



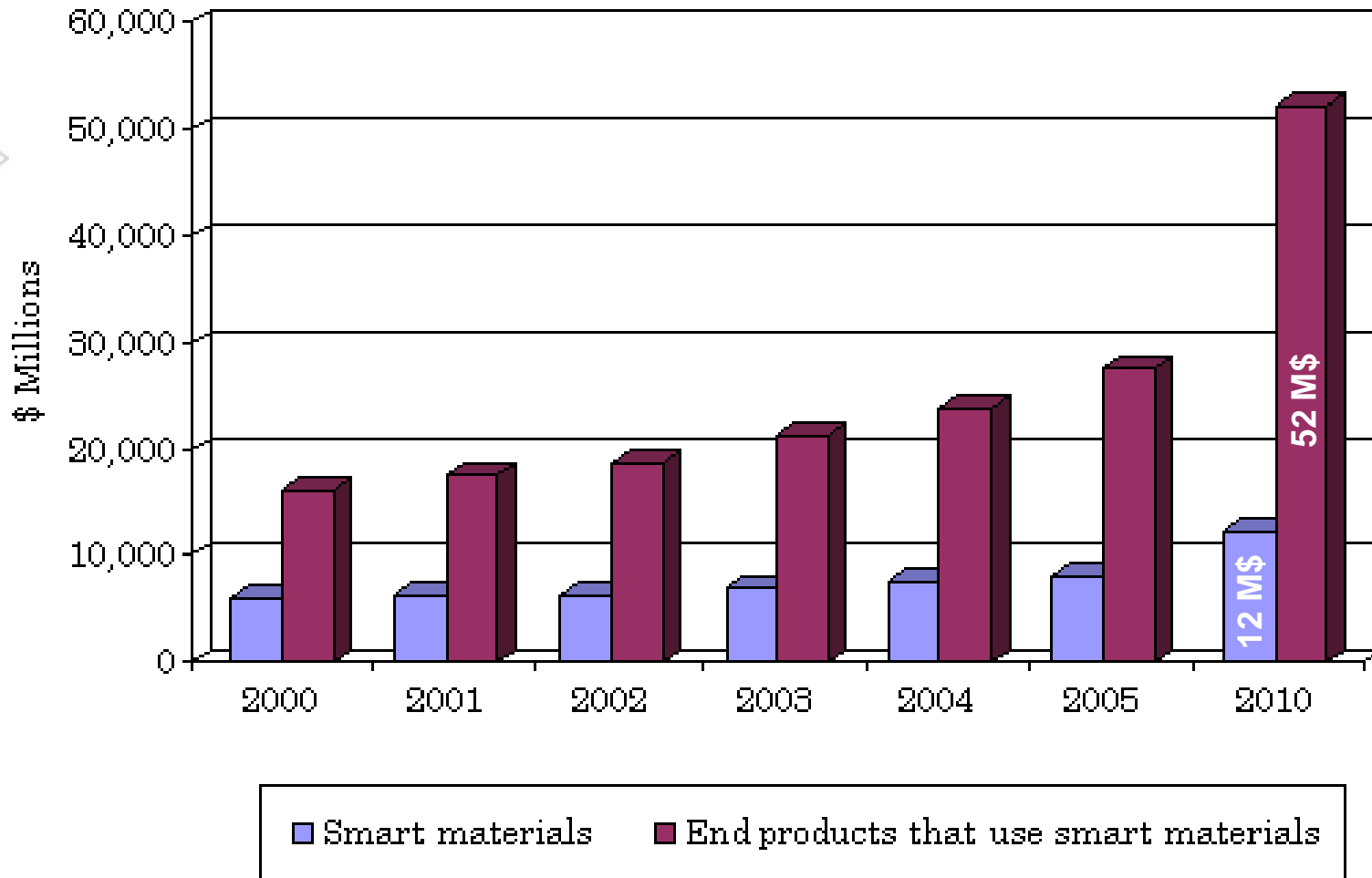
Bright metals inspire

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OCAS : a joint venture between ArcelorMittal and the Flemish Region

