

# **EUROMETAUX'S PROPOSALS FOR THE RAW MATERIALS INITIATIVE**

## **ANNEXES**

Darmstadt / Brussels, 11<sup>th</sup> June 2010

Jointly prepared by:





**Annex A-1 :  
A CASE STORY ON RECHARGEABLE BATTERIES,  
prepared by UMICORE and RECHARGE**



Improving Access to Secondary Raw  
Materials

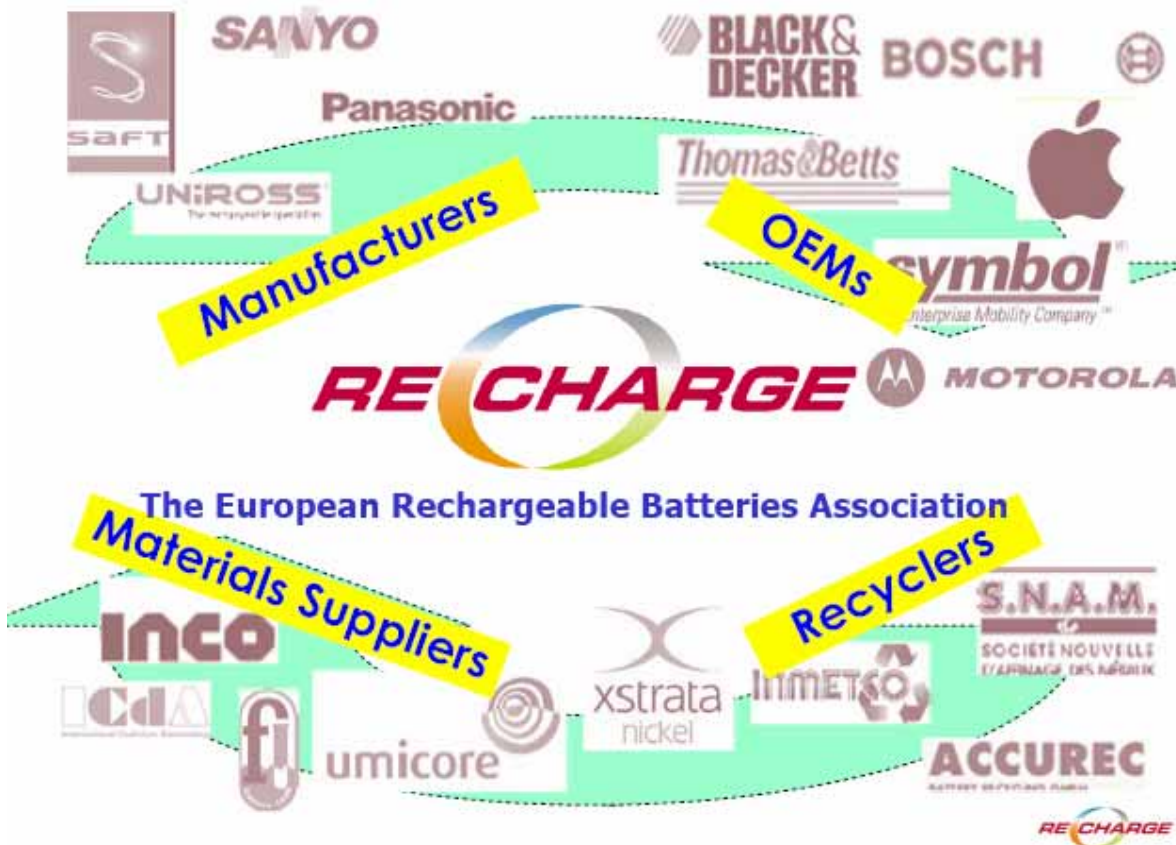
Case Story  
Batteries  
Umicore and Recharge

**RAW MATERIALS INITIATIVE**

**A CASE STUDY ON  
RECHARGEABLE BATTERIES**

**Prepared by**





## Recent Reports Prepared by RECHARGE asbl



The Role of Rechargeable Batteries  
in an Energy Saving Economy

The Added Value of Using Rechargeable Batteries in  
Private Transportation Mode

LCA of a Portable Rechargeable Battery  
Used in a Cordless Power Tool

Ecolabelling of Portable Rechargeable Batteries

RMI - A Case Study

## Umicore Battery Recycling Presentation

- The industry has developed technology to recycle rechargeable battery. Nevertheless Europe still faces the challenge of reaching an efficient collection rate. Umicore proposes today the following technology:
- A unique recycling process with a maximum recovery of valuable metals contained in all types of rechargeable batteries (PRB and HEV/EV)
- A clean process with minimum energy use, CO<sub>2</sub> and waste generation. The "Best Available Technology"
- Offering a full and safe service, from packaging and transport to an eco sound recycling process




43



## New smelter in Hoboken (B)

### UHT technology in Hoboken



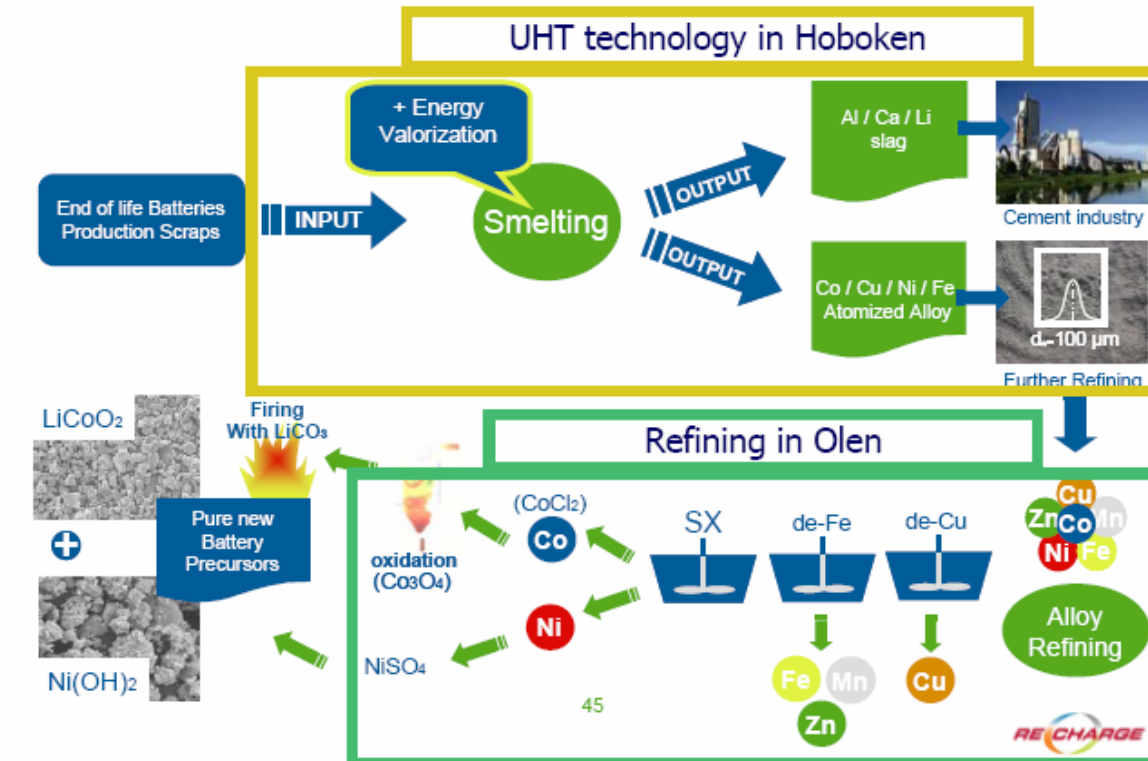
- Up & running: spring 2011
- Capacity: 7000 ton/y
- Improved energy and CO<sub>2</sub>-balance
- 25 million € investment



