



# Company

The companies of ALTANA AG develop, manufacture, and distribute high-quality, specialty chemical products and provide the associated services. ALTANA is a globally active corporation headquartered in Wesel, Germany, with an international revenue share of approximately 85 percent. Its four Divisions, BYK Additives & Instruments, ECKART Effect Pigments, ELANTAS Electrical Insulation, and ACTEGA Coatings & Sealants, occupy a leading position in their target markets with respect to quality, product solution expertise, innovation, and service.

ALTANA offers innovative and environmentally compatible solutions with the matching specialty products for coatings manufacturers, paint and plastics processors, for the printing and cosmetics industry, as well as for the electrical and electronics industry. Our product portfolio includes additives, special coatings and adhesives, effect pigments, sealants and compounds, impregnating resins and varnishes, and testing and measuring instruments.

The ALTANA Group currently includes 41 production sites and over 50 service and research laboratories worldwide. All of the shares in ALTANA AG are held by SKion GmbH, an investment company owned by Susanne Klatten. Employing a workforce of approximately 5,300, ALTANA posted sales exceeding €1.6 billion in fiscal 2011. Its impressive earning power and high growth rate make ALTANA one of the most successful and innovative chemical groups worldwide.

## Corporate performance indicators

	2011	2010
Number of employees	5,313	4,937
Sales	€1.617 million	€1.535 million
EBITDA	€308 million	€314 million
EBITDA margin	19.1 %	20.5 %
Research and development expenditures	€88 million	€82 million
Investments	€94 million	€74 million
Total production ****	547,451 t	495,509 t
Gross value added ****	€593 million	€567 million
Final products ****	422,450 t	374,591 t
WAI 1 *	7.43	7.73
WAI 3 **	69	99
Total CO <sub>2</sub> (Scope 1 + Scope 2) *** + ****	133,348 t	135,901 t
Drinking water ****	562,870 m <sup>3</sup>	559,685 m <sup>3</sup>
Non-hazardous waste ****	7,556 t	6,057 t
Hazardous waste ****	20,418 t	18,323 t

\* Work Accident Indicator 1 (Number of occupational accidents with lost work time of more than one day per million working hours)

\*\* Work Accident Indicator 3 (Number of lost work days due to occupational accidents per million working hours)

\*\*\* Scope 1: direct emissions; Scope 2: indirect emissions

\*\*\*\* Projection for 12 months (calendar year)

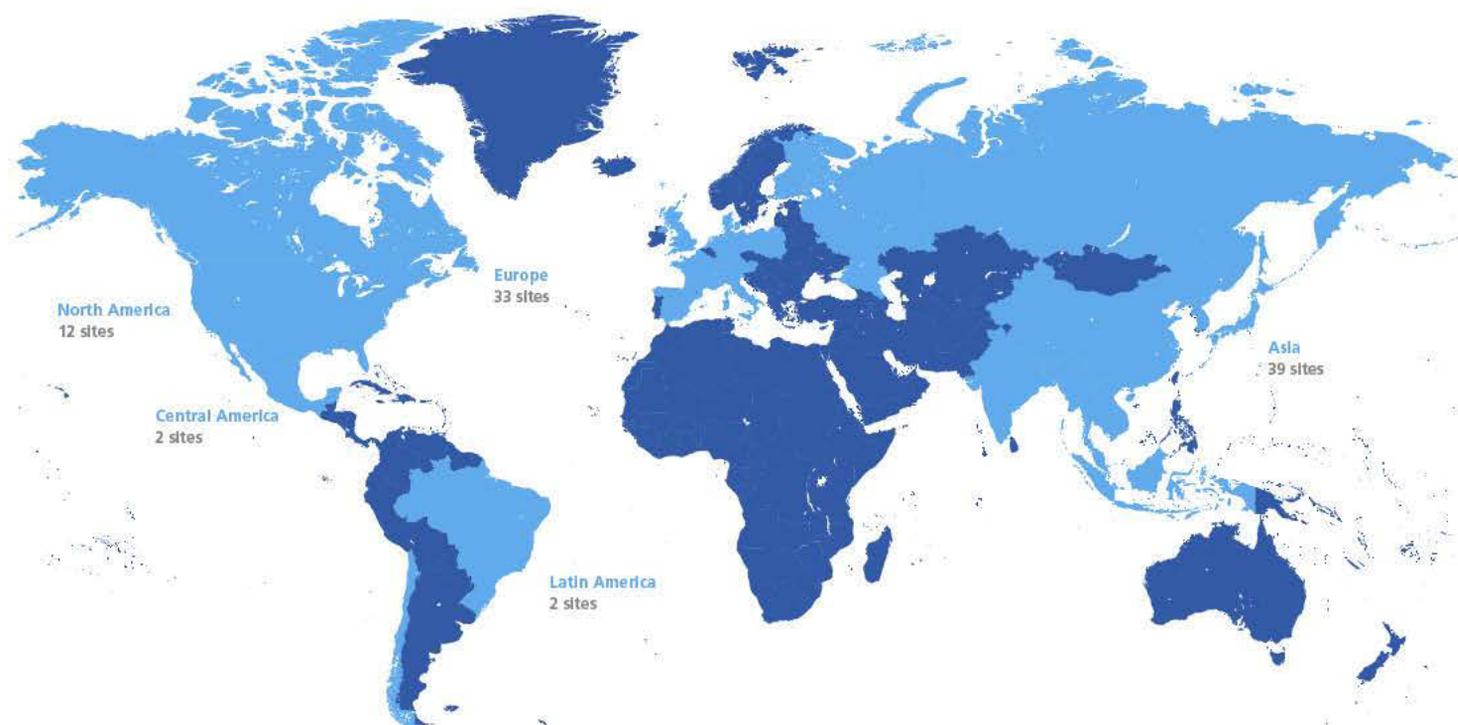
### About this report

The Sustainability Report 2011 was written to provide the public, our employees, business partners and authorities, non-governmental organizations, and all other stakeholders with information about the sustainability strategy of ALTANA AG in terms of economy, ecology, and social responsibility. Our 2011 Annual Report offers details about our economic development, while the content of this report is guided by stakeholder interests.

The facts and figures presented in this report refer to the fiscal year 2011. Because of the switch in the reporting period from the calendar year to the period from October 1 to September 30, the absolute environmental indicators of the first nine months were projected for the full year 2011. Unless otherwise noted,

our statements apply to all Divisions and worldwide subsidiaries that were part of the ALTANA Group prior to January 2012. The report follows the international G3 guidelines of the Global Reporting Initiative (GRI). We performed an in-house assessment of our compliance with GRI indicators and have concluded that the report meets the requirements of application level B.

For further information on the topics presented in this report, please visit [www.altana.com/sustainability](http://www.altana.com/sustainability). The Sustainability Report 2010 was published in October 2011 and is available for download online. Future reports will be published annually and will serve as the required communication on progress for the Global Compact. The report is available in both German and English.



## ALTANA

2011 sales: € 1,617 million

Employees: approx. 5,300

EBITDA 2011: € 308 million

EBITDA margin: 19.1 %

 **BYK**  
Additives & Instruments

2011 sales: € 582 million

#### Business Lines

- Paint Additives
- Plastic Additives
- Industrial Applications
- Measuring and Testing Instruments

 **ECKART**  
Effect Pigments

2011 sales: € 347 million

#### Business Lines

- Coatings
- Graphic Arts
- Cosmetics and Personal Care
- Plastics Industry
- Functional Applications

 **ELANTAS**  
Electrical Insulation

2011 sales: € 391 million

#### Business Lines

- Primary Insulation
- Secondary Insulation
- Electronic and Engineering Materials

 **ACTEGA**  
Coatings & Sealants

2011 sales: € 297 million

#### Business Lines

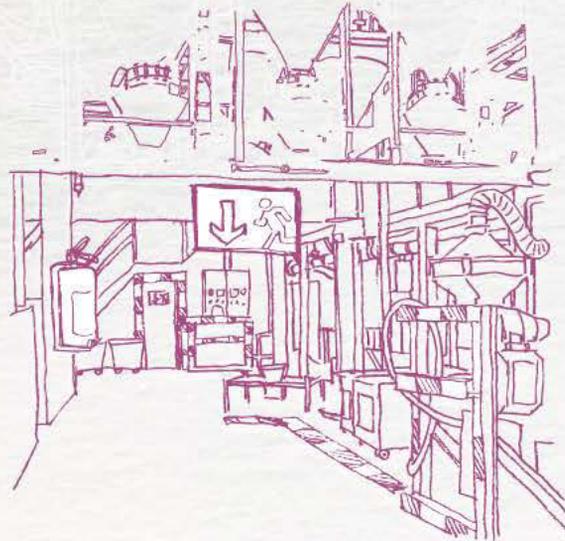
- Converting Specialties
- Graphic Arts



6 Management

## We are ALTANA

"We want to be leading in everything we do," say the new Guiding Principles of ALTANA. That also applies to our corporate responsibility and the new "ALTANA identity" that helps support the sustained success of the company in the future.



28 Safety

## EHS represents major responsibility

A chemical company not only offers opportunities, but also is associated with risk. For this reason, occupational safety and health are top priorities for ALTANA. EHS managers make sure that standards are met and risks are minimized.

14 Products

## Everything to protect the customer

Innovative power is a vital success factor for ALTANA. As the manufacturer of specialty chemical products, we continuously bring new products on the market that improve our eco balance and that of our customers.



	Management	Products	Safety
1	Our Guiding Principles	14	EHS management
4	Company	18	Occupational health
	Acquisitions/divestments	18	Occupational safety
	Management systems	24	
	Compliance	26	
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	Stakeholder dialog		
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	Suggestions system		
		Innovative chemicals	
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		Global Product Strategy	
		Globally Harmonized System	
		Nanotechnology	

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### Heat and power from our own production

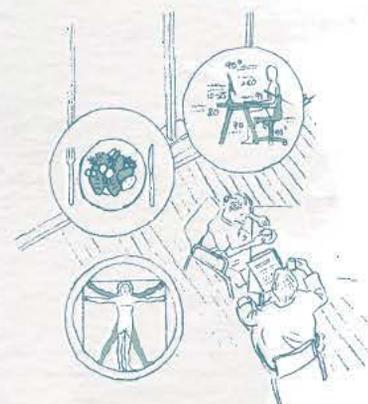
Even though non-consumed energy is the best form of resource protection, power and heat are necessities we cannot do without. However, ALTANA is committed to improving efficiency wherever possible, for example by combining power and heat in a co-generation plant.



46 Human Resources

### We have great trust

Employment at ALTANA is built on mutual trust and the high motivation of our employees. This means everyone's physical and emotional wellbeing must be guaranteed, and a new counseling center for psychological stress is contributing to this effort.



52 Social Responsibility

### Only professional support is helpful

ALTANA is involved in a number of social projects and initiatives, both at the regional and the international level. Our focus is on education, science and research, which also includes supporting disadvantaged people.



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Dear Readers,

Thank you for your interest in the ALTANA Sustainability Report 2011. Our Sustainability Report also illustrates our progress, which—together with our annual report—offers a comprehensive insight in the way ALTANA lives its corporate responsibility.

This report covers a wide range of topics, extending from responsible use of valuable resources to our human resource policies and social commitment. The concept of sustainability serves as a guideline and represents a self-obligation that far extends past statutory provisions and standards.

As a specialty chemicals company placing particular importance on sustainable development, our activities can be broadly summarized to focus on products that protect and optimize surfaces and help both our company and our customers reach sustainability goals. Sustainable development offers fundamental opportunities for ALTANA and our customers, provided of course that we are intimately familiar with the current requirements of sustainable development, of climate protection, and resource concerns.

The major challenges of the future associated with resource and energy efficiency, healthcare, or secure drinking water and food supply can only be solved in conjunction with the innovative developments of the chemical industry. In addition, we believe innovation and responsible care are the best ways for hedging against the risks of the global economy.

Our employees who develop sustainable solutions and products with great dedication, creativity and professionalism are our most important asset for innovation and for consistently pursuing sustainability goals. This report highlights their efforts, and every section of this report presents employees who drive respective efforts and innovations at ALTANA.

Our Identity, which was discussed in detail and broadly communicated in 2011, also expresses the importance of our employees' well-being and places employees at the center of our corporate development. The new Guiding Principles include all important aspects of our voluntary commitment. ALTANA also supports the objectives of the UN Global Compact, which are full in line with the Identity of ALTANA. As a consequence, this sustainability report also serves as our annual communication on progress for the UN Global Compact.

I hope you will enjoy your reading.



Dr. Matthias L. Wolfgruber  
Chief Executive Officer

Dear Readers,

I am pleased to present you with the second sustainability report of ALTANA. "Sustainable" has become a widely used term, and may even be a bit overused with reference to any long-term concept—certainly with a wide range of interpretations. For that reason, I would like to give you some insight in the definition and implementation of sustainability at ALTANA.

To our company, sustainability is the question of successfully meeting the needs of current generations while ensuring that future generations have sufficient resources for their needs. It involves the issue whether we may be overtaxing the capacities of the Earth. Specifically, we need to address natural resources, the ability of the environment to absorb



waste and emissions, and climate protection in light of the fact that industrialized countries already have a resource demand that the Earth cannot meet for its entire population.

The question whether a company is sustainable certainly touches on the question of long-term economic success, but we must recognize that such success is only feasible when ecological and social

aspects are taken into account in addition to economic factors. There are clear interactions and improvements in ecology can definitely result in economic benefits.

All this means that companies such as ALTANA have to design their own development sustainably while contributing to the sustainable development of society. They are continuously obligated to keep their environmental impact or ecological "footprint" as small as possible. At the same time, this is closely associated with a high level of commitment to our employees around the world. Our new Guiding

Principles say: "ALTANA's corporate duty is to care for the health and safety of our employees and to protect the environment."

