Closing the loop: Umicore contribution towards a resource efficient society

Stephan Csoma, Umicore
Umicore: a history of transformation

1800s to 2007

Umicore today

- Umicore’s predecessor companies were involved primarily in mining, smelting and refining of metals
- 1990s: Repositioning through an industrial plan which moved away from mining and focused on transformation and products
- From 2003: Completion of exit from commodity metal production and focus on high value added material solutions and recycling
Umicore journey

1990s

Industrial Plan
Laying the foundations for financial survival

Late ‘90s –’00s

Product focus
Build the downstream product businesses

Mid-’00s

Transformation
Transforming divestments and acquisitions

Late ’00s - 2010

Building for the future
Increasing focus on clean technologies

Basic approach
Local programmes and no co-ordination

Dealing with the past
Tackling historical environmental legacy

A common approach
Combining social & environmental aspects

Setting the standard
Achieving a common level for all businesses

Process innovation
FSD Hoboken flowsheet NSB (Ge)

Process innov. & ideation
Hoboken flowsheet Umagine

Materials technology
R&D intensity increases exponentially

Clean technology
Leveraging common platforms

= industrial

= EHS, social

= innovation, R&D
Dealing with the past: taking care of historical legacies

Before

After
Umicore today is ...

- Providing automotive catalysts for one in three passenger cars in the world

- A world leader in the production of key materials for rechargeable batteries used in a quarter of the world’s laptops & mobile phones

- Producing the germanium substrates for high-efficiency solar cells that are used in the bulk of the satellites launched today

- Providing recycling services for the most complex raw materials and is able to extract more than 20 different metals
Umicore’s business approach

- We transform metals into hi-tech materials
- We use application know-how to create tailor-made solutions in close collaboration with our customers
- We close the loop and secure supply by recycling production scrap and end-of-life materials
- We build on unique metals properties: metals are infinitely recyclable
Closing the loop at Umicore

- Umicore operates the world’s largest precious metals refining installation in Hoboken, Belgium
  
  - 0.5 billion euros invested in past 15 years in innovation to maximize metals recovery and minimize environmental impact
  - Comprehensive flowsheet: 17 metals of which 7 precious metals
  - Up to 350,000 tons of material from industrial by-product waste and urban mines (e.g. electronic scrap, automotive catalysts) are processed per year => maximise efficient use of available resources

- Expanding to other End of Life products and related metals: recycling of rechargeable batteries; recycling of PV production scrap

- Umicore efficient refining/recycling turns by-products and waste into valuable resources. It offers a crucial contribution to a circular and sustainable economy
“Less is more”: Examples of Umicore in-house materials supply

- cathode materials for rechargeable batteries
- platinum group materials (PGMs) for automotive catalysts and fuel cells
- precious metals for electroplating and contact materials
- germanium for high efficiency germanium substrates
- indium used in sputtering targets for LCD, LED, solar cells
- zinc for zinc powders and oxides, building products
Clear growth focus and expectations

+ Innovation as a integrated driver of success in all areas

+ Performance-based environmental and social objectives

= One, integrated sustainable development strategy....

No trade-offs!
Fostering a resource efficient society

- Umicore business model goes beyond recycling into resources-efficient use and re-use (primary and secondary)

- Primary by-products bearing low metal content are processed at Umicore together with end-of-life products to extract valuable resources

- Umicore moved from in-house technology development into advocacy to address the whole value chain

- Policy makers and industry need to work together across the entire value chain
Resource efficiency/recycling success depends on effectiveness of each step in the value chain.

Example: $50\% \times 90\% \times 80\% \times 95\% = 34\%$

Complex products require a well organised & dedicated recycling chain!
The “urban mine” – a huge & rich “above ground deposit” for precious metals

• Primary production: ≈5 g/t Gold in ore located, some from 3000 meters deep
• Recycling: 350 g/t Gold in cell phones located above ground

Umicore Hoboken secondary production saves 1 million tons of CO2 emission per annum compared to primary mining
The “urban mine” is growing continuously

- 8.6 billion devices for a contained metal value of 9 billion euros, including 200 tonnes Gold
- Recycling potential around 800 million units per anno x 100 g = 80,000 t/a. In reality, less than 3% of old mobiles are recycled!
Resource efficiency through best available technologies

Back-yard recycling = low tech
- some recycling in developing countries
- total Au-recovery efficiency only 25%, while health & environmental damage is dramatic
- virtually no recovery of other metals

Best Available Technology (BAT) precious metals refining = high tech
- high precious metals yields: > 95%
- special & base metals recovered
- elimination of hazardous substances
- high environmental standard
Urgent required actions to realize the full potential of a closed loop approach

- Increase the collection of end-of-life products
- Prevent illegal & dubious exports of relevant end-of-life products
- Create a level playing field internationally
- Foster innovation in recycling technologies along the entire value chain
Conclusions: Umicore aligned with key megatrends

- Resource scarcity
- Renewable energy
- More stringent emission control
- Electrification of the automobile
Conclusions

• Today, Umicore produces in-house the equivalent of 50% of its products supply requirements. This contributes to the circular economy and reduces CO₂ emissions substantially

• Efficient materials use and wider scale collection and recycling are essential to ensure sustainable and secure materials supply

• Umicore has been demonstrating that efficient use of resources and recycling is a profitable and sustainable business model offering investment, innovation and employment opportunities for Europe
Thank you!

Stephan Csoma
Senior Vice-President
Government Affairs
Umicore
stephan.csoma@umicore.com