IFIEC Energy Forum

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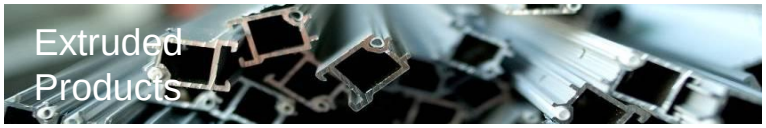
Europe's No. 1 aluminium company
Resourceful and integrated



- Global provider of aluminium and aluminium products
- Leading businesses along the value chain; energy, raw materials, primary metal products, aluminium components, solutions, recycling
- 22 000 employees in 40 countries.
  40 000 customers in 110 countries
- Annual revenues NOK 82 billion (€ 11 billion - 2012)
- Market cap: NOK 55 billion (€ 7.5 billion - May 2012)
- Annual R&D: NOK 0.5 billion (€ 60 million – 2012)
- Evaluated by Dow Jones Sustainability Index and FTSE4Good

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Transforming the way we use energy

Energy efficient, low-emission electrolysis	Lighter vehicles	Zero emission/ Energy surplus buildings	Enhance solar energy growth	Packaging that reduces food waste	Recycling and reusing aluminium
					
Reduce energy consumption, improve cell efficiency, CO2 capture ready cells	Reduce fossil fuel consumption and GHG emissions from lighter cars by use of aluminium	Reduce energy consumption and GHG emissions from buildings	Reduce emissions from fossil fuels by making solar energy solutions lighter, simpler and cheaper with aluminium	Reduce GHG emissions related to food by conserving and protecting food better in storing and transport - reduce food waste	Reduce waste in a world of limited resources by recycling aluminium endlessly. 75% still in use 5% use of energy for recycling

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Powerhouse – 63° N

Office project in Trondheim – Norway’s first energy-positive building

“We’ve chosen materials that are the best from an environmental perspective” Apple

You can call me Al One of the founding visionaries behind the critical and commercial success of Apple products, Steve Jobs used polished metal to bring geek chic to a global clique

Steve Jobs – the man who made aluminium sexy

NEW YORK
BY ANDREA HOTTER

Steve Jobs' list of achievements is long, and one of them includes being the man who made aluminium sexy.

Most of us recall the buzz surrounding the launch of an Apple product, with queues around the block for what are probably the most instantly recognisable and highly desired items in the consumer electronics marketplace.

So enamoured with aluminium was Jobs that the Apple co-founder, who died of cancer in 2011, even created a super yacht – named Venus, after the goddess of love – made out of it.

It was not just the look of the metal that Jobs fell in love with; its properties allowed him to create the products that have become synonymous with smartphones and tablet computers.

Gone are the mobile phones the size and weight of a brick. In their place are slick, innovative, beautifully designed smartphones, such as the aluminium-dominated iPhone 5.

Banished too are the plastic or painted-metal laptops of the past decade. In their place are modern designs, like the brushed aluminium iPad and MacBook Air.

Forget battery-operated plastic Walkmans that frequently cracked and destroyed the tapes they played; they're obsolete, replaced by iPods in eight different colours of anodised aluminium that clip like a tie pin.

Jobs changed the face of consumer electronics and with it the consumers' perception of aluminium.

Why aluminium?

Apple's use of aluminium has not significantly increased demand for the metal, used elsewhere in aerospace, transportation and construction.

Actual consumption volumes in the consumer electronics sector are tiny, relatively speaking.

Jobs' desire to use aluminium as the dominant material in Apple products, however, has made the metal instantly recognisable in a way that few, if any, other metals can match.

"Aluminium was the ideal choice for the product, because it provides the thinness and lightness that we want in the portable category, [it has] a great strength-to-weight ratio and it also provides us with some really nice options from a finishing perspective," Dan Ricchio, senior vp of hardware engineering at Apple, said.

"We've chosen both materials and processes that are the best in the industry from an environmental perspective," he added.

Apple – which will not discuss its suppliers – has not always picked aluminium as its metal of choice, however.

"Initially, the company used plastic, but as technology evolved and processes got smaller, Apple needed something less bulky for its products," Kevin Green, global director, electronics, appliances, industrial, and power business units at US aluminium firm Novelis said.

