



HONEYWELL
SPECIALTY CHEMICALS SEELZE GMBH

Sustainability Report 2007

Future prospects ...

seem promising when we look at our successful year in 2007. Industrial safety, quality, costs, reliable deliveries or environmental protection – we were able to further improve the performance of the Seelze subsidiary in all these and other categories. The programs and initiatives which help us to compete successfully in world markets have paid off.



Take industrial safety for example: for the second year in a row, this plant was free of accidents; at the end of 2007, the status was zero. This is a remarkable result when compared to the average chemical sector standard and we can be proud of it. The same applies to the measures taken to improve the quality of our products and deliveries, lower our inventories and reduce emissions. These positive developments have focused considerable interest on us in the international arena. Thus, for example, the US Chemical Association SOCMA has singled out this facility for its annual competition awards in the product responsibility and customer communication categories.

Such successes, as we know, are passing highlights – no more than that, but certainly no less. This recognition of the everyday achievements of all employees here in Seelze shows that we are on the right track to keep this site internationally competitive, and we will keep working persistently to become even better. We have set the course for this goal.

Dr. Peter Degenkolb
Managing Director of Honeywell Specialty Chemicals Seelze
GmbH and Manager of Seelze Industrial Park

Honeywell Operating System – Raising the performance efficiency of this site



All key indicators of performance efficiency at this location – from industrial safety to quality, timeliness of deliveries, costs and stock-keeping – confirm once more positive developments in 2007. The Honeywell Operating System, which was introduced in three plant sections last year, contributed to this success.

“HOS is already firmly integrated in everyday production”, says Michael Polzer, Quality Manager of Honeywell Seelze. The core of the program contains tools and lean methods to structure, standardize and optimize working procedures and routines, clearly describe manufacturing processes and define key data. The underlying goal is to become better and re-inforce the competitive strength of the plant. A vital advantage singled out by Polzer is that “HOS allows us to overview the current production status at all times.”

HOS was introduced step-by-step last year in three plant sections which account for 65 percent of the production capacity and costs of the plant. All personnel in the selected operations – from chemical assistants to the operations manager – were trained and familiarized with the tools over a period of three

months. “HOS helps all employees to assume greater responsibility and identify more closely with the processes,” Polzer asserts. “Furthermore, they can recognize faults and divergencies more quickly and solve problems more effectively if they work together as a team.”

“The quality has improved”

Success has rewarded the test of practical application. “We have increased our performance capability, work more efficiently and handle the same tonnage with a smaller workforce”, says Dr. Harald Heuduk, Operations Manager of the Inorganic Chemicals division (see also Interview). But the positive effects of HOS are shown by other management criteria as well. For example, costs have dropped and stocks in hand were also significantly reduced.

“The key data show us that the selected operations continue to improve in terms of on time to request deliveries (OTTR) and quality”, Polzer confirms. It is intended to continue this development this year too with workshops, special promotion days and exhibitions in which employees can learn about sources of error and reasons for customer complaints. The long-term success of HOS will pivot around the integration of all employees, since they support the process and facilitate the growing success of the site. Following the successful introductory phase, HOS will be expanded throughout the entire plant by the end of 2009.

Interview

“Basis for sustainable improvement”

Dr. Harald Heuduk, Operations Manager for the Inorganic Chemicals Division, about the introduction of HOS.

What effect has HOS had on production?

We have raised our productive efficiency. We can handle the same volume with fewer employees without increasing individual burdens. Furthermore, HOS gives us the means to portray production processes effectively and represent the current status with key data. Not only can every employee now see which areas are running well or where there are divergencies, but we also get to the bottom of a problem faster and can eliminate the causes. That’s an important step forward – and the basis for lasting improvement.

In which way does the system stand out in everyday work?

HOS functions from bottom to top in the hierarchy, promotes communication and motivates all employees to assume more responsibility. One example: during shift handovers in the morning, the night shift employees inform the day shift and the operations management. This chain of information is threaded all the way through to the works management. By 10 a.m. at the latest, every employee on site has the information he needs for his work.

How was HOS accepted by the workforce?