This responsibility is binding for us throughout the world. We maintain a number of worldwide sites to be close to our customers. They reduce transport and create employment in countries such as China, India, and Brazil. We pay our employees fair wages so they don't have to send their children to work. Ensuring the future of our business activities demands an active contribution to the social development on site. As a consequence, the promotion of educational and research projects represents a high priority in our social commitment.

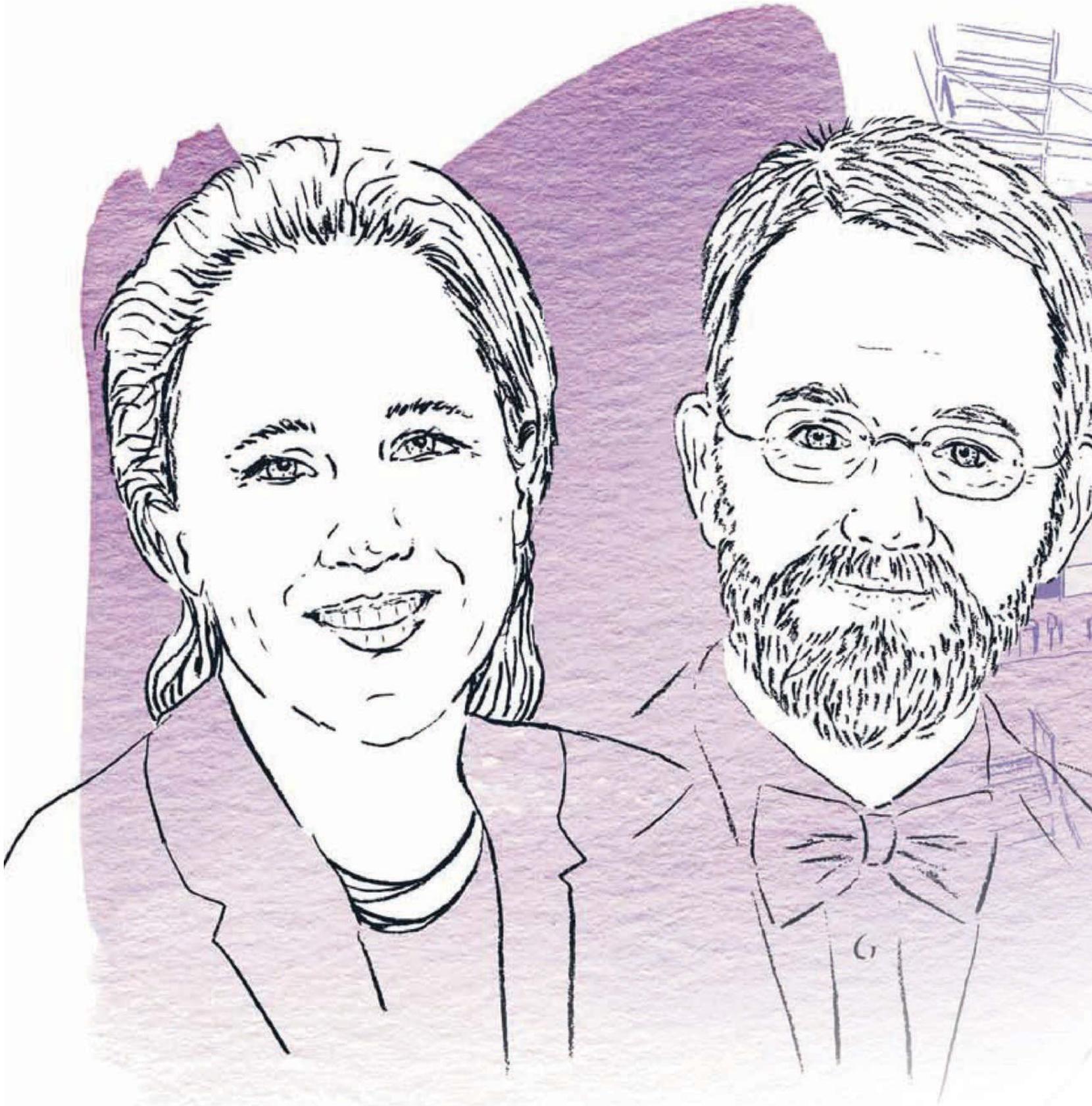
By the same token, we have to think about our resource efficiency and raw material sources, along with their ecological and social impacts and will need to identify potential new material sources for the future.

The innovations and products of ALTANA for our customers and users represent an important contribution to sustainability. They create higher energy and resource efficiency and lower emissions. That reduces the environmental impact of our supply chain, provides our customers with a competitive edge, and benefits our own future.

As you can see, the sustainability strategy of ALTANA is not an isolated matter. Rather, sustainability is an integrated part of our overall strategy for creating long-term value. We hope this report will make our understanding of sustainability more tangible and that it convincingly documents our progress. Thank you for your interest in ALTANA and please let us know if you find anything amiss.

Dr. Andreas Diez

Vice President Environment, Health & Safety





## We are ALTANA

The year 2011 marked the further definition and communication of our Guiding Principles for all employees of ALTANA to serve as a shared "ALTANA Identity" that will support the sustained success of the company in the future.

"The newly developed Guiding Principles came directly from the core of the company as a result of the feedback from ALTANA employees all over the world," says Annette Lampe of ALTANA Human Resources, who led the project together with Dr. Norbert Flüggen of ALTANA Corporate Procurement. A team of eight employees from multiple Divisions began the effort to identify and eliminate the weaknesses of the previous guidelines in the fall of 2009. "It was a particular challenge to integrate the full scope of regional and cultural diversity at ALTANA into the project and to create a set of Guiding Principles that would not simply be filed away as another document after its introduction," notes Flüggen, who has been in charge of Strategic Procurement at ALTANA since 2005. "The project members from the various Divisions represented the specific interests of all company units, which was particularly important

for a company with a decentralized structure such as ALTANA."

This principle vividly illustrates the culture of ALTANA for employees around the globe. In addition, our newly developed Leadership Guidelines provide detailed guidance. They clearly and unmistakably

"We want to be leading in everything we do"

define the management style ALTANA expects from its executives and document how the four core values of the Guiding Principles (Trust, Openness, Appreciation, and Empowerment to Act) form the basis of the leadership culture at ALTANA. Accordingly, the two documents spell out what employees can expect at ALTANA, and what ALTANA expects from its employees.



Guiding Principles ambassadors of the 2011 Identity Workshops

We have charged forty trained ambassadors to communicate the content of the Guiding Principles and to bring them across in an entertaining manner with the help of a special tool box. "In the end, all participants will have a personal identity set,

**"Employee response has been very positive"**

consisting of the Guiding Principles and the Leadership Guidelines to identify even more with their work and ALTANA," explains Annette Lampe. The official kick-off for implementing the Guiding Principles was held at the Global Management

Meeting in Wesel in October 2011. All employees had attended a one-day workshop about the new Guiding Principles globally by the end of March 2012. "Employee response has been very positive," says Flüggen. "People like how clearly the text is phrased, and our principle, "We want to be leading in everything we do" expresses the continuous development at ALTANA and will be part of our shared identity in the future. The aspects of cooperation and corporate culture are described by four values.

"The goal of developing the Guiding Principles was not just to define the ALTANA philosophy in print, but to achieve broad acceptance among employees," summarizes Lampe. Supplementary measures in years to come will ensure the lasting effect of the new guidelines.

## Company

ALTANA develops, produces, and distributes high-quality, innovative specialty products for coatings manufacturers, paints and plastics processors, for the printing and cosmetics industry, as well as for the electrical and electronics industry. The business seat of our globally active Group is Wesel. The ALTANA Group comprises four Divisions, BYK Additives & Instruments, ECKART Effect Pigments, ELANTAS Electrical Insulation, and ACTEGA Coatings & Sealants.

ALTANA AG has a dual management and monitoring system. The Supervisory Board appoints two executive managers for a term of five years. The Management Board is solely responsible for managing the company and exclusively serves its interests. The Management Board forms the advisory Executive Management Team together with the Presidents of the Divisions and selected executives of central functions.

The Supervisory Board of ALTANA AG has twelve members, half of which are elected by German Group employees in accordance with German corporate co-determination law. The other six members are elected by the annual shareholders' meeting. Supervisory Board members serve terms of five years. The Supervisory Board monitors the business and advises the Management Board on company management matters. With the exception of Susanne Klatten, all Supervisory Board members elected in the shareholders' meeting, along with the Chair of the Supervisory Board, are independent.

For more information on the company please visit [www.altana.com](http://www.altana.com)

### Acquisitions and divestments

Thanks to our clear, strategic alignment with innovative and technically demanding growth markets, we are optimally positioned in our current environment. In addition to targeted acquisitions, large investments in research & development play a vital role and our share of R&D expenditures, which is far above the industry average, is an important aspect of our growth. In 2011, ALTANA invested some €88 million in promising projects, exceeding our R&D expenditures of the previous year by €6 million.

The companies we acquired during the reporting period, along with the associated expansion of our innovative product portfolio, are a key component of our sustainability strategy. This includes the can end sealants business for the metal can packaging market of Watson Standard Adhesives Company, which was acquired as part of an asset deal and has been integrated into the ACTEGA Coatings & Sealants Division. The additional products are mostly based on a sustainable, renewable resource. We also acquired the Color Chemie Group, which manufactures environmentally friendly, water-based specialty printing inks for packaging boxes, foils, carrier bags, gift wrapping papers and wallpapers and also was integrated into the ACTEGA Coatings & Sealants Division. ECKART Effect Pigments also took over the production of Metalure pigments (PVD aluminum pigments) from Avery Dennison to accelerate its innovation processes, and ALTANA added Kometra Kunststoff-Modifikatoren und -Additiv GmbH to its portfolio, which is part of the BYK Additives & Instruments Division as BYK Kometra GmbH. The additional know-how will give us access to a patented, globally unique technology that enhances the durability of technical plastics and contributes to resource efficiency.

We divested the ceramic paint business of ACTEGA Rhenania to focus even more on our core competencies. The elimination of the energy-intensive ceramic paints also improves the CO<sub>2</sub> emissions balance of ACTEGA Rhenania. At the same time, we divested the pearlescent pigment business of ECKART in Finland that was based on natural mica (glimmer mineral). That unit will now concentrate on pigments from synthetic sources, which also helps prevent interference with biodiversity and child labor in the extraction of natural glimmer in India, since the new material will no longer be surface-mined in India. Furthermore, we closed the facility of ACTEGA Radcure in the U.S. and integrated the corresponding activities into ACTEGA WIT to reduce our footprint and optimize energy efficiency.



2011 sales: € 1,617 million

Employees: approx. 5,300

**BYK-Chemie GmbH**

BYK Asia Pacific  
BYK-Cera  
BYK Chemie de Mexico  
BYK-Gardner  
BYK Gardner USA  
BYK Japan  
BYK Kometra  
BYK Solutions  
BYK Tongling  
BYK USA

**ECKART GmbH**

ECKART America  
ECKART Asia  
ECKART Benelux  
ECKART Cosmetics  
ECKART France  
ECKART Italia  
ECKART Mexico  
ECKART Pigments  
ECKART Suisse  
ECKART UK  
ECKART Zhuhai

**ELANTAS GmbH**

ELANTAS Beck  
ELANTAS Beck India  
ELANTAS Isolantes  
Elétricos do Brasil  
ELANTAS Italia  
ELANTAS PDG  
ELANTAS Tongling  
ELANTAS Zhuhai

**ACTEGA GmbH**

ACTEGA Artística  
ACTEGA Colorchemie  
ACTEGA DS  
ACTEGA Foshan  
ACTEGA Kelstar  
ACTEGA Rhenacoat  
ACTEGA Rhenania  
ACTEGA Terra  
ACTEGA WIT

41 production sites and over 50 service and laboratory sites worldwide

## Management systems

The ALTANA Corporate Environment, Health & Safety Department (EH&S) ensures the implementation of occupational safety as well as occupational health and environmental protection in line with the key performance indicators and goals (e.g. environmental targets) defined by the Management Board. The department submits a quarterly report to the Executive Management Team. The qualification of employees and committees with responsibility for sustainability at ALTANA is ensured by training, professional experience, seminars, and conferences. Environmental and safety targets are part of the personal targets to be achieved by Division Presidents and other executives at ALTANA. They serve to determine variable compensation components that are evaluated annually.

The companies of the ALTANA Group record essential environmental impacts within the scope of their environmental management systems. These include resource and water consumption along with waste volumes, VOC and CO<sub>2</sub> emissions,

minor chemical-specific emissions below the applicable limit values in the wastewater of ELANTAS Beck India, transports of source materials and finished products by ship, truck, or rail along with impacts on biodiversity (see also page 59). Opportunities primarily arise from new products, which reduce environmental impacts in the supply chain (see also page 18).

BYK-Chemie in Wesel maintains an integrated management system for the areas of quality, environment, occupational safety, and operational safety (Industrial Accident Ordinance). The first-ever certification of the occupational safety management system according to OHSAS 18001 by the Employers' Liability Insurance Association Raw Materials and Chemical Industry is planned for early 2012. BYK-Chemie also established a new energy manager in July to develop a certifiable energy management system according to ISO 50001. The first steps in 2011 included participation in the pilot project



“Modular Energy Efficiency Model” of the NRW energy agency. The implementation is to be completed by 2013.