"It turned to aluminium and its use of brushed metal became

'Aluminium was the ideal choice, providing thinness, lightness and nice finishing options' *Dan Ricchio*

Machined from solid: Jobs' products – and his views on quality

The iPad features recyclable materials – and a 9.7 inch display and an HD camera

8 | Metal Bulletin | 6 May 2010

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”Worth its weight in aluminium”

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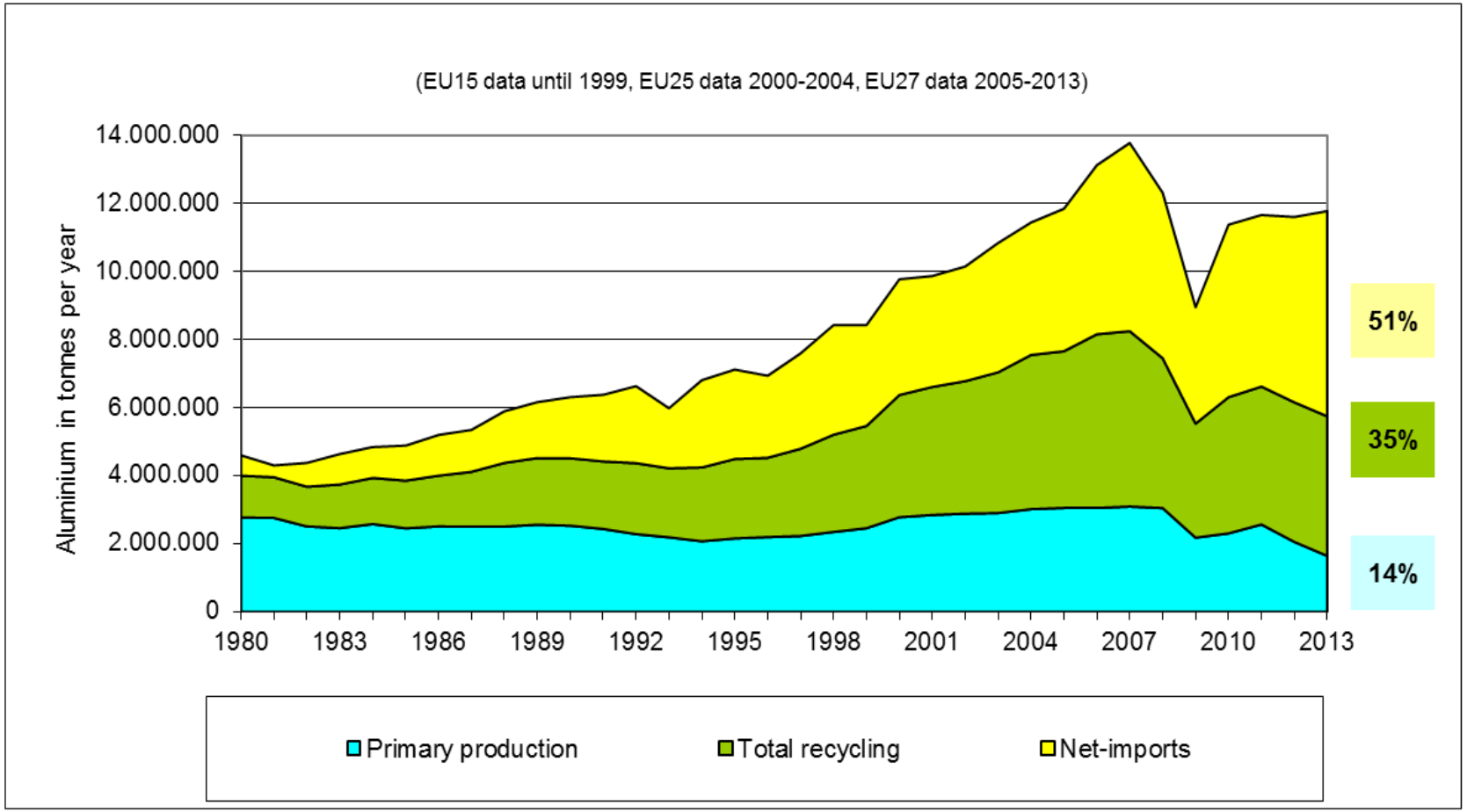
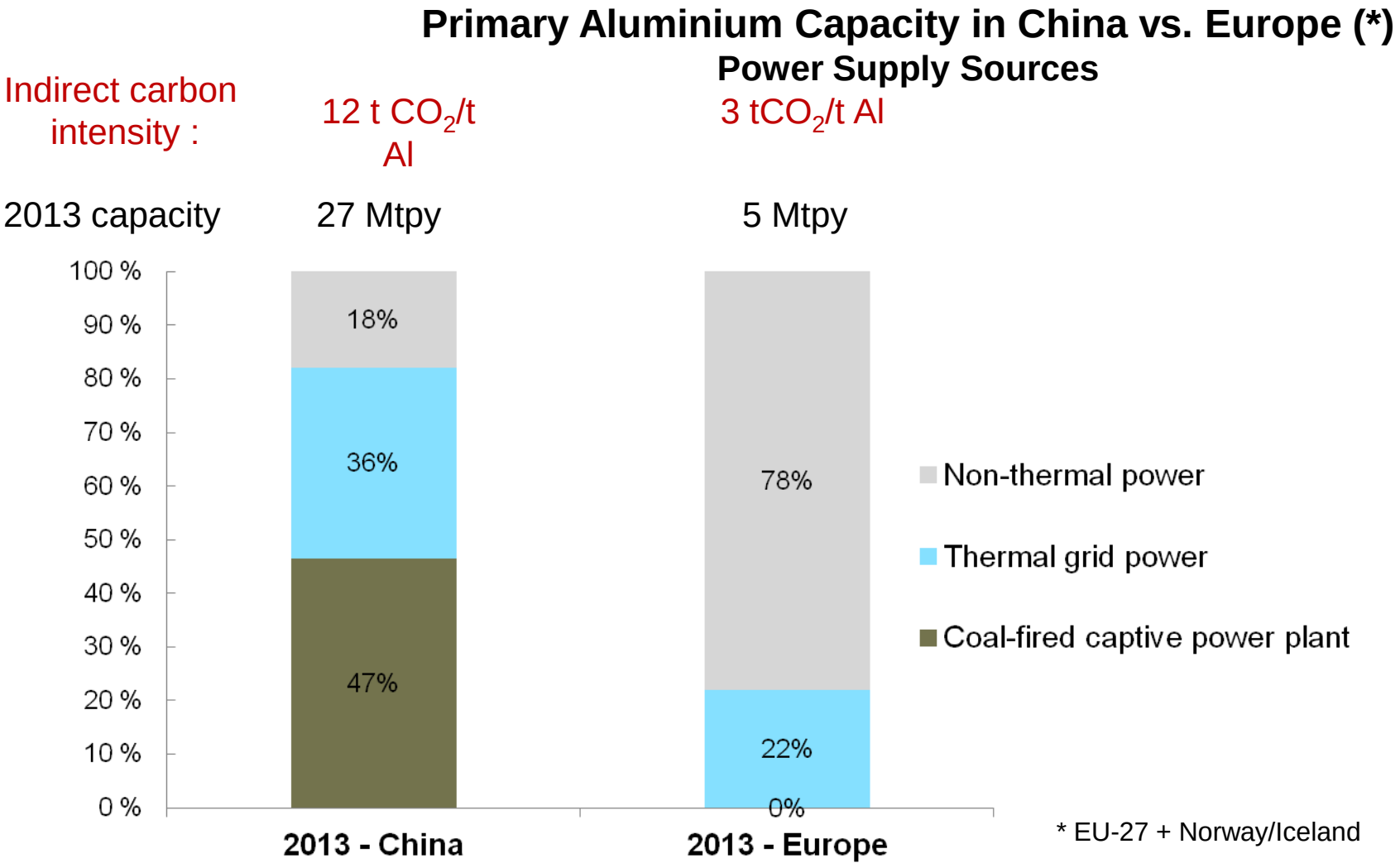
Europe's fast-growing metal imports dependency