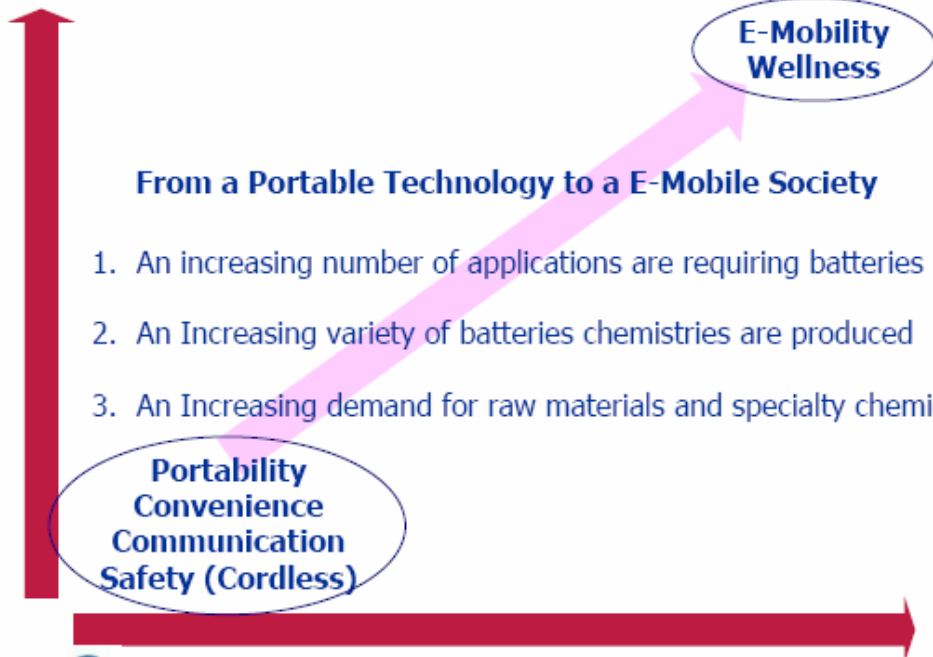
44

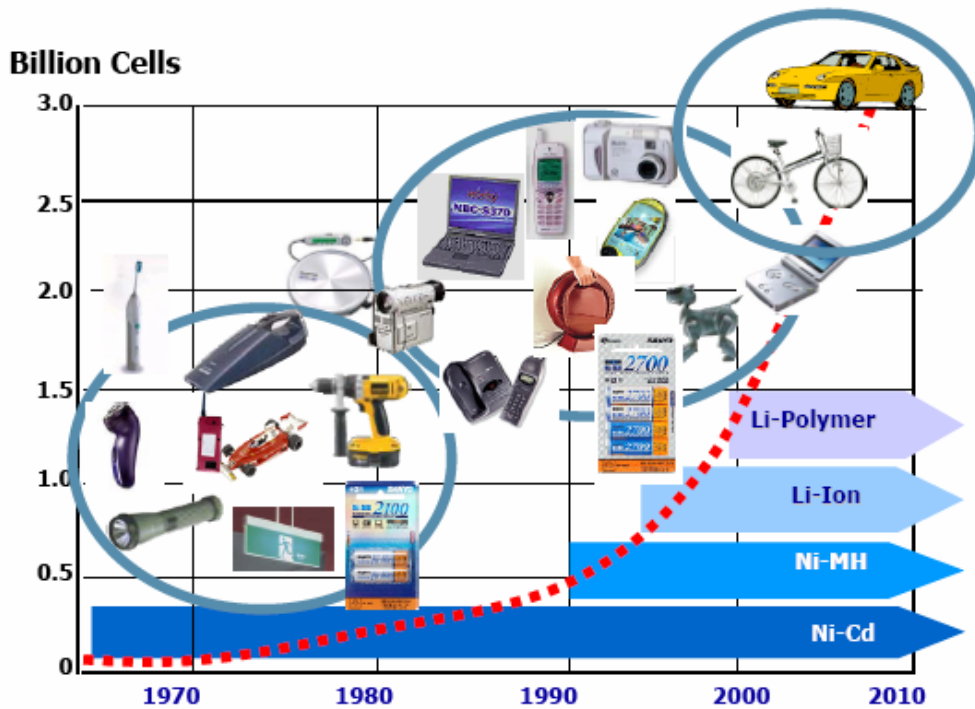


## Overview of the complete process



### TECHNOLOGY EVOLUTION





NB: Non Lead-acid based batteries



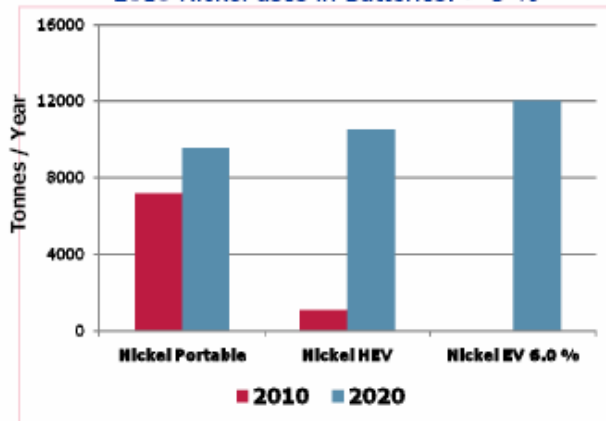
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Trends in Battery Materials Uses - EU Market

NICKEL

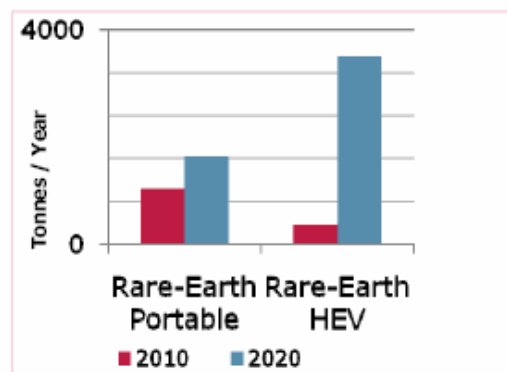
2010 Nickel uses in Batteries: > 5 %



From 100,000 to 1.0 million HEV & 1.0 million Full EV

RARE EARTH

Rare Earth uses in batteries: ≈ 20 %



From 100,000 to 1.0 million HEV



48

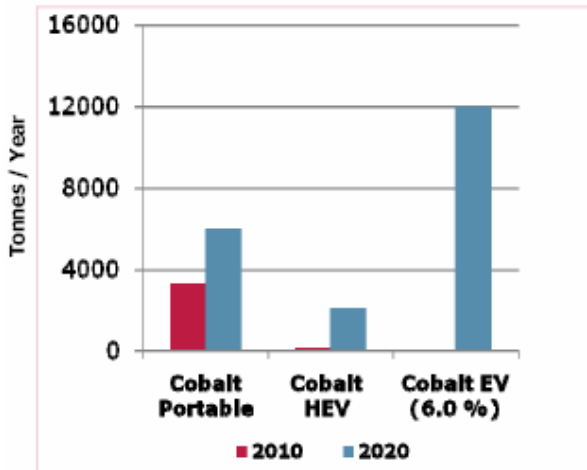
HEV = Hybrid Electric Vehicle EV = Full Electric Vehicle