During the reporting period, ECKART GmbH in Hartenstein further advanced its energy management system that had previously been implemented in parts. Plans call for ISO 50001 certification in 2012. ECKART America at the Painesville site now also has a certified environmental management system according to ISO 14001. ELANTAS PDG and ELANTAS Italia (Quattordio, Ascoli Piceno) also started similar programs and hope to become certified in 2012, while the process may take a bit longer at other companies (ACTEGA WIT, ACTEGA Kelstar, ACTEGA Rhenacoat).

In a parallel effort, BYK-Chemie in Wesel was able to save some 2,800 MWh of energy—the equivalent of 890 metric tons of CO<sub>2</sub>—with previous measures. The company plans additional technical measures to save another 8,600 MWh or 3,600 metric tons of climate-damaging carbon dioxide. BYK plans to invest €4 million in 2012/2013 to optimize the energy efficiency of its production infrastructure. This will compensate for rising energy prices, such as those resulting from emissions trading, renewable energy, and expanded grids.

### Compliance: Fighting discrimination and corruption

Since our 2010 Sustainability Report included a detailed discussion of our compliance management system, this report focuses just on a few major activities in 2011.

In March 2011, a regular survey went out to all companies to inquire about incidents and violations regarding HR risks in the past year. None were reported. In Germany, all employees of ALTANA attended refresher courses on the Equal Opportunity Act (AGG). In addition, the female employees of German ALTANA companies received a survey on the topic of women in leadership positions. It was designed to find out whether the company discriminates against women and how to counter such practices.

### Implementation of Global Compact principles in the ALTANA supply chain

Based on the sustainable implementation of the Global Compact principles for suppliers, the new ALTANA Global Purchasing Network website features the ALTANA Code of Conduct and a special code of conduct for suppliers. It is both a prerequisite for working with ALTANA and a self-obligation on our part to comply with and advance the principles of the Global Compact. Copies are handed out during supplier visits and audits, which also gives us an opening to talk to existing and potentially new suppliers about compliance with the Global Compact principles.

### Measures in the reporting year

#### Measures in 2011:

1. Communication of ALTANA commitments by presenting the Code of Conduct during supplier visits and audits (ongoing)
2. Review of compliance with principles during supplier visits and audits (ongoing)
3. Communication of the ALTANA Supplier Code of Conduct within the scope of the ALTANA Corporate Procurement Intranet site.
4. Communication of the self-commitment of ALTANA in the purchasing network website. The web pages went online in November 2011. In the first six weeks, more than 25 suppliers voluntarily contacted us to confirm their self-commitment.
5. Information of all employees through the “faces” ALTANA staff magazine.

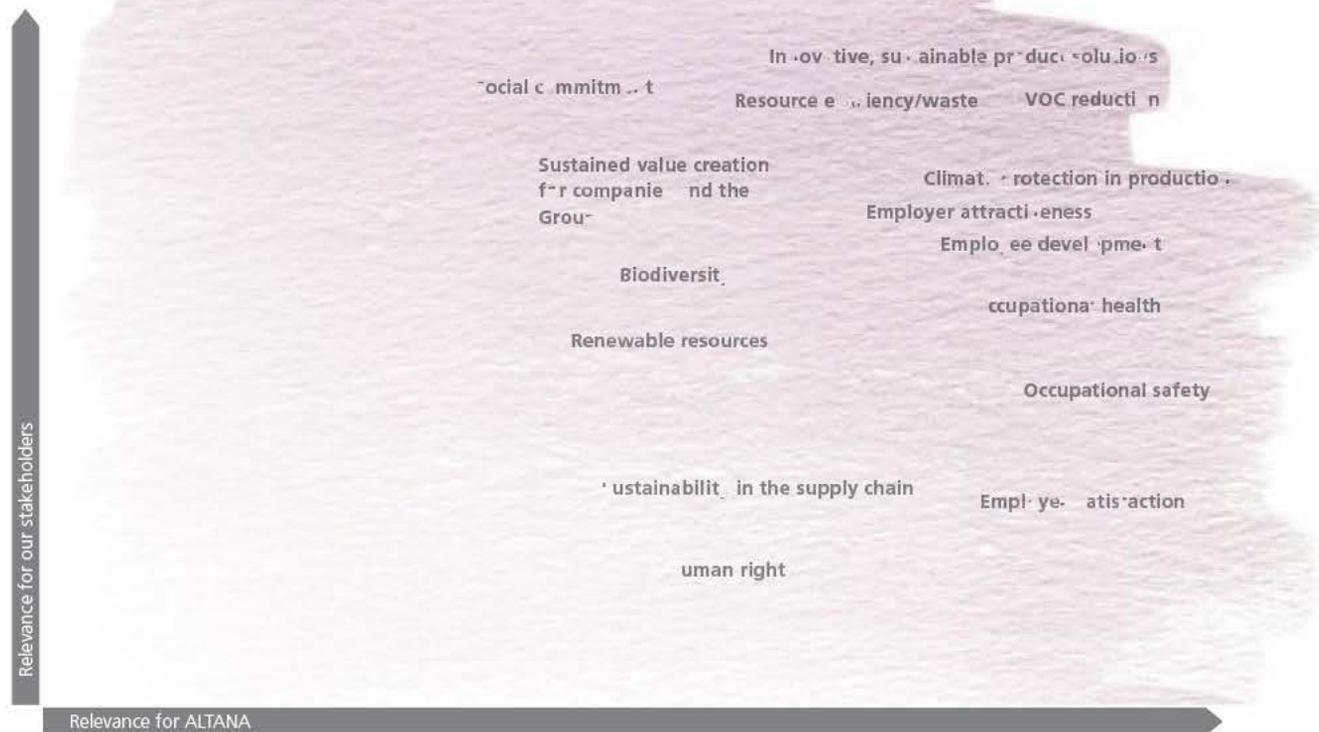
#### Outlook for 2012:

1. Measurement
2. ALTANA is reviewing the option to join regional and supranational initiatives such as the industry code of conduct of the German Association for Material Management, Procurement and Logistics (BME), which pursue the goal of implementing and upholding the principles of the Global Compact (i.e. fundamental rules to combat corruption, support anti-trust efforts, fight child and forced labor, uphold ethical principles toward suppliers [Compliance], principles of human rights, environmental protection and occupational health and fair working conditions).
3. Continued communication of ALTANA requirements for suppliers in the context of supplier visits and audits.

#### Services

- <http://www.altana.intranet/procurement>
- <http://www.altana.com/purchasing-network>

ALTANA Materiality Matrix



During the Global Management Meeting of the ECKART Effect Pigments Division, Compliance was discussed in general, with particular focus on corruption, bribery, and corruptibility. Some 120 executives took part in this meeting. Compliance was also a core topic at the Management Meeting of BYK-Chemie GmbH. The corresponding presentation brought up concerns associated with bribery, corruption, and corruptibility. The event was attended by 124 employees of BYK-Chemie GmbH.

**Audits**

All other ISO 14001 certified sites (environmental management system) perform annual internal audits and arrange for external audits as well. Our high standards are also upheld by cross-audits, in which auditors of ALTANA companies review other sites. During the reporting period, energy audits were performed at the German sites of ELANTAS Beck, ACTEGA Rhenania as well as ACTEGA DS with the help of external service providers. In Wesel, BYK used the services of external energy consultants. The ECKART site in Louisville, U.S. also analyzed its energy savings potential and conducted a study with experts of Louisville University. Furthermore, forty water-based coatings of ACTEGA Terra received the

FoodSafe Seal in 2011, which marks the safety of our products for direct contact with dry food items.

The Internal Audit department performed eighteen audits of German and foreign subsidiaries of the ALTANA Group in 2011.

**Dialog with stakeholders**

ALTANA maintains a close dialog with neighbors, local politicians and media, associations, investors, customers, suppliers, authorities and all other interest groups who are directly or indirectly affected by our activities to strengthen public trust in the safety of our plants and products. This is achieved with our annual report and sustainability report, participation in association meetings, and open house activities held every three years. During the 2011 Chemical Industry Open House Day, several thousand visitors toured our sites in Hamburg, Bremen, Lehrte, Wesel, Grevenbroich, Kempen, and Güntersthäl.

The results of our continuous dialog with our stakeholders are displayed in a so-called materiality matrix (shown above). It lists the most important sustainability topics and their significance for ALTANA and our stakeholders by relevance.

The same topics are discussed in this sustainability report. Although we find all action areas important, our special focus is on the topics in the right field of the matrix.



A few of the winners of the ALTANA Innovation Award 2011

### Memberships

Regular professional exchanges are part of our sustainability concept. Accordingly, the German companies of the ALTANA Group are members of the German Chemical Industry Association (VCI), of CEPE, the umbrella organization of the 17 European professional associations for coatings, printing inks, and artists' colors as well as the Association of the German Coatings Industry (VdL). Some of our affiliates also are members in the German Verband der Mineralfarbenindustrie (association of producers of pigments, fillers, functional additives, food colorants and others, VdMi), the German Association of Plastic Films (IVK) and TEGEWA (association representing manufacturers of textile, paper, leather and fur auxiliaries and colorants, surfactants, complexing agents, antimicrobial agents, polymeric flocculants, cosmetic base materials, pharmaceutical excipients and allied products).

By joining the Global Compact, ALTANA confirmed the important role of social commitment and our full support of the Compact's ten principles of human rights, occupational standards, environmental protection, and anti-corruption. Protection and respect for human rights are part of our core values. This topic, which is overseen by the head of Corporate Procurement, may be associated with risks among our suppliers. ALTANA has been committed to the principles of Responsible Care, an initiative of the global chemical industry for product stewardship, occupational health and environmental protection, since 2002.

### Awards

As part of the ALTANA Innovation Conference, outstanding projects have been honored with the ALTANA Innovation Award since 2009. Last November, the award went to employees of the ACTEGA Division for their work on PVC-free sealant and coating systems that increase food safety.

The innovative contribution of this system was underscored by our high rankings in the German Packaging Award 2011. The world's first PVC-free lug cap Pano Blue Seal powered by PROVALIN/metal screw closure with TPE seal, produced by ACTEGA DS and Pano Verschluss GmbH, won first prize in the category Design, Equipment, and Optimization. In addition, we were nominated for the WorldStar of the World Packaging Organization (WPO).

### Employee suggestion system

ALTANA began the implementation of a global employee suggestion system in 2009 to provide employees with the opportunity to share their ideas for cost savings, occupational safety, or protection of environment and health. Ideas are rewarded appropriately, and there is a mechanism for exchanging ideas within the Group. The global implementation was completed in April 2011 with the ratification of the concept in the U.S.

	2010	2011
Total rewards paid	€ 131,881	€ 105,917
Calculated savings in the first year	€ 152,344	€ 340,402
Number of improvement suggestions	790	855

For further details on our company, our strategy and on the topics of the Global Compact, Compliance, management systems, and our vendor relationships, please visit [www.altana.com](http://www.altana.com) or see our latest annual report.





## Everything to protect the customer

What is an innovation? According to the original definition, innovation is a new idea or improvement, but the term has become so overused that an actual new idea or improvement is rarely even present when the concept of innovation is invoked.

Things are different at ALTANA. We bring a variety of products on the market every year that actually are based on new ideas. We feel the industry should start talking about innovation when a new idea has truly resulted in a new product, such as in the case of PROVALIN. A globally unique seal for vacuum twist closures, protected by six patents.

“We were convinced of the idea from the start.”

When you open the lid of a glass jar that was sealed with PROVALIN you will see an unusual shade of blue, although green would have been a more fitting color since PROVALIN offers improved consumer protection in addition to environmental advantages. Polyvinyl chloride, better known as PVC, is usually the preferred material for sealing compounds in metal lids. “However, PVC contains plasticizers, so-called phthalates that can come into contact with the food, affecting its odor, flavor and healthiness,” says Sebastian Landeck, Project Manager Technical Service & Development at ACTEGA DS.



The product was originally developed for food products with fat content, which are particularly likely to absorb fat-soluble plasticizers, but ACTEGA DS has come out with a wide range of other variants for many different requirements. Special PROVALIN seals now include those for low-fat items, bonded metal-plastic lids as well as the sensitive area of baby food and other particularly susceptible products.

#### Five years from the idea to the finished product

Landeck's team researched plasticizer-free sealants for five years and has managed to create true innovation in that time. PROVALIN remains unique to this day. "The European decision to gradually phase out plasticizers in food sealants was an

change in food composition, and may not impact the so-called organoleptic properties (taste and odor) of products. Plasticizer-free materials offer a safe solution.

However, PROVALIN is not just the answer to the highly restrictive EU regulation, but also meets the requirements of the food industry. It took a while for the product to be finally ready for the market. The PROVALIN team met several times a month to analyze progress and obstacles and to keep searching for new solutions. Additionally, the equipment technology to process PROVALIN had to be developed as well. Two partners, the lid manufacturer Pano and the food producer Reichold, were willing to use PROVALIN in their lids for retail distribution.

Pano is currently projecting an annual demand for 20 billion plasticizer-free lids.

"The development of a sealing compound may seem like a small step, but when it is associated with a new technology, it can turn into a revolutionary change."

important, if not decisive argument to research plasticizer-free alternatives," says Landeck. The EU regulations pertaining to synthetic materials coming into contact with food specify that materials and objects with food contact may not cause any health hazard or unreasonable

#### Numerous benefits for the environment

In addition to offering an unplasticized alternative, PROVALIN has other consumer benefits as well. "We always try to optimize materials for environmental protection in our development processes," says Landeck with reference to the ALTANA sustainability strategy. PROVALIN mostly consists of so-called thermoplastic elastomers (TPE) that are processed as granulates. "This optimizes the energy consumption in essential production steps," explains the project manager.

