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Plant & community 2007 Hoboken

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"Princess Elisabeth"

Umicore is the main sponsor of the first "zero-emission" research station in Antarctica.

Plant & community 2007

Dear Neighbour,

Our company and our community: a new name and also a new approach for our environmental report. In addition to environmental information we now devote more attention to other subjects that may be of interest to you: what exactly does Umicore do in the factory in Hoboken? What is Umicore's overall contribution to the concern for our environment? Tell us something about the employment opportunities in your company. And give us some more information on the sustainability projects you are collaborating on.

In this report we obviously want to continue to inform you of the results of our environmental policy. As you will see, many efforts have been and continue to be made to improve our environmental impact as regards air, water and soil. We are obliged to do so for the sake of our neighbours and we like to make it a priority.

In this report we will also highlight Umicore's activities in the field of automotive catalysts. Here too, our environmental policy is the driving force, both in the development and production of increasingly better automotive catalysts and in our efforts for the environmentallyfriendly recycling of used converters.

Did you know that Umicore is very active in the development and production of solar cells? The Solar Car, a vehicle completely powered by solar energy, is a fine application of the latter. And did you also know that Umicore is also contributing to building a brand-new base in the Antarctic?

Finally, we also want to look forward to what the new year will bring us: the commissioning of our brand-new Precious Metal Concentration with far lower emissions of dust and lead, our continuing efforts to reduce diffuse emissions, tests with a new wastewater treatment concept, new energy-saving projects and, rather important to many of you, the remediation of 55 plots in the Hertogvelden district.

As you see, there is a lot going on! We wish you much reading pleasure.

With kind regards,

Jan Kegels Head Environment Department

Hugo Morel **Executive Vice-President**

Clean air is our business: automotive catalysts

Some products,

such as automotive cata-

lysts, contain

Umicore produces new catalytic converters and recycles used ones

als. sive manology group, able to recycle expensive matecatalysts reach the end of their life cycle. Metals are actually infinitely recyclable, without losing any of their quality.

Cars that run on hydrogen is still a thing of the future, but that does not mean that the current vehicle fleet should not fundamentally improve its environmental performance. In the past twenty years this has been done by the large-scale introduction of automotive catalysts . Nowadays virtually every vehicle has such a catalyst.

The catalysts in cars are used for cleaning exhaust gases. In the catalytic converter, the exhaust gases

(such as nitrogen oxide, organic compounds and carbon monoxide) flow through a ceramic block with many channels that are coated on the inside with a layer of platinum, palladium and rhodium. These precious metals play a prominent role, for they make up the actual catalytic component. They act on the exhaust gases, rendering them largely harmless.

The Umicore group's Automotive Catalyst business has been active in developing, producing and engineering catalysts for various types of engine since the 1960s. And in the meantime, Umicore has become one of the world's top three players.

Legislation in the area of exhaust gases is becoming increasingly strict, not only in the European Union and North America, but also in Asia and China. Because of its extension to new categories of vehicle (such as trucks and buses) technological development has become very important.

Although the precious metals in automotive catalysts are not consumed, catalytic converters do not last forever. Moreover, a catalyst sometimes has to be replaced during the life of the vehicle due to engine or mechanical damage.

Umicore closes the loop

Before a worn-out vehicle goes to the scrap heap, the catalyst has to be removed so that it can be recycled. And that is exactly what happens on the site in Hoboken: you might call it above-ground mining that makes a major contribution to meeting the overall demand for precious metals.

The need for recycling is certainly felt in the precious metals sector. Although catalysts are designed in such a way that they prove to be more efficient with increasingly fewer precious metals, the application of this modern technology in everyday objects has grown exponentially in the last few years. This greatly enhances the demand for scarce precious metals.

Meanwhile Umicore has become the world's I

eader in recycling precious metals: for example, two thirds of our production of platinum and palladium originates from secondary materials.

Umicore? That's who we are!

A company where everyone can feel at home

Umicore wants to be an attractive employer for its present and future employees. We try to create a company ambience in which everyone can feel at home and where there is room for development and growth. Therefore we pay a great deal of attention to health, working conditions and training. In order to get to know our employees' opinions on these subjects, we carry out a personnel survey every three years. In 2007 over 90% of our employees participated! Through their answers to questions on safety, communication, commitment, team orientation, management, etc. we can find out where we score well and which points should be improved.

