




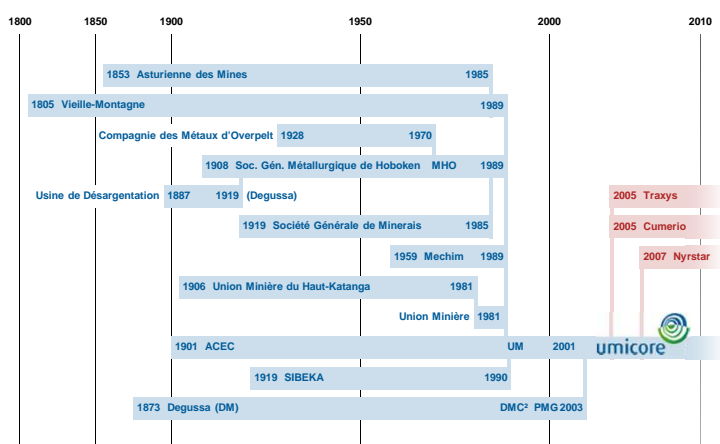

umicore
materials for a better life

Umicore's transition towards a sustainable corporation

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Senior Vice President Government Affairs

OMC Manufacturing Cyclus Part 1 - World Class Production Tools
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Umicore's history: the roots

The timeline illustrates the historical roots of Umicore, starting from 1800 and ending in 2010. Key milestones include the formation of various mining and metallurgical companies, their subsequent mergers, and the final acquisition of Umicore in 2001. The timeline is divided into two main color-coded sections: blue for the historical period (1800-2000) and red for the modern period (2000-2010).

Year	Company Name	Year	Company Name
1805	Vielle-Montagne	1985	Asturienne des Mines
1805	Vielle-Montagne	1989	Vielle-Montagne
1828	Compagnie des Métaux d'Overpelt	1970	Compagnie des Métaux d'Overpelt
1887	Usine de Désargentation	1919	Usine de Désargentation (Degussa)
1887	Usine de Désargentation	1985	Société Générale de Minerais
1901	ACEC	1981	Union Minière
1901	ACEC	2001	UM
1906	Union Minière du Haut-Katanga	1981	Union Minière
1906	Union Minière du Haut-Katanga	1981	Union Minière
1908	Soc. Gén. Métallurgique de Hoboken	1989	MHO
1908	Soc. Gén. Métallurgique de Hoboken	1989	MHO
1919	SIBEKA	1990	SIBEKA
1919	SIBEKA	1990	SIBEKA
1959	Mechim	1989	Mechim
1959	Mechim	1989	Mechim
2005	Traxys	2005	Cumerio
2005	Traxys	2005	Cumerio
2007	Nyrstar	2007	Nyrstar
2007	Nyrstar	2007	Nyrstar
2001	UM	2001	umicore
2001	UM	2001	umicore
1873	Degussa (DM)	2003	DMC ² PMG 2003
1873	Degussa (DM)	2003	DMC ² PMG 2003

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Our elements

Umicore's products and services cover 26 different metals and materials



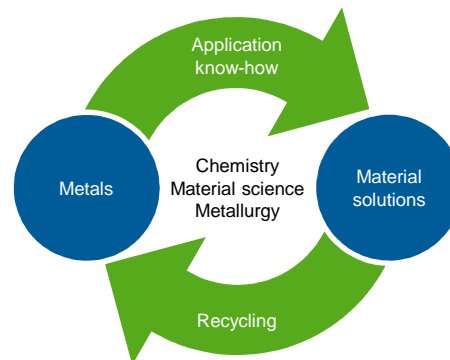
1 H 1.008																	2 He 4.003
3 Li 6.94	4 Be 9.01											5 B 10.81	6 C 12.01	7 N 14.01	8 O 16.00	9 F 19.00	10 Ne 20.18
11 Na 22.99	12 Mg 24.31											13 Al 26.98	14 Si 28.09	15 P 30.97	16 S 32.07	17 Cl 35.45	18 Ar 39.95
19 K 39.10	20 Ca 40.08	21 Sc 44.96	22 Ti 47.87	23 V 50.94	24 Cr 52.00	25 Mn 54.94	26 Fe 55.85	27 Co 58.93	28 Ni 58.69	29 Cu 63.55	30 Zn 65.41	31 Ga 69.72	32 Ge 72.64	33 As 74.92	34 Se 78.96	35 Br 79.90	36 Kr 83.80
37 Rb 85.47	38 Sr 87.62	39 Y 88.91	40 Zr 91.22	41 Nb 92.91	42 Mo 95.94	43 Tc [98]	44 Ru 101.07	45 Rh 102.91	46 Pd 106.42	47 Ag 107.87	48 Cd 112.41	49 In 114.82	50 Sn 118.71	51 Sb 123.76	52 Te 127.60	53 I 126.90	54 Xe 131.29
55 Cs 132.91	56 Ba 137.33	57 La 138.91	58 Ce 140.12	59 Pr 140.91	60 Nd 144.24	61 Pm [145]	62 Sm 150.36	63 Eu 151.96	64 Gd 157.25	65 Tb 158.93	66 Dy 162.50	67 Ho 164.93	68 Er 167.26	69 Tm 168.93	70 Yb 173.04	71 Lu 174.97	
87 Fr [223]	88 Ra [226]	89-103 Rf [261]	104 Db [262]	105 Sg [265]	106 Bh [264]	107 Hs [277]	108 Mt [268]	109 Ds [271]	110 Rg [272]								
89 Ac [227]	90 Th 232.04	91 Pa 231.04	92 U 238.03	93 Np [237]	94 Pu [244]	95 Am [243]	96 Cm [247]	97 Bk [247]	98 Cf [251]	99 Es [252]	100 Fm [257]	101 Md [258]	102 No [259]	103 Lr [262]			