In principle, granulate is cleaner to process than liquid PVC compounds and causes less waste. In contrast to previously used injection molding processes with high-temperature curing, the TPE technology involves liquidizing granulate with extrusion and applying it to the lids. "Because the production of the lids no longer requires curing in a fusing furnace, there are fewer space and energy requirements. "This means we avoid emissions that are associated with processing conventional compounds," says engineer Landeck.

The intensive research effort has paid off, and Sebastian Landeck and his colleagues from the sister companies ACTEGA Rhenania and ACTEGA Artistica not only won the 2011 ALTANA Innovation Award, but PROVALIN also was recognized in the German Packaging Awards. The work will not stop here, and the team is already working on the next innovation: the upcoming generation of sealing compounds will be biodegradable.

For more information on the innovation culture at ALTANA, visit our website at [www.altana.com/innovation](http://www.altana.com/innovation) or find out about Provalin at [www.provalin.com](http://www.provalin.com)

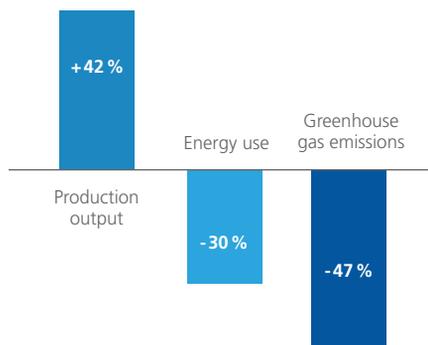


## Environmentally sound products

The chemical industry is facing a clear challenge for the future and must strive to achieve greater sustainability. This applies in particular to products - "green" products. Even though the exact characteristics of "green," or environmentally compatible, is not clearly defined, new products such as PROVALIN undoubtedly stand out for better environmental properties than their predecessors. This not only takes into account product properties, but also resource efficiency and fewer emissions. BYK calls this strategy "Greenability," while ECKART refers to it as "Blueffects," but they both mean the same. At the same time, our "green" products are designed to help our customers achieve their environmental goals.

### Changes in production, energy consumption, and greenhouse gas emissions

German chemical industry 1990 - 2009



Source: VCI statistics on energy, climate protection, and resource use in the chemical industry

Since the chemical industry consumes some 25 percent of the entire energy used in commercial processing, optimizing resource and energy consumption is a core task. On the other hand, the chemical industry has been able to uncouple energy consumption and growth in a manner no other German industry could. Thus, energy use was reduced by 30 percent

in the time from 1990 to 2009, while greenhouse gas emissions even fell by 47 percent with increases in production of 42 percent. This trend makes us hopeful that the development can be continued in the future.

### More savings with additives

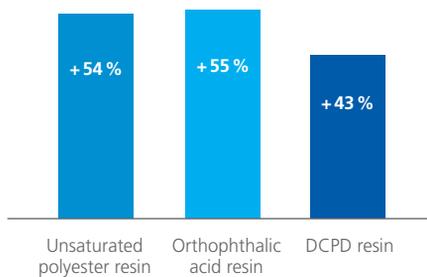
As a research-intensive specialty chemicals company, ALTANA has brought a number of innovative environmental products on the market. Besides the plasticizer-free sealing compound PROVALIN, this also includes a number of new additives. For example, BYK-P 9908 and 9909 improve the compatibility of polyol blends, which saves energy because the easily separable blends can be stored without continuous agitation. Similarly, the additive BYK-399 for coatings with solvent content has no fluoroc components.

Our last sustainability report contained information about BYK-C 8000, an additive that improves the mechanical stability of radically curing systems filled with quartz sand (e.g. unsaturated polyester resins). It significantly prolongs the service life of ready-made parts or reduces the resource consumption of items such as plastic pipes by fifty percent without impacting mechanical stability. This



makes an essential contribution to the resource efficiency of our customers.

Improvement of flexural strength in different types of filled resins with BYK-C 8002



As an added advantage, simple quartz can be used as filler instead of the usually required silanized quartz (silane compound at the surface). This cuts out a process step that is associated with major energy and water consumption, and accordingly, saves costs for our customers. The improvement consists of mechanically embedding the quartz sand in the polymer matrix. The long-chained additives create a permanent bond with the quartz and the polymer, saving about 16 kilograms of polymer and 160 kilograms of quartz per kilogram of additive.

By the end of 2011, we had sold some 23 metric tons of BYK-C 8000, which means that our customers in theory saved 4,200 tons of resource materials. This volume is expected to increase further in years to come, as customer testing phases prior to the actual use of an additive can take a long time.

BYK-C 8002 was another additive of the same type we introduced in the market in 2011. It expands the portfolio of synthetic systems in which the additive will be used (e.g. aluminum trihydroxide, ATH). The applications of resins in which the additives can be used range from polymer concrete

to pipelines (e.g. for wastewater) and kitchen sinks to window sills. We expect significant sales of BYK-C 8002 to start in 2012.

### Greater transparency with eco balances

The foam inhibitor BYK-1740 is produced from renewable resources (plant oil), making it biodegradable and solvent-free. That not only saves fossil resources, but also reduces the energy consumption to one ninth compared to the conventional petroleum-based product; at the same time, emissions in form of CO<sub>2</sub> equivalents dropped to below 20 percent.

#### CO<sub>2</sub> equivalent

The CO<sub>2</sub> footprint is a partial aspect of the lifecycle analysis. It reflects the greenhouse gas emissions generated throughout a product lifecycle and is indicated as Global Warming Potential (GWP100), using kg CO<sub>2</sub> equivalent per functional unit as the calculation unit. All substances that contribute to global warming potential according to the Intergovernmental Panel on Climate Change (IPCC) are converted into CO<sub>2</sub> equivalents with a specific factor. Thus, methane (CH<sub>4</sub>) has 25 times the global warming potential of CO<sub>2</sub>. In practical terms, this means that the emission of 1 kg CO<sub>2</sub> and 1 kg CH<sub>4</sub> result in a net global warming potential of 26 kg CO<sub>2</sub> equivalents.

BYK uses eco balances, or lifecycle analyses (LCA) to be more precise, to specify the energy and resources consumed from production and transport to selling a product along with the associated emissions. The results, which are calculated with special software, are documented in the Environmental Product Declaration (EPD) according to the ISO standard 14025. BYK is the first additive manufacturer to have four eco balances certified on the basis of standards ISO 14040 and 14044 for the additives DYSPERBYK-190, BYK-012, BYK-023, and

BYK-1740. The certifications, performed by TÜV Rheinland, have set a new standard and represent another milestone in the Greenability strategy of BYK.

CERAFLOUR 1000 is another biodegradable polymer made from renewable resources for aqueous, radiation-curing coating systems with or without solvent content. The additive, which is produced with a special biotechnology involving bacteria, can be used in materials (e.g. packaging) with food contact under specific application conditions.

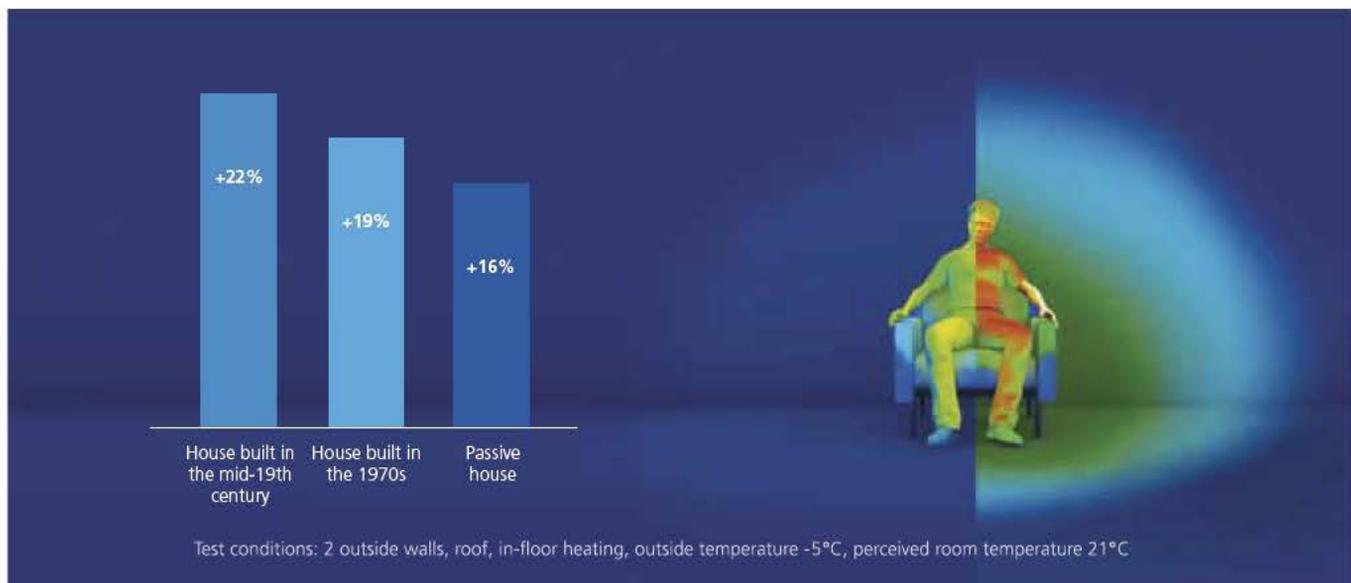
### Reduction in heating energy thanks to reflective wall paint

Our 2010 sustainability report included details about the energy savings effects of wall paint with aluminum pigments (IReflex). The Construction Physics department of Bauhaus University in

Weimar confirmed this property in a 2011 study. While conventional interior paints absorb a high share of room heat and transfer it to the outside through the wall, paint with aluminum pigments can contribute to the thermal insulation of buildings. Aluminum offers the highest values for infrared reflection (IR) among metals. Wall paints that contain the ECKART specialty pigment IReflex 5000 white can reflect up to 50 percent of heat back to the rooms with 10-percent pigment content. This saves a considerable portion of heating energy.

The university in Weimar performed extensive measurements to analyze the effects of higher reflection in interior wall paint. The results showed that the energy savings potential can be up to 22 percent. However, the savings depend significantly on the surface temperature of the exterior walls. Depending on the thermal insulation of the building, energy savings potential may therefore vary. Furthermore, the product achieves a much more comfortable room climate (draft effect).

Energy savings with use of IReflex  
Simulated building type





### Greater food safety

Products that extend the shelf life of food items make a significant contribution to sustainability. The longer food can stay fresh in packaging, the longer it can be offered for sale, which translates into lower consumption of resources and energy for replacement food and lower waste volumes. Based on the process of oxidation, oxygen has a particularly pernicious effect on food. The barrier properties of sealing compounds developed by ACTEGA have the capacity to protect products from damaging external influences such as oxygen and keep food fresh along ever-growing transport paths. At the same time, the materials guarantee optimal pressure or vacuum position in case of mechanical impact. One of the newly developed sealing materials even absorbs oxygen actively and leads to a significantly improved protective function.

In addition to PROVALIN completely plasticizer-free vacuum twist closures require further components for a perfect seal between the lid and the glass. Thus, the sister company ACTEGA Rhenania developed a suitable coating to be

used for metal closures made from TPE and another resin. METALSTAR FPG 11 by ECKART is another product offering greater food safety. It is the first low-migration, sensorially neutral metallic printing ink that is suited for all paper and cardboard packaging with food contact.

Coatings for food packaging produced at ACTEGA Terra have been marked with the "FoodSafe" seal since 2011. FoodSafe seals fulfill three quality characteristics: They are low in migration and remain below the global migration limit value of 60 mg/kg. They are analyzed in accredited testing laboratories and are certified for direct contact with dry and fatty food items. FoodSafe coatings meet the provisions of the Swiss Consumer Goods Ordinance and exclusively contain the materials that are listed in that legislation. Additionally, FoodSafe coatings do not contain any undesirable components and are low in odor. Some forty water-based coatings of ACTEGA Terra currently meet the stringent FoodSafe requirements.

### Greater protection for brand-name products

Brand piracy and plagiarized products result in corporate losses of several hundred billion Euros every year. Items that are pirated in large volumes include pharmaceutical and cosmetic products as well as ink and toner cartridges. ACTEGA offers solutions for open or concealed brand name protection for printing and coating, including phosphorescing pigments or magnetic ink. They can change the color impression of an imprinted package under an infrared or UV light to document the authenticity of a product. Open and concealed security characteristics can also be combined for particular effect.

Pearlescent pigments made of silicates are an environmentally friendly and socially acceptable alternative for conventional effect pigments that are frequently extracted in non-sustainable surface mining (e.g. in India). LUXAN CFX pigments made from borosilicate can be integrated into aqueous or solvent-based coating systems with little energy. They are resistant to UV radiation and can withstand condensation and rainwater, which means that fewer coats of paint are needed and the associated large resource volumes can be saved.

### Protecting the environment with solvent alternatives

One of the greatest environmental effects of coatings results from solvent emissions, the so-called volatile organic compounds (VOC). VOC are air pollutants and are responsible for the so-called summer smog (ozone formation). VOC emissions also accelerate climate change, and efforts are underway worldwide to prevent these emissions.

Technical solutions for reducing VOC emissions in the coatings industry include:

- Water-based coatings (water as solvent)
- High-solid coatings (reduced solvent content)
- Powder coatings (no solvents, but energy use for film formation)
- UV-curing coatings

ALTANA is making contributions in all of these areas with a variety of products to reduce environmental impact, either by developing the corresponding coatings or by offering additives and pigments that allow for manufacturing such coatings.

In UV coatings, the diluting function of the solvent is taken over by the so-called monomer. It reacts with other substances during film formation and becomes a fixed component of the coating that is not released into the environment. These systems typically require UV radiation for curing, which is why they are also called UV coatings. ACTEGA produces such coatings for packaging.