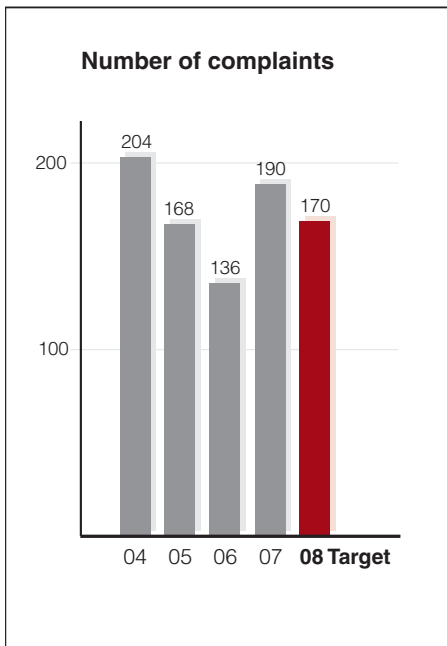
After initial reservations, there’s a sense of great acceptance because everyone has recognized that HOS brings along specific improvements. In addition, everyone can see how his work contributes to the success of the plant so that he can do his best and have his ideas and comments taken seriously and implemented. This raises the level of identification and engagement.

Most Improved Site

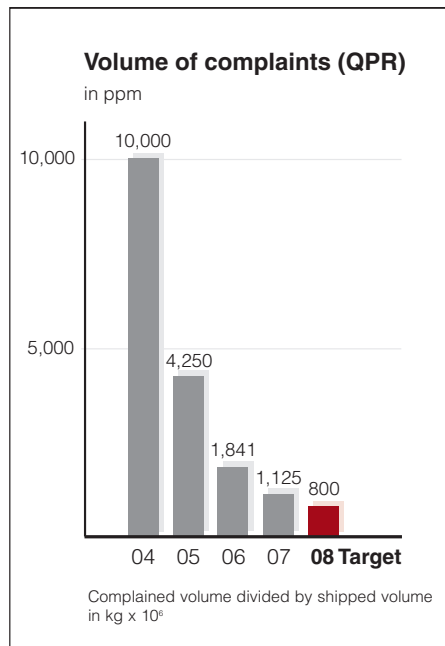
Recognition for achievements in 2007

The Seelze plant is one of the Honeywell Group sites which achieved the greatest improvements during the past year. Honeywell CEO Dave Cote awarded Seelze the title of "Most Improved Site" at the beginning of the year 2008. Honeywell Seelze not only managed to raise its operating result for 2007 and outshine international standards of industrial

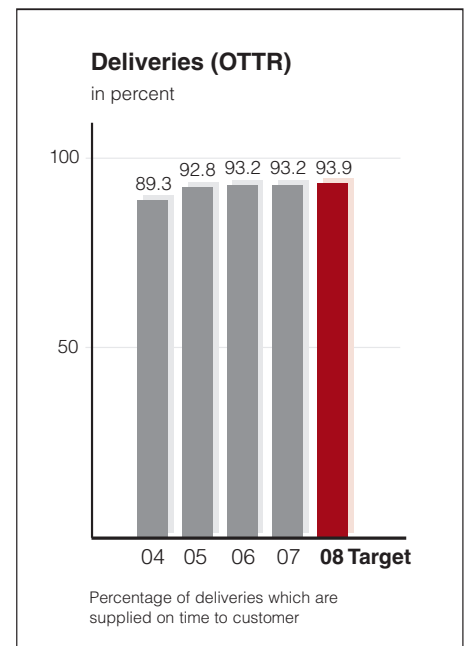
safety, but also achieved peak results in terms of quality, quality, complaints and deliverability. Managing Director Dr. Peter Degenkolb thanked the staff for "the willingness of every individual to continuously improve his performance and thereby push the facility ahead." Besides Seelze, two other sites also won awards.



More than 20,000 deliveries produced 190 complaints. In spite of the increase compared to 2006, the level of complaints remains constantly low. Most complaints involved service and packaging defects such as faulty labels, incomplete delivery documents, late deliveries or dirty containers. The objective for 2008 is a 20 percent decrease in this figure. Special promotion days revolving around quality and training, which will also be open to contractors, are expected to help achieve this goal.



