing increases in demand levels placed an enormous strain on the supply chain throughout the world, but particularly in Europe. Aluminium rod traded as high as \$700/800 premium in 2007. The chart shows an estimated premium level for 2008. However, when projecting future price premium levels, please note I have a vested interest. We will soon find out the premium level for 2008 as contracts are closed.



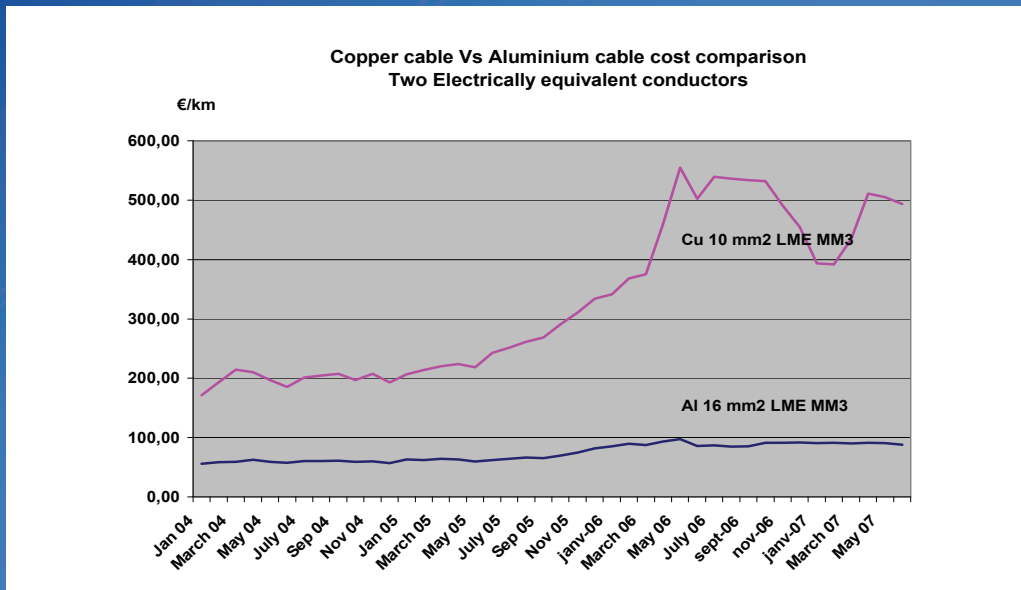
Before I finish, I would like to leave you with a thought about potential substitution from copper to aluminium.

There are a few well known factors that will determine whether a copper or aluminium cable is to be used for any given application. I do not propose to enter the detail of this debate. However, I would like to arouse your interest by taking a brief look at the price argument.

We are all familiar with the fact that copper has historically traded at a slightly higher level to aluminium. In January 2003, it was \$200 a tonne higher. In January 2004, it was \$800 a tonne higher. In January 2005, it was \$1250 a tonne higher. In January 2006, it was \$2350 a tonne higher. In January 2007, it was \$2850 a tonne higher. Today it is a massive \$5500 higher. This dramatic change and the difference between the price level of copper and aluminium has quickly and substantially changed the economic relationship when considering which metal to use in the production of a power cable.

Clearly a copper cable will be higher priced than an equivalent aluminium cable. Although aluminium is a weaker conductor than copper, it is three times as light. This fact can significantly increase the price distortion between the 2 metals yet further.

## Copper cable Vs Aluminium Cable Cost Comparison Two Electrically Equivalent Conductors



Data: Bernard Loreau

Let us take 2 electrically equivalent conductors, a 10 mm<sup>2</sup> copper cable (pink) against a 16 mm<sup>2</sup> aluminium cable (blue), and let us explore the cost impact.

Today, the raw material cost is slightly less than €100/km for the aluminium cable or possibly a little more if the aluminium rod premium is fully considered. The raw material cost for copper cable is about €500/km. Copper works out to be 5 times more expensive. My understanding is that aluminium can perform at least equally to copper, particularly in low and medium voltage cables. Remember the example I have given is for 2 electrically equivalent conductors.

I would therefore like to ask the floor the following question:

“What is the likely impact for both copper and aluminium consumptions in the cable industry given that the raw material cost difference between Copper and Aluminium for an electrically equivalent cable is so ENORMOUS?”

## Thank You

### CRU

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Before I conclude, I would like to thank CRU for supplying me with important information and helping me to prepare some charts.

I would also like to thank Bernard Loreau. Bernard has undertaken a major study to which I contributed in aluminium rod and its impact in the cable industry. This is a thorough and fascinating study. Any further information on this study can be obtained from him. The details are on this slide.

So we have looked at:

- A helicopter view of the aluminium industry
- Its growth prospects in the future
- The impact on the cable industry
- We have made a brief analysis of the aluminium rod market and asked the question whether aluminium will substitute copper in the cable industry.

So as you've seen, the aluminium market has proved itself to be capable of growing without undue price distortion.

Currently aluminium consumption in the cable industry is 3.55m tonnes, copper consumption is 13m tonnes?

Would it be beneficial for your industry to use more aluminium?

All of this is up for discussion.

Thank you.