Smart materials – market prospects

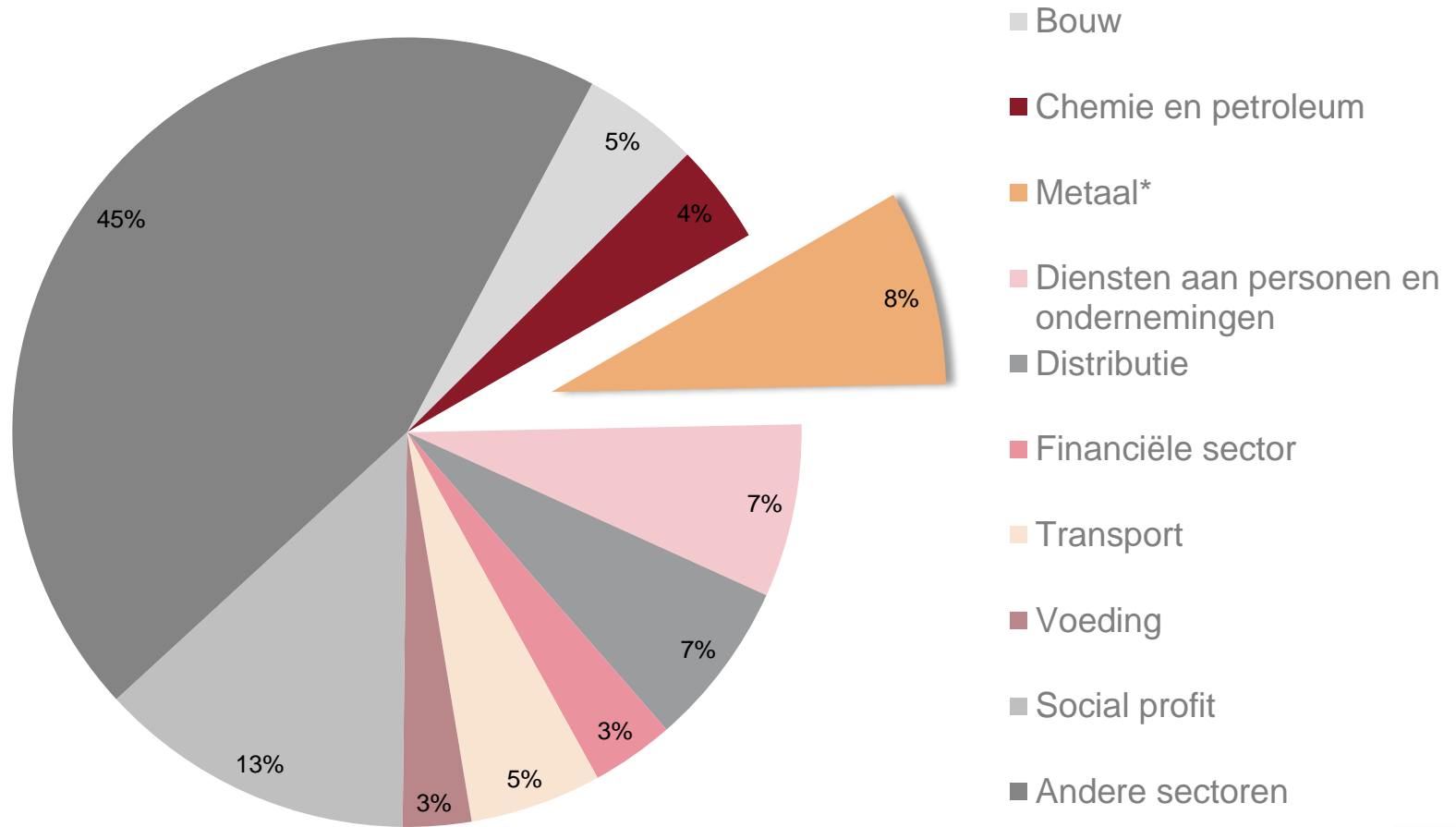


Source: Smart Materials: A Technical and Market Assessment, Report Code: AVM023C, Published: December 2005 by J. Buchaca, <http://www.bccresearch.com/report/AVM023C.html>

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Smart materials – zoom on metal industry