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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 aim to minimize our environmental impact and be the best employer and neighbour

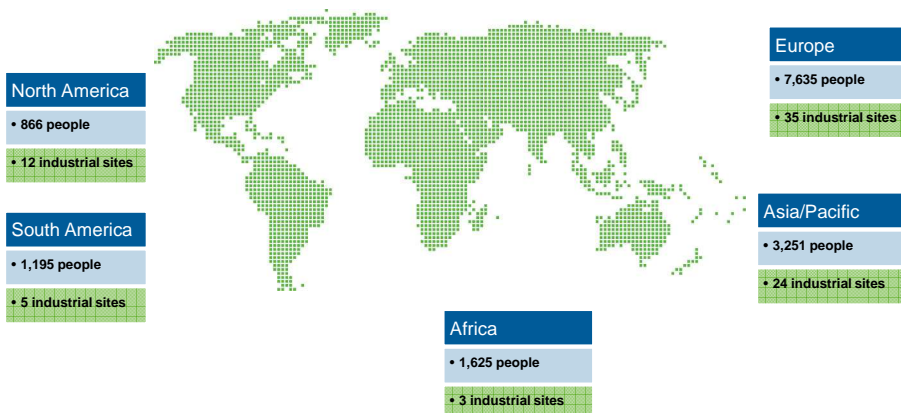


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Key megatrends for Umicore



Global presence: 14,600 people in 79 industrial sites



Umicore's transformation: A change in the business profile & in mentality

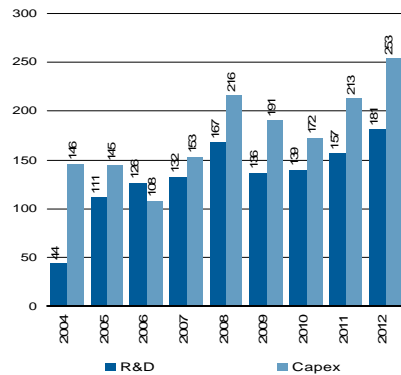


Capital intensive
metal refiner



R&D intensive
materials technology
company

R&D & Capex
(in million €)




Change in business mentality


- *Process development / engineering*
- **Science / Research**
- *Secretive, in house developments*
- **Open innovation, collaborative**
- *Inwards looking*
- **Customer intimacy**
- *Slow and cautious evolution*
- **Fast launching of new products**
- *Little communication*
- **Attention to PR and stakeholders**

Umicore number 1
in global 100 sustainable companies




Umicore's businesses






Energy Materials

- We develop materials which enable the clean production and storage of energy
- The business is driven by the demand for clean, low-carbon energy solutions




Recycling

- We operate a unique recycling process to deal with complex industrial residues and end-of-life materials
- The business is driven by materials scarcity and recycling legislation



Catalysis

- We develop technologies to treat automotive emissions
- The business is driven by increasingly stringent emission norms to promote clean air





Performance Materials

- We produce a range of essential materials and chemicals based on precious metals and zinc
- Diverse applications: e.g. high-purity glass, construction, pharma, electrics/electronics