In figures

In 2007, Umicore Precious Metals Refining had 1330 employees. In that year, 114 employees left (the majority because of early retirement) and 122 new ones joined, including 21 women. The large number of new employees indicates that there is a great rejuvenation process in our workforce.

Our employees work in a variety of shifts: day shift, 2 shifts, 3 shifts, 3 full continuous shifts (i.e. including weekend work). In 2007 there were 455 employees on shift work, including 4 women.

In 2007, 15% of our staff lived in Hoboken; 20% of our newly recruited colleagues also live in this area.

Said El Kabouzi (36) has been working at Umicore in Hoboken since 1990. "After a year of college I decided to go and work temporarily, but this 'temporary' job has now been going on for 17 years. I started as a worker in the Lead Refinery. After a while I was promoted to foreman of the Refinery Section and later even to superintendent. Nowadays I am coach in the Pre-

"Continuous changes and new challenges"

cious Metals Refinery, one of the largest and most efficient refining facilities in the world. The process – developed by Umicore as such – is almost completely computerised."

"As coach I lead the production process in the silver and gold department and I ensure that all

precious metals that come in leave my section as soon as possible. In addition I am responsible for order and neatness, safety, the environment and the efficiency of the work supplied." Said is also the driving force behind the training and support of his colleagues. "I like the variation in my job. The Precious Metals Refinery is continuously changing and new challenges only make my work even more fascinating."



Personal development

In order to remain a progressive company, promoting training and development of staff is very important. Therefore Umicore supports its employees and offers training and career possibilities. In 2007 we achieved a total of 24,578 training hours in various domains, i.e. on average 18 hours per employee. For the production department mainly technical training courses were organised, including chemistry. In addition there were also language and IT courses. The training course "Working safely" was held for team leaders on shifts. Furthermore, there were also general courses about the company.

Schools and work experience

In 2007 we had places for 32 trainees to acquire work experience at Umicore in the context of their studies. These trainees were put to work in the most divergent departments, ranging from production departments and security to technology and communication. Moreover we also work with a number of schools, such as the Karel de Grote College (work experience) and Don Bosco (parttime students)

Ann Heyrman (30) worked as security officer at the airport in Zaventem for a number of months. "In 2005 I transferred to Umicore, because I was looking for something new. At Zaventem I sometimes had the feeling that the work had become routine after a while and that I wasn't learning a lot. In Internal Security at Umicore there is no such thing as working on automatic pilot and that really appeals to me."

"I ensure that nobody can access our site without authority and that nothing leaves the place without it being known. Security on site is optimised thanks to modern security technology, such as cameras and detection

"No such thing as working on automatic pilot"

systems in high-risk areas. Security also oversees compliance with company rules."



Ann is the first female security officer to work in three shifts at Umicore. "This is the first time that I work in fully rotating shifts. It has its pros and cons: for my family it is not so easy, but I can do my housework in peace: there is never a long queue at the till."



Air

Water



Environmental expenditure



Environmental results 2007

In the first part of this report we tried to outline a wider picture of Umicore and its activities. However, in this report we also want to continue to inform you of the results of our environmental policy. In 2007 a great many efforts were again made to improve our environmental results in the fields of air, water and soil.



Metals in floating dust are measured every day

Some drastic interventions ensure a major reduction in guided

emissions

By emissions we mean the amounts of dust or gas released into the atmosphere. Guided emissions are dust and gases dispersed through a stack. All other emissions are diffuse emissions, such as dust or gas that escapes from buildings or is blown about during load transfer, storage or transport of raw materials.

Guided emissions

Gas purification of the blast furnace underwent fundamental adaptation in the summer of 2007. As a result, the gases generated in the blast furnace process receive additional cooling and purification. This leads to considerably lower emissions of, mainly, arsenic. Before this adaptation, a proportion of the arsenic was present in gaseous form and was less efficiently removed in the former gas purification process. The graphs on the next page show the total amounts of arsenic, lead and cadmium discharged annually.