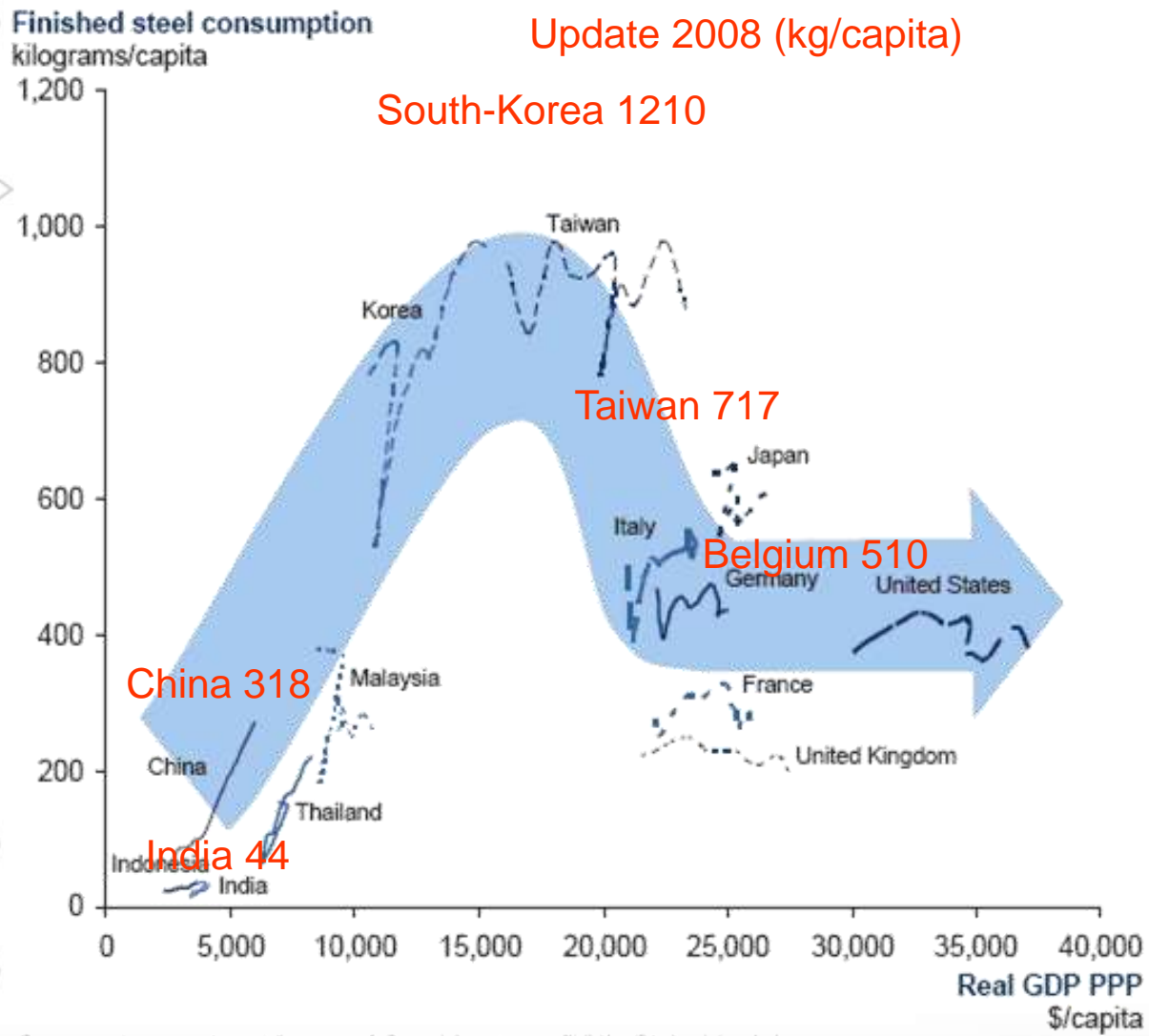
Tewerkstelling in het Vlaams Gewest in 2009



Metaal* met uitsluiting van electriciens, garagisten en koetswerk

Source: RSZ DMFA (Bewerking : Departement Werk en Sociale Economie)

Smart metals - zoom on steel



- Steel consumption is directly linked to GDP growth in developing regions, and slowly declining with little link to GDP in developed regions
- China is likely to continue to increase its steel consumption significantly for at least the next 10-15 years
- Worldwide steel industry is therefore forecast to experience stronger growth over the next 20 years than it did over the past 20 years

Source: International Iron and Steel Institute (IISI); Global Insight
 Grey/blue figures from 2000, update 2008 in orange

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Smart metals – available on the market

- High strength and ultra-high strength steels
 - Widely used in modern cars
 - Introduction in other markets such as trailers, agri-tippers, yellow goods, is on-going



Average weight reduction **20%**

Average cost reduction **10%**

Smart metals – available on the market

- Re-design of agri-tipper

- 22% weight reduction
 - less fuel consumption
 - less CO₂ emissions
 - less damage to soil structure
 - improves next year's harvest yield
- Better wear resistance
 - longer life time of the vehicle
 - less waste



Weight reduction **22%**

Carbon footprint reduction **8 t/y**

Smart metals – available on the market

- Customer appliances with reduced environmental footprint
 - Energy saving design
 - Ready-to-use steel products
 - Skip labour intensive and energy consuming pre-treatment
 - Reduce firing time