UV radiation has been a proven industrial process for years. Our Chinese company ACTEGA Foshan is researching this environmentally friendly technology for areas such as metal packaging where UV curing has not yet been applied. To overcome technical difficulties and to guarantee appropriate support for such a project, we assembled a development team of resource vendors, coatings manufacturers, printers, can manufacturers, and end customers in China under the project management of ACTEGA Foshan. Thanks to the intensive work, the project, which was initiated in the second quarter of 2010, has produced a practical solution that has already been implemented, with a market launch for selected customers in the second half of 2011.

Water-based coatings reduce VOC emissions by partially or completely replacing solvents with water. This also makes a contribution to resource efficiency because fewer fossil fuels are needed.

In 2011, BYK developed a number of additives for manufacturing aqueous coatings:

- CERAFLOUR 1000 (see also page 20)
- AQUACER D 272 increases scratch resistance (resource efficiency).
- BYK-1711 is a foam inhibitor for aqueous coatings.
- AQUAMAT 272 (higher scratch and abrasion resistance, for matting)
- The BYKJET family for inkjet printer inks includes products for aqueous, solvent-free, and radiation curing systems.
- BYK-015 is a silicone-free polymer foam inhibitor for aqueous coatings.



BYK has also introduced new additives for powder coatings. They improve flow, an essential property of coatings that is difficult to achieve. BYK-3933 P is a multifunctional additive that not only improves flow but also prevents craterization with almost complete transparency.

ECKART also developed new products for water-based coatings:

- The new borosilicate-based pigments of ECKART are suitable for water-based systems.
- New products of the HYDROLAN series (effect pigments for water-based systems)

ECKART also introduced new pigments for powder coatings. Powder Coating Ultra (PCU) has only been available with aluminum pigments in the past and is now also available as gold bronze pigment. PCU stands out for higher durability thanks to a double coating of metal pigments.

Meanwhile, ELANTAS Italia optimized a water-based product (epoxy resin dispersed in water) and adapted it to customer requirements. It is VOC-free and handles both the use of the emulsion and the wetting of metal without problems, which improves resistance to corrosion and enhances resource efficiency. The product is the successful result of team work with other ALTANA companies.

#### Overview of UV-curing products

- First commercially available UV-curing heat seal coatings as an alternative to solvent-based coatings
- UV curing bonding agent for use in lithium ion batteries as a contribution to electromobility
- Graphic arts and the packaging industry are consistently searching for ways to enhance the appearance of imprinted products. ACTEGA Terra came out with a UV-curing primer and a UV-curing coating that does not emit any volatile organic compounds thanks to UV curing. This allows for high-value products with recycled paper or cardboard.
- UV-curing printing ink for inkjet printers can now replace solvent-based products.
- UV-curing printing ink for use on shrink sleeves: The UV-curing product must be able to withstand shrinkage of up to 80 percent.

ACTEGA further expanded its palette of water-based products, both with the acquisitions of the Color Chemie Group and with developments of its own.



## REACH

In the opinion of Geert Dancet, Director of the European Chemicals Agency ECHA, the European Chemicals Regulation REACH (Registration, Evaluation, and Authorization of Chemicals) has been a great success. ALTANA supports REACH in principle and its goals (protection of humans and in the environment) without reservations. However, we advocated for an easy-to-use and efficient regulation in the scope of the political discussion.

A first review of REACH is scheduled for 2012 to look at its first five years in effect. The review will adjust the chemicals regulation for the future to make it easier to comply with. Difficulties particularly arise from the expanded safety data sheets and the communication within the supply chain. Most data sheets issued by suppliers for registered substances include hundred or more pages, sometimes even several hundred. By comparison they contain little safety-relevant information. Additionally, the safety data sheets must be available in the corresponding national language, which is not a problem as long as the content is made up of standardized phrases, which can be easy to translate with specialized software. The "expanded" part contains free text, which leads to significant expenditures for translation.

Because ALTANA primarily works with preparations consisting of multiple substances, this is a major administrative challenge. We have to merge several expanded safety data sheets into a single data sheet for our mixture. This requires intensive expert work to provide our customers with safety data sheets that are not only shorter, but also understandable. Since we don't receive the safety data sheets from our suppliers at the same time, the process may need to be repeated several times for a single product. A simplification of this procedure is definitely required.

It would be helpful to focus on processing conditions and risk management measures. In addition, standard phrases for the "expanded" part are urgently needed. We also believe there is a need for greater cost efficiency for small-volume substances (e.g. with fewer tests). Although the registration of small-volume substances costs significantly less than large volumes in absolute terms, the costs are much higher on a per-volume basis and may endanger the economic marketing of small-volume substances.

In principle, all ALTANA customers receive safety data sheets about the hazardous properties of products. The corresponding database is continuously expanded by REACH.

Material Safety Data Sheet		BYK Additives & Instruments	
<b>Disperbyk</b>			
Version 2	Revision Date 04/06/2010	Print Date 04/07/2010	
<b>SECTION 1. PRODUCT AND COMPANY IDENTIFICATION</b>			
Product name	: Disperbyk		
Product Use Description	: Processing Additive		
Company	: BYK USA Inc. 524 South Cherry Street Wallingford CT 06492		
Prepared by	: J.Nole, Safety; M.McCutcheon, Regulatory		
Telephone	: (203) 295-2055		
Visit our web site	: www.byk.com		
E-mail address	: ehs.byk.usa@altana.com		
Emergency telephone	: CHEMTREC 800-424-9300		
<b>SECTION 2. HAZARDS IDENTIFICATION</b>			
<b>Emergency Overview</b>			
Form	: liquid		
Colour	: yellow		
Odour	: slight		
<b>OSHA Regulatory Status</b>			
While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this MSDS contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and available for other users of this product.			
<b>Potential Health Effects</b>			
Eyes	: Contact may cause irritation.		
Skin	: Contact may cause irritation.		
Ingestion	: Ingestion may irritate the digestive tract.		
Inhalation	: None expected.		
Chronic Exposure	: No known chronic health effects.		
Aggravated Medical Condition	: May be aggravating to some skin conditions		
Primary Routes of Entry	: Skin contact Skin absorption Inhalation Eyes Ingestion		



We have also noted that the conditions for the safe handling of chemicals have not led to any changes in our facilities. The reason is that the chemical facilities we operate are subject to stringent permit requirements, which focus on risk

management measures to guarantee safe handling for humans and the environment. Changes to facilities would only need to be made if REACH were to result in new toxicology or ecotoxicology evaluations.

## Global Product Strategy

The “Global Product Strategy” (GPS) is closely associated with REACH. This initiative and self-obligation of the International Council of Chemical Associations (ICCA) has the support of many national chemical associations. ALTANA has also agreed to contribute to GPS as part of its product stewardship and sustainability efforts. The goal of GPS is to reduce differences in chemicals safety between developing countries, emerging economies, and industrial countries. The effort will increase product safety and sustainably improve the handling of chemical products, while creating fair global competition. GPS therefore benefits environmental and occupational safety and implements the Strategic Approach to International Chemicals Management (SAICM) of the United Nations.

The implementation follows the same time schedule as REACH. The goal is to make the insights of REACH (toxicology and ecotoxicology data, measures for safe handling) available to the public online (both on the ICCA website and on company sites) in useful summaries. This makes the necessary information available to all users of a substance on a global basis and without dependency on a supplier.

The first self-imposed deadline expired at the end of 2011 for substances registered in late 2010. ALTANA published an online summary for three registered substances that allowed for such a step (see [www.icca-chem.org/en/Home/ICCA-initiatives/global-product-strategy](http://www.icca-chem.org/en/Home/ICCA-initiatives/global-product-strategy) or [www.altana.com/sustainability/environment/global-product-strategy.html](http://www.altana.com/sustainability/environment/global-product-strategy.html)). This was not feasible for two substances because of confidentiality. In this respect, we hope for solutions from chemical associations so that ALTANA can continue to contribute to GPS in the years to come.

## Globally Harmonized System

The Globally Harmonized System (GHS) of the United Nations is a proposed standardized worldwide system for classification and labeling of chemicals. ALTANA monitors the implement-



ation of this system in national legislation and complies with the resulting requirements. GHS was implemented in China in 2011 and the corresponding U.S. law will take effect in 2012.

**ALTANA**

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Home > Sustainability > Environment > Global Product Strategy

Global Product Strategy - initiative for the safe handling of chemicals

ALTANA has joined to support the initiative, which is led by the International Council of Chemical Associations (ICCA). The initiative is a key element of the Strategic Approach to International Chemicals Management (SAICM) of the United Nations. The goal of the initiative is to reduce differences in chemicals safety between developing countries, emerging economies, and industrial countries. The effort will increase product safety and sustainably improve the handling of chemical products, while creating fair global competition. GPS therefore benefits environmental and occupational safety and implements the Strategic Approach to International Chemicals Management (SAICM) of the United Nations.

The aim of the GPS initiative – which ALTANA fully supports – is to reduce any negative effects on human health and the environment by the year 2020. Additionally, general safety standards should be improved.

- Improved protection of human health and the environment worldwide
- Improved conditions of competition by aligning general safety standards
- Better acceptance of chemicals

Thus, the focus is on sustainable development, effective chemical management along the entire supply chain, greater transparency in contracts and stronger communication of the national Responsible Care programs.

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Product Safety Domains:  
 A.P. methylenebisoxazolone, MGA  
 Nitrobenzoyl  
 Nitrobenzoyl, TRIC  
 Stannous octoate, TGA

## Nanotechnology

For ALTANA, nanotechnology is closely associated with REACH review (see page 24). The European Union intends to regulate nanotechnology and may do so as part of the REACH review. ALTANA supports this approach since REACH is suitable for regulating the handling of nanomaterials. In our view, a separate regulation would be disproportionately expensive. REACH could fulfill the requirements in its current version, but further details would be helpful.

The statutory regulations are based on the concern that nanomaterials may harbor risks that cannot be discerned today. The German Advisory Council on the Environment (SRU) published an expert report on "Preventive strategies for nanomaterials" in September of 2011, in which it proposes criteria for preliminary risk assessment where data may be missing.

ALTANA also researches the area of nanotechnology and has marketed the material in additives, where nanomaterials enhance scratch resistance and UV protection of coatings. Coatings durability makes an important contribution to resource efficiency and NANOBYK-3605, introduced in August 2011, enhances the scratch resistance of radiation-curing coatings without any negative impact on the transparency or shine of coatings. Overall, BYK now markets eight nanoprod-ucts for various systems with higher scratch resistance and eight products for better UV resistance.

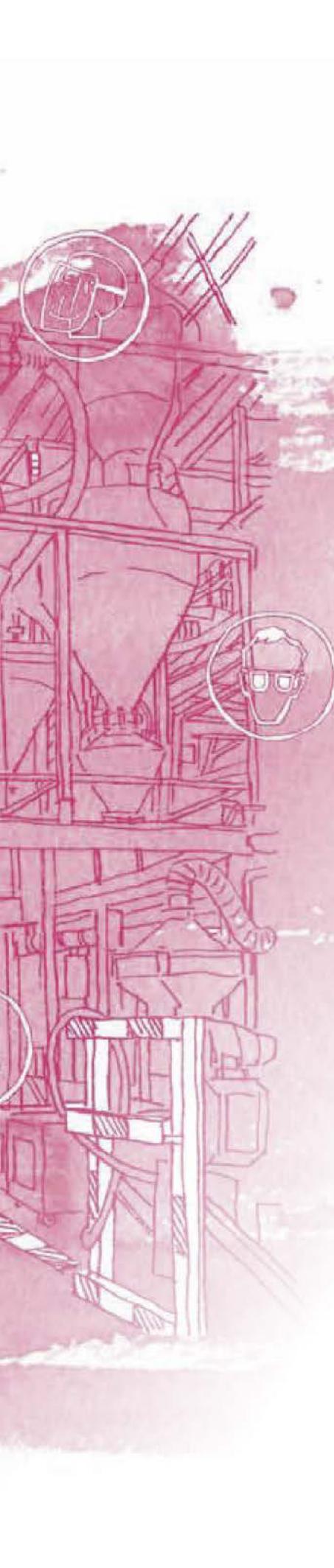
Do these products constitute a risk for humans and the environment? Consulting the list of "Criteria for the preliminary assessment of nanomaterials regarding their impact on humans and the environment" of the German government's Nano Commission, we concluded that our products are in the category "No acute need for preventive measures" because

- The products are manufactured in a closed facility, for which ACTEGA Rhenania invested in new equipment.
- The material is dispersed in a fluid for further processing, so that no dust, aerosols or wastewater concerns are present
- The material is permanently bonded in the coating and does not represent a risk for consumers and the environment
- The material is not used in the form of fibers, rods, or tubes
- The materials are not chemically, catalytically or biologically reactive

CARBOBYK-9810 is an exclusive eight-percent dispersion of carbon nanotubes (CNT) by BYK. CNT are difficult to disperse and most dispersions contain one percent. For our customers, this means high safety for handling the nanomaterials because no dust can develop. Furthermore, CNT stand out for their high thermal and electrical conductivity as well as mechanical characteristics that may help to replace copper.







## EHS represents a major responsibility

In discussions about industrial production in China, people often express skepticism about standards of safety and environmental protection, and non-governmental organizations such as Hong Kong's Globalization Monitor have reported little or no occupational or environmental protection in Chinese manufacturing facilities. However, a number of statutory regulations have been introduced in the country and a growing number of companies undergo certification to comply with the latest standards. This also includes the plants of ALTANA, where EHS managers such as Irene Li, who works full-time at ELANTAS Zhuhai, are responsible for safety and environmental protection.

