

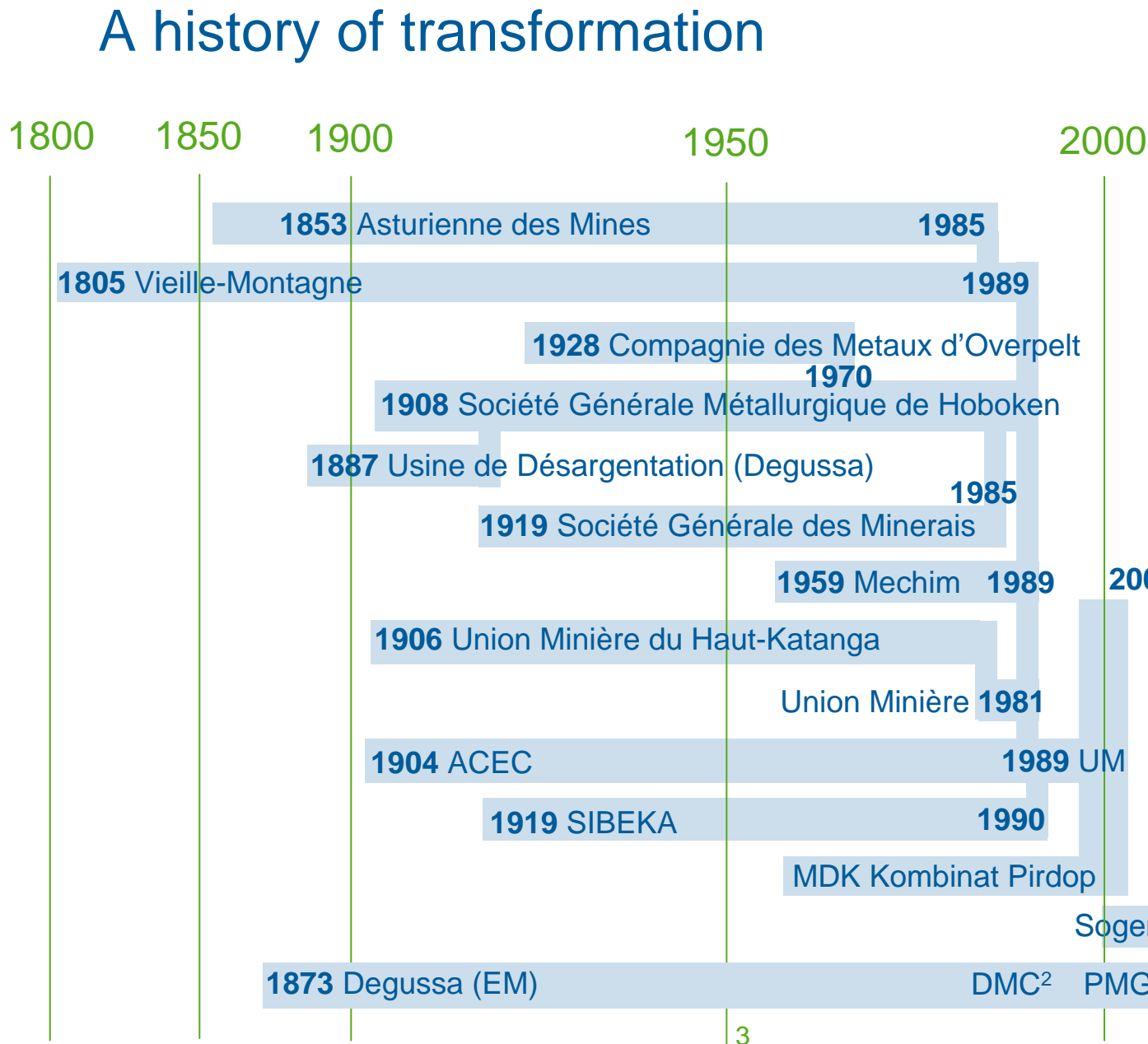


# Umicore Precious Metals Refining

Excellence in recycling

# Exploring Umicore





\* Smaller acquisitions not mentioned in this overview

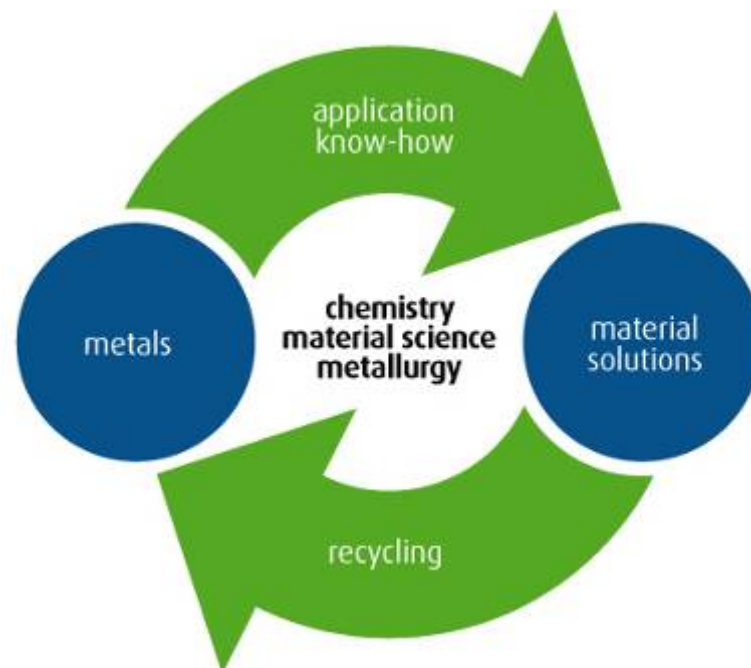
## Today, our company is...

- one of the world's biggest suppliers of automotive catalysts for passenger cars.
- a world leader in the production of key materials for rechargeable batteries used in laptops and mobile phones.
- a producer of high efficiency germanium-based solar cells are used in the bulk of the satellites launched today.
- the world's largest recycler of precious metals from old mobile phones, laptops, electronic scrap or spent catalyst material.