Trends in Battery Materials Uses - EU Market

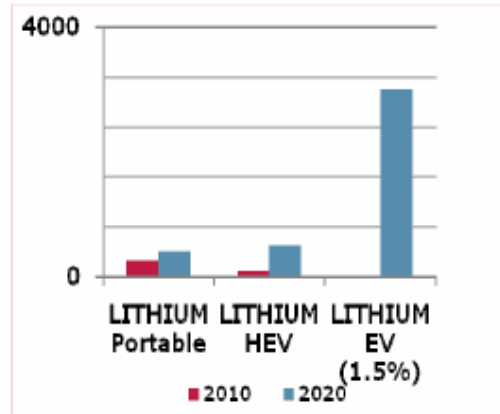
COBALT

2010 Cobalt uses in Batteries: ≈ 20 %



LITHIUM

2010 Lithium uses in batteries: > 25 %



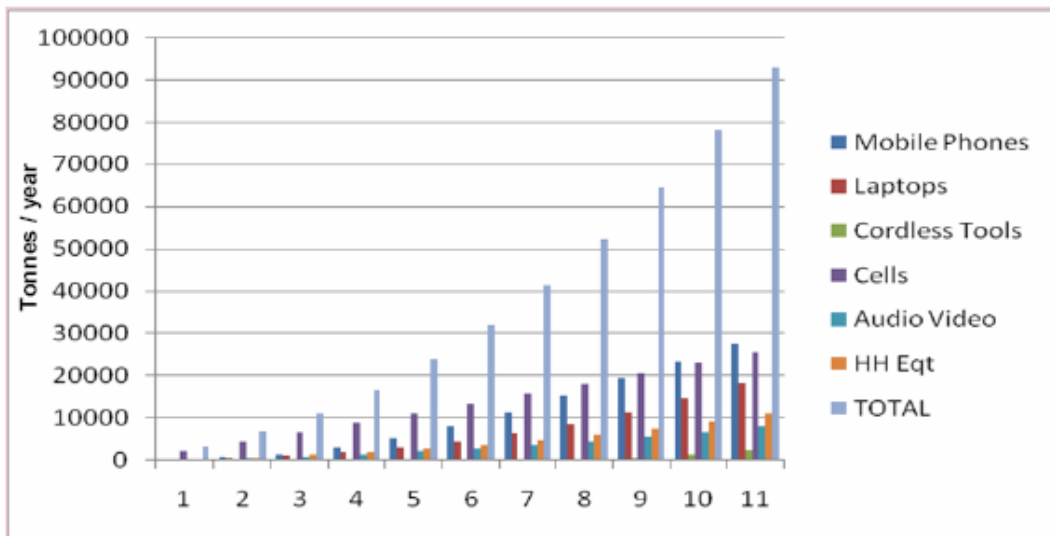
From 100,000 to 1.0 million HEV and & 1.0 million Full EV



HEV = Hybrid Electric Vehicle<sup>49</sup> EV = Full Electric Vehicle



Rechargeable Batteries Contribution to the Stock of 2<sup>nd</sup> Raw Materials in the EU Economy Portable Segment



Evaluation of ten years of stock of Portable Rechargeable Batteries In Europe - 66 % hoarding rate





## Barriers to access recyclable materials from batteries

- **Low collection rate** for rechargeable batteries incorporated in equipment
- **Absence of traceability** of the return of small EEE using batteries: Laptops, Cordless Tools and Mobile Phones, ...
- **Dismantling costs** of batteries from small HH appliances (WEEE)
- **Lack of means to sort spent batteries** by chemistry
- **Early technological development** for separating active electrode materials from other battery components
- **Recycling cost impact** due to various battery chemistries

## Proposed solutions

- **Enforce existing legislation (see Issue II in subsequent proposal))**

**Batteries Directive** requirements: Collection and Recycling

**Waste Statistics Directive** >>> Presence of batteries in MSW streams

**Link between WEEE and Batteries Directives** >>> 10 references

**Reduce illegal export of WEEE** >>> when containing batteries

**Apply Batteries separation requirements to the ELV Dir.**

## Proposed solutions

- **Enhance access to raw materials (Issues III & IV in subsequent proposal)**

Improve knowledge and management of hoarded (home storage) equipment with incorporated batteries

Motivate consumers to accelerate the return of hoarded EEE

Define specific realistic Collection Targets per major EEE applications

Develop Efficient Separation Technologies/Practices

Implement Colour Coding for separation of batteries by chemistry

Evaluate return channels and End of Life management of E-vehicles batteries

## Conclusions

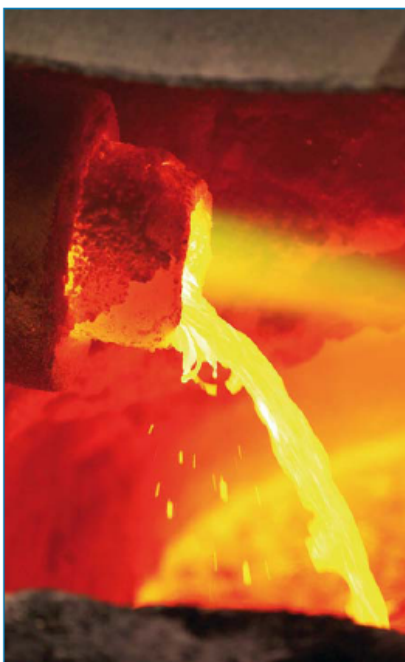
- With the evolution of electric mobility, there is a risk of imbalance between supply/demand of certain raw materials for batteries
- The European Industry will strongly depend on such raw materials sources
- An efficient collection of Rechargeable Batteries from EOL is key to enhance access to critical Secondary Raw Materials in Europe
- Enforcement of existing legislation is key to achieve efficient collection and recycling of spent Portable Rechargeable Batteries (PRB)
- New tools will be required to improve some technical aspects and boost consumer's participation to take back programs

**Annex A-2:  
A CASE STORY ON COPPER SCRAP AND WEEE  
prepared by AURUBIS**



**Improving Access to Secondary Raw  
Materials**

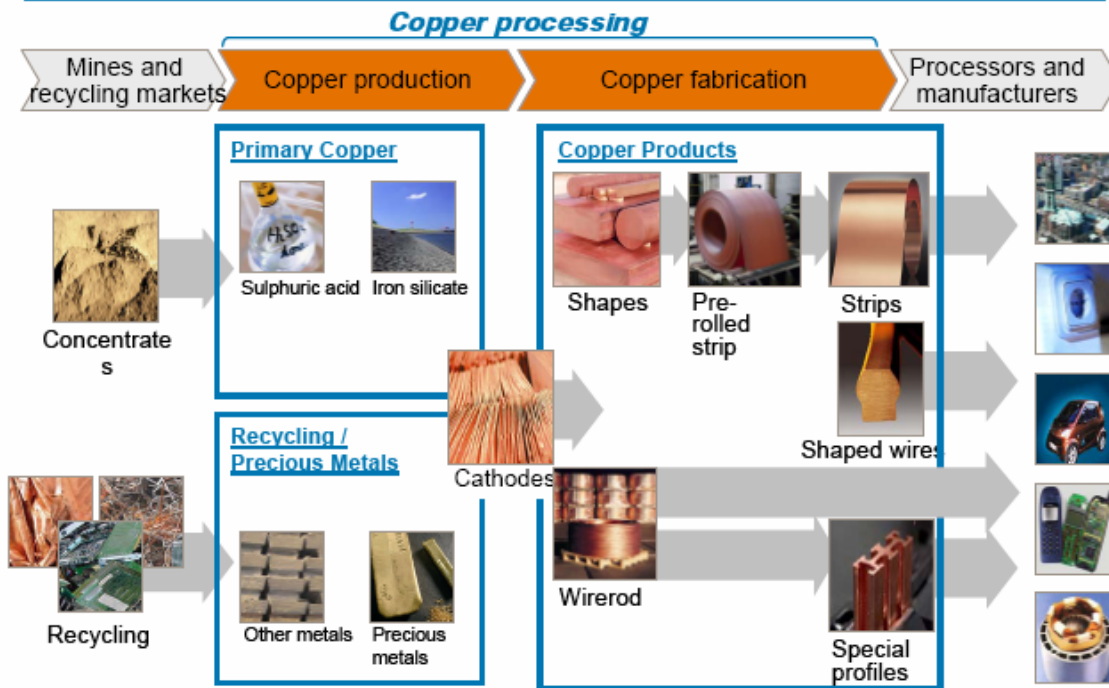
Case Story  
Copper scrap and WEEE  
Aurubis