The key figure "volume of complaints" (QPR) is an important benchmark for the quality and performance of the plant. The figure reflects the ratio of the entire shipment to the quantity subject to complaints. The positive trend continued in 2007, even causing the objective of 1,250 ppm to be undershot. The figure of 1,125 ppm means that, out of about 41 million kg produced and delivered in 2007, the volume affected by complaints was 45,000 kg. The majority of the complaints involved the delivery service.



The high 2006 level could be maintained in 2007. More than 93 percent of all shipments were delivered on time and punctually received at their destinations on the date specified by the customer. Continuous improvements by the Honeywell Operating System are expected to produce a further increase, although it will be more moderate than in previous years.

Regional News

As one of the largest employers in the region, Honeywell Seelze supports projects concerning natural science and mathematics education as well as industrial and personal safety. Here is a sample of our activities.

Seelze Voluntary Fire Brigade

Donation for new safety equipment

Safety is of highest importance inside the Seelze site and outside. Honeywell Seelze has donated EUR 3,500 to support the work of the local Voluntary Fire Brigade. The money will be invested in new work clothes “and a colleague will be able to gain a fire-engine driver’s license”, said Voluntary Fire Brigade Chief Alfred Blume when he accepted the check last year. Honeywell’s donations focus on safety issues in communities around its various corporate locations.



Support for the Voluntary Fire Brigade: Dr. Peter Degenkolb (right), Honeywell’s Managing Director, with Alfred Blume, Chief of the Seelze Voluntary Fire Brigade (center) and Mayor Detlef Schallhorn (left).

Humboldt Secondary School

Pupils investigate water quality



The purpose of a chemical research project at the Humboldt secondary school is to investigate the water quality of ponds in Seelze. A group of pupils will regularly study ponds within the city limits throughout the year. Honeywell is promoting this chemical education project with an initial oneyear grant of EUR 7,000 and will assist the students wherever it can. The school plans to spend the money on equipment including measuring instruments, a refrigerator and a weather station.

IdeenExpo in Hanover

Are you still recharging your batteries or are you already back on the road

Visitors to IdeenExpo in Hanover could personally experience the advantages of modern energy storage systems such as supercapacitors. As a co-sponsor of the innovation fair in the fall of 2007, Honeywell’s display on the group stand of the Northern Chemical Industry Association (VCI) demonstrated the everyday relevance of its products. Honeywell’s remote-controlled pick-up trucks were

equipped with supercapacitors which rely on electrochemical fluids – electrolytes – for more efficient energy storage. The small vehicles were real powerhouses and could be re-charged extremely quickly. Compared to standard battery-driven vehicles, which need several hours to load electricity, the trucks were once more ready to hit the road with recharged condensers in just a few seconds



IdeenExpo 2007, Hannover

SOCMA Award

US Association awards communication prize

Award for Honeywell: The Seelze plant has won a silver prize from SOCMA for good communication with stakeholders such as local residents and public authorities. Every year, the US Industry Association for Organic Chemistry rewards outstanding performances by individual US corporate operations. Representatives of Honeywell Seelze accepted the award in December 2007 in New York.

Product Stewardship – Using chemicals safely and effectively



Product Stewardship stands for awareness of responsibility and the safe handling of chemicals. At the Seelze plant, six specialists register all substances produced and used here. They assess and maintain them throughout their entire life cycle.

The use of chemicals always poses a certain risk. To reduce this risk and to guarantee safe handling of the products, each substance is analyzed, documented and supported throughout its entire life cycle. This process covers all areas the chemicals pass on their way to the customer – from delivery of the raw materials through development, manufacturing, sales and shipment to use and disposal by the customer.

This complicated task requires the full concentration of Dr. Dagmar Preugschat and her five colleagues. After all, it requires them to keep track of about 2,000 chemicals manufactured in Seelze as well as the raw and auxiliary materials required to manufacture them. The experienced specialists are on familiar ground here because "product stewardship has always been given high priority at the Seelze plant," Preugschat stresses.