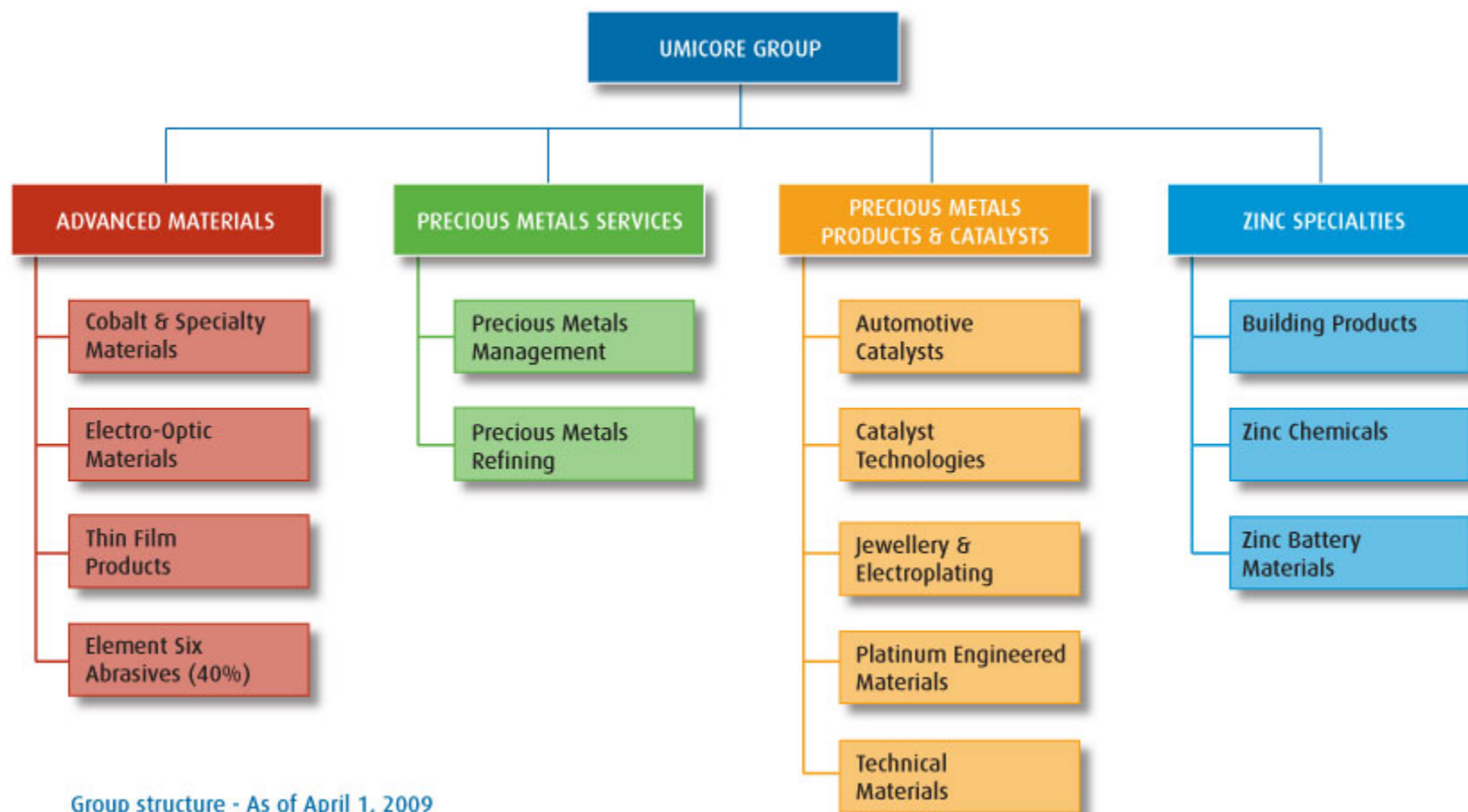
## A world leader in specialty materials

Metal related materials can be **efficiently and infinitely recycled**, which makes them the basis for sustainable products and services.

Umicore's expertise in **materials science**, **chemistry** and **metallurgy** can make a real difference, be it in products that are essential to everyday life or those at the cutting edge of new technological developments



# A decentralised, customer-focused organisation



Group structure - As of April 1, 2009



Umicore has industrial activities on all continents & serves an international customer base



# Committed to sustainable development

	2007 in mio €	2008 in mio €
Turnover	8,309.9	9,168.6
Revenues	1,910.0	2,123.6
EBIT	359.1	355.3
EBITDA	528.8	488.8
Net Consolidated Profit	653.1	121.7
Capital Employed	1,878.0	1,897.8
Workforce	14,844	15,447

Umicore recognizes that its commitment to financial success must also take into account the broader economic, environmental & social impact of its operations.

In June 2005 Umicore was ranked in the world's top-50 companies for combined financial & corporate social responsibility performance.

Umicore ranked 8<sup>th</sup> in terms of corporate social responsibilities.