2013 net imports seen at more than 50%, primary production only at 14%



But, while aluminium is produced in Europe from low carbon power sources…



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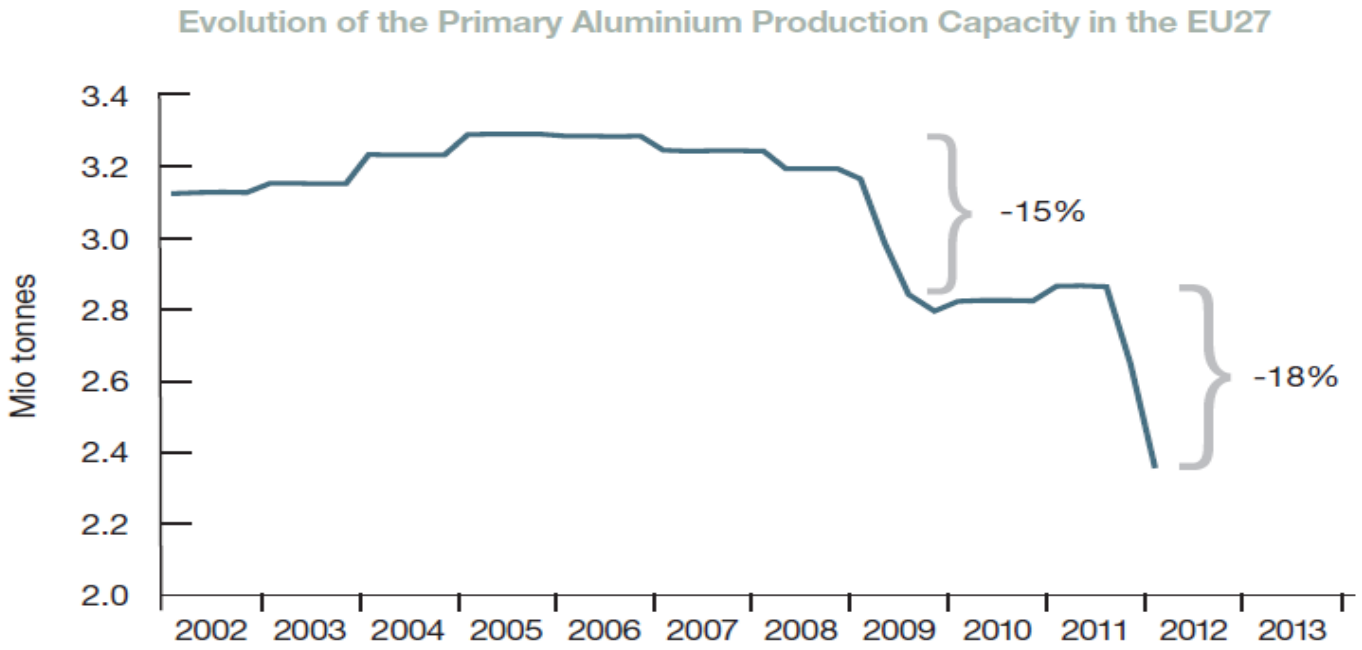
Primary production in danger