ALTANA operates five plants in China to be close to its customers, not to get around regulations for occupational safety and environmental protection. In addition, maintaining plants in China saves a number of transports from Europe. There are no differences between European and Chinese sites in terms of safety and environmental protection, since the Environment, Safety and Health (EHS) organization and all standards are consistent with European and American plants.

All ALTANA sites in China have environmental management systems that are certified in accordance with ISO 14001. Further-

more, the safety management systems of ACTEGA Foshan, ELANTAS Zhuhai, and ELANTAS Tongling have been validated according to OHSAS 18001, and each ALTANA site is audited by two EHS managers of other Chinese sites. "I have been

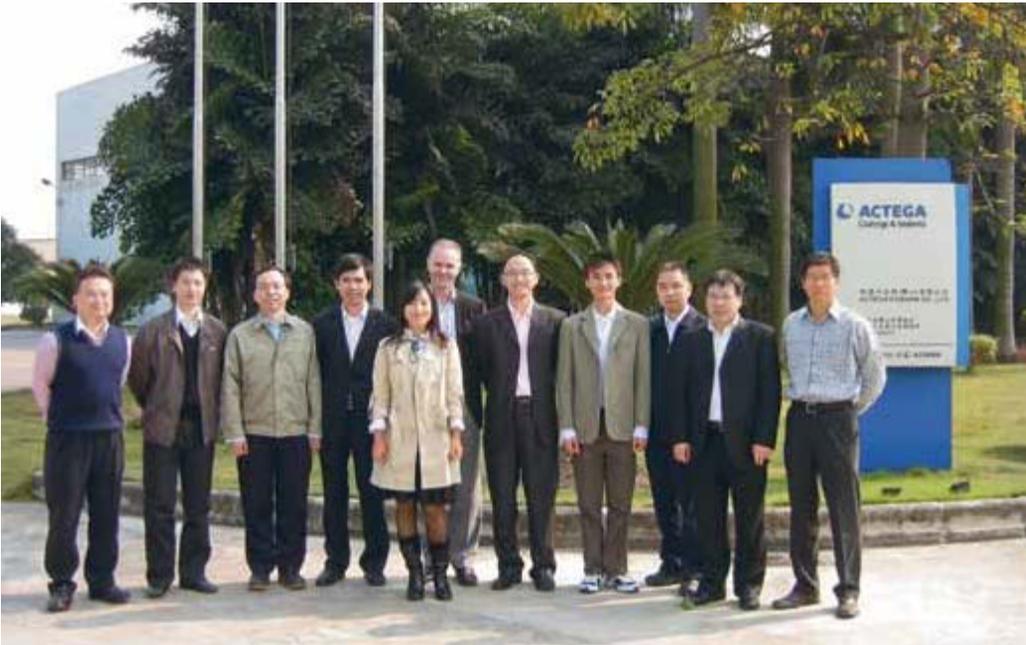
involved in auditing all Chinese sites," reports EHS manager Li.

### Examination every three years

Irene Li, who completed an internship with ELANTAS while she was a student, has been the company's EHS manager since 2005. She not only has studied "the use of chemicals in production processes", but also participates in state-mandated continuing education events. "These seminars are held every three years," she explains. "They

**"Our Chinese sites are subject to the same standards as those in Europe"**

address topics such as hazardous waste and dangerous chemicals, fire fighting, or occupational health systems." What exactly are the tasks of an EHS manager? We asked Irene Li.



Dr. Andreas Diez, Head of EHS at ALTANA, with EHS manager Irene Li and her Chinese colleagues

EHS managers must have broad knowledge and master a variety of topics, particularly in smaller companies. In principle, all executives and employees of a company are responsible for environmental protection, health and safety. As a consequence, most EHS managers serve in an advisory capacity to the executive management. They ensure that companies use water, energy and other resources with consideration for the environment and without waste and that all applicable standards and legal requirements are met in production and for the emission and disposal of hazardous materials. EHS managers are charged with identifying deficits and suggesting improvements. Of course, they also advise on the best approach to comply with individual safety and environmental regulations and permits. Given the wide range of tasks, larger companies typically employ an EHS team that divides the various activities among several employees.

### Chinese EHS meetings introduced

During her training, Li also visited the ELANTAS Beck plant in Hamburg, which gave her an opportunity to deepen her knowledge of European environmental standards. Furthermore she and some of her Chinese colleagues took part in European EHS meetings. ALTANA now also holds special Chinese EHS events to keep the Chinese colleagues informed about the activities in other Divisions. Over the past years, Li has gathered

## “EHS managers identify deficits and suggest improvements”

extensive expertise. She therefore was charged with introducing the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) in China as part of a team (see also page 26).

As EHS manager, Li is also responsible for the implementation of all occupational health measures. As an example, the storage of methylene diphenyl diisocyanate (MDI) in Zhuhai underwent important improvements. The substance, a known carcinogen, used to be stored in pulverized form, but the risk of dust development could not be ruled out. MDI is now supplied in insulated and heated containers and pumped into a tank via closed pipelines, where it is diluted with a solvent to ensure that the melting point remains below 80°C and that MDI can flow into the reaction container from the tank in a closed circuit. “This process is much safer for employees, who no longer have to wear protective clothing and respirators,” says Li. In an additional effort, Zhuhai has started replacing diesel-fueled forklifts with environmentally friendly electrical models. “We plan to replace all five forklifts by 2016 at the latest. The new models not only have fewer emissions, but also use less energy,” explains the 29-year-old chemist.

## Occupational health

In accordance with the guidelines of the Responsible Care initiative of the chemical industry, the protection of employees always takes precedence. For this reason, safety and occupational health are top priorities for ALTANA along with preventive health protection and occupational and process safety.

In 2008, ALTANA signed the Luxembourg Declaration on Workplace Health Promotion in the European Union in its current version of 2007 to confirm its commitment to a system of occupational health promotion that exceeds the framework of conventional occupational safety and leads to sustained health improvements in the workplace.

Examples of preventive health protection at ALTANA include designated local health days and weeks as well as regular health courses that focus on health-related topics such as sport and exercise, healthy nutrition, relaxation and stress prevention.

### Better ergonomics in the workplace

To ensure a safe and healthy working environment in production, it is not sufficient to simply wear protective gear. The behavior of employees must be in tune with the necessary work to ensure long-term occupational health.

The "tut gut!" (Feels good) occupational health campaign at BYK-Chemie offered special training for production and logistics employees of the Wesel and Kempen sites to protect their back in their movement sequences and to strengthen their back muscles. This helps prevent back problems caused by incorrect lifting and carrying, especially when we consider that almost half of all employees in production and logistics



Occupational health campaign in Wesel and Kempen

This includes the avoidance of work accidents and occupational illnesses as much as boosting employee health and wellbeing in the workplace.

Healthy, motivated, and well-trained employees are an important prerequisite for our company's success both in social and economic terms. Our targeted measures and activities for health promotion lower the costs associated with illness and at the same time boost the productivity of our employees. As a result, we have a healthier workforce with higher motivation and better work morale in a more relaxed work environment.

have been on sick leave at some point because of back problems.

The training was led by an ergonomics specialist of the "pro homine" health service. In addition, 14 employees volunteered for further training at the Wesel and Kempen sites to help them share their newly acquired insights in ergonomics with their colleagues. Other Divisions initiated similar ergonomics projects. For example, ECKART in Güntersthal conducted a thorough analysis of workplaces and then trained 130 employees to become ergonomics managers who can keep an eye on proper ergonomic behavior at work.

BYK-Chemie introduced a PC training program for computer workstations to encourage employee fitness throughout the workday. The simple exercises, shown in videos and images, help avoid unilateral strain and everyone can put together individual exercise programs. The program supports participants with instructions, tips, and e-mail reminders. After the pilot phase, up to 90 percent of survey respondents indicated that the use of the exercise program had resulted in improvements of the three most common health complaints (back pain and tension in the neck and shoulders).

### Health days for greater sensitivity

ACTEGA Rhenania, BYK-Chemie, and ECKART GmbH held health days to sensitize their employees to occupational health concerns. While BYK emphasized emotional health, ACTEGA focused on cardiovascular diseases. The activities included health screening, blood typing, an ergonomics course to explore back health, a workshop on coping with stress, attentiveness training, imagination travel, a drunk-driving simulator, goggles to simulate the influence of alcohol, as well as spinning, fitness boxing, and massages. The response of employees who were able to attend the events during working hours to the program of the health days was exceedingly positive.

### Global Management Meeting

ALTANA Health was one of the core topics of the 2011 Global Management Meeting. The offers included a workshop as well as information booths on ergonomics, nutrition and emotional health. Various measures, such as improved ergonomics for employees at ECKART, health management at BYK-Chemie, and the "iHealth" concept at BYK USA were presented for information exchange among the sites.



Global Management Meeting October 9-11, 2011

Participants also had an opportunity to test the exercise program for computer workers, engage in sports, and to learn more about ergonomic computer workplaces. Additional offers included nutrition counseling, BMI measurements, and the option to try different fitness gear. The relaxation chairs with massage function as well as audio and light stimulation were particularly popular. ECKART in Güntersthal already provides two of these relaxation chairs to employees. The earnings from the 1-Euro user fee for ten minutes are donated to charity.



### Sports activities and occupational health activities around the globe

Many sites offer their employees fitness rooms or even running trails (BYK USA) to stay in shape. At ACTEGA Artística some 35 percent of employees regularly visit the company gym that features treadmills, spinning bikes, cross-trainers, and a weightlifting bench. Some sites also offer fitness courses, such as yoga at ELANTAS Beck India. The offer is supplemented with annual health screenings for all employees along with on-site health and nutrition counseling.

The health management of BYK USA has been operating an extensive “iHealth” initiative to support employees and their families with their efforts to achieve better health. Everyone receives a guideline with recommended medical examinations and vaccinations for all age groups, cancer prevention information, and a newsletter. The company also offers an information hotline for health questions.

Thirty-two employees of ELANTAS PDG posted an unusual achievement when they jointly lost 751 pounds (1 pound = 454 grams) of body weight as part of a “Biggest Loser” program over the course of 18 weeks. The campaign was followed by a physical maintenance program to encourage the employees to keep the weight off until at least February 2012.

Further sports activities include the indoor soccer team sponsored by ACTEGA Artística. The focus of the team is less on athletic competition and instead emphasizes social relationships between employees from production, research & development, accounting, and sales. ELANTAS Beck in Hamburg also has a soccer and tennis group for employees.

## Occupational safety

ALTANA has defined key performance indicators for accidents and has implemented a corresponding system for mandatory regular data collection. Our goal is to be a permanently accident-free company. To achieve this, we primarily focus on employee behavior, because this approach can now achieve more for occupational safety than technical options.

Most occupational accidents are the result of human error, including the improper use of machines and tools, failure to wear, or improper wearing, of protective clothing, undue haste, or stumbling. This makes constant reminders about proper behavior all the more important, and we use approaches such as Behavior-Based Safety (BBS) that are rooted in the analysis of behavior with the goal of correcting unsafe behavior by positive intervention.

### Enhanced safety with modern technology

At ELANTAS Italia in Quattordio, technical measures were able to achieve advances in safety. With an investment of almost €700,000, the plant separated the production of primary and secondary insulation materials, which involved an almost completely new construction of the secondary insulation materials unit and the installation of an automatic fire extinguishing system (water/foam). In addition, we automated the pallet and filling station, which resulted in considerable ergonomic improvements and lower air pollution from solvents (VOC) in the building. New filters with improved handling also contributed to ergonomic enhancements and a new lifting stage for €40,000 made working at large heights quicker and safer.

We invested €18,000 in a magnet-coupled gear pump for handling toxic materials, which reliably prevents material leaks and the associated air pollution. As an added benefit, the new pump only uses a third of the energy compared to the old model. The continuous infrared measurement of the VOC concentration in the exhaust air system (thermal afterburning) has brought additional safety and energy efficiency, while the

### "5S" introduces greater order

Orderliness and cleanliness are important prerequisites for lowering the risk of occupational accidents and to improve work processes. These considerations prompted several companies (ELANTAS PDG, ELANTAS Italia in Collecchio and Quattordio, ELANTAS Beck, BYK USA) to independently start "5S" projects. The term stands for clearly defined measures to design workplaces and their surroundings in a safe, clean, and clearly structured way. This can, for example, be visualized with images (before/after) in workplaces. All companies working with this method saw improvements in the level of safety, order, and cleanliness.

### What does "5S" stand for?

- Sorting
- Straightening out
- Systematic cleaning
- Standardizing
- Sustaining (the practice)

€8,000 investment in monitoring limit values has reduced explosion risks and regulates the exhaust air speed on the basis of the measuring data while saving fan energy.

At ELANTAS Beck in Hamburg, "5S" is part of an even more comprehensive "Excellence Team Program" (ETP) for the general improvement of safety, organization, quality, and service awareness. A number of different project teams are working to optimize technical resources, workplace equipment, and preventive health services.

ELANTAS Beck India has had a very good safety record for years (accident-free). This is due to many programs that strengthen the culture of safety at the company. To give an example, the Indian National Safety Day of March 4 prompted an entire safety week with fire drills, posters, information booths, quizzes, and writing contests. The purpose was to not only inform the employees about the "zero accidents" policy of the company, but to actively involve them in the effort. Thus, the team of the Pimpri plant entered into a full commitment to greater safety, and the management issued certificates and awards for a number of contests.



ELANTAS Beck India featured a safe-driving course to discuss important principles for defensive driving in city traffic and other heavily used traffic zones. The company also organized safe driving courses for suppliers and logistics companies handling their final products and distributed checklists to all drivers about proper ways to secure cargo.