**BEST IN CLASS**  
environmental and  
social performance  
STOREBRAND SRI



World Business Council for  
Sustainable Development

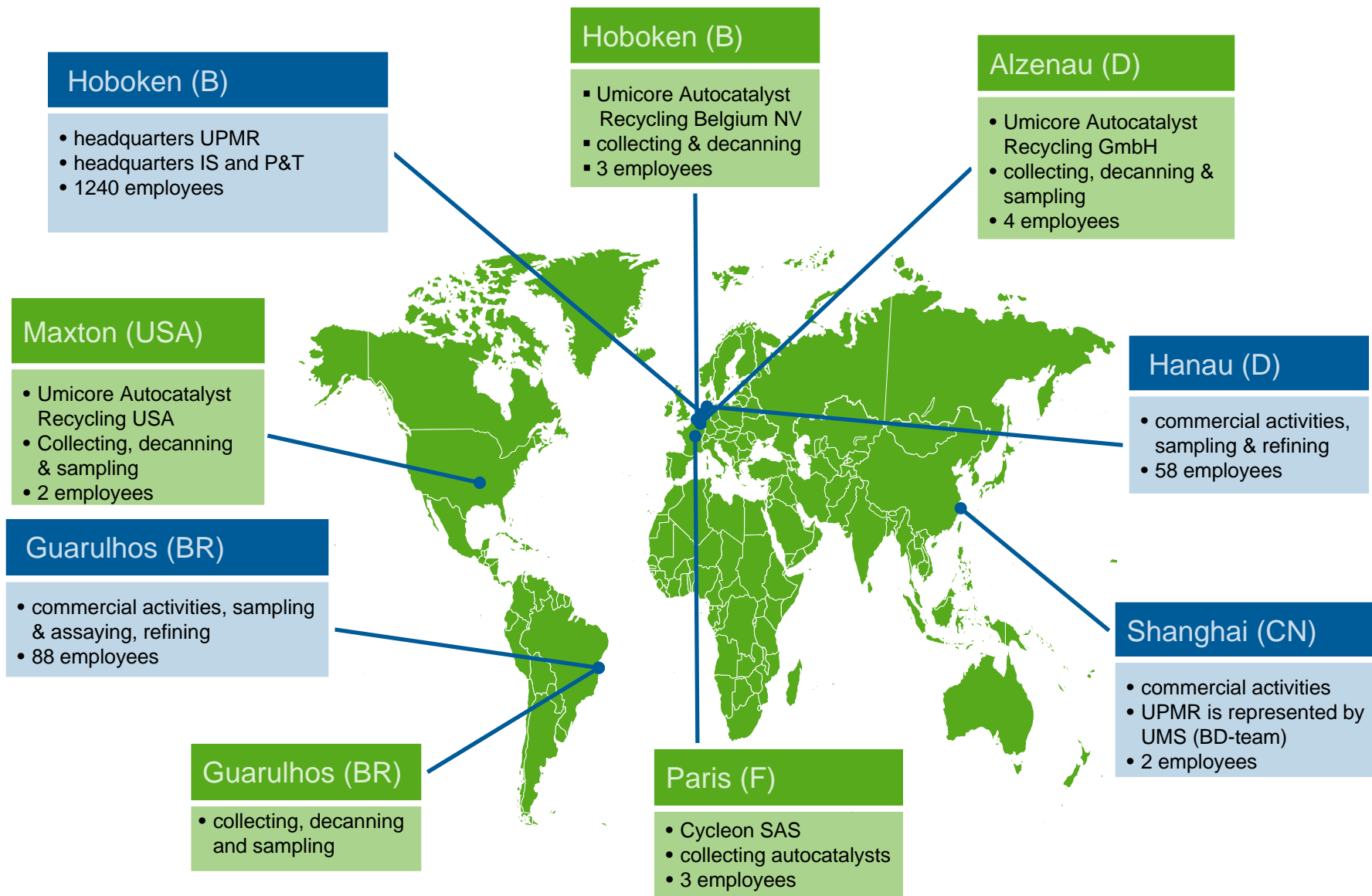




# Exploring Umicore Precious Metals Refining



# UPMR worldwide



# UPMR worldwide

## Hoboken (B)



- UPMR's largest industrial activities are located at Hoboken, near Antwerp
- around 1,240 people active in sampling & assaying activities, in smelting & refining operations or in commercial & supporting services
- first operations started in 1887 as a desilvering plant
- now the world's largest precious metals recycling facility

## Hanau (D)



- a sampling & sales department
- particularly the autocatalyst recycling facilities are run out of Hanau
- 58 people are active in Hanau

## Guarulhos (BR)

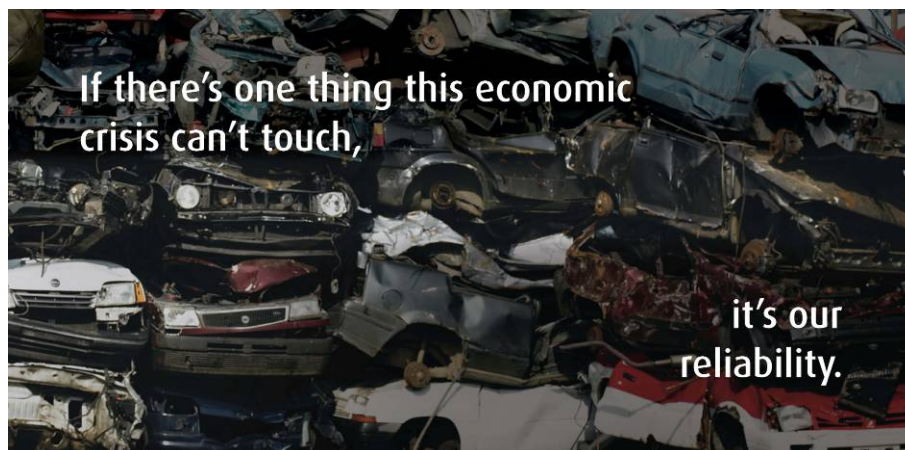


- silver & gold refining activities near Sao Paulo
- sampling & assaying
- the sales department is serving the South-American market in order to supply our Brazilian refinery as well as Hoboken's plant
- employment: 88 people



# UPMR: the leading precious metals recycler

- unique & innovative technology
- excellent services to an international customer basis
- wide range of complex precious metals bearing materials
- efficient recovery of 17 different metals
- applying world class environmental standards



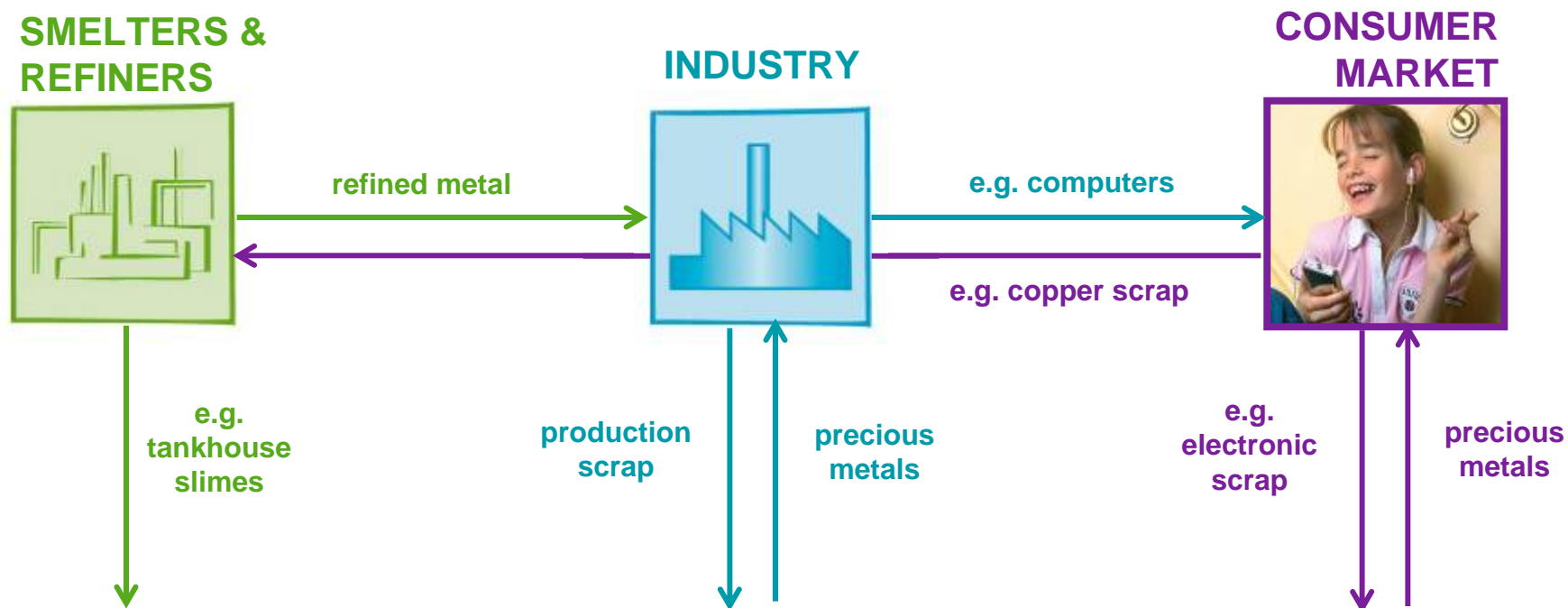
Spent autocatalyst recycling  
[www.autocatalyst-recycling.umicore.com](http://www.autocatalyst-recycling.umicore.com)  
Contact: [preciousmetals@umicore.com](mailto:preciousmetals@umicore.com)

# Umicore Precious Metals Services\*

## Key Figures

	<b>2007</b> <b>€million</b>	<b>2008</b> <b>€million</b>
EBITDA	173.3	218.2
EBIT	133.9	183.7
Average Capital Employed	201.8	221.1
ROCE	54.4%	80.1%
Capital Expenditure	52.1	60.9
Workforce	1,452	1,514
Surface	116 ha	116 ha

# Umicore Precious Metals Refining





## Our core business



## SUSTAINABLE DEVELOPMENT



# Raw Materials Supply

Each year UPMR processes around 350,000 tonnes of more than 200 different types of raw materials containing lead/copper/nickel & precious metals.