The increase we see for arsenic vis-à-vis the past few years has to be qualified. Before 2007, only arsenic in the form of dust was taken into account. However, a substantial part of the arsenic was also discharged in gaseous form via the blast-furnace stack. The conversion of the blast-furnace gas purification now enables improved purification of arsenic from the gases. Before the conversion (January – June 2007), 651 kg of arsenic were emitted, and after the conversion (July – December 2007) as little as 73 kg. This demonstrates that the new gas purification system is operating efficiently.

For lead, we see an increase over 2006 which can be almost completely ascribed to the emissions from the stack in the old Precious Metal Concentration. This stack is responsible for approx. 75% of the guided lead emissions of the entire plant. The new Precious Metal Concentration, which was inaugurated in April 2008, is based on a different metallurgical process and is also equipped with high-quality gas purification, so that we expect that the conducted emissions of lead, selenium and dust will decrease considerably.

Overall, the conducted emission of cadmium remains at a low level.

Furthermore, the combustion installation of the Lead Refinery was also converted at the end of 2007. Now combustion occurs with gas burners instead of heavy fuel. Thanks to this cleaner fuel the guided emissions of dust, nitrogen oxides and sulphur dioxide will decrease drastically. Occasional black smoke from the Lead Refinery stack is therefore definitely a thing of the past.

In general it may be said that, since all guided emissions occur at a great height, they have only a very slight effect on the neighbouring residential areas and the environment.

Diffuse emissions

Diffuse emissions may, for example, be generated in the transport and load transfer of raw materials and intermediate products. They are estimated on the basis of the measurements in the surroundings of the company. In that sense, they differ from guided emissions, which can be measured directly.

For diffuse emissions of lead and arsenic, we noted a reduction compared to 2006. For cadmium, we found a slight increase as can be seen from the tables on the following page.

















The impact of the diffuse emissions in the immediate surroundings of the plant is much more significant than the guided emissions via stacks. For this reason we are continuously looking for improvements on this level and are currently working on a large number of small and larger improvement projects, such as:

- automated sprinkling of the Smelter feed preparation;
- covering the boxes for the blast furnace feed preparation;
- continuous dust measurements on the work floor to obtain better insight into operations that may cause dust in buildings, which is then discharged to the outside as diffuse dust;
- a test with windscreens at the level of the boxes at the Plant.

By immissions we mean the amount of dust present in the environment, such as suspended dust and fall-out of coarser dust that falls to the ground.

Measurements of metals in suspended dust

Both the Flemish Environment Agency (VMM) and Umicore measure the amount of metals in suspended dust at a number of measuring stations on a daily basis. For the measuring station at Constant Meunier Square the concentrations in PM10 dust, i.e. fine dust smaller than 10 μ m (less than one hundredth of a millimetre), measured by Umicore are:

	2007 (ng /m³)	2006(ng /m ³)	
 lead (limit value : 500) cadmium (limit value : 40) arsenic (no limit value) 	117 0 6 19	219 6 61	

For lead and arsenic, this means a decrease compared to 2006, and for cadmium a status quo. This year too, average levels remain largely under the legal limits.

As a result of European regulations, strict target values will be in force from 2012: for cadmium the target value amounts to 5 ng/m³, and for arsenic 6 ng/m³. As the above values show, we are already approaching the target value for cadmium, while arsenic is even higher. We want to decrease metal concentrations in suspended dust even more and achieve the strict target values by additional measures, which are mainly aimed at further decreasing diffuse emissions.

Measurement of metals in dust fall-out

The metals in dust fall-out are also measured by means of a network of dust-collection gauges and monitored by Umicore and the VMM. In 2007, the VMM measuring network was reduced from 26 gauges to 4 as a result of the decrease in levels measured in the past few years. Umicore measured these decreasing concentrations on Constant Meunier Square:

Measurements of dioxins in dust fall-out

	2007 (mg /m².day)	2006 (mg /m².day)		
 lead cadmium arsenic 	0.72 0.012 0.086	1.22 0.013 0.121		

The VMM describes monthly figures exceeding 26 pg TEQ/m².day as "increased", between 6 and 26 as "moderately increased", and 6 or less as "not increased".