The implementation of REACH, the EU chemicals policy, and the Responsible Care Initiative of the Chemical Industry, have increased the challenges facing the companies. These demands have also been reflected in Honeywell's organizational structure since the beginning of 2007. All tasks connected with product stewardship, which were previously integrated in the Health, Safety and Environmental Protection area, have been expanded to embrace European responsibilities.

The six team members research and document all data relating to the product with scientific precision: which properties does it have? How high is the potential danger? Is it highly volatile? Is the material explosive? Is it toxic? Is an environmentally compatible disposal system provided for? What safety equipment is

zardous Materials Ordinance as well as transport or export regulations. But the overall objective remains that of minimizing the risks to public health and the human environment and to achieve the greatest possible benefits through the proper use of the products.



required? The experts find answers to these and many other questions while cooperating with in-house development laboratories as well as external institutes. They document their findings in safety data sheets, which form a reliable basis for the safe and effective handling of chemicals.

"We are expanding product responsibly towards our customers still further and support the sales department on regulatory questions", says Preugschat. "We issue recommendations on the professionally safe use of our chemicals while allowing for particular legal aspects such as international chemical laws, the Ha-



Walk cautiously – be safe



For the second time in a row, The Seelze plant has completed the year without a single accident. Special promotion days, exhibitions and a competition once more focused special attention on accident prevention during 2007. The key topic was workplace ergonomics.

“This road will not be an easy one to take ...” – many who negotiated the Honeywell obstacle course must have been reminded of the hit song with which Xavier Naidoo encouraged the German

national team during the 2006 World Soccer Championships. Wobbly stone slabs, grids, edges, steps, a pallet blocking the way or a slippery ramp demanded the full attention of some 500

participants as their feet encountered everyday plant-floor pitfalls. There was a serious purpose behind the seemingly playful event. “Pitfalls are some of the most frequent causes of workplace

Ergonomics Competition

Ingenious safety solutions

Open stairways, unsecured hoses, equipment left lying around – how can potential pitfall hazards be diminished? Some 50 teams or about 250 employees submitted suitable answers in a competition. They surveyed their operations critically and came up with practical solutions to make everyday routines safer. Simple changes often produce the greatest benefits for all, as illustrated by the contribution which won first prize: attachments to fork lift trucks such as fork extensions or personnel hoist-ing cages have hitherto been stored unsafely at various places. (photo, top). Now, markings on the floor and barrier tapes secure these areas (photo, bottom). The five best solutions were shown at the “Safer Action” day.



accidents”, says Olaf Schrader, Safety Engineer at Honeywell Seelze. His view is backed up by statistics from the Workmen’s Compensation Board: about 1,000 people are injured every day by accidental falls during work.

As part of a “Safer Action” campaign and a competition on the subject of ergonomics (see box), Honeywell invited

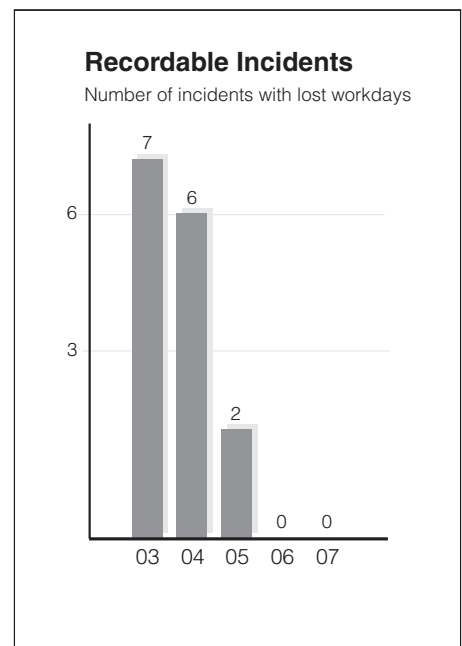


“Safe action” campaign: encountering everyday pitfalls

employees to the plant premises in the spring of 2007 to grapple with the pitfalls of “tripping, slipping, falling”. Most accidents are avoidable, but they still happen because we fail to consciously register many everyday situations or underestimate the dangers. Fortunately, most mistakes do not have serious consequences – “it turned out all right,” we sigh with relief and carry on as before. But luck is an unreliable companion. “Special events such as the obstacle course or the ergonomics competition re-awaken our attention and sharpen our perception of accident risks”, Schrader states with conviction.