# Types of raw material: by-products

## By-products from non-ferrous industry



e.g. **slags** from nickel, PGM & PM industry and slimes processing



e.g. **copper cement** from zinc industry



e.g. **lead sulphate** from zinc industry



e.g. **flue dust** from nickel, PGM & PM industry



e.g. **electrolysis slimes** from copper industry



e.g. **drosses** from lead smelters

# Types of raw material: recyclables

## Recyclable products

### Spent Industrial Catalysts



industrial catalysts  
from oil refining &  
petrochemical  
industry

### Electronic Scrap



e.g. printed circuit  
boards

### Spent Automotive Catalysts



end-of-life  
car catalysts

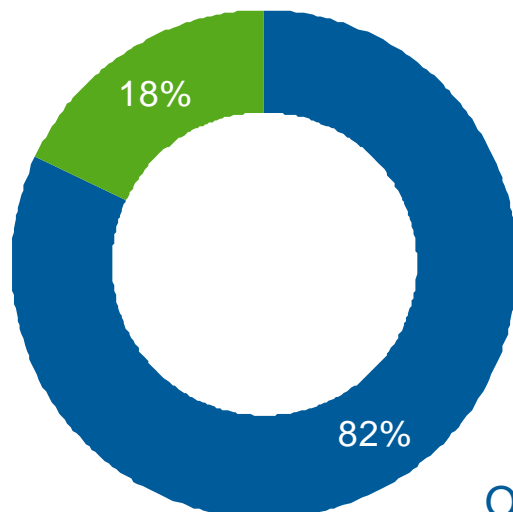
### Precious metal bearing raw materials



e.g. fuel cells,  
photographic  
residues

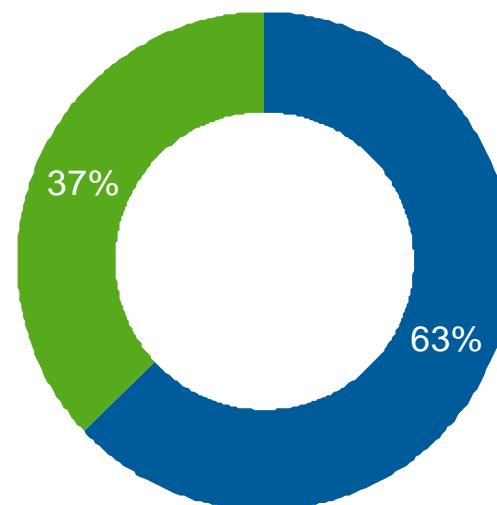
# Raw materials supply

Based on volume



Outlook 2009

Based on turnover



Outlook 2009



# Metals Sales

We recover and sell precious,  
special & base metals,  
chemicals & derivated products.





# UPMR has flexible capacity for PMs

**Ag**

**Au**

**Pt**

**Pd**











**Rh**



<b>Capacity t/y</b>	2,400	100	25	25	5
<b>Output t/y</b>	1,200	25	20	20	4
<b>From recyclables</b>	25%	25%	65%	65%	30%

# Base & special metals

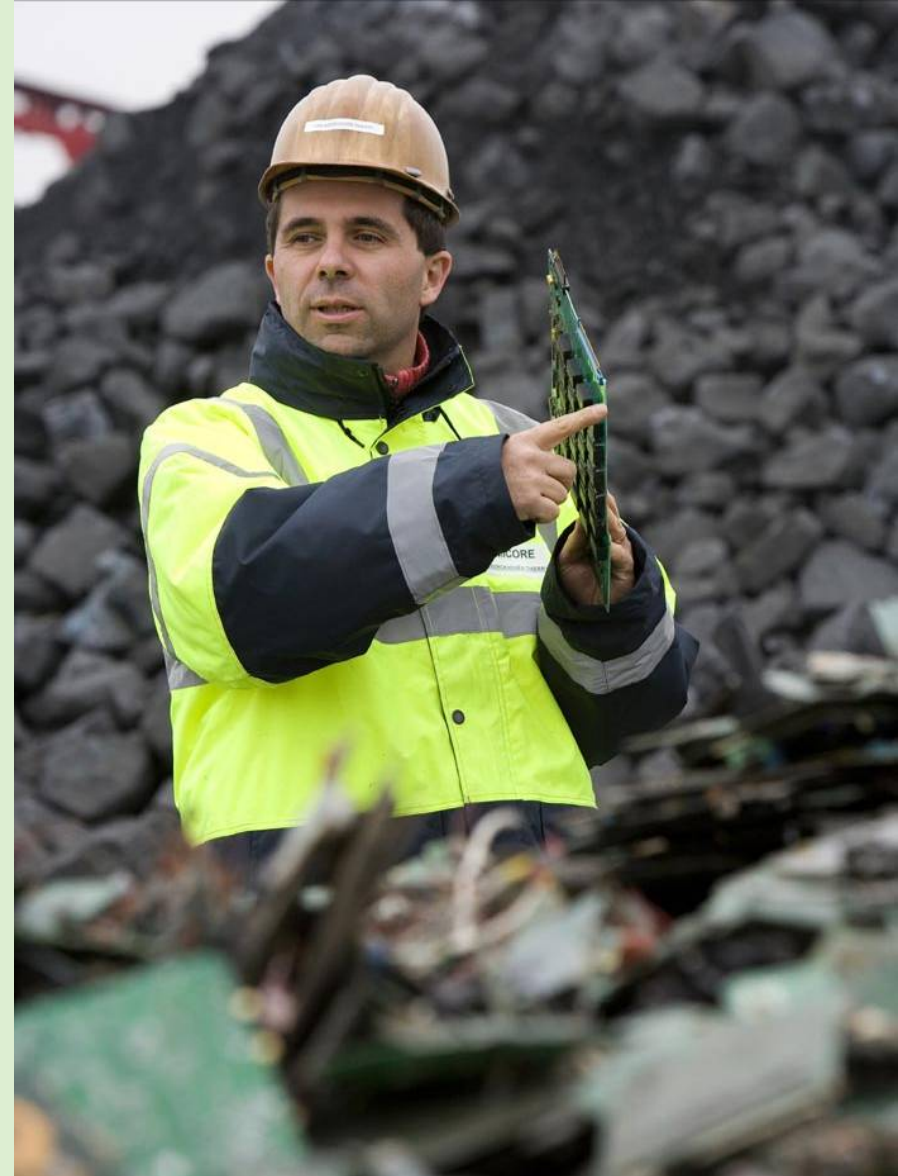
## Capacities for other non - PM elements

									
Pb	Cu	Sb	Sn	Bi	Ni	In	Se	Te	Slags
125,000t	30,000t	3,000t	1,000t	400t	2,000t	50t	600t	150t	140,000t

# Customer Support

UPMR provides a complete range of commercial & financing services for an optimal match with our costumers' needs.

Logistical assistance is provided as well as cross border transports & all legislative related matters.