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Umicore's businesses





Performance Materials

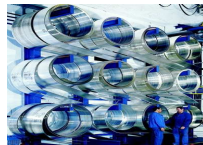
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Example of manufacturing in the Business Unit Jewellery & Industrial Metals



- Provides gold, silver and other precious metals containing manufactured products to the jewellery sector and industrial applications
- Closed loop offering for precious metals products, refining and related PM supply services, with focus on recycling of high-value scraps & sweeps



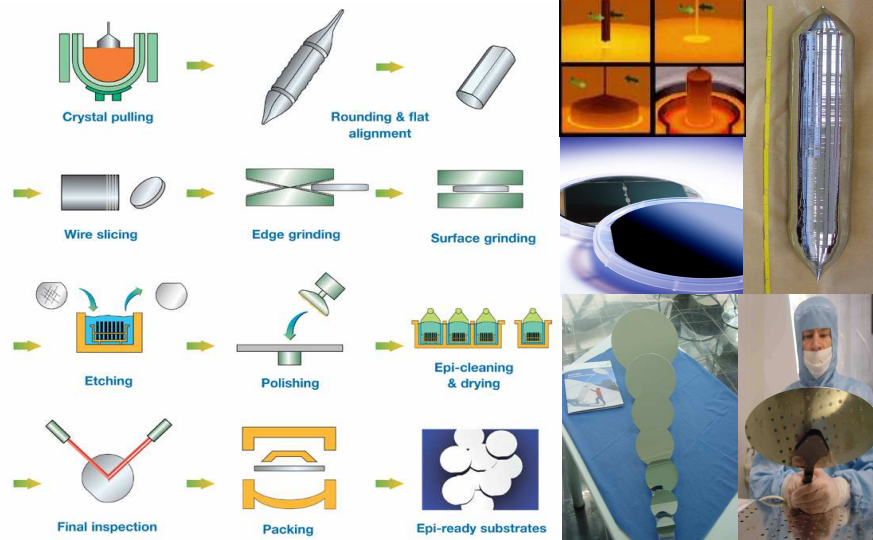
Umicore's businesses



- We develop materials which enable the clean production and storage of energy
- The business is driven by the demand for clean, low-carbon energy solutions

Example of manufacturing in the Business Unit Electro-Optic Materials

Materials for multi-junction Photovoltaics



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Applications of multi-junction solar cells Concentrator Photo-Voltaics (CPV)



- Condition for use of germanium based cells on earth : reduce cost by factor 100
- Solution : concentrate sunlight by factor 500 (or more) by means of low cost optics, thereby reducing required solar cell area by same factor
- Superior conversion efficiency
 - > 40% at cell level
 - maintaining efficiency at elevated temperatures, crucial in hot/water scarce regions of deployment