***High-Tech copper recycling  
needs a Level playing field***

Workshop DG Enterprise, April 19 2010  
Stefan-Georg Fuchs  
Business Unit Recycling/ PM  
Lünen

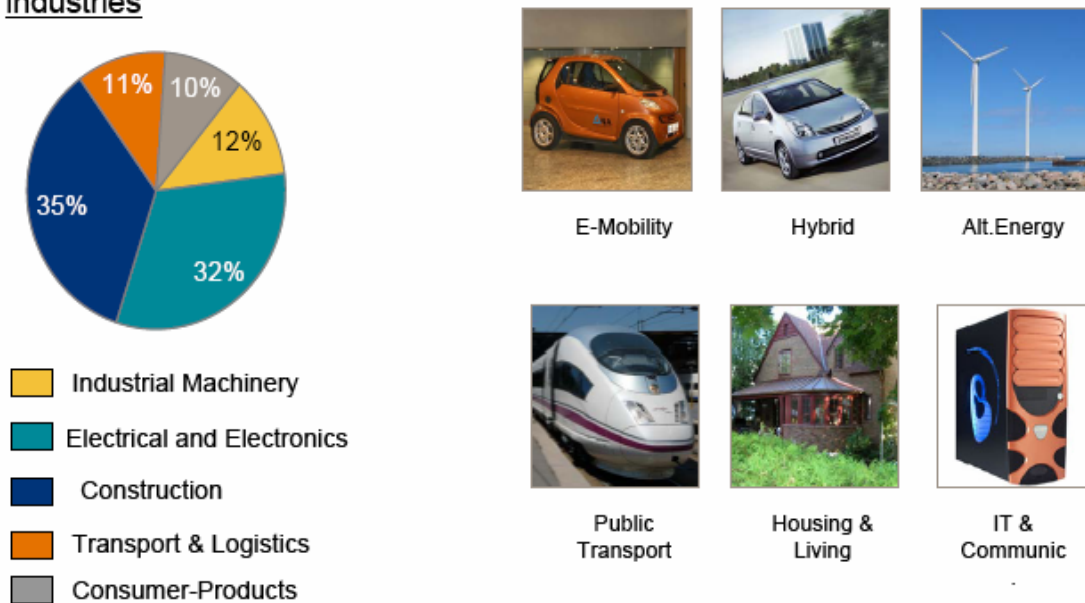
**The Copper value chain**



**Copper is important for a multitude of applications**  
**Global copper cathode market 18. Mio t in 2008**



**Global copper cathode demand per industries**

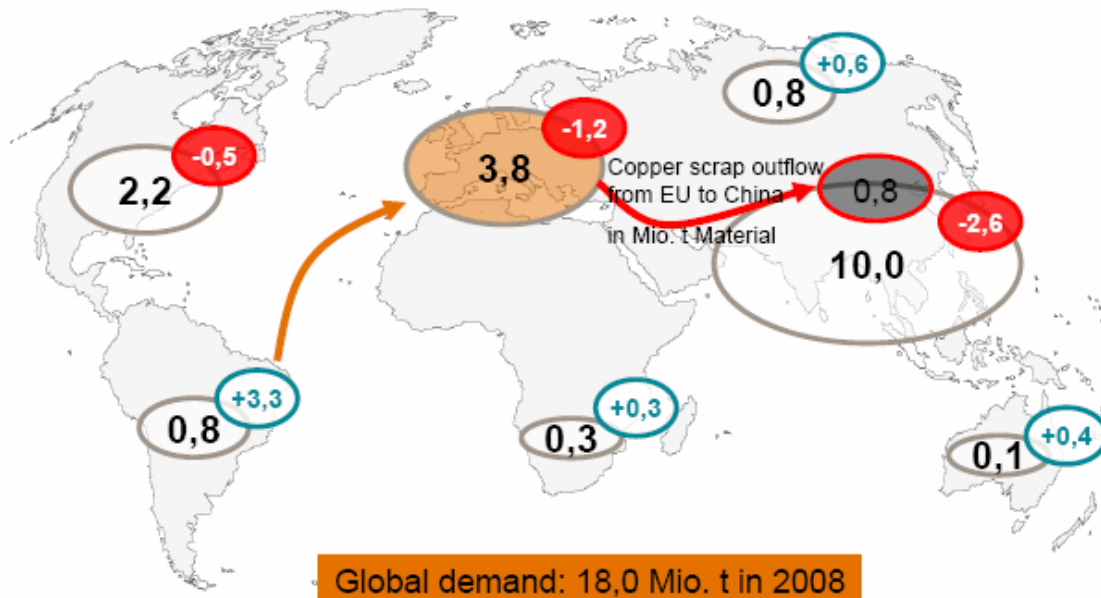


Source: Brook Hunt 4Q 2008

**Europe depends on imports of refined copper for its High-tech Industries - but loses own copper scrap resources**



- Demand for cathode by region in 2008 (in Mio. t)
- Cathode +surplus / - deficit