# Comprehensive customer service



- present **worldwide** to provide all necessary support
- provides its clients complete incoming & outgoing **logistical assistance** for raw materials and for refined metals & products
- assists the customer in taking care of all environmental & administrative obligations resulting from international waste regulations & shipments, such as the **Basel Convention** & the **Decision of the OECD Council**
- **VAT warehouse** allows our clients to trade with their metal credit loco Hoboken without VAT registration in Belgium & without declaration to the related EU Tax authorities

# Metal Management Service

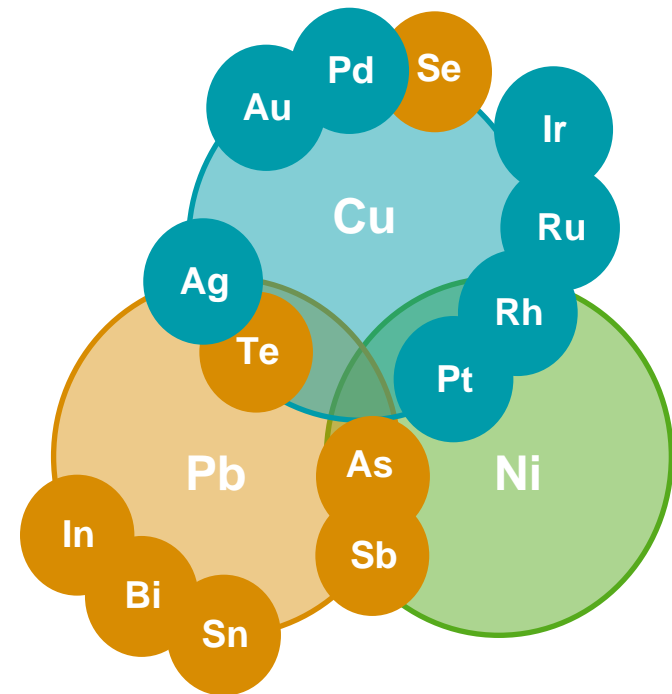
- **optimal metal valorisation** is ensured by team of experts, watching closely London fixings & market information
- supplier's **risk management** can be facilitated through forward pricing, transmission of limit orders or more specific solutions
- **refined metals can be returned or repurchased** at the best available market conditions
- clear **individual metal accounts** reflect all of the results of the metal transactions
- UPMR offers **special services** like financing, leasing, swaps, metal account transfers, pledges, early metal returns, market information, regular metal statement...



# Recycling & Refining

Pb, Cu & Ni drive our unique recycling process. By using the specific properties of these collector metals, precious & other secondary metals are recovered with the greatest efficiency.

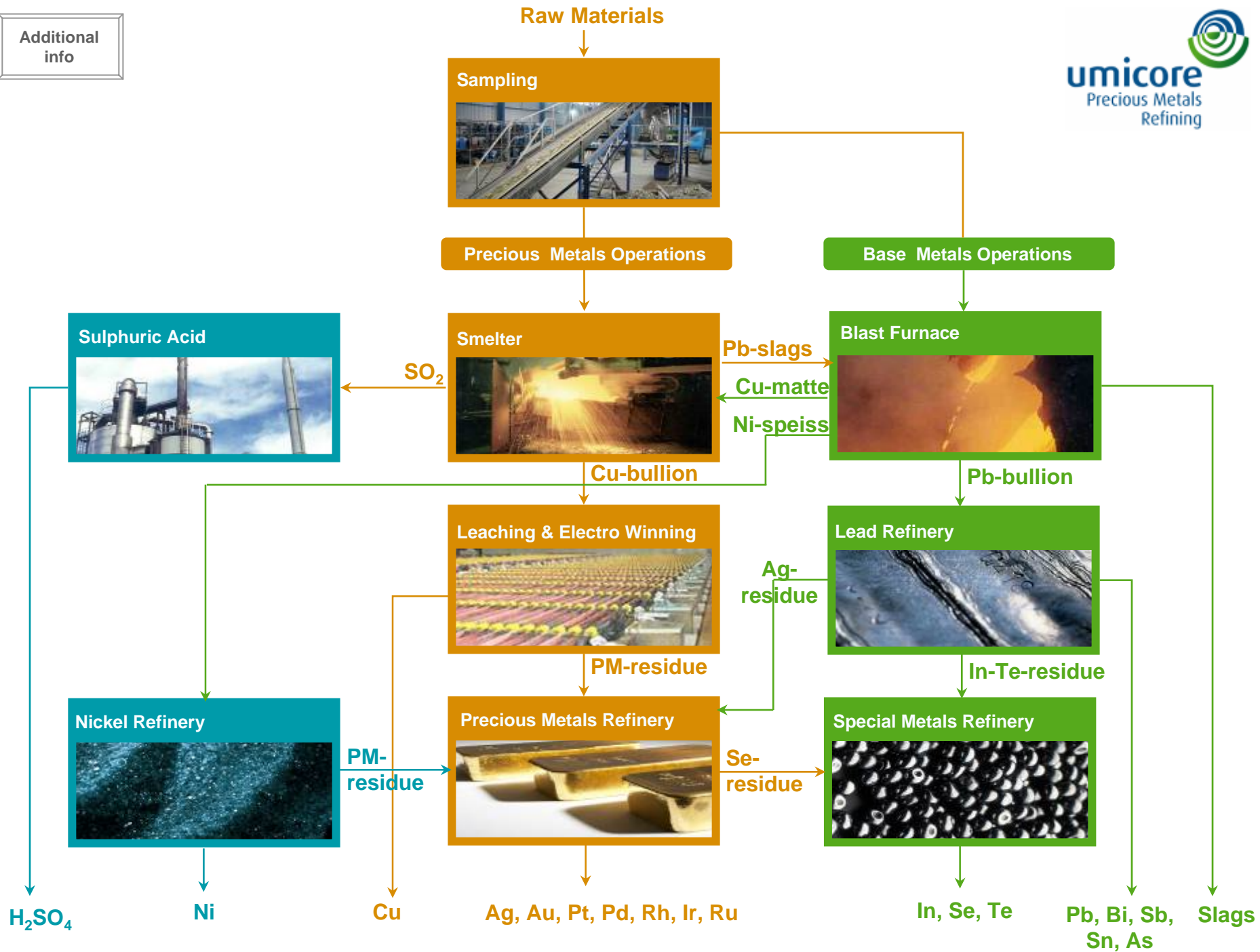
Our in-house developed Precious Metals Refinery is one of the world's largest & most efficient refining facilities.