Solar Systems - Australia



Concentrix, ex-Fraunhofer, now Soitec Solar

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Umicore's businesses

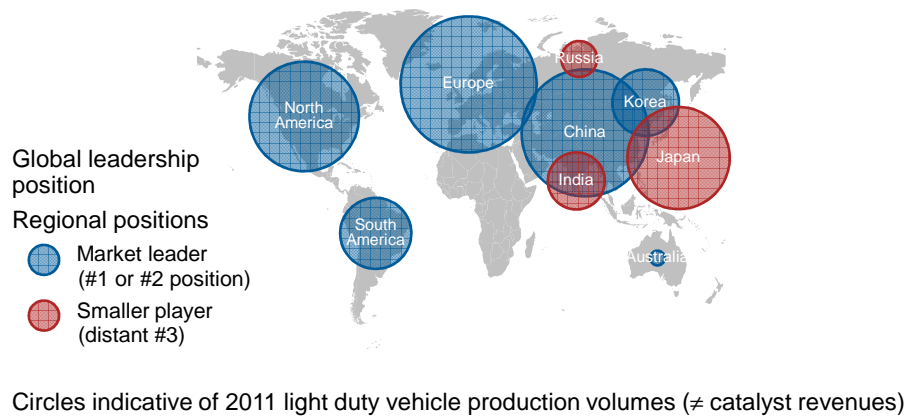


Catalysis

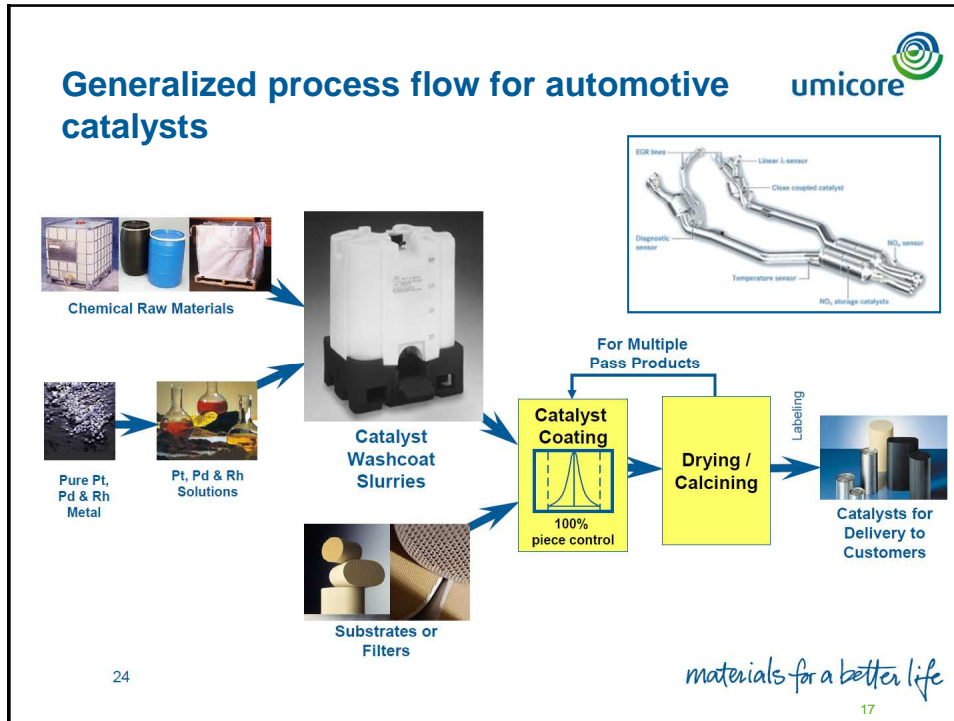
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Example of manufacturing in the Business Unit Automotive Catalysts



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Umicore's businesses

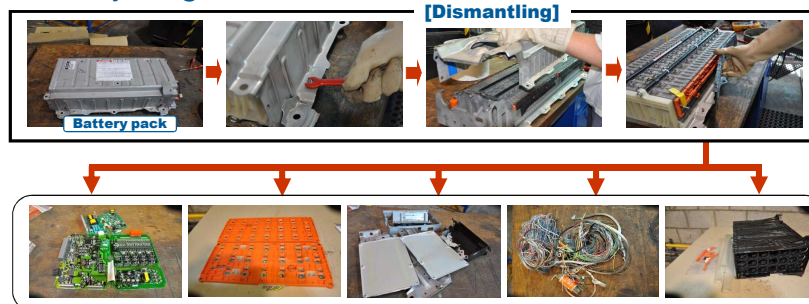


Recycling

- We operate a unique recycling process to deal with complex industrial residues and end-of-life materials
- The business is driven by materials scarcity and recycling legislation

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Example of “de-manufacturing” in the Business Unit Recycling



• Dismantling/discharging facility for (H)EV in Germany since January 2011.

• Another dismantling/discharging facility in US is operational since mid 2012.

• Industrial-scale UHT smelter in Hoboken, Belgium. Operational since mid 2011.



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Umicore's new Battery Smelter



- New battery smelter in Hoboken, opened September 2011, has a 7000 T/y capacity (= 140 000 (H)EV batteries or 250 Million cell phone batteries)
- Sufficient for EU- and world wide market for coming years
- Commitment to have installed capacity to cover all customer needs
- Robust process, compatible with all Li-ion battery chemistries and NiMH batteries



Future of manufacturing : "Industry 4.0"



1. See website of the German Federal Government
 - www.hightech-strategie.de
2. Development induced by the growing together of the real world ("internet of things") and the virtual world ("internet of services")
 - Cyber Physical Systems (CPS) – linking the embedded IKT systems to the internet and inbetween each other
3. Future industry production characteristics ("smart factories")
 - Strong individualisation ("lot size 1")
 - High flexible production, highly productive (+50%)
 - Production with less resources (-50%)
 - Production which is urban compatible
 - Full integration of customers&business partners
 - Linking production to high value services
 - Further automatization of the production processes with intelligent monitoring and autonomous decision processes (Cyber Physical Production Systems -CPPS)
 - New business models in production & logistics