Energy saving 30%

Smart metals – available on the market

- Integrated steel solutions: the winds of change
 - Steel windmills are more cost-effective and longer lasting
 - Windmill tower height increased thanks to new steel grades, providing larger generators producing more green energy

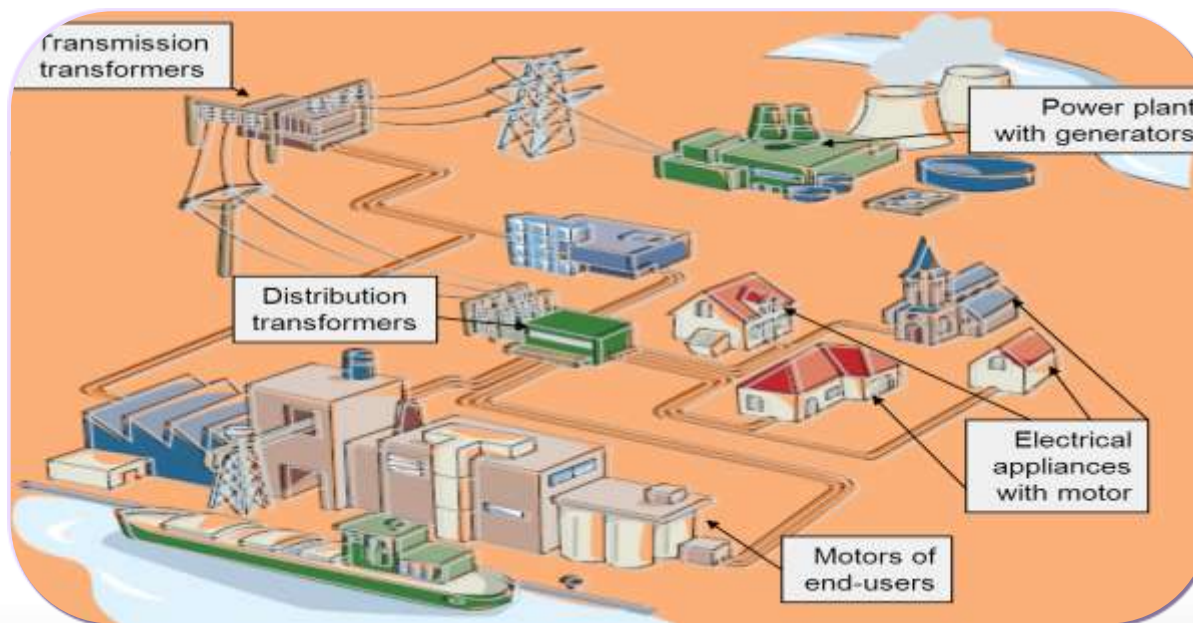


Tower
height
increase **x 2**
2000-2010

Installed
generator
power **x 10**
2000-2010

Smart metals – available on the market

- Improved efficiency of energy conversion
 - Development of new low loss electrical steel grades
 - Numerical modelling of electro-magnetic properties
 - Optimising concepts in relation with properties

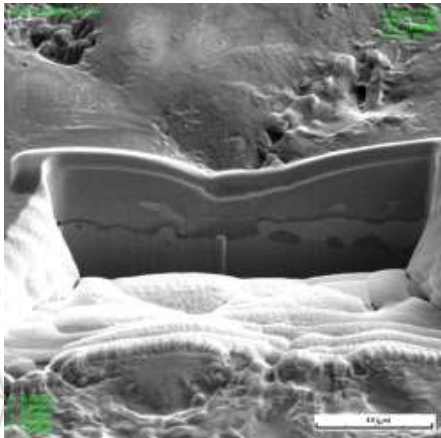
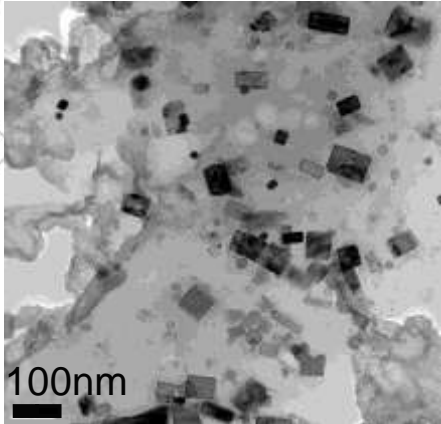


Worldwide energy & power consumption (2008) $474 \cdot 10^{18} \text{ J}$
 $15 \cdot 10^{12} \text{ W}$

36% of energy is used in electricity generation

Total losses in distribution transformers EU-27 2.5%
 $0.12 \cdot 10^{18} \text{ J}$

Smart metals & bright use



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