

## Production and logistics

# How we optimize our processes as a whole



Our worldwide production sites:



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### Improving our performance, reducing resource consumption

Continuous improvement of our processes and site structures, while simultaneously reducing energy, water and materials consumption and environmental burdens, is an important part of our promise of quality. Our business sectors set up their own optimization programs to achieve these aims, as the various production processes involved in making products such as tiling adhesives, household cleaners, and skin creams, offer fundamentally different approaches for improvements.

In addition to optimizing local production processes, the Laundry & Home Care business sector has set itself the goal of reducing the growing complexity between its 31 production sites and its suppliers, distribution centers and customers. A planning and steering system was already introduced for this purpose in 2006, and this has increased the transparency of the worldwide processes. It enables us to identify inefficient processes and effect integral improvements in the interplay of the various partners. For example, we increasingly group production capacities in the geographical vicinity of our markets. Taking a cross-border view of our production network enables us to locate our logistical distribution centers in such a way as to optimize the distance between sites and customers, thus reducing transport mileage to a minimum.

Since 2006, we have systematically carried out analyses of the processes in our eight Cosmetics plants as part of our Total Productive Management Plus program. The aim is to identify losses in the various production processes and the supply chain, so that we can continuously increase added value. On the basis of detailed analyses which were carried out at the start of the program, our sites specify actions and quantified targets each year. To achieve these objectives, we rely on the process-specific experience and the ideas and creativity of our employees. To involve all employees as unbureaucratically as possible in the process of continuous improvement, "blue cards" have been placed at clearly visible locations in all cosmetics plants. Our employees can use these cards to submit suggestions for improving processes.

Regarding the production of our Adhesives, Sealants and Surface Treatments, we continued to consolidate our worldwide production network in 2010 and have reduced the number of sites to 149. Key aspects of our production planning are production in the geographical vicinity of our customers, as well as economies of scale and the resulting optimized utilization of resources, see **AR** Pages 58 and 59.

In 2010, as a result of all our worldwide programs, cuts were achieved in energy consumption at 62 percent of our sites, in water consumption at 57 percent, and in waste at 55 percent. We were thus able to further improve our performance on important sustainability indicators in 2010 and have already achieved the 2012 environmental targets we had set for our production sites, see **SR** inside front cover and Page 14.

### Globally applicable standards, audits and training courses

Our safety, health and environment standards (SHE Standards) and our Social Standards apply to all of our sites worldwide. We ensure compliance with these standards, especially at the production level, through a clearly defined process of communication, training courses and audits. Checking the level of compliance with our standards is part of the due diligence procedure undertaken before we buy into a company. On the basis of the results, we draw up detailed action plans to raise newly acquired sites to the level of the Henkel standards where necessary.

*In November 2010, at the presentation of the national Awards for Cleaner Production, our site in La Luz, Mixco, Guatemala, received the prize in the Energy category. The prize is awarded annually by the Guatemalan Ministry of the Environment (MARN), in cooperation with the U.S. Agency for International Development (USAID), the Central American Commission on Environment and Development (CCAD) and the Center for Clean Production in Guatemala (CGPL).*



Leadership behavior at the local level plays a key role in Henkel's successful focus on sustainability and the implementation of our standards. We therefore give high priority to special training programs to raise the awareness of all production employees. These include the introduction of modern management methods, continuous professional development seminars, and training courses on Safety, Health and Environment (SHE) Leadership. In 2010, the Corporate Internal Audit department alone trained more than 250 employees in the Henkel standards on safety, health and environment. The program content ranged from risk assessment to emergency management and management systems.

"Companies are crucial to sustainable development. We drive forward the efficiency of processes worldwide, through the international transfer of knowledge and technologies, for example. We create jobs with fair and safe conditions and develop products that offer an increase in social value added. In this way, industry creates a central basis for society's prosperity, now and in the future."











**Dr. Andreas Bruns**  
Member of the Sustainability Council for Infrastructure Services and Safety, Health and Environment (Corporate SHE).