### Clamping down on speeding

The "Safe Driving" campaign at ECKART in Günterstal was part of the "Risiko raus" (Out with Risks) initiative to improve safety on the works premises. Some 2,000 vehicle movements are counted on the premises every day and speed controls between 2006 and 2009 showed that 30 to 40 percent of drivers exceeded a speed of 35 km/h, although the speed limit is 30 km/h. This prompted speed readings from 2010 and speeders are now informed about their misconduct. Traffic guidelines were integrated into the plant's management system in 2011. From now on, speeding will have direct consequences for employees, including a report to the HR office. Those found to drive speeds of 35 to 45 km/h will get an exhortation, while speeds over 45 km/h result in fines amounting to one percent of the employee's salary.

### Number of significant accidents increased

Regretfully, ALTANA recorded six significant incidents (as defined by VCI) in 2011 (see also page 66). We therefore plan to conduct internal one-day training sessions worldwide on the issue of industrial incidents in 2012 and 2013 with the responsible executives and EHS managers (see also page 29). The events will address specific risks for ALTANA, strategies to avoid incidents, and proper responses in emergencies (e.g. development of an emergency plan with the corresponding training). Another training emphasis will be on internal and external communication and its management in emergencies.

At BYK-Chemie, a project to improve emergency management was initiated with the help of external consultants. It will be completed by the end of 2012 and may serve as a Best Practice example for all Divisions. "Safety on the Job" is another initiative within the scope of the ALTANA Management Development Program (MDP) that aims to find Best Practice examples within ALTANA and in other companies to improve occupational and process safety. Plans call for finding, evaluating and proposing such practices as recommendations or standards by the end of 2012.

### Fewer accidents with BBS

Behavior-Based Safety (BBS) is another promising method, which was introduced with very positive results at ELANTAS Italia in Ascoli Piceno and is now also in use at ACTEGA Rhenania. The program focuses on ergonomics, work structure, equipment operation, protective gear, as well as order and cleanliness. BBS was begun in the fall of 2010 with the training of twelve employees who monitor the daily work of all employees. The collected data are evaluated statistically and discussed in a so-called competency team, which determines the necessary actions and controls their implementation. Prior to the introduction of BBS, ACTEGA Rhenania had always experienced more than one occupational accident per year, but with BBS, the plant has remained accident-free for more than a year.





## Heat and power from our own production

The positive summary of the new energy supply at the ELANTAS plant in the Italian town of Ascoli Piceno: 24 percent less CO<sub>2</sub>. This figure is the result of a co-generation plant that became operational in May 2012. The advantage of this local combination of power and heat lies in its great efficiency, since exhaust heat from power generation is almost completely consumed on site. Such investments in the future of energy do not simply happen, but require people with vision and commitment and those who take care of process details. Ascoli Piceno is fortunate to have such a person in Luca Mannozi, the EHS manager who supervises the operation of the plant on a daily basis.

When the co-generation plant entered its first test run in March 2012, the responsible team had already spent five years of planning and organizing the project. In addition to Luca Mannozi, this included Alfonso Ramazzotti, the head of Engineer-

ing, and Giorgio Monni, the supply chain manager who is the driving force behind the power plant.

of Environment, Health and Safety (EHS) since October 2010 and is now the department head. Before the project could finally start in 2011, Luca Mannozi not only had to get a regional environmental permit, which is a prerequisite for operating a power plant, and apply for connection to the national power grid, but he also arranged for the fire protection plan to be approved by the fire department, and secured customs permits to generate power and store plant oil and diesel. "My main occupation now is to correspond with the Italian energy authority to continue the state funding for our power plant," shares Mannozi, a certified chemist.

"We did not see any alternative to co-generation."

"Getting a power plant connected to the grid takes many steps," says Luca Mannozi. The 34-year-old has been working in the Department

### Amortization in less than 2.5 years

Power generation from renewable energies of European origin, in this case, certified plant oil, qualifies for state subsidies in the amount of 28 Euro cents per kilowatt hour (kWh). Additionally, the power produced by the plant is not consumed directly on site but fed into the power grid, which generates buyback compensation. However, these two reasons alone were not essential in the decision to build a co-generation plant. Small power plants are particularly expedient when the exhaust heat of the engine and exhaust fumes is used directly on site all over the year for process heat and for heating, which is the case at ELANTAS.

The co-generation plant, which is driven by a 12-cylinder diesel engine, has the potential to save about 40 percent natural gas for the operation. The power feed into the grid and the locally produced heat for processes and heating quickly

#### What is a co-generation plant?

A co-generation plant is a small power plant operated with a combustion engine, in which both the generated electrical and thermal energy is utilized. The exhaust heat of the engine is used in a heat exchanger to heat water. The heat of exhaust fumes can be used to generate steam (process heat) and/or to heat utility water via a heat exchanger. By combining power and heat, co-generation plants have an efficiency of up to 85 percent, depending on the capacity use.

lead to tangible reductions in energy costs. "Our investment will amortize after just 2.5 years," says the supply chain manager, Giorgio Monni.

## "Co-generation plants are a good fit for the chemical industry"



Luca Mannozi is the head of the Environment, Health and Safety (EHS) Department at ELANTAS Italia and led the permit procedure for the co-generation plant.

#### Mr. Mannozi, is the new co-generation plant a Best Practice example for other operations?

Yes, because it is the first co-generation plant for ALTANA. Usually, co-generation plants are a good fit for the chemical industry, where process heat is required year-round, not just in the winter.

#### What is the output of the plant?

The co-generation plant operates approx. 8,000 hours per year and produces some eight million kWh of electrical power and 7.6 million kWh of heat in that time. It consumes about 1,870 metric tons of plant oil a year.

#### Is the power generated by the plant consumed completely at the site?

I wouldn't say so. Our plant consumes approximately five million kWh of power a year, but the power generated by the co-generation plant is completely fed into the grid. Only the exhaust heat is fully used on site.

#### How many years will the system remain operational?

At least twenty years, which is also the term of state subsidies for power from renewable energies.

## Energy efficiency

Energy efficiency has become one of the core aspects of corporate sustainability and ALTANA has been working to improve its energy balance for years, for two primary reasons:

- High share of energy cost in production cost
- Rising energy prices

However, it is equally important to reduce our specific CO<sub>2</sub> emissions and to make an essential contribution to climate protection apart from the contribution of our products. These objectives apply to all ALTANA sites worldwide.

Energy efficiency can also be achieved by streamlining the corporate portfolio and merging sites. Thus, ACTEGA Rhenania divested its ceramic color unit, which was its most energy-intensive production, and ACTEGA Radcure was integrated into ACTEGA WIT. This allows for better capacity usage of volume-independent energy consumers such as light, ventilation, heating, or air-conditioning. Our acquisitions also made a comparable contribution to efficiency, for example the acquisition of Watson Standard Adhesives Company, where production will be integrated into existing manufacturing processes (see also page 9).

### Analysis prior to efficiency measures

Prior to taking energy-saving measures, we typically perform a thorough analysis of consumption and savings potentials through the energy management system (e.g. at ECKART GmbH, BYK-Chemie Wesel). In other cases, we rely on external expertise. To give an example, ECKART America in Louisville cooperated with the J.B. Speed School of Engineering of the University of Louisville to compile an "Environmental Sustainability Report On Site Opportunities." The report identified ten measures, which were then rated for their profitability. Five of them had amortization periods of less than a year, while the others will pay off in one to five years. Leakages in the compressed air system were fixed in 2011 and other measures pertaining to management, exhaust heat use, movement sensors, or illumination will be implemented in steps.

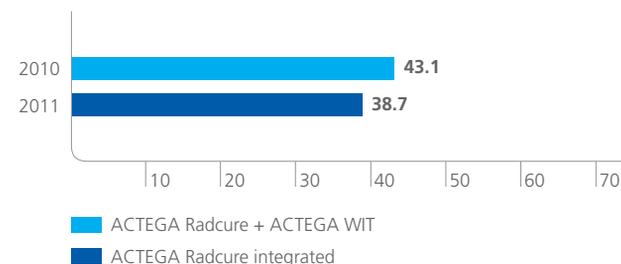
ECKART America in Painesville also developed a list of various measures, but without external support. It ranges from improving the compressed air network to speed-controlled compressors, more efficient electrical motors and lights to time-controlled consumers (e.g. heaters) and switching from compressed air motors to electrical drives.

### "Spotlight" on illumination

Other sites also maintain working groups that regularly address savings potential and the associated measures. For example, BYK USA in Wallingford has formed an energy efficiency team within the context of the ISO 14001 management system. In

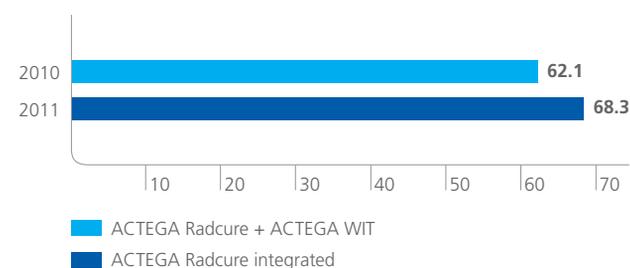
#### CO<sub>2</sub> emissions

With reference to GVA (g/Euro)



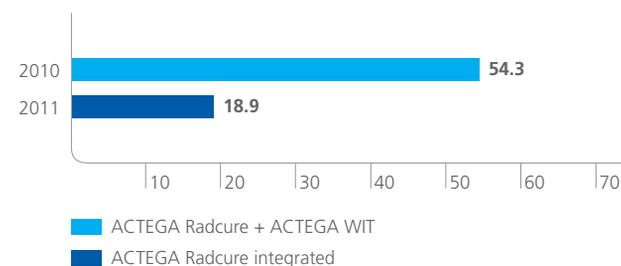
#### Electricity

With reference to GVA (Wh/Euro)



#### Natural gas consumption

With reference to GVA (Wh/Euro)



In addition to speed-controlled and efficient motors, the focus of these efforts is particularly on illumination. This was the case at ACTEGA Kelstar in the context of a laboratory renovation in Cinnaminson, which also involved optimizing the ventilation system to improve the air quality in the laboratory. ACTEGA Kelstar also plans to switch to more efficient lighting, while further savings are expected to come from speed-controlled motors and high-efficiency pumps.



ELANTAS Beck in Hamburg upgraded its outside lighting to LED technology for €33,000, which will reduce the annual consumption from 71,000 to 14,000 kWh. Amortization is expected in three to four years. ACTEGA Foshan in China also invested €22,000 in outdoor and hall illumination with LEDs, which will save some €4,800 in utility costs a year. Since LEDs require little maintenance and repair, the upgrade will pay for itself within a few years.

Further energy savings measures have to do with heating: In facilities with high ceilings, such as the production hall of ECKART America in Painesville or the high-bay warehouse at ELANTAS Italia in Collecchio, heat tends to collect underneath the roof. These operations installed fans to counter energy waste, and ACTEGA Kelstar even uses large hoses to return warm air to lower levels with even greater consistency.

### Large savings potential of exhaust heat

ECKART in Güntersthal uses the exhaust heat of its mill cooling water to heat an entire building. This will save some €33,000 or 450 MWh and 120 metric tons of CO<sub>2</sub> a year based on a fifty-percent reduction of heating energy needs. The exhaust heat of a compressor was used to heat another building, saving €18,000 and 66 metric tons of CO<sub>2</sub> a year. The investment in the heat exchanger paid for itself in just one year. ECKART in Wackersdorf adopted the same approach and also managed to save €18,000 and 66 metric tons of CO<sub>2</sub> a year by converting the exhaust heat of a compressor. The amortization is expected to be about 1 year.

ELANTAS Italia in Quattordio installed a heat exchanger at a cost of €61,000 to combine the recovered heat from the exhaust gas combustion with the gas boiler. Savings are expected to amount to approximately €24,000 or 80 metric tons of CO<sub>2</sub> a year, and the measurement of VOC (solvent emissions) in the exhaust air cleaning system is saving additional energy.

Meanwhile, ACTEGA Terra started a system for load optimization. The so-called 3-phase voltage stabilizer balances the grid when its standardized voltage level rises or fluctuates because these processes lead to higher energy losses, unnecessary power consumption, higher use and more wear and tear, all of which contribute to higher cost. Savings are expected to amount to approximately €14,000 or 30 metric tons of CO<sub>2</sub> a year, with an amortization time of about eight years.

### New production process with higher energy efficiency

ECKART in Güntersthal initiated a new approach to using energy more efficiently. Since the company uses a number of energy-intensive methods to prepare products, it developed a new approach that not only reduces energy consumption by up to 90 percent, but also the use for source materials by up to 30 percent. This allowed us to save 84,000 liters of fuel oil and accordingly, 200 metric tons of CO<sub>2</sub> in 2011. The projected emissions reduction for 2012 is approx. 600 metric tons of CO<sub>2</sub>.



New investments also offer excellent opportunities for increasing energy efficiency and cutting down on CO<sub>2</sub> emissions. As a consequence, ALTANA has developed a checklist that is used for renovation measures. It contains all CO<sub>2</sub> reduction potentials known to us and is continuously updated. A new laboratory constructed at BYK in Wesel is an example of greater energy efficiency. The building, which has been operational since October 2011, uses heat pumps for heating, groundwater for cooling, and recycled heat from the ventilation system. This saves some thirty percent of energy compared to conventional buildings and was recognized with a pre-certification award by the U.S. Green Building Council, along with BYK's efforts to use renewable resources. BYK scored 85 of a possible 110 points, and hopes to seek final certification in 2012.