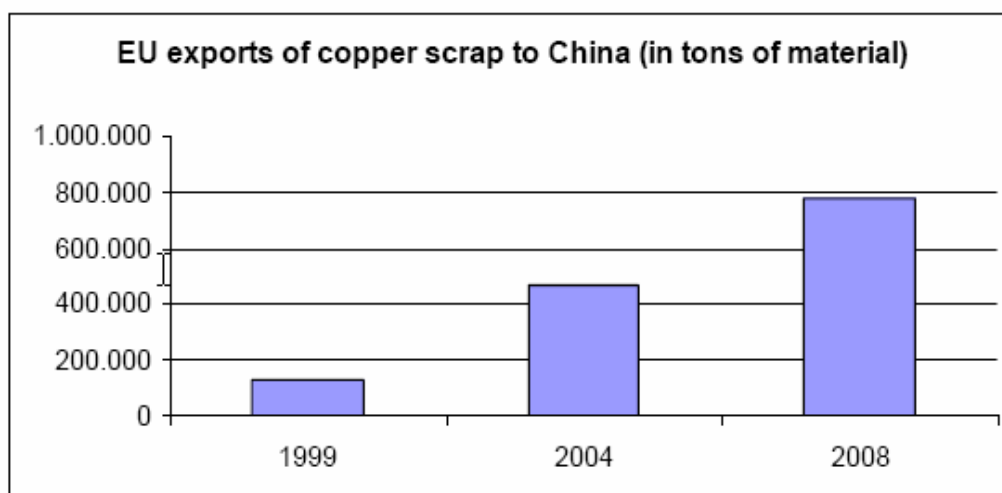


Source: Brook Hunt 1Q 2009

**EU exports of copper scrap to China have continuously gone up during the last decade**

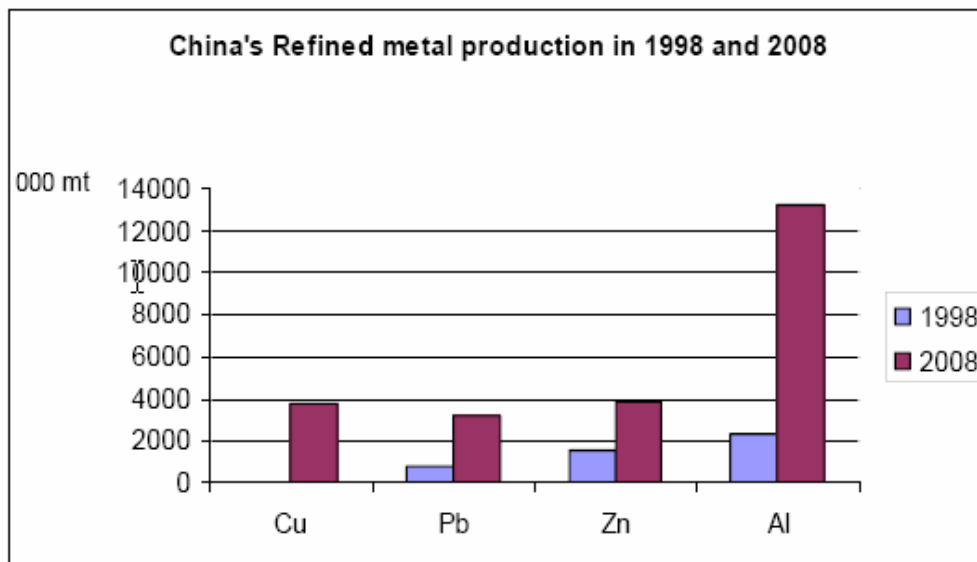


EU Exports reached 780.000 t of copper scrap material in 2008



Source : Eurometaux 09/2009

**Growth in China's refined Metal Production**

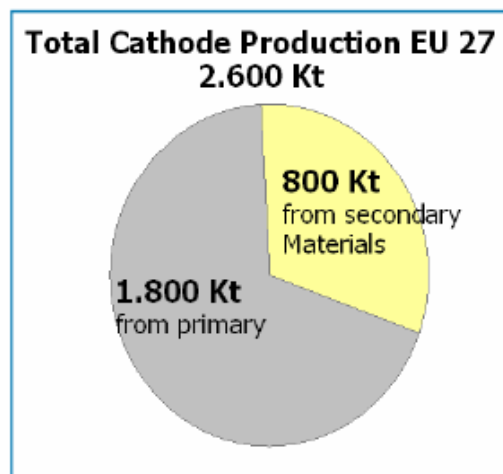


Source : Eurometaux 09/2009

**Recycling - an important contributor to copper supply in Europe**



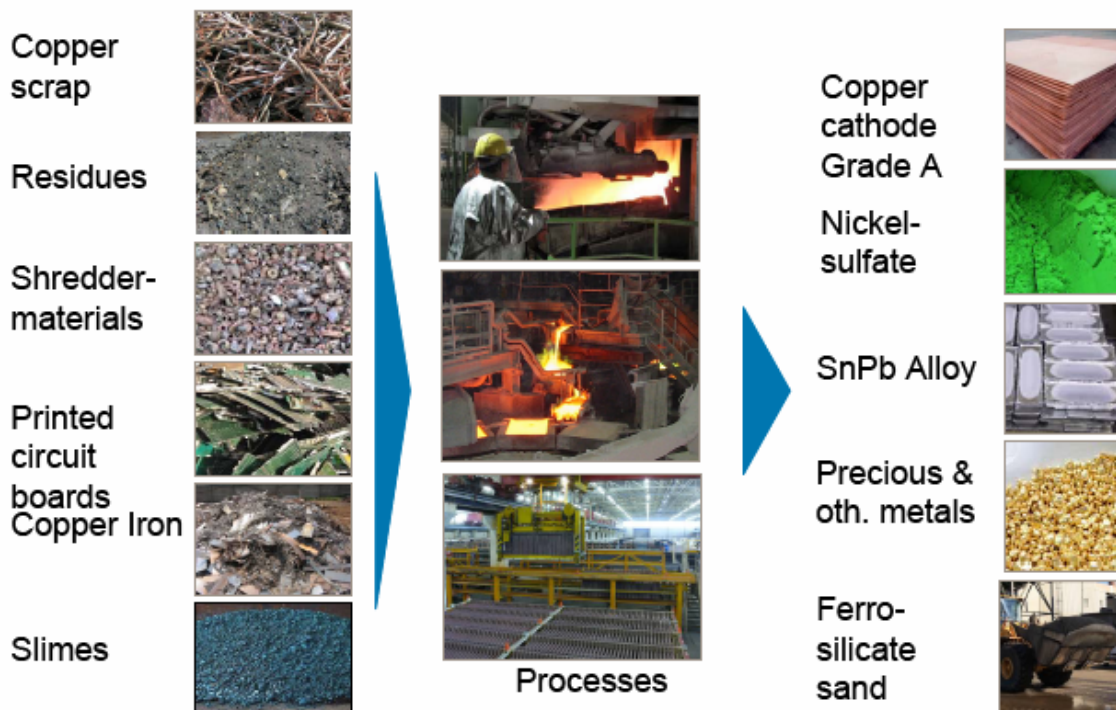
Share of recycling in the European copper market 2009  
( EU 27 , in 1.000 t )



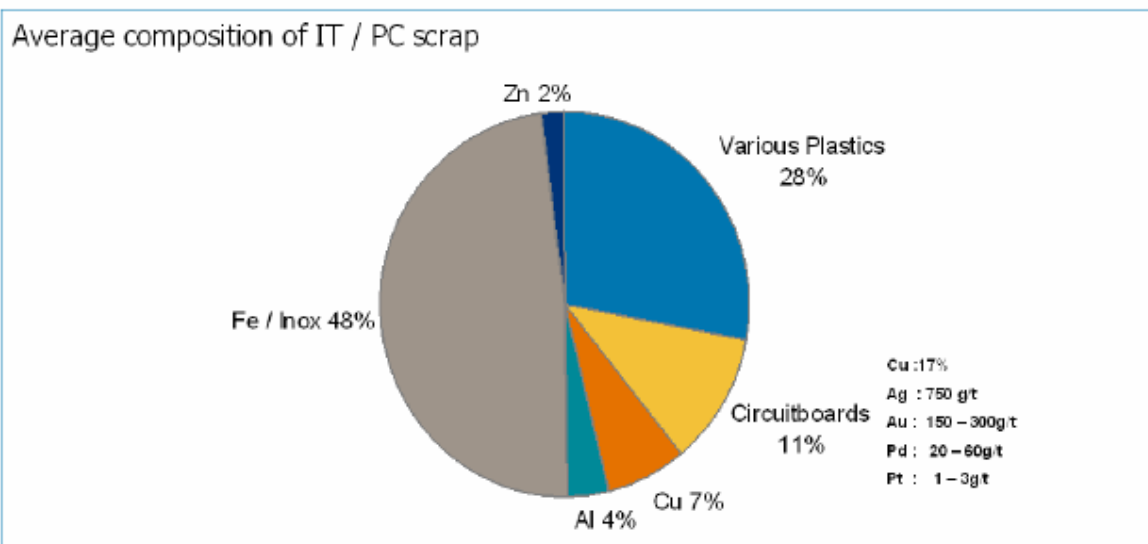
**Total share of secondary input in EU copper cathode production: 31 %**