**a unique metallurgy**







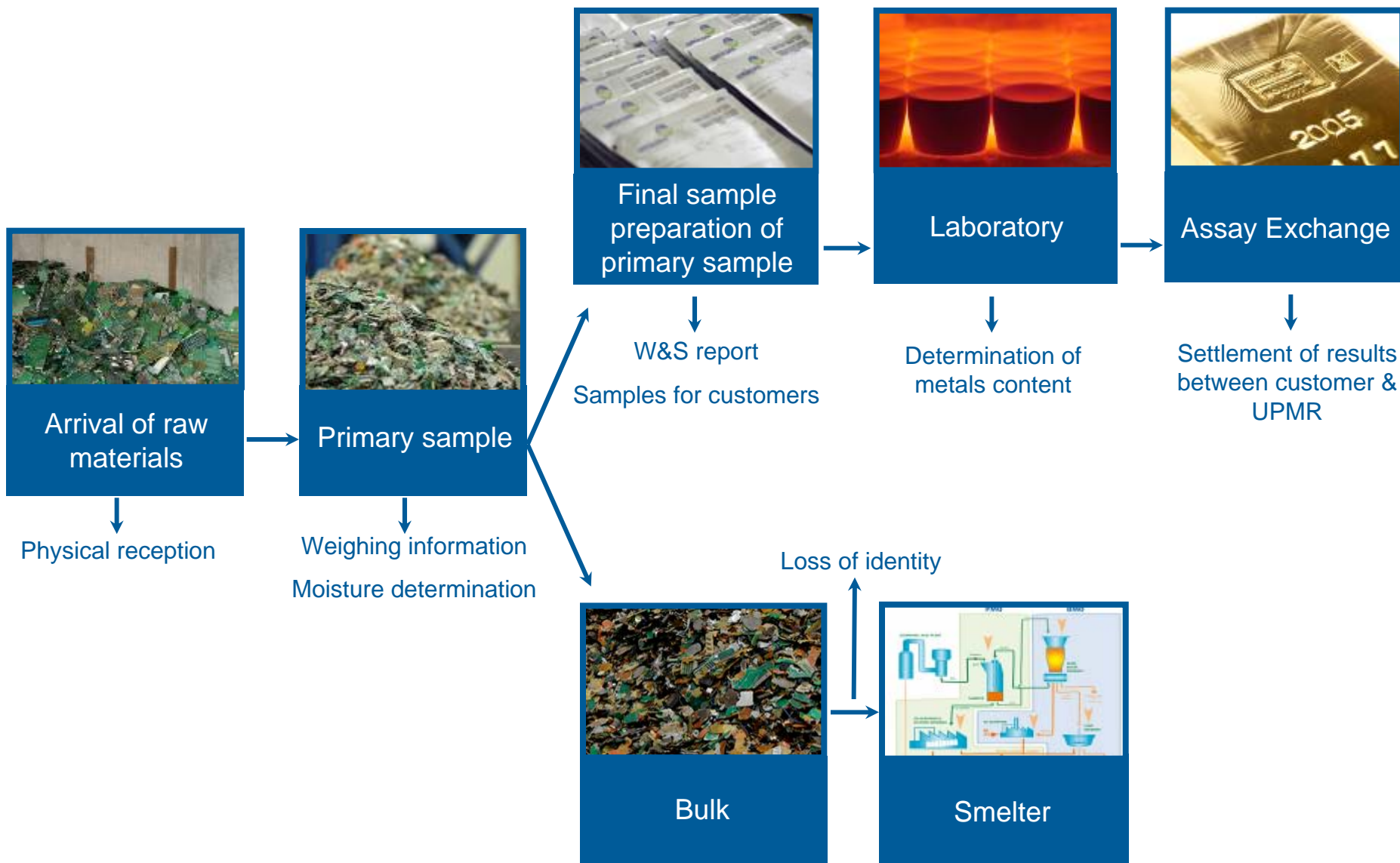
# Sampling & Assaying

The wide variety & complexity of incoming materials mean that sampling & assaying are key success factors in determining our customer's financial yield.

UPMR allocates more than 15% of its operating budget to these services.



# Raw materials flow





# Sampling



- unique state-of-the-art facilities
- dedicated to process all raw materials
- key drivers:
  - maximizing automations
  - adequate capacities in growing segments (e-scrap, auto catalysts...)
  - shortening the lead times
  - respecting environmental, health & safety standards
- employment: 130 people
- secured area
- ± 8000 lots & 350,000 t/year

# Main sampling process

<b>Autocatalysts</b>		<ul style="list-style-type: none"> <li>Decanning &amp; sampling of ceramic converters in Hoboken (B) &amp; Hanau-Alzenau (D)</li> <li>Shredding &amp; sampling of metallic converters in Alzenau (D)</li> </ul>
<b>Electronic scrap</b>		Two separate lines for shredded & unshredded
<b>Fine free-flowing material</b>		Sampling via blending, e.g. sweeps, industrial catalysts
<b>Metallic material</b>		Sampling after remelting
<b>Wet material</b>		<ul style="list-style-type: none"> <li>Homogenisation by mixing</li> <li>Automatic spear sampling, e.g. leach products, slimes</li> </ul>
<b>Lumpy material</b>		Sampling via milling
<b>Liquid spent</b>		Homogenisation; increments from bulk flow, e.g. spent homogeneous Rh catalyst

**Final sample preparation**

# Assaying

- recognized leadership in the precious metals industry
- an up-to-date analytical equipment, supported by:
  - a robust quality assurance system
  - a laboratory information & management system
- key drivers:
  - customer orientation
  - respect for short lead times
  - continuously investment in analytical research & method improvement
- employment: 100 people
- 55,000 samples/y





# Assaying process



- internationally recognised by our customers in precious metals assaying using conventional fire assay & chemical procedures
- in-house developed technologies/processes
- extensive wet chemistry experience
- environmental analysis, including dioxins (by Gas Chromatography – Mass Spectrometry)
- trace metals determination
- broad range of instrumental techniques, e.g. X-Ray Fluorescence

# Sustainable Development

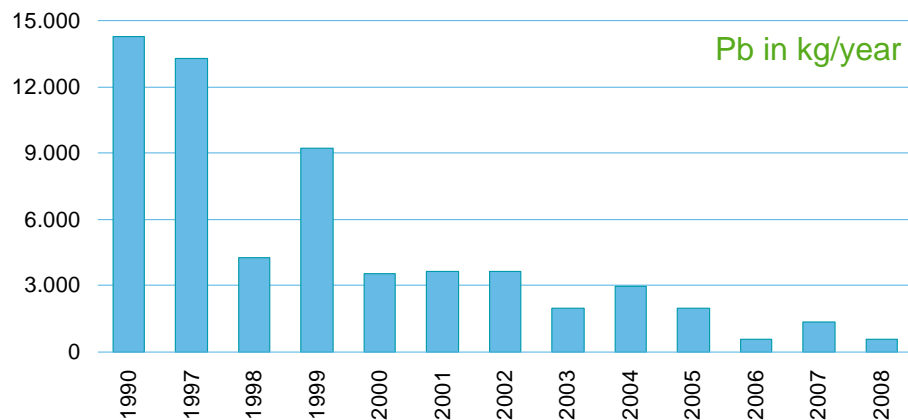
For UPMR this implies:

- continuous improvement of environmental performance
- social responsibility especially towards the local community
- a challenging & supporting policy towards our employees
- economic sound management in a Total Quality approach