As shown by figures from the measuring station at Curie Street – Standbeeld Street, the year 2007 is a confirmation of the decreased values that we have been recording there since 2005. In the bi-monthly measurements undertaken by the authorities (VMM), we arrive at an average of 6 pg TEQ/m².day.

Emissions from stacks are checked regularly.



WATER

Stricter licence to discharge water from May 2007 with very low limit values for cadmium and arsenic



In May 2007 the licence to discharge water from our Waste Water Treatment Plant was revised by the government. This new licence resulted in a stricter standard for a large number of parameters. Some standards came into force immediately (e.g. lead, cadmium, and arsenic). For others (e.g. selenium, thallium, nitrogen), the feasibility of the new limit values has to be demonstrated by means of a test with an additional biological purification step. This test was performed in the spring of 2008.

Setting stricter standards also resulted in the analysis device, with which proper functioning of the purification process was monitored, having to be replaced by a higher-quality analysis technique. The new technique was inaugurated in March 2008.

The biological purification step consists of removing even more metals from the drain water after the current purification process by means of a bacteriological process. Furthermore, a sand filter ensures that suspended particles are even better separated from the water. The pilot plant works on a partial flow that amounts to approx. 10% of the current discharge area and is intended to demonstrate the effect and feasibility of the biological process on our waste water.

Levels in mg/l	Up to 05/2007	Current standard	2003	2004	2005	2006	2007
lead	1	0.3	0.05	0.04	0.03	0.02	0.03
cadmium	0.2	0.03	0.027	0.014	0.013	0.008	0.02
arsenic	1	0.5	0.15	0.18	0.18	0.22	0.15
copper	3	0.5	0,10	0.22	0.19	0.12	0.03
selenium	5	5	1.7	2.8	2.3	1.84	1.30
nitrogen	125	125	39	46	44	45	38

Moretusburg-Hertogvelden

Remediation in Moretusburg is complete,

we now turn to Hertogvelden



Moretusburg

Soil remediation work in the Moretusburg area started in September 2006. About one year later, at the end of 2007, the work was nearly finished. No fewer than 700 houses were involved in this large-scale project. Fences still have to be put back and grass replanted on a limited number of plots. This can of course only be done in good weather to give the grass the best chance of growing well. Dust-removal work is still planned in about one hundred homes. The public area was also cleaned up and refurbished.

Fast progress was only possible because of the good cooperation of the residents. There were long execution periods on some plots, due to the high clay content of the subsoil, which therefore drains very poorly and causes waterlogging problems.

We hope that the remediation will make an important contribution to improving the wellbeing of residents, especially children.

After completion of the work in Moretusburg, the residents were asked to give their opinion on the approach of the soil remediation project. Around one in four residents replied which is a good response. In general the project as a whole was thought acceptable to very good by 87% of the residents. There was less enthusiasm about the finishing: the repair work on pavements and fences, as well as the finishing of gardens with grass. Residents approved strongly of the accompanying measures (reimbursement for plants, waste collection, beautification of the public area), information and personal contact.

Hertogvelden

At the end of 2006, the soil remediation expert took additional soil samples to define per plot whether remediation was required. Unlike Moretusburg, not all plots actually have to be cleaned up. For each plot, soil samples were taken in different places, which were then mixed. These mixed samples were analysed for existing levels of lead, cadmium and arsenic.

In some plots it became clear on the basis of the soil values (generally only for lead) that



soil remediation was required. In other plots, the results for the three metals were so low that it was also immediately clear that no remediation would be required there. There was a lack of clarity about a certain number of plots and an additional study was necessary. For this reason, the Provincial Institute for Hygiene carried out a study of the connection between the soil values and the lead-in-blood values per plot. This resulted in a safe limiting value being defined for lead. This limiting value guarantees maximum safety for residents and was used to decide whether or not a plot had to be excavated.

The soil remediation project for Hertogvelden was submitted to the responsible authority OVAM in July 2007 and was declared to be in conformity on 16 October 2007. Thus the remediation obtained legal status and the remediation and dust removal of the plots in question became an obligation.