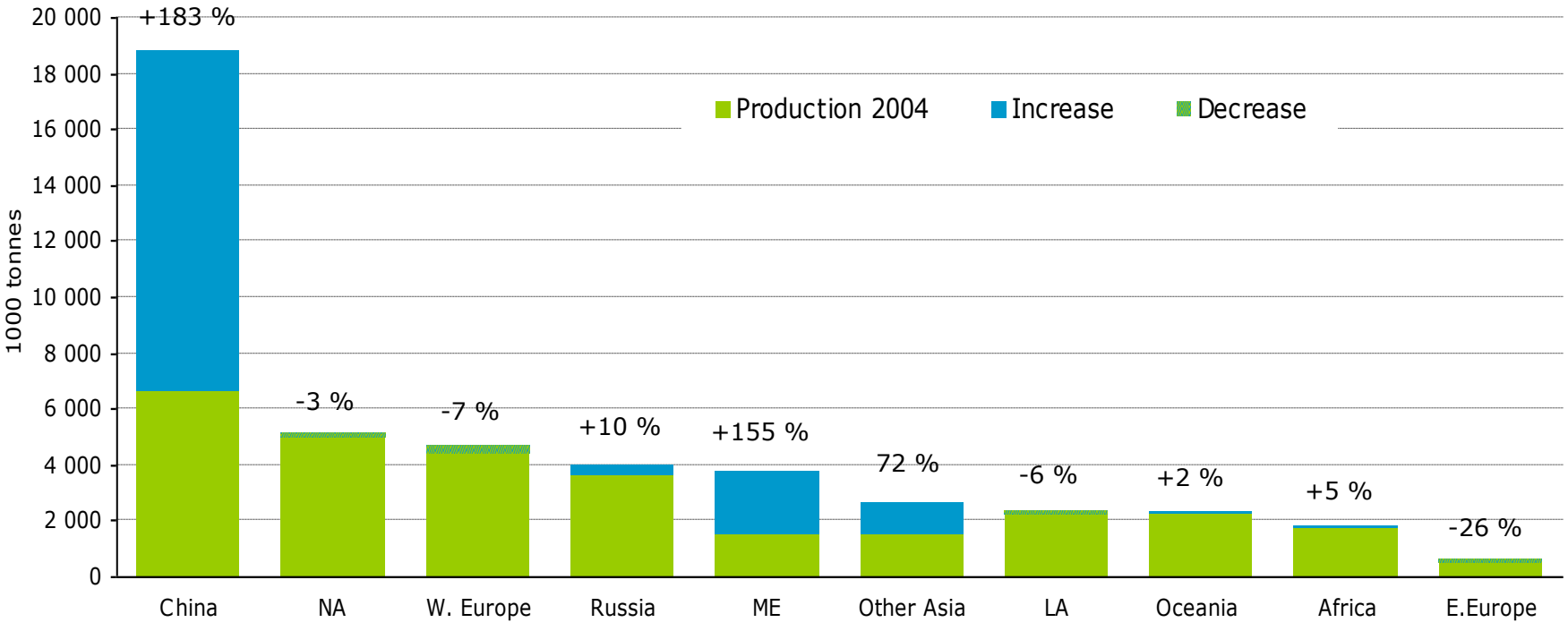
- Since the crisis the primary production in the EU-27 decreased by ±30%, leading to a reduction of more than 1 Mt in European capacity

- The remaining European smelters are under severe risk of closure

Global aluminium capacity continues to rise

But in regions with higher carbon footprint than Europe, such as China

Production increase 2004 to 2011*



Source: CRU 2011 ** estimate*

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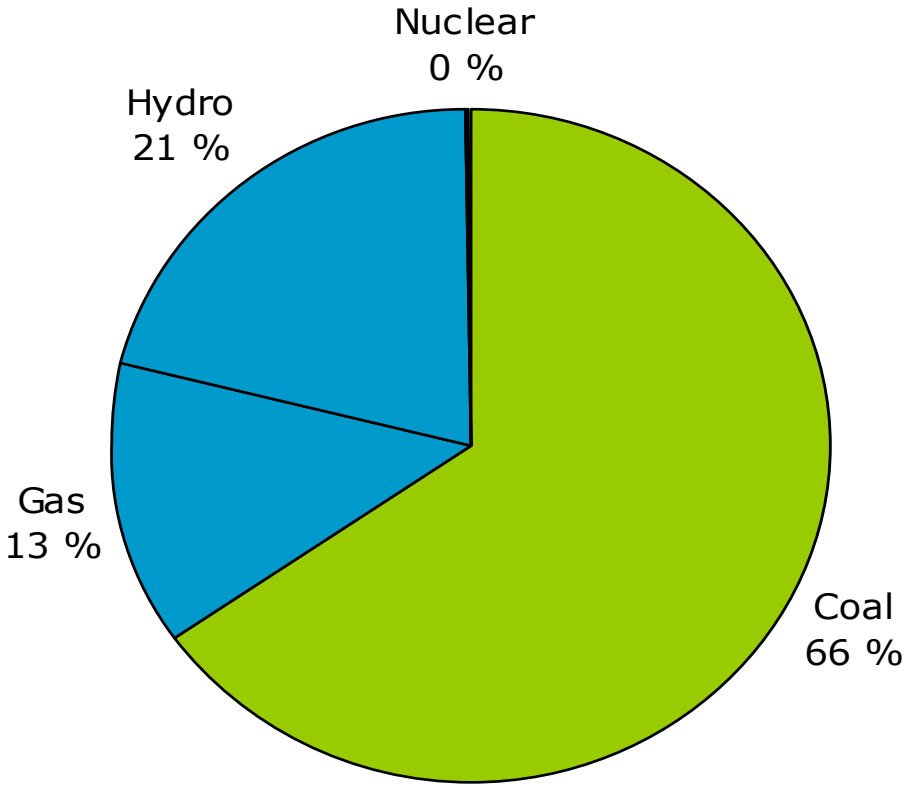
New production mainly based on coal and gas generated power