Source: ICSG

**European copper recyclers turn a variety of complex secondary raw materials into first class products**



**Typical Example of complex scrap : IT / PC Scrap**



**Only High-Tech Recyclers ( mainly EU ) can provide highly efficient recovery processes for all valuable components**

**European metal refiners represent the global benchmark for state of the art metals recycling**



State of the Art Recycling

Outdated recycling methods cannot be the future



ISA smelting technology



Recycling of WEEE in China and Africa

**European copper recyclers are facing unfair competition - Issue 1 - Level Playing Field**



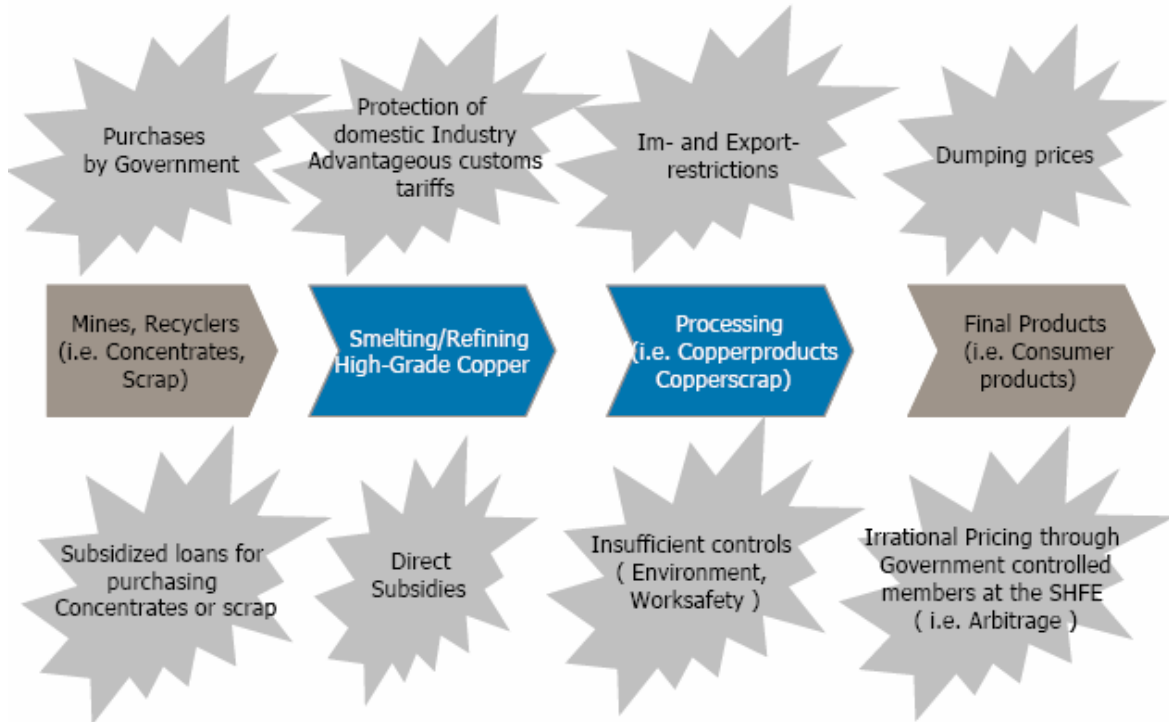
- » The EU Commission stated in their raw materials initiative report , dated as of Nov. 4th. 2008, more than **450 trade distortions** on more than 400 different raw materials (metals, wood, chemicals etc.) worldwide.
- » These are primarily in the form of:
  - » VAT rebates
  - » Import/ export taxes and duties
  - » Exceeding of „WTO Bound-Rates“
  - » Fraud in import/ export procedures/ documentation



***Urgent call to politicians:  
We need globally harmonized rules of trade for copper, copper scrap and other scrap materials. Existing trade distortions must be identified and abolished.***



**Example : China's „Macro-Control“ creates trade distortions along the complete value chain of copper production**



**Proposals Issue / Levelled Playing Field**



- » **Immediate action** against non-compliance with WTO commitments, in particular on export taxes
- » **Clear and firm diplomacy** from EU and Member States about market distorting impacts of
  - unaddressed fraud and smuggling,
  - manipulation of taxation regimes,
  - access to finance at « non-market » conditions,
  - lenient implementation of domestic EHS rules
- » **WTO consultation** on the operation of the Shanghai Futures Exchange
- » **Strengthening of WTO rules** on hidden subsidies and on export taxes
- » **Better Enforcement of EU Waste Shipment Legislation**
- » **Stop export of copper scrap and other recycling materials to sub-standard recycling facilities outside of the EU.**

**Annex A-3:  
A Case Story on Aluminium APPLICATIONS  
prepared by HYDRO**



# Improving Access to Secondary Raw Materials

Case Story  
Aluminium applications  
Hydro

55

## Will recycled aluminium meet increasing demand?



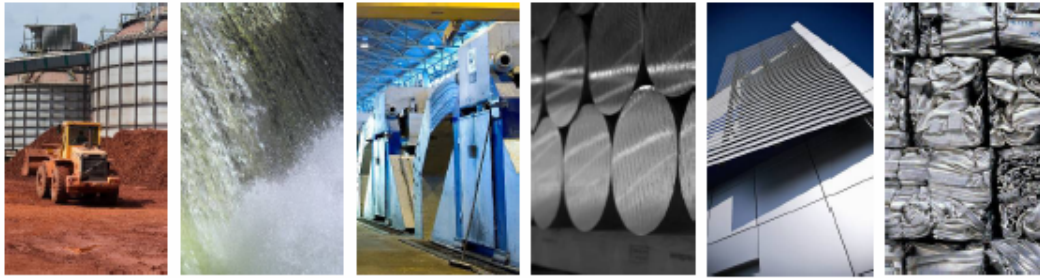
## Aluminium

### 640 million tonnes still in use globally since 1888

- Lifetime and growth – the need for primary metal
- Aluminium applications - all alu collected and sorted in Europe, is recycled into valuable products and applications in Europe
  - Buildings
    - long lifetime limits current access to the scrap
    - need for quality materials data
  - Automotive
    - large numbers of end of life vehicles and components are exported as 'reuse'
    - open loop recycling - the alloy cascade
    - need for environment sound management globally
  - Packaging
    - packaging recycling rates have greatly improved over the last 10years
    - need for quality collection of used packaging at source to maintain metal value
    - provide incentives to the recycler
- End of Waste criteria – when alu waste is declared a product
  - material leakage



## Europe's largest integrated aluminium & energy company



Bauxite/  
alumina

Energy

Primary  
aluminium

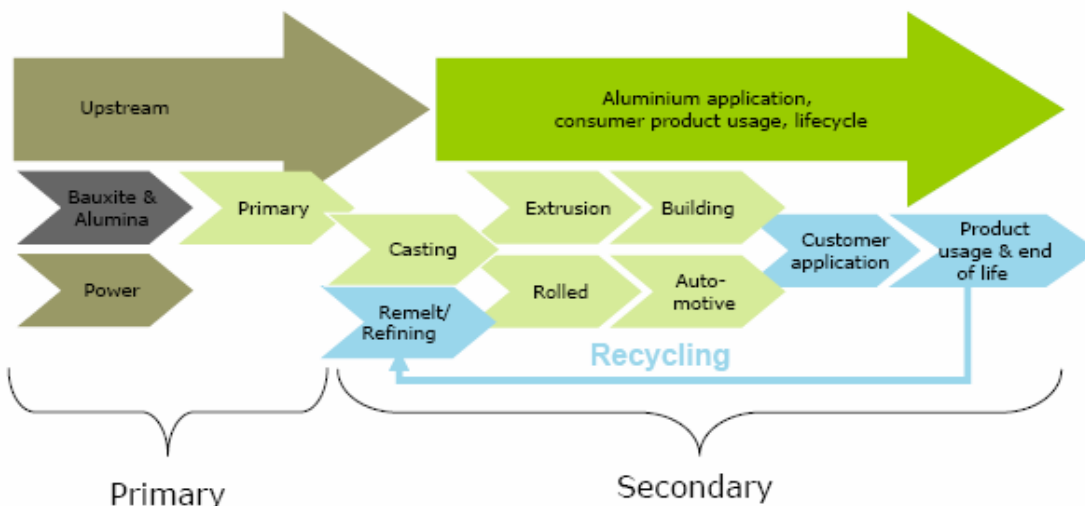
Metal  
products

Semi  
fabrication

Remelt/  
recycling

- Global supplier of aluminium and aluminium products
- Operations in more than 40 countries
- 19 000 employees, including 10 000 in the EU
- Annual turnover €8.4 billion (2009)
- Industry group leader of Dow Jones Sustainability Index