Remediation work in the Hertogvelden neighbourhood started at the beginning of March 2008. Here too, the aim of the remediation work is to remove the health risks for the residents, especially children. The approach is the same as in Moretusburg: non-paved parts of the terrain are removed to a depth of 30 cm and filled in with clean soil. Afterwards, the gardens will be finished with lawns. Here too the residents can opt for turf or seeded grass.

This project provides specifically for remediation of 55 plots in the southern part of Hertogvelden. Afterwards, a professional cleaning company will dedust the dustiest places, such as attics and cellars, in 12 houses. The work started on 12 March 2008 and will be finished before the summer, subject to the weather.



Site remediation

Over 120 years of metallurgic activities also resulted in soil pollution on the company site. Remediation of the company site was also provided for in the covenant that Umicore concluded with OVAM and the Flemish Government in 2004.

As regards the soil part, the study was performed and finished in the course of 2007. The soil remediation project was submitted to OVAM at the end of 2007. It is the intention to perform part of this soil remediation work in 2008. Much of the excavation and covering of the ground has already been done in the past few years. This prevented polluted soil drying out and possibly blowing away. The soil remediation still to be undertaken consists of excavating and covering the top layer of the still uncovered sections of polluted soil. The final covering may consist of clean soil with plants, brick rubble or concrete pavement. This removes the risk of the polluted soil spreading. Like the remediated soil in Moretusburg and Hertogvelden, the plan is to work the soil that becomes available into a noise barrier which is being built on the company site. The wall will be constructed in a sustainable way so that exposure to the polluted soil is no longer possible once the wall has been finished.

There is an on-going study on the approach to groundwater pollution.



Environmental expenditure

€ 20 million expenditure for the environment in 2007

In 2007, environmental expenditure amounted to no less than \notin 20 million, of which approximately 13 million was spent on environment-related investment projects. The remainder involved operational costs and soil remediation projects.

The expenditure concerned mainly:

- the soil remediation executed in the Moretusburg neighbourhood;
- adaptation and conversion of the gas purification in the blast furnace, in which the process gases of this plant undergo an additional cooling and purification step;

- conversion of the Lead Refinery combustion installation: from now on, gas is the combustion fuel instead of heavy fuel;
- construction of the new Precious Metals Concentration, including modern gas purification equipment.



Conversion of gas purification in the blast furnace



Umicore Hoboken gets a facelift

A completely new access zone with a new building, large open spaces and a great deal of green



© Conix Architects

Processes at Umicore Hoboken are being continuously modernised: the new Precious Metals Refinery (1995), the Smelter (1997), the Leaching and Electrowinning Plant (2003) and the Precious Metals Concentration (2008) are the main examples. In this way, our technology stays ahead of the curve and, in many cases, is cutting-edge and sometimes even unique in the world.

The mentality in our company has evolved highly towards more openness and transparency, enhanced cooperation and greater involvement of all employees, and greater commitment to sustainability and continuous improvement. We thought this should also be translated into our company's actual appearance: our factory will receive a real facelift!

In a previous issue we already talked about our plans for renovating our main entrance: not just beautifying the old buildings, but a renewed main building in an overall concept for the entire access zone, with lots of open space and a great deal of green according to a design by Conix Architects. Work started some months ago and the new building should be ready in early 2009, with meeting rooms, training rooms and facilities for receiving visitors. The existing main building will be completely renovated and adapted to the latest fire-safety standards. In addition, the entire entrance zone will be renewed with a great deal of open space and the façade covering of the adjacent buildings will also be renovated in order to create an attractive whole

However, modernisation will not be limited to the access zone: nowadays, attention is being paid to good design for all buildings. This is shown by the renovated Precious Metals Refinery and the new Precious Met-

als Concentration building. The austere, industrial architecture that was used in buildings such as the Smelter and Leaching and Electrowinning is making room for a more creative design that should ensure a different image, inside the factory too. In this way, we want to show that fundamental changes have taken place inside and outside the company both physical and in terms of our mentality.

Green will also be afforded a bigger area on the company site. Not only will Greiner Street become a green zone, but inside the factory too, islands of green will appear. In this way we want to flesh out as much as possible the ideas of the spatial structure plan of the City of Antwerp, which strives for a connection of the green areas of the Hoboken park and fort to the River Scheldt.