The complete interview with Dr. Andreas Bruns:

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**Worldwide: Contributions to resource-efficiency in 2010**

Focal areas	Contribution
	<b>Wassertrüdingen and Dülken, Germany / Maribor, Slovenia / Sfax, Tunisia / Bogotá, Colombia / Chonburi, Thailand:</b> Numerous optimization measures were carried out in 2010 as part of the Total Productive Management Plus program for our cosmetics sites. These enabled us to reduce the energy consumption by a total of 10 percent, water consumption by 12 percent, and waste by 19 percent.
	<b>Toluca, Mexico / Mixco, Guatemala / Perm and Engels, Russia / Port Said, Egypt / Düsseldorf, Germany / Montornès, Spain / Ferentino, Italy:</b> Through the use of new production technologies, we succeeded in optimizing the production process for laundry detergent powders. A comparison shows that the new process needs 13 percent less energy per year.
	<b>Düsseldorf, Germany:</b> The introduction of the Late Customization technology and other actions enabled us to reduce wastewater volumes and the associated product losses in liquid laundry detergent production by 60 percent.
	<b>Körösladány, Hungary:</b> By converting the hot-water generation system in the liquid detergent production facility to calorimetric technology, we reduced the annual consumption of natural gas for heat generation by 10 percent.
	<b>Navi Mumbai (Thane), India:</b> By optimizing the water flow in the hotmelt production lines we were able to exploit natural gravity. We now no longer need to run the water pumps at such high delivery rates as before and have thus reduced the energy they consume. Moreover, we adjusted the cooling water tanks to the site's actual production capacities. As a result, we have achieved decreases in water and energy consumption of, respectively, 26 percent and 4 percent.
	<b>Shanghai (Songjiang), China:</b> Besides conventional hot air blowers, the use of special moisture-absorbing fabrics in production supports the drying of the industrial adhesives produced there. This has enabled us to reduce the energy consumption for this line section by some 60 percent.
	<b>Auckland (East Tamaki), New Zealand:</b> The installation of a closed-loop system for chilled water reduced the annual water consumption in adhesives production by about 50 percent. At the same time, the new process brought about significant financial savings in the form of reduced costs for water intake and disposal.
	<b>Cabuyao, Philippines:</b> Through improvements to the production process, we reduced the number of operating hours and therefore the energy consumption per batch. Overall, the more efficient adhesives production planning resulted in a reduction in energy and water consumption by 15 and 36 percent, respectively.

The energy efficiency of our administration buildings is also increasingly a focus of our efforts.

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Examples from other sites worldwide:

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We regularly audit our production and administration sites and logistics centers, see **SR** Page 7. For us, audits are a key instrument for identifying risks and potential improvements. We have our environmental management systems at the individual sites externally certified, if this yields competitive advantages. At the end of 2010, about 71 percent of the production volume came from sites certified to ISO 14001, the internationally recognized standard for environmental management systems.

### Use of subcontractors for production

Third-party manufacturing constitutes an integral part of our production strategy and is used flexibly for our products and markets. For example, we may use toll and contract manufacturers when entering new markets or introducing new products and technologies. In these cases the corresponding production volume is often still small. In other circumstances, the use of external partners helps to optimize our production and logistics network and to increase resource efficiency.

Currently, we source about 10 percent additional annual production volume from toll and contract manufacturers. We place the same requirements regarding quality, environmental, safety and social standards on our subcontractors as well; they are an integral part of all contractual relationships and order placements. We monitor the implementation of our standards through audits by our Corporate Internal Audit department and, increasingly, by specialized third-party service providers.



*In March 2010, the Energy Reduction Team of the Henkel site in Sabana Grande, Puerto Rico, organized a one-day seminar on the subject of renewable energies. All employees were able to gain a greater insight into the advantages and potential applications of new technologies such as LED lighting and solar power systems.*

### Use of renewable energies



*Pilot projects: In Spain, we have installed small-scale solar thermal systems at our sites in Seville and in Montornès (photo). These systems use the heat from solar radiation to provide hot water for the sites.*

In the area of climate protection, our primary focus is on the efficient provision and utilization of energy, to prevent climate-damaging emis-

### Occupational incidents in 2010

In 2010, one serious incident occurred at a Henkel site. After a factory in Oitti, Finland, had been closed down, potentially harmful emissions were generated when an external service provider was carrying out cleaning work on tanks. The emissions also settled on the neighboring area. Henkel informed the local residents, supervisory bodies and the media about the incident and the measures to be taken. We also set up a central hotline so that we could respond rapidly to residents' questions. An independent external expert analyzed soil, water and plant samples; the results showed that no health risks to those living around the site and no long-term damage to the environment were expected. To confirm these findings, we will again have the soil, water and plants tested by an independent expert in the spring of 2011. All actions were taken in close cooperation with the Finnish authorities. We have thoroughly analyzed this incident and, as a consequence, revised the specifications for site closures accordingly.