Similar intentions lay behind the Health Care Day on “Lifting and Carrying”. At three contest stations, participants labeled and packaged laboratory flasks at ergonomically optimized workplaces, lifted cartons, stacked them on pallets or shoveled out containers. Health experts gave contestants tips on the best ways to move while lifting and carrying without unnecessarily straining their backs and

joints. The organizers saw the positive reaction to these campaigns and the solutions submitted during the ergonomics competition as evidence of an increased sense of responsibility among all employees – an important precondition for maintaining the high safety standard at the plant.



Energy Storage – Expanding research activities



How can energy be stored more effectively and supplied faster? Honeywell's response to this question is to control part of its research activities at its Seelze site. A new energy applications laboratory was established in 2007 to develop new materials for modern energy storage systems. The State of Lower Saxony is supporting this project.

Wind power plants, hybrid vehicles, cell phones or electronic toys – wherever a large amount of power is needed and must be provided quickly, supercondensators show their strength. Their ability to store more energy, occupy less space and be recharged in just a few seconds opens up a multitude of interesting applications for them.

A supercapacitor consists essentially of two electrodes, the condenser plates, a separator for the insulation and the liquid electrolyte which conducts the electricity. Electrolytes like those Honeywell Seelze has been supplying for years to leading battery and condenser manufacturers contribute significantly towards improving the performance and storage capacity of capacitors. “The interaction between electrodes and electrolytes is nevertheless very complex,” says Dr. Michael Fooker, Manager of Specialty Chemicals Technology. “In order to achieve further improvements, we must consider the entire system instead of regarding its individual components separately.”

Honeywell Seelze created the preconditions for this development last year. Three specialists in the new energy applications laboratory are working on a new generation of electrolytes which conduct electricity more efficiently. “With this laboratory, we now have all we need to build capacitors, develop and test new substances and materials and optimally attune all components to each other”, says Fooker.



Optimum alignment: because of their low space requirements and light weight, supercapacitors can be used to align wind energy plants quickly and efficiently. Acting as local energy stores, they supply enough power quickly to turn the 40-meter long blades into the wind.

Along with the development of new chemical substances, the manufacturing procedures have moved into the focus of attention. One example is the direct process for electrolyte manufacturing which Honeywell has patented. Electrolytes consist of solvents and salts which are blended in several steps. The direct process simplifies and shortens these procedures significantly by synthesizing the salt directly into the solvent. Explaining the advantages of the process in terms of the interaction between electrolytes and electrodes, Fooker says that “fewer steps in the process mean higher quality and purity and therefore higher performance.”

The declared objective of raising the efficiency of existing energy storage systems has also won over the State of Lower Saxony. The state government is supporting the project as part of its “Innovative Lower Saxony” research funding program.



Recovery of braking energy: Because a supercapacitor can both release and absorb electrical power quickly, it can recover the excess energy produced during braking or when the engine is switched off at a traffic light. In hybrid cars, supercapacitors also cover the power peaks of the electric drive which is switched parallel to the combustion engine. This reduces overall energy requirements and emissions.

Wax Applications Laboratory – Bridge to new markets



For more than 50 years, Honeywell has ranked amongst the leading suppliers of polyethylene-based PVC lubricants and waxes – indispensable components for manufacturing plastic window frame profiles and waste water pipes. This US corporation maintains an Applications Laboratory at the Seelze plant to develop formulae for new applications and test them under practical conditions

About 2,000 different chemicals are produced in Seelze, but these do not include waxes and other lubricants required to produce pipes and window frames. They are produced in two plants in the USA. Nevertheless, Honeywell Seelze plays an important sales role in this business sector. Since 2004, new PVC formulae have been developed in the Wax Applications Laboratory for the German and European markets.