## The aluminium value chain

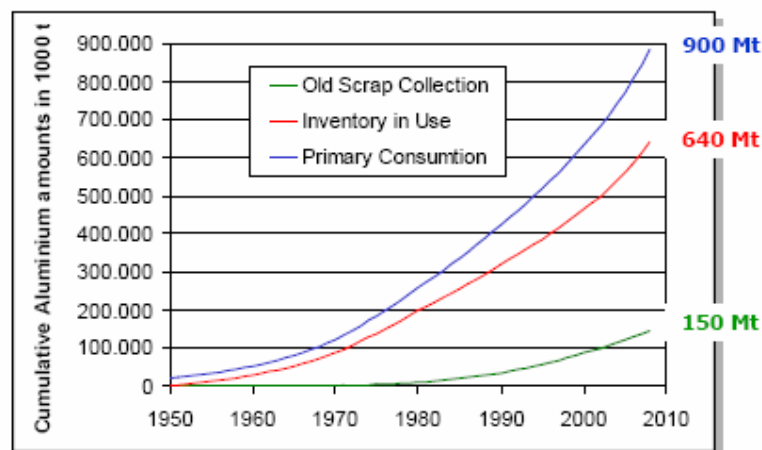


# 2 Lifetime and growth - the need for primary metal

(61) 2010-03-03



## Fast Growing Aluminium Inventory

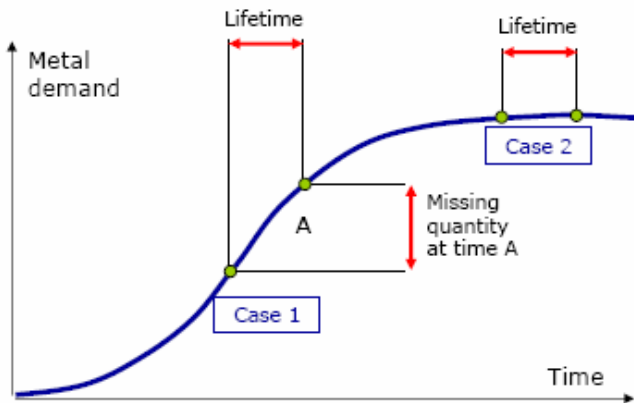


- o A total inventory in use of 640 Mt is calculated by MFA models (GARC 2007)
- o 73 % of all primary aluminium produced is still available in this inventory
- o 16 % of all aluminium produced has been collected as old scrap

(62) 2010-03-03



## Metal supply by end of life scrap



Source: Steinbach, Wellmer:  
Consumption of Non-renewable Mineral and  
Energy Raw Materials from an Economic Geology  
Point of View.  
Sustainability Journal 2010

- Due to demand – primary material is essential, resulting in a deficit of secondary material.
- Credit recycled materials – reduces the environmental footprint – thereby increasing competition for secondary material.

# 3

## Aluminium Applications

## Example 1: Building & Construction – Europe

- Commercial and industrial building lifetimes – 40 year average
  - In use - approx 50 million tonnes (2007)
  - Demand (2007) – 3.0 million tonnes
  - Recovered scrap (2007) – 1.0 million tonnes
- ➔ Gap of 2.0 million tonnes bridged by primary

**With a 95% recycling rate – there is insufficient secondary raw material available to feed demand.**



(66) 2010-03-03



## Example 2: Automotive – Use of Alloys

- Alloyed alu used in :castings, sheet material and extrusion profiles
- Dismantling occurs for accessible parts
- Closed-loop recycling occurs for dismantled single alloy/material components
- Multi-alloy components is recycled as casting alloys

### Challenges:

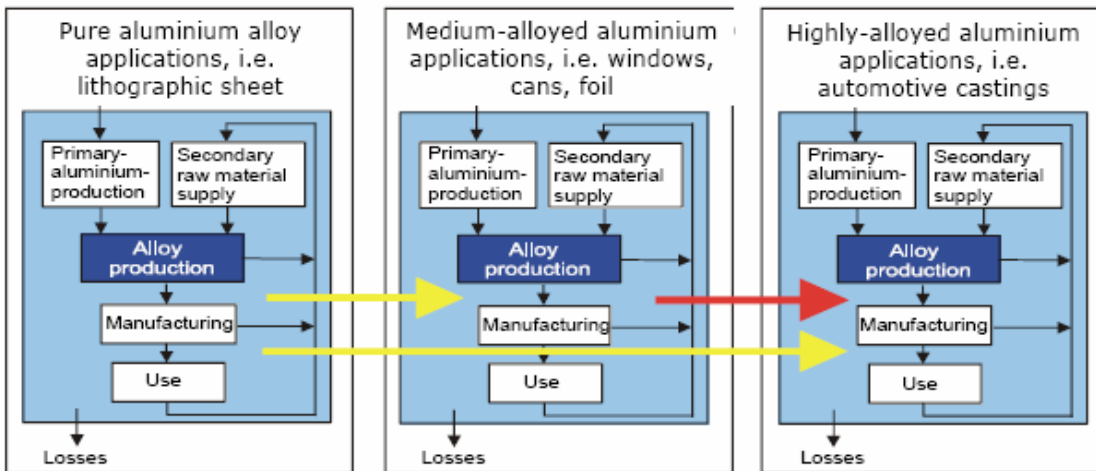
- Further improve efficiency of shredding to increase yields
- Improve quality of sorted NFM's and alloy groups



(66) 2010-03-03



## Open-loop recycling systems



- Alloy cascade defined by aluminium content or level of alloying elements
- Perfect sorting technology needed to maintain alloy quality, which enables product-to-product recycling
- Lack of sorting forces scrap into higher alloyed applications

(67) 2010-03-03



## Handsorting, Nanghai China



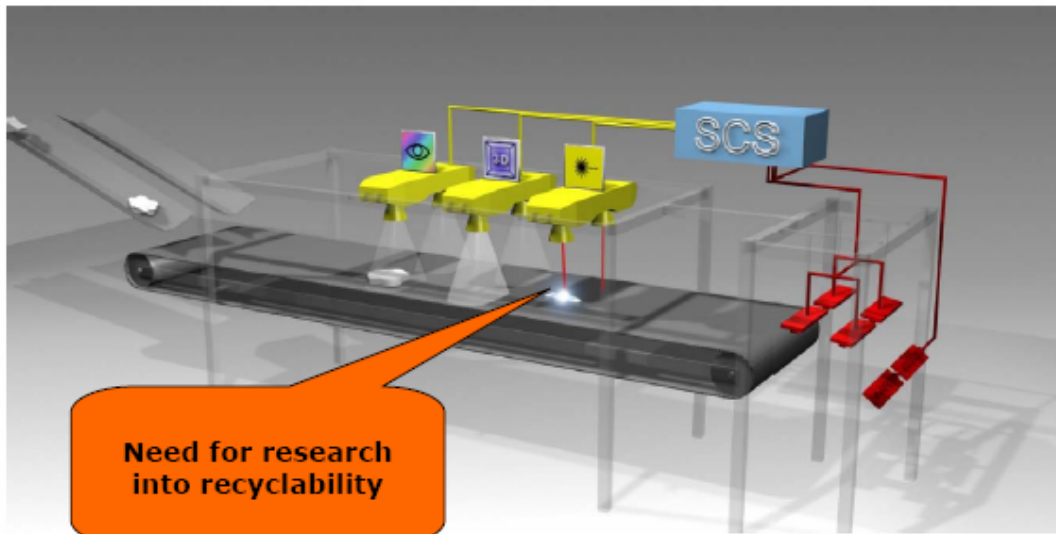
Need for environment sound management globally

(68) 2010-03-03





## Achieving improved sorting quality and efficiency



SILAS, Fraunhofer ILT, Aachen: Optical – 3-D – Laser-OES sensors

(69) 2010-03-03



## Example 3: Packaging Material

### Characteristics:

- Maintains food quality/durability
- Short lifetime
- Collection rate varies by country and product family
- Large volumes incinerated or land-filled (country dependant)