At our site in Saveh, Iran, there was a fire in a warehouse for packaging materials. Thanks to the rapid action of employees, and with the support of the fire department, the fire was brought under control and farther-reaching damage prevented. As a consequence, the fire protection equipment at the site was thoroughly examined. This incident underscores the importance of regular SHE training for our employees.

sions in the first place. As a basic principle, we explore all other options for reducing energy consumption first before considering the use of green electricity or carbon offsetting certificates.

Nevertheless, we regularly check whether and where the use of renewable energy sources for electricity generation or the provision of heat is economically worthwhile for us and can make an additional contribution to climate protection. Our Laundry & Home Care business sector has developed a scouting tool to help with this. It takes into account the local availability of different forms of renewable energy, as well as the changing economic conditions and the demand at our sites.

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# Logistics

## Logistics planning for different products

Taking responsibility throughout the value chain includes the optimization of the transport of our products. Throughout Henkel, we are working to simplify our logistics structures and develop efficient and environmentally compatible logistics concepts. In most cases, our logistics planning is tailored to the nature of the final products to be transported. For relatively bulky products, we reduce the transport mileage and the resulting environmental burden by maintaining regional production sites. This applies especially to our laundry detergents and household cleaners, and to some cosmetics and adhesives. More compact products with a low specific weight make fewer demands on transport, so we produce them centrally in large quantities wherever possible. Our instant adhesives, for example, are produced at just a few sites worldwide.

## New requirements on our transport service providers

Worldwide, more than 90 percent of the transportation of our products from the production site to the warehouse, and from the warehouse to the customer, is now carried out by external logistics companies. It is therefore important for us to consider efficiency and environmental performance when we select our transport partners. In 2010, we defined new criteria for systematically assessing providers of logistical services in the context of "invitation to tender" processes. These include the definition of energy-saving targets, measures for modernizing vehicle fleets, and investments in programs for optimizing routes and determining emissions. Requesting information from companies about these criteria emphasizes our expectations in regard to environmentally responsible transport concepts, and we take them into account when we place new logistics orders.

## Determining our logistics emissions

We established comprehensive environmental data systems for our production operations many years ago. These cover both our own carbon dioxide emissions and the emissions resulting from the generation of energy bought from third parties, see **SR** Pages 14 and 15. In order to record the emissions associated with the transport of our products or with business trips, we are continuing to invest in the development of appropriate data collection systems. To ensure the transparency and comparability of transport emissions, in particular, we actively participate in discussions aiming to define a standard covering methods, basic data, and system boundaries. We work together intensively with

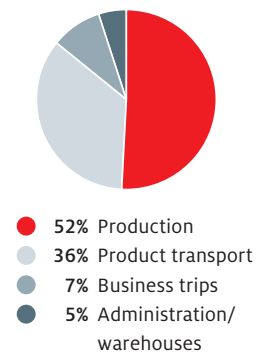
other industrial companies as well as with our logistics partners, also concentrating on data exchange and the avoidance of duplication of effort. The improvements in our data basis help us to check the effect of the actions we take and to respond to the growing number of data requests from industry and retail customers.

## Initiatives to improve our carbon footprint

We look closely at the development, production, transport and storage of our products, as well as business trips and the use of company cars, to find ways to achieve an across-the-board improvement in our operational carbon footprint. For example, we improve truck capacity utilization wherever possible by increasing the number of delivery units and maximizing the shipment weight or by grouping different consignments – also with those of suppliers of similar products.

In addition, we have been working with our European logistics partners to build up our intermodal transport routes for the efficient transport of products by means of different modes of transport. To identify potential for improvements in our collaboration with our retail partners, we participate in the Europe-wide Efficient Consumer Response initiative.  [www.ecrnet.org](http://www.ecrnet.org)

Our operational carbon footprint




Based on primary data and the extrapolation of secondary data, average values, and emission factors, we estimate our operational carbon footprint for 2010 at about 1.4 million metric tons.

### Specifications for our car fleet

In 2010, we were able to cut the carbon dioxide emissions per kilometer of new company cars by about eleven percent relative to 2009. Technical progress as well as the country-specific definition of efficient reference vehicles and the fixing of upper limits for carbon dioxide emissions when ordering new cars have all contributed to this reduction.

Moreover, we now break down the total monthly costs of a car into the company fraction and the employee's own contribution, including an estimate of the monthly fuel consumption. By increasing the transparency of the fuel costs incurred every month, we want to encourage our employees to drive more efficiently.