Modern infrastructure

“As a modern production site, Seelze offers an appropriate infrastructure in which our laboratory is ideally integrated”, says Dr. Rolf Spiekermann, Technical Manager of the Wax Applications Laboratory. The laboratory was relocated from Belgium to Seelze four years ago. Several specialists with many years of experience in the PVC and wax business develop new formulae here and tailor them to fit customer needs and application profiles exactly.

As a rule, a PVC formula consists of up to twelve components, including stabilizers which prevent the decomposition of the PVC when it is heated up, pigments such as chalk for the coloring, modifiers to ensure mechanical rigidity and stability after hardening and lubricants. PVC is heated up to 200 degrees Celsius and squeezed through an extruder into a mold under high pressure. Special lubricants such as PE waxes demonstrate their power to affect the surface of the PVC by ensuring that the melt is fed easily and smoothly through the narrow metal nozzles of the extruder for shaping in the mold. The quantity of produced parts depends on how smoothly this is accomplished. Experts refer to this as an external lubrication effect. Another property is the internal lubricating effect achieved by a range of ester products.

They penetrate more easily into the PVC and ensure the mobility of the molecular chains amongst each other so that the PVC can be processed more easily in the extruder. The torque and energy input are reduced because less power and pressure is required to transport the PVC through the extruder.

Finding the balance between the components

“All PVC components must be precisely attuned to each other”, emphasizes Spiekermann, adding: “The art is to develop a formulation which flows well through the extruder and achieves high output with the lowest possible expenditure of energy.” The laboratory gives Honeywell a know-how surplus beyond the information required to simply manufacture the additives. “This is a decisive competitive factor”, says Spiekermann, “because many processors keep invest-

The PVC formulae are tested and improved in an interactive process between the Wax Applications Laboratory and the customers’ production facilities. This is necessary because PVC formulations can vary from customer to customer. For example, window profiles in the USA do not contain the same compounds as those in Germany or Korea. “Global markets vary considerably”, says Spiekermann. “We must know the markets well and respond to their special needs in order to develop sophisticated complete solutions.” Measured in terms of PVC consumption, Germany is the strongest market in Europe and thus the most important market for additives. But new PVC processing capacities are also emerging in Eastern Europe and Russia as construction continues to boom there. That makes the laboratory even more important as a geographically close bridge to these markets.



ing less and less in formulating their own recipes in order to reduce development costs.” They depend on their suppliers to offer them ready-made formulations. “This is our chance to offer our customers complete solutions and establish Honeywell as a development partner.”

Environmental protection



Environmental protection measures are an integral part of our corporate policy. We invested about Euro 675,000 in environmental protection measures in 2007. The running costs for environmental protection dropped by 5 percent in comparison with the previous year. These effects are the result of consistent preventive maintenance of environmentally-relevant parts of the plant.

Environmental Program of Honeywell Specialty Chemicals Seelze GmbH (Extract)


We have been preparing site and operating programs for the Seelze site since 1999. The environmental programs they include are indispensable as tools to

implement sustainable environmental protection projects. They help to lower running costs, guarantee the strategic deployment of resources and provide for

transparent traceability. The environmental aspects of all projects are tested.

Objective	Soil conservation	Measures	Planned date	Initial values Remarks
Emissions				
Compliance with limits	Availability of exhaust combustion > 98%, improvement of heat/and- power cogeneration efficiency	Preventive and optimized plant maintenance, optimal gas turbine operation mode and reworking of energy concept	12/2008	2007: 98.1% Target: 98.5% Gas turbines over 40,000 operating hours
Reduction of short-term emission peaks to even out emission flows	25% reduction below 2005 base level		12/2008	Target: 25% reduction below 2005 base level
Lower CO ₂ emissions	Reduction of external energy consumption by 8%	Reduction of flow quantity while aerating the waste gas purificant plant with new compressed air system	12/2008	Target: 1.9 Mio kWh
Reduced waste volume				
Reduction of hazardous wastes		Optimization of sludge loop procedure and use of additives	12/2008	2007: 11,500 tons filter press cake Target: 10,900 tons filter press cake
Soil conservation				
Improved soil conservation	Safe provision of chemicals	Determination of need for action, preparation of concept	12/2008	Implementation of new statutory requirements

 New projects

 Taken over from 2007 program

Data and Facts

Energy

Energy consumption in 2007 remained almost constant in comparison with the previous year. Through its energy center, our plant has engaged in emission trading since 2005. The CO₂ balance for 2007 was positive, meaning that we did not use all our allocated emission entitlements.