### Challenges:

- Metal recovery dependent on scrap purity
- Need to further improve efficiency or sorting processes
- More automatic hand sorting facilities needed to address materials heavily contaminated with food residues

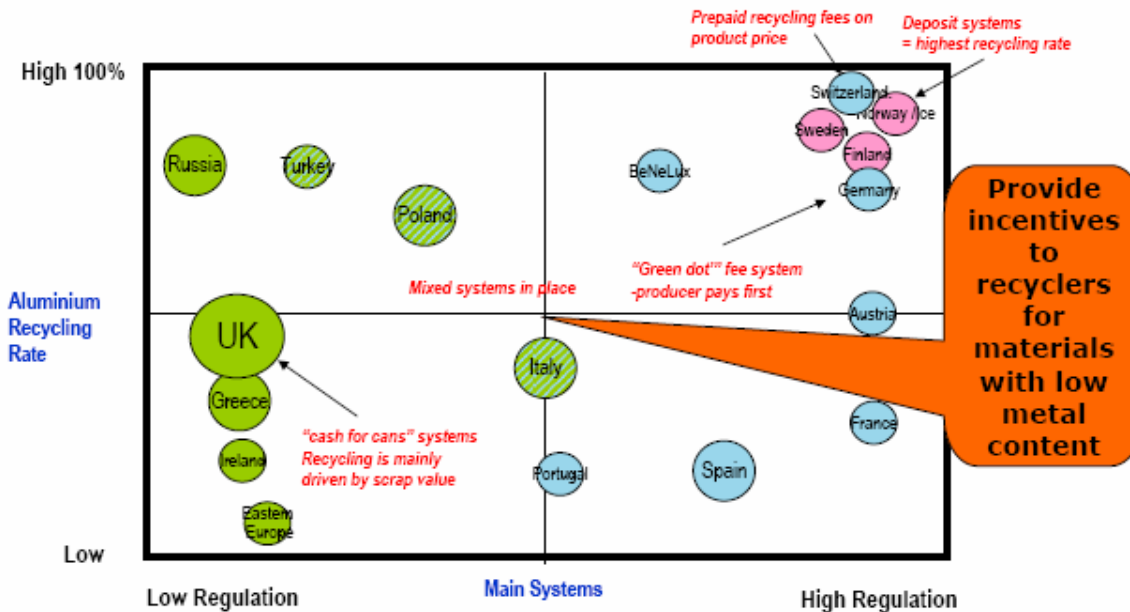


Need for quality collection

(70) 2010-03-03



## Challenge of collection



Source: EAA (aluminium beverage can)

(71) 2010-03-03



# 4

## End of waste criteria – when alu waste is declared a product

(72) 2010-03-03



## Implementing aluminium end of waste criteria – the issues

- Criteria: aluminium scrap which is sufficiently pure is classified a product
  - Sufficiently pure (by weight)
    - $\geq 90\%$  metal yield
    - $\leq 2\%$  **foreign material**
  - Assessment by EN 13920
- Expected draw-back for pure scrap (as defined above) falling out of
  - Waste Shipment Regulation - encouraging scrap leakage
  - Waste Framework Directive –encouraging a negative environmental impact
- REACH – 'Product' falls in scope

**We need a global  
level playing field**

### **We call for:**

- o **an economic & environmental impact assessment to address scrap leakage and to ensure proper treatment of waste in 3rd countries.**
- o **a re-examination of the technical definition to assess foreign material.**

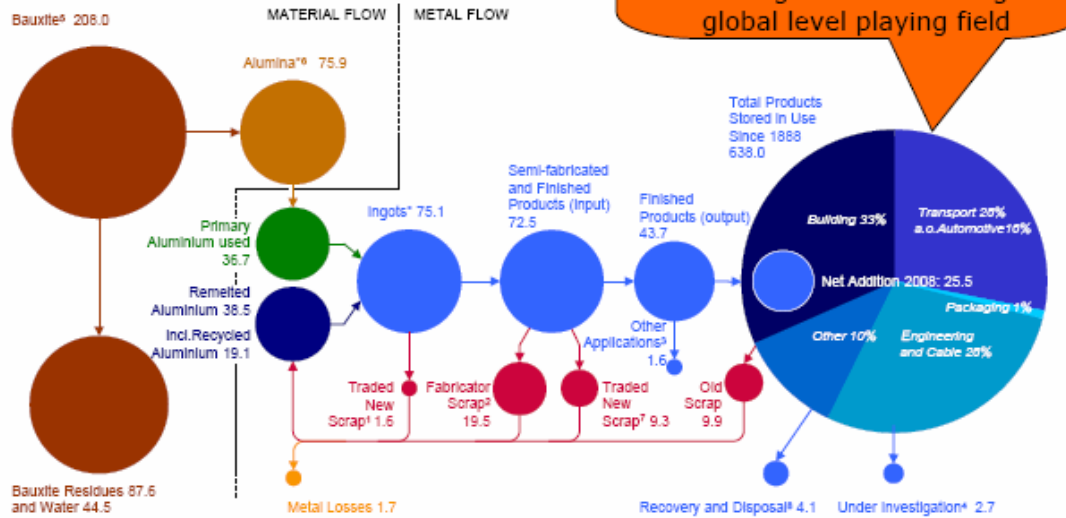
(73) 2010-03-03



(74) 2010-03-03



# 73% alu still in use globally since 1888



Ensure implementation of the principle of environment sound management – creating a global level playing field

Values in millions of metric tonnes. Values might not add up due to rounding. \*Change in stocks not shown  
 1 Aluminium in skimmings; 2 Scrap generated by foundries, rolling mills and extruders. Most is internal scrap and not taken into account in statistics; 3 Such as deoxidation aluminium (metal property is lost); 4 Area of current research to identify final aluminium destination (reuse, recycling, recovery or disposal); 5 Calculated based on IAI LCI report - update 2005. Includes, depending on the ore, between 30% and 50% alumina; 6 Calculated. Includes on a global average 52% alumina; 7 Scrap generated during the production of finished products from semis; 8 Either incinerated with/without energy recovery, material recovery or disposal.  
 Global end of life scrap – 22.7%

SOURCE: IAI 2008

(75) 2010-03-03



## **Annex A-4: EUROMETAUX "TRADE" ACTION**

- 1994 TBR complaint against South Korea and India for tariff escalation on copper raw materials**
- 1996 Submission on distortions caused by China on the copper scrap market**  
→ Bilateral consultations by EC + statistical surveillance of exports in 1999-2000
- 2001 Submission on export taxes operated by Russia in the frame of the WTO accession negotiations**  
→ On EC negotiation agenda but no satisfactory outcome
- 2002 Submissions on distortions caused by China on the copper raw materials market**  
→ Repeated EC interventions within the framework of the WTO China Transitional Review Mechanism
- 2003 2-year advocacy plan for awareness and alliance building at EU and national level on distortions in access to raw materials**
- 2004 Submission on the injury caused to the copper and aluminium refining sectors by competitive distortions caused by China on the copper raw materials and aluminium scrap markets**
- 2005 Submissions in the frame of the DDA for new disciplines on export taxes -** from then on, continuous monitoring of export restrictions operated on metal value chains worldwide and focused interaction with DG Trade and DG Enterprise  
→ EC proposals on export taxes and forbidden subsidies in the framework of the DDA  
→ Development of a data base in DG Trade and elaboration of a comprehensive action plan
- 2006 BUSINESSEUROPE position paper and BIAC discussion paper**
- 2007 EU Competitiveness Council calls for a coherent policy approach regarding raw materials and G8 Summit acknowledges importance of the issue**
- 2008 Raw Materials Initiative**