Additional measures to reduce our logistics emissions:

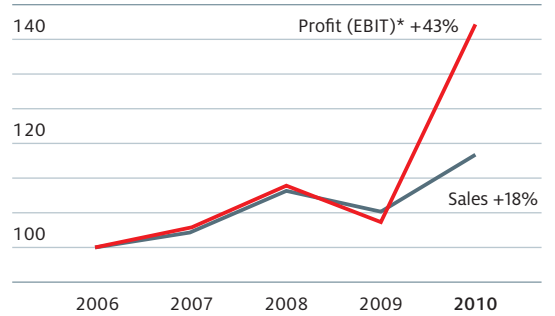
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## Environmental indicators

**Sustainability performance from 2006 to 2010**  
Environmental indicators per metric ton of output

Wastewater load (COD emissions)	-13%	↘
Energy	-23%	↘
Carbon dioxide (CO <sub>2</sub> )	-25%	↘
Waste	-28%	↘
Water	-31%	↘
Occupational accidents (per million hours worked)	-40%	↘
Volatile organic compounds (VOC)	-44%	↘
Sulfur dioxide (SO <sub>2</sub> )	-72%	↘
Heavy metals	+7%	↗

**Business performance from 2006 to 2010**  
Percent; index: 2006



Competitive advantage rather than cost factor: As impressively demonstrated above, sustainable business practices improve not only environmental performance but business performance as well. We are working constantly to increase the efficiency of our production processes. In addition to reducing resource consumption and environmental burdens, this also reduces costs. In the 2010 reporting year, we were thus able to achieve further improvements in key sustainability indicators.

\* After adjusting for one-time expenditures and gains as well as restructuring costs.

We report on the progress of other environmental indicators on the Internet:



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### Creating transparency

The indicators we use throughout the Company offer transparency in many respects. They help us to identify potential improvements, steer programs, monitor target achievement, and inform the public about our performance and progress in compact form. Our indicators are based on the environmental indicators of the European Chemical Industry Council (CEFIC). In the Sustainability Report, we focus on the publication of our globally relevant core indicators. Details on the progress made in regard to other environmental indicators are reported on the Internet only.

### Continuous data recording

The production-related data were determined at 182 Henkel sites in 57 countries. The data represent

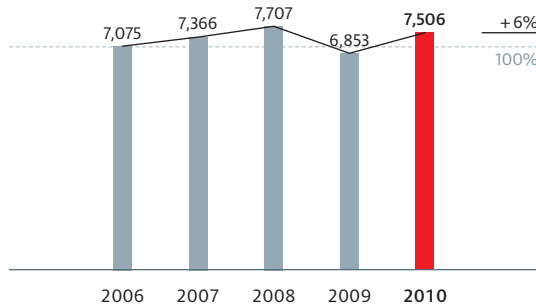
more than 95 percent of our worldwide production volume in 2010. They are validated centrally for year-end reporting and also verified locally within the framework of our international audit program, see **SR** Page 7. Any differences in data discovered or reported at a later date are corrected retroactively in our reporting system.

### A comparable basis

Our production structures are constantly changing – as a result of acquisitions or site closures, for example. The number of sites contributing data to the environmental indicators therefore changes accordingly: from 162 in 2006 to 182 in 2010. To ensure the comparability of the annual data, we also plot their progress as index curves relative to the volume of production.

### Production volumes

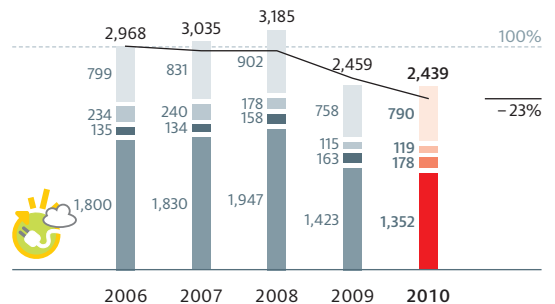
In thousand metric tons



In 2010, production volumes rose again, almost to the 2008 level, due to increasing demand.

### Energy consumption

In thousand megawatt hours



Legend: Bought-in energy, Coal, Fuel oil, Gas. Bought-in energy is electricity, steam and district heating that is generated outside our sites.

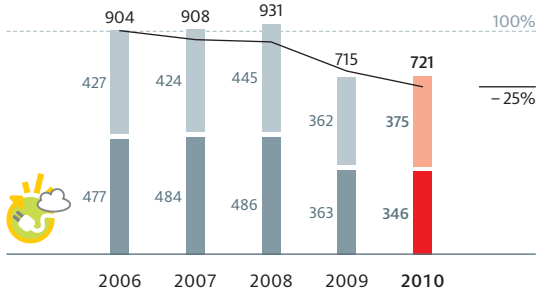
### Index curve

The index curve on the graphs shows the progress of the specific environmental indicators relative to the volume of production (per metric ton of output).