Planed global capacity 2011-2015



Source: CRU

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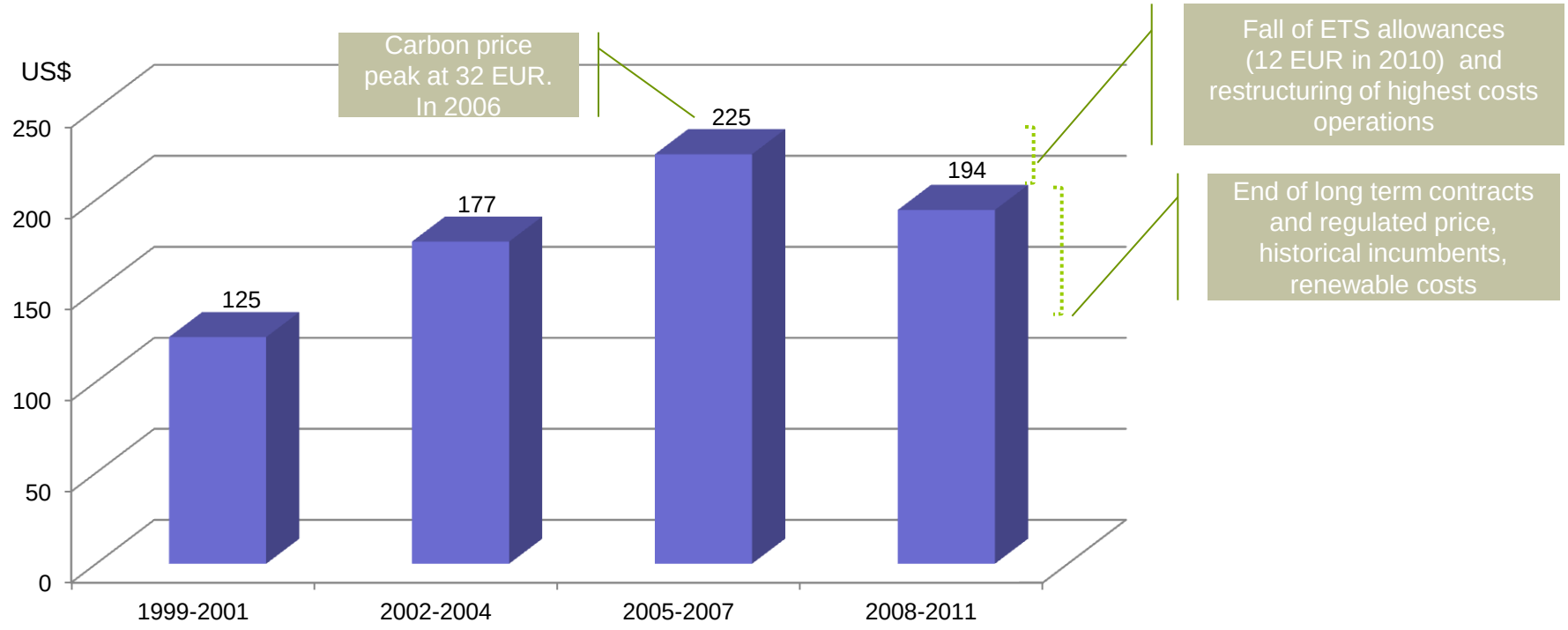
Degradation of European power costs competitiveness

Evolution of power cost differential per tonne of primary aluminium incurred by EU27 + EFTA smelters vs. production in the rest of the world (China excluded)

- Per tonne of produced metal, European smelters incurred in average 194$ more costs for their energy than other regional producers. Since the late 90's this cost differential increased by more than 50%.



Based on CRU data of average power cost (in US$) delivered to smelters per producing regions 1999-2011

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