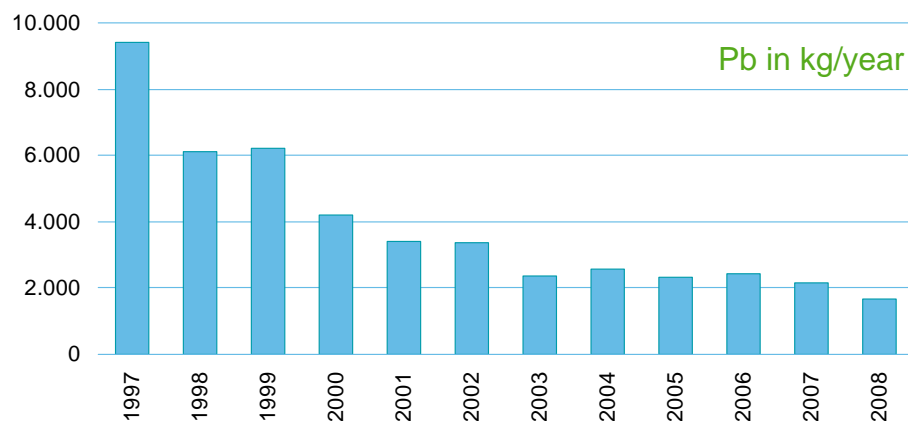


# Environment: reduction of air emissions

## Stack air emissions



## Diffuse air emissions



## Environment: waste water treatment

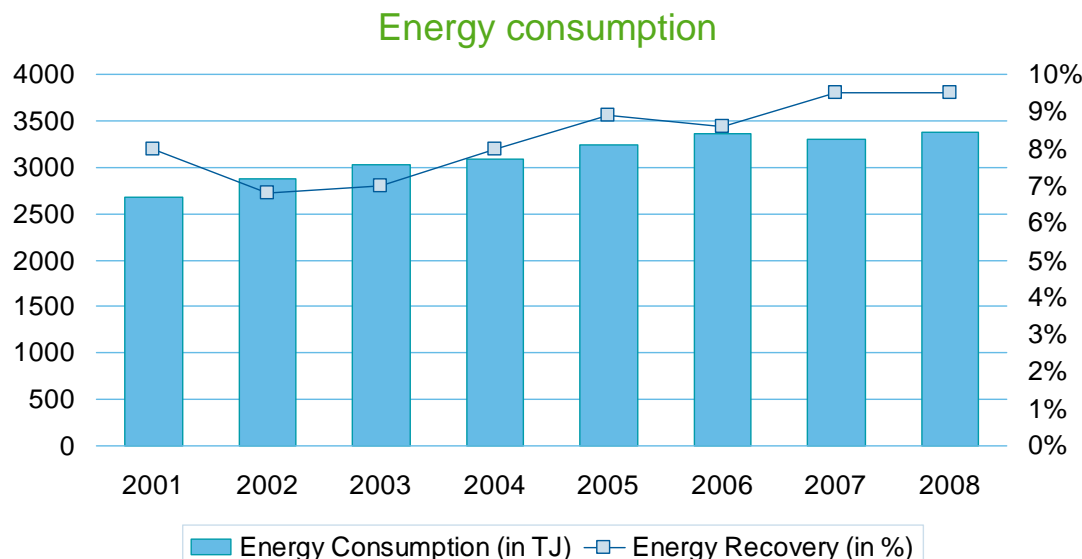


- all site waters (process water, cooling water, rain water, sprinkling waters...) are treated; there is no direct drain to the River Scheldt
- 2/3 of all treated water is reused in the plant
- strict compliance with emission standards: quality of flushing water is meticulously observed



# Environment: contribution to Kyoto Protocol

- UPMR strives to respect the climate change/CO<sub>2</sub> objectives:
  - heat recovering facilities at Smelter, Blast Furnace & Lead Refinery
  - efficiency increase at LEW
  - several improvement projects
- covenant with the authorities: pledge to stay within the world top for energy efficiency





## Social responsibility: soil remediation Moretusburg & Hertogvelden



- replacement of historically contaminated soil by clean soil
- 750 houses & public area
- activities started in September 2006 & were finished in summer 2008



## Social responsibility: communication & information

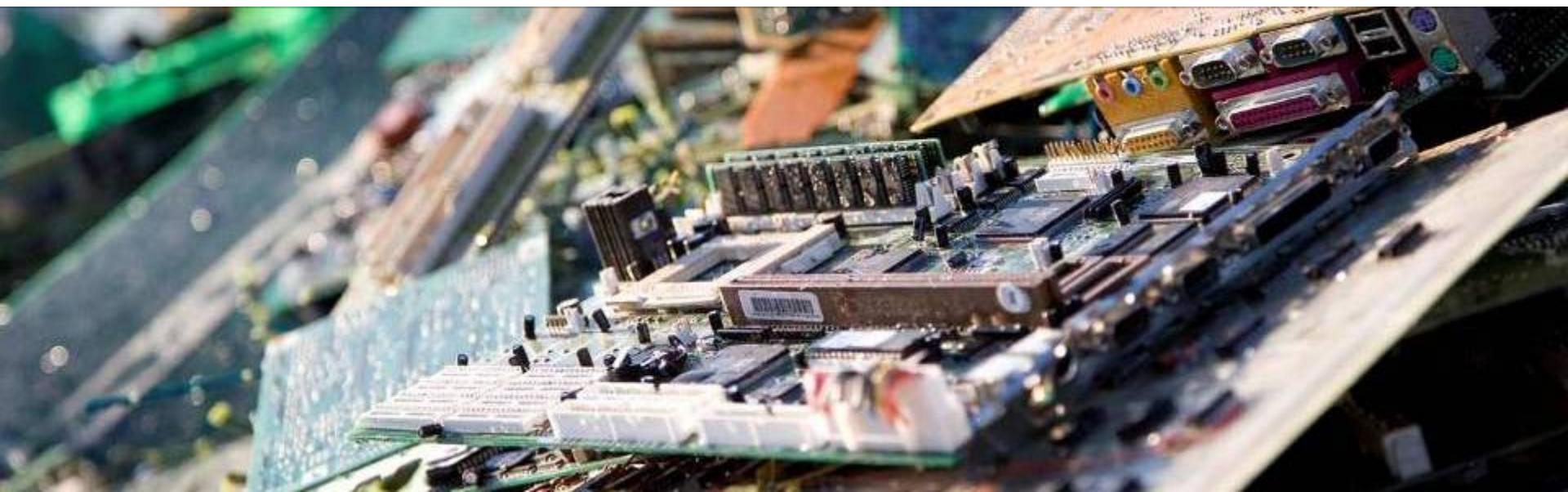
- yearly environmental report, distributed on 7,000 copies
- yearly information session to inhabitants
- consultation Committee with representatives of residents & authorities
- toll-free telephone number 24/7
- visits, open house...
- special communication efforts for soil remediation project of Moretusburg

## Recent make-over

At the start of the **nineties**

- strategic decision for recycling
- “extreme makeover” of the plant
- clean-up of historical pollution