What will 2008 have in store for us?

We continue to look for solutions to reduce emissions

By the time you read this, the new Precious Metals Concentration will have been inaugurated. According to a new method developed by Umicore, the precious metals are concentrated to silver (doré silver) from various intermediate products, after which they are separated from each other and refined in the Precious Metals Refinery. This can now be done more rapidly and in a more environmentally friendly way. Thanks to this project, there will be a major and sustainable reduction in dust, lead and arsenic emissions.

We continue to be concerned about reducing diffuse metal-containing dust from our sites. Dozens of large and small projects are on-going to achieve continuous improvement in this field as well and new initiatives are constantly being developed. In 2008 we want to install an automated sprinkler system at the Smelter feed preparation. The extraction of the granulation vapours at the Smelter will also be improved. Some storage boxes in which the feed for the blast furnace is prepared and in which scrap iron is stored, will also be covered.

In Water Treatment we are carrying out tests of a biological water treat-

The new Precious Metals Concentration

ment system to further purify the discharge water.

Kyoto is also a topic for Umicore. By defining a series of energy-saving projects for the years to come, we want to use all types of energy as efficiently as possible and retain our position in the world's top three.

As regards soil remediation, we now turn to the Hertogvelden area, as we mentioned in the previous chapter. Afterwards we will start the next stage in constructing the noise barrier, when all plots are available.

Another point to consider is how much we know about our products. To comply with new European REACH legislation, we will perform far more tests in cooperation with other non-ferrous companies in order to research all properties and characteristics of metals and their applica- tions for safe use. This project still requires several years' work.

Projects that can count on Umicore's support

Last year, Umicore made major investments in its brand awareness and image. There were remarkable initiatives at group level: a number of sustainable projects received practical support from Umicore. The two most striking projects were the sponsorship of the first CO₂ emissions-free base in the Antarctic and

the Solar Team, which appeared in the news worldwide thanks to its fine performance. And there is also the Antwerp initiative of the new Museum by the River (MAS), which can count on Umicore's support..



South Pole station

design and construction of a new Belgian research station in the Antarctic, the Princess Elisabeth. This is the first Belgian South-Pole project for 40 years and it will be able to call itself the first 'zero-emission base' in Antarctica.

The project will be almost entirely powered by renewable energy and other sustainable technologies. For Umicore this is not new, since we are working with technologies to make products increasingly eco-efficient with production processes that meet the strictest emission standards. Moreover, Umicore develops technological and material solutions for sustainable electricity generation The team from the college of enand energy storage. Umicore helped to acquire the necessary funds and invested € 1 million in this project.



Solar Team

In 2004, Belgium commissioned the Traditional energy sources such as oil, coal and gas are exhaustible and polluting as well. Why not use a source of energy that will last far longer? Solar energy for instance. Umicore's extremely thin, pure germanium discs are particularly popular as the base material for solar cells.

> Umicore became the main sponsor of the Solar Team of the Leuven Group T and supplied special germanium substrates that are the core of the solar cells on the top of the solar car. This advanced technology is now mainly used in satellites and other space applications.

> gineering took second place in the Australian Solar Challenge race on 25 October 2007. A very smart result!



Museum aan de Stroom (Museum by the River)

Since its establishment in 1887, the factory in Hoboken (popularly called 'The Silver') which, just like the MAS, lies next to the River Scheldt, has undergone a series of fundamental changes. It went from "Société de Désargentation de Plomb" to "Metallurgie Hoboken" to the present "Umicore Precious Metals Refining".

The MAS (Museum by the River) tells the story of the river, the city and its inhabitants, the port and the world. The factory in Hoboken, a Factory by the River ('FAS'), has been part of that story since 1887. Here too Umicore Hoboken assumes its social role and is pleased to help ensure that this story is told. Umicore is a keen supporter of the 'Hands' action and has committed itself to the MAS as Founder for the next five years.

Complaints, questions, remarks?

Please call us on the green number 0800/93739. Your call will be answered 24/7. We guarantee an answer as quickly as possible. For questions concerning the Moretusburg - Hertogvelden remediation project, the green number 0800/94028 is available.

Umicore Hoboken site

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