Products

The product range was sustainably restructured. Our high-quality, high-priced products successfully attracted new customers. New products replaced those which had reached the end of their lifecycles.

Waste

The total volume of waste from production processes (not including anhydrite) declined by 8.1% in 2007 compared to 2006. An additional 2,991 kg of excavated soil was disposed of in the course of cleaning up historic pollution legacies.

Water

A further annual decrease in the total effluent volume caused it to decline by 2.4% in 2007 compared to 2006. At the same time, the volume of water consumed by the plant remained unchanged from the previous year. While a slight increase in our CSB (chemical oxygen requirement) and BSB₅ (biological oxygen requirement) was registered, there was a significant drop in the levels of toxic pollution by substances such as AOX* and heavy metals.

* adsorbable organic halogen

Emissions

The total amount of airborne pollutants has been reduced by another 1%. This slight decline resulted from a reduction of NO_x. Compared with 2002 levels, a 90% reduction of hydrocarbon pollution by post-incinerated exhaust gases has been recorded. Authorized air and water emission levels were not exceeded during the review period.

Pollution legacies

In 2007, three wells were regularly employed to remediate contaminated soil and ground water. The effluents were fed into the company's own wastewater purification system.

Noise and odors

No complaints concerning noise or offensive odors were registered at this site in 2007. These and other site-relevant issues are debated once a year in our neighborhood discussion group. For almost 15 years, the neighborhood group has constantly served this corporate location as a channel of communication. These exchanges with adjacent residents have made a successful contribution towards drastically reducing the number of complaints. We have stayed well below our targeted maximum of 12 bona fide complaints about offensive odors during 2007. The limit for 2008 has been fixed at 10 complaints.

Input 2007		Output 2007	
Energy input [MWh]	193,869	Products [t]	67,993
Water [cbm]	2,170,693	Waste [t]*	17,992
Drinking water	660,638	Waste without excavated soil	15,001
Mittelland canal	1,510,055	Waste for disposal	12,223
Leine river water	ca. 30,000	Waste for utilisation	5,769
Rain water	ca. 200,000		
		Emissions [t]	111.781
		Nitrogen oxide (as NO _x)	97.120
		Carbon monoxide (CO)	11.093
		Sulfur oxide (SO ₂)	1.025
		Dust (without Co, Ni, Cr)	1.009
		Organic compounds (VOC)**	0.172
		Hydrogen chloride (HCl)	0.850
		Ammonia (NH ₃)	0.100
		Hydrogen fluoride (HF)	0.188
		Hydrogen sulfide (H ₂ S)	0.006
		Hydrogen bromide (HBr)	0.146
		Other org. substances	0.072
		Quota of emissions from power operation:	103.431
		Nitrogen oxide (Nox)	91.656
		Carbon monoxide (CO)	10.773
		Sulfur oxide (SO ₂)	0.466
		Dust (without Co, Ni, Cr)	0.454
		Organic compounds (VOC)**	0.082
		Wastewater [cbm]	2,332,000
		From own sewage plant	2,332,000
		Sent to municipal sewage plant	10,000
		Relevant wastewater parameters [t]	242.604
		Chemical oxygen requirement (CSB)	159.006
		Biological oxygen requirement (BSB ₅)	15.510
		AOX ***	0.275
		Phenol index	0.255
		Nitrogen	63.316
		Phosphorus	0.759
		Zinc	1.725
		Manganese	1.324
		Tin	0.025
		Antimony	0.049
		Copper	0.077
		Nickel	0.173
		Chrome	0.017
		Lead	0.078
		Silver	0.014
		Mercury	< 0.001
		Cadmium	< 0.001

* without anhydrite

** easily volatile organic materials

*** adsorbable organic halogen

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