⇒ **investment** of **400 mio euro** during 1996 - 2008





# Rehabilitation of historically polluted areas



1998: before the clean-up



2001: after the clean-up

# Facelift



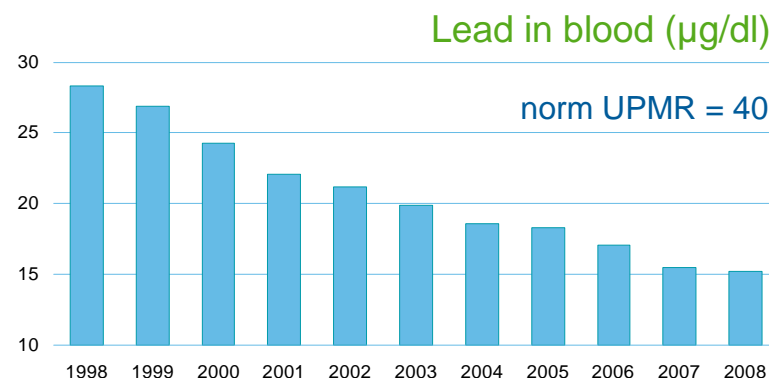
- support new image
- further improvement of the working environment (comfort & safety)
- welcome visitors/clients more attractively
- improve training facilities
- what?
  - modern zinc & glass reception
  - renovation administrative building
  - the facade of the surrounding buildings will be renovated too



# Health & safety

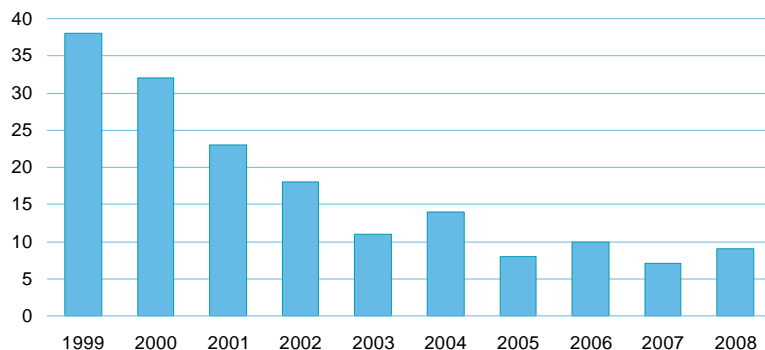
UPMR continuously improves its occupational health & safety performance

- occupational **health monitoring**:
  - bio-monitoring
  - workplace analysis
  - vaccination
- **comfort**:
  - ergonomics
  - advice & training for use of computers
- **well-being**
  - alcohol, drugs & non-smoking policy
  - stress management
- **health**
  - own medical service
  - reduction program for lead in blood of employees

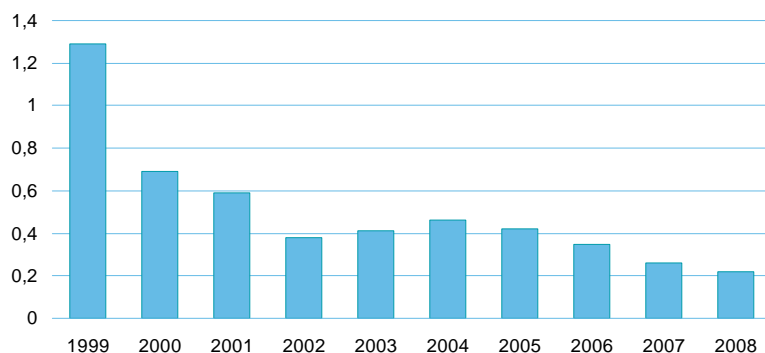


# Health & safety

## Frequency lost time accidents<sup>1</sup>



## Severity lost time accidents<sup>2</sup>



<sup>1</sup> number of accidents x 1.000.000 / number of hours worked

<sup>2</sup> number of lost time days x 1.000 / number of hours exposure 60

Safety policy based on:

## Technique

- risk analysis of installations
- identification & follow up of critical components
- reliability of safety systems
- fire & explosion restriction

## Organization

set up & audit of safety procedures

## Human

sensitivity & motivation of all employees

# Sustainable employment

world leader thanks to **all** our employees ⇒ it is our **duty** to strive for:

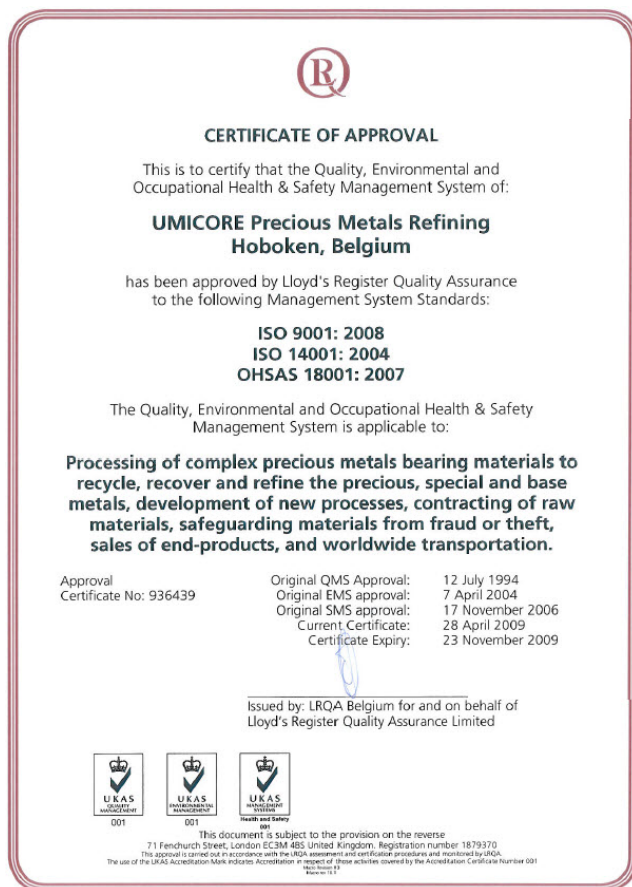
- sustainable employment
- a safe & healthy working environment in which we stimulate our employees' development
- respect for each individual

leads to a steady/growing employment:

- 1390 employees in Hoboken: important regional employer
- more than 150 recruitments in 2008
- space for alternative employment (e.g. green team, adjusted work)



# A Total Quality approach



Our Total Quality system is driven by the European Foundation of Quality Management (EFQM) model. The EFQM approach is formalized in **one integrated management system** certified against international standards.

- environmental care system certified according to ISO14001: "... very well designed and implemented ..."
- ISO 9001: quality management
- OHSAS 18001: safety certificate



# umicore

## Precious Metals Refining

[www.preciousmetals.umicore.com](http://www.preciousmetals.umicore.com)

[www.electronicscrap.umicore.com](http://www.electronicscrap.umicore.com)

[www.autocatalyst-recycling.umicore.com](http://www.autocatalyst-recycling.umicore.com)

[www.industrialcatalyst-recycling.umicore.com](http://www.industrialcatalyst-recycling.umicore.com)