~ The base for these index curves is the year 2006 (= 100 percent).

**Carbon dioxide emissions**

In thousand metric tons

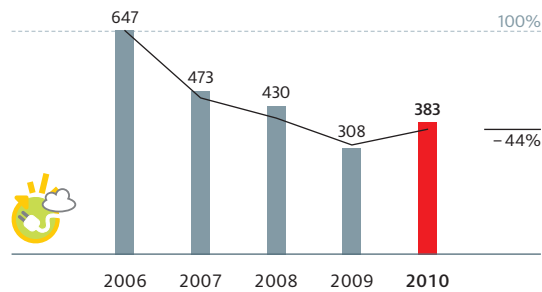


■ Carbon dioxide emissions from bought-in energy  
 ■ Henkel's own carbon dioxide emissions

Energy generation accounts for almost all of the carbon dioxide released as a result of Henkel activities. The given values include carbon dioxide formed during the generation of bought-in energy at non-Henkel sites.

**Emissions of volatile organic compounds**

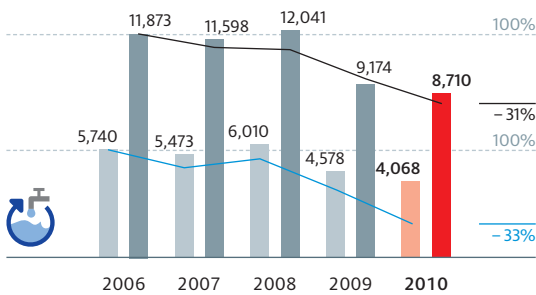
In metric tons



The high level in 2006 is primarily due to acquisitions. Since 2007, additional measures have been implemented to reduce emissions of volatile organic compounds. The rise in 2010 is due to the increase in production volume.

**Water consumption and volume of wastewater**

In thousand cubic meters

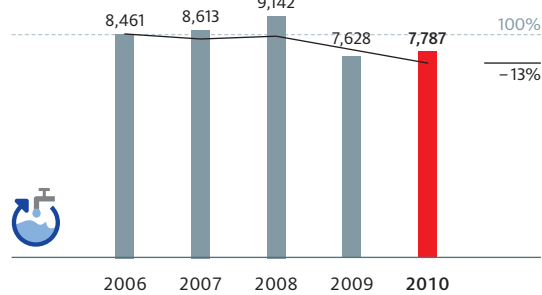


■ Water consumption ■ Volume of wastewater

Because water is lost by evaporation and water is contained in many products, the volume of wastewater is smaller than the volume of water consumed.

**COD emissions to surface waters**

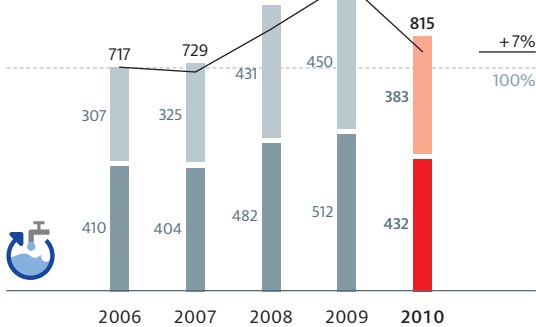
In metric tons



Chemical oxygen demand (COD): Measure of the pollution of wastewater with organic substances.

**Emissions of heavy metals to wastewater**

In kilograms



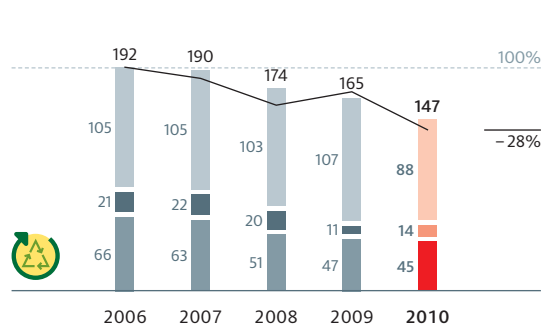
■ Zinc ■ Lead, chromium, copper, nickel\*

The rise in the years 2008 and 2009 is primarily due to the acquisition of the National Starch businesses in 2008.

\* Particularly hazardous heavy metals, such as mercury and cadmium, are not relevant in our production.

**Waste for recycling and disposal**

In thousand metric tons



■ Waste for recycling ■ Hazardous waste for disposal ■ Waste for disposal

"Hazardous waste for disposal" includes all kinds of waste that are classified as hazardous under the laws of the respective countries and the hazardous wastes listed in the Basel Convention of 1989.