A new building at BYK-Cera even managed to save CO<sub>2</sub> twice. The company built a new plant for micronized waxes for approx. eight million Euro. The building height of over 16 meters allowed for the vertical installation of filters, mills, and mixers so that source materials move through the processing line exclusively by force of gravity. The mills are operated with compressed air and therefore require multiple compressors with high power use, but the corresponding exhaust heat is sufficient to heat the entire building and an adjoining warehouse. This represents an emissions reduction of about 900 metric tons of CO<sub>2</sub>. Since the production facilities are designed as a closed-circuit system, no dust can develop in the manufacturing process, which protects workers from dust and from the risk of dust explosions. Furthermore, the new plant replaces a contract production agreement and also saves transports, resulting in a further emissions reduction of 90 metric tons of CO<sub>2</sub> per year.

## Emissions

ECKART in Güntersthal conducted a feasibility study for energy-intensive milling of pigments to establish whether the use of wind power would reduce CO<sub>2</sub> emissions. The study focused on three potential locations, none of which were in the immediate vicinity of the company's premises. The project has been suspended pending further decisions because of the uncertain permit situation on the part of the authorities and unclear profitability data (depending on the wind yield at the site), in addition to relatively high investment costs.

### ALTANA generates the following emissions:

- CO<sub>2</sub> (from energy consumption)
- VOC (in production)
- Wastewater
- Dust
- Noise

ECKART in Güntersthal sees feasible reduction potential in the conversion from oil-fueled to natural gas heating, which would lower the resulting CO<sub>2</sub> emissions by more than 20 percent, or 1,500 metric tons. In spite of the relatively long gas pipeline and the conversion of boilers, the upgrade makes economic sense and will be completed by 2013. The same switch is also planned for ELANTAS Zhuhai, but the timing depends on the installation of the necessary pipelines by the potential natural gas utility.

### 650 new trees for climate protection

Except for simple avoidance, planting trees is one of the easiest measures to reduce CO<sub>2</sub> emissions. ELANTAS employees in India planted 650 trees on the premises in Pimpri. 500 of these were needed for the new administrative building, since Indian law requires one tree for every ten square meters of new construction. Another 150 trees were planted voluntarily and together, the trees bind about 6.5 tons of CO<sub>2</sub> per year. However, the Indian employees went even further. They grow seedlings on the roof of



Employees of ELANTAS Beck India in Pimpri planted 650 new trees

the administrative building in Pune and distribute them to employees and others with the request of planting them.

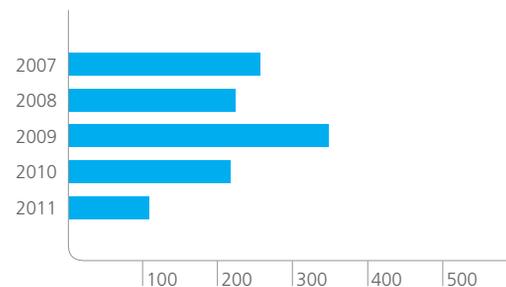
ALTANA already installed a number of exhaust air cleaning systems in past years to reduce VOC emissions so that there is no further need for action at this time. The expansion of the water-based product portfolio, especially at ACTEGA, is another effective measure against VOC (see page 22) along with the use of resource tanks. In closed systems, source materials have no contact with the outside world from delivery to use, which means there are no emissions. BYK USA in Wallingford und ELANTAS Italia in Collecchio have invested in expansions of their tank farms.

## Water

ALTANA tracks its consumption of drinking water as well as groundwater and surface water. ECKART Pigments Ky has the largest water consumption, which is associated with the specific production processes that involve the use of a natural

mineral as a raw material. However, water consumption has been reduced considerably with process optimization, and a conversion to synthetic glass flakes as base material will further cut it down. When leakages were discovered at ACTEGA Foshan, the entire piping network was renovated, which will have a positive effect on the 2012 balance.

ECKART Pigments Ky drinking water consumption production-related (in m<sup>3</sup>/t)

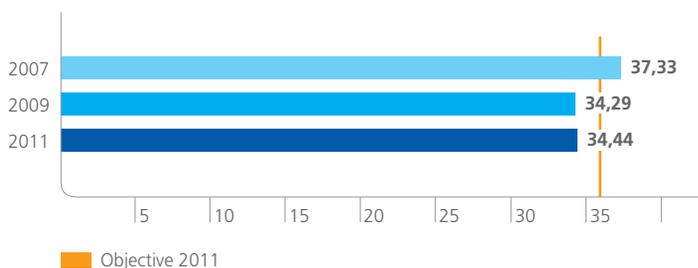


## Wastewater/solid waste/existing contamination

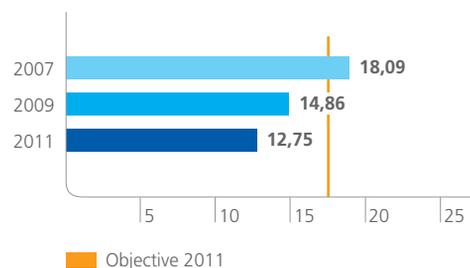
ELANTAS Beck India built three new basins for aerobic wastewater treatment at its Pimpri site. The system uses smaller air bubbles than the previous treatment plant, which resulted in energy savings of over 40 percent. Emissions into wastewater (measured as chemical oxygen demand) also are 30 percent below those of the old plant. The two former treatment basins will be used to catch rainwater in the future, including for landscape watering.

Resource efficiency has special significance next to climate protection and biodiversity. According to the German Advisory Council on the Environment (SRU), the drastic reduction of our resource and energy use and the associated environmental damage are the core challenges of the 21st century.

**ALTANA hazardous waste**  
With reference to GVA (g/Euro)



**ALTANA non-hazardous waste**  
With reference to GVA (g/Euro)



Resource efficiency in the production processes of ALTANA can also be expressed in terms of waste volume. It is approximately five percent (in terms of manufactured products), with a resource-product conversion rate of 95 percent. Nevertheless, we are making every effort to further increase our resource efficiency to create even less waste.

**Exemplary employee behavior**

ALTANA keeps records of hazardous and non-hazardous waste and publishes its recycling and disposal volumes. We exceeded our waste-related goals by - 8 and - 28 percent, respectively (see also page 62), as a result of the exemplary behavior of employees and technical measures. As an example, ELANTAS Beck had not been recording the consumption of cleaning solvents in the production area for impregnating and casting resins, but the installation of a counter allowed for product-related volume specification for cleaning and dosing via the process control system, which saved 15 percent of hazardous waste and €30,000 in expenses.

Unfortunately, not all optimization attempts are equally successful. ACTEGA Terra recorded a significant increase of hazardous waste. It consists primarily of contaminated cleaning water, for example from taking back cleaned empty

containers. The “FoodSafe seal” has also contributed to the increase because it limits the reuse of cleaning water.

ACTEGA Terra has made several attempts to reduce the volume of contaminated water with aerobic and anaerobic treatment, without much success. A vacuum evaporator did not provide any solution and filters became stuck. It took until 2011 to optimize the cleaning of the facilities and the reuse of cleaning water. As a result of the measures taken to date, ACTEGA Terra expects a hazardous waste reduction of ten percent from 2012.

The recycling of distillation water via phase separation, activated carbon filters, and combustion at ELANTAS PDG has not yet achieved the desired results, as there are use restrictions because of official limit values. Nevertheless, the company has reported some cost savings and lower waste volumes and the improvement work is still ongoing.

Our support for the industry association to promote the restoration of contaminated sites in North-Rhine Westphalia (AAV) has been described in past reports. AAV is a cooperation model that involves state authorities along with municipalities and various corporations, including from the chemical industry. The revenues from the sale of restored areas in part come back to the AAV and are then available for new

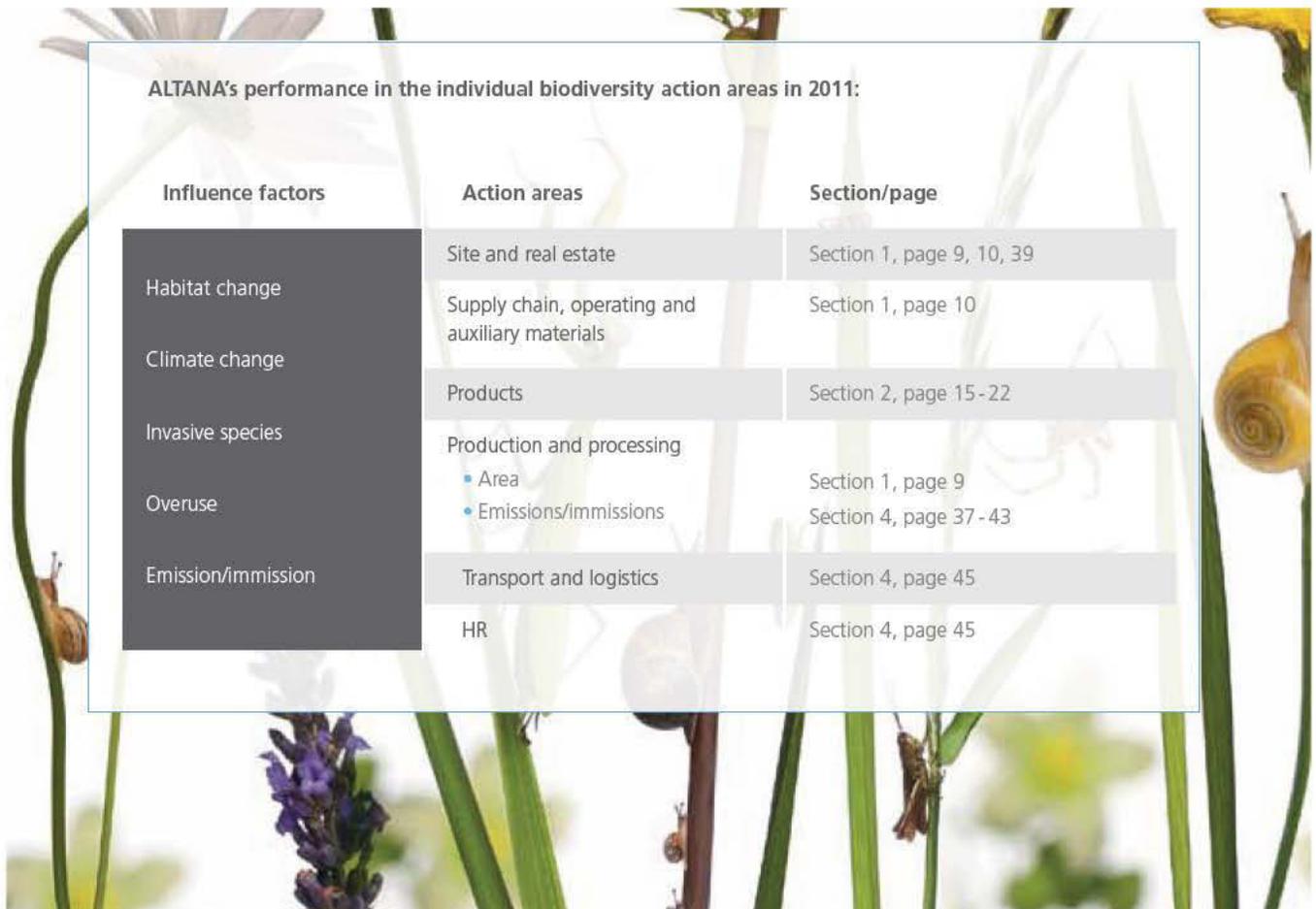
## Biodiversity

recovery projects. Although the cooperation agreement has not been formally extended past the year 2011, ALTANA and other chemical companies have committed to continue their financial contributions in the absence of an agreement. We also call on industrial corporations in the chemical and other industries to support the constructive work of the AAV.

ALTANA supports the efforts to maintain biodiversity as the irreplaceable basis of ecosystems and their services. Our last sustainability report contained a detailed discussion of our influence factors and areas of action in this regard. The report is available online at [www.altana.com/sustainability](http://www.altana.com/sustainability)

### ALTANA's performance in the individual biodiversity action areas in 2011:

Influence factors	Action areas	Section/page
Habitat change	Site and real estate	Section 1, page 9, 10, 39
	Supply chain, operating and auxiliary materials	Section 1, page 10
Climate change	Products	Section 2, page 15-22
Invasive species	Production and processing	
Overuse	<ul style="list-style-type: none"> <li>• Area</li> <li>• Emissions/immissions</li> </ul>	Section 1, page 9 Section 4, page 37 - 43
	Emission/immission	Transport and logistics
	HR	Section 4, page 45





## Transport

ALTANA exclusively works with logistics and transport companies that have certified environmental and quality management systems. This strategy has proven helpful because it guarantees that our standards are upheld whenever we order transport services. When deviations occur, which can happen in daily business, we are notified without delay and make every attempt to address shortcomings with our service providers to achieve permanent improvements.

Furthermore, we were pleased to notice that a growing number of customers are asking about our criteria for service provider selection within the scope of their audits and that these questionnaires inquire about the environmental management systems of our vendors with growing frequency. Accordingly, our actions not only meet our own expectations for sustainable management, but also are increasingly in line with the requirements of our customers. That is a clear competitive edge for ALTANA.

### Internet platform for greater transparency

Thanks to an Internet-based logistics platform that we use to exchange transport data with our logistics providers, we were able to further optimize our supply chain. The full transparency of our global material flows is an important strategic aspect of

this Web platform. The data associated with the exchange form the basis of this transparency, ranging from intermediate-term optimization of material flows to pooling the transport volume to reduce individual shipments.

To improve the market presence of ACTEGA Artística in the U.S., ACTEGA Kelstar set up a manufacturing facility for its products. This eliminates the need to ship ready-made products from Spain to the U.S. ACTEGA Rhenacoat began constructing a new warehouse in 2011, which will eliminate a large number of transports, since the company had previously leased a warehouse for finished products and source materials at a distance of 100 km for reasons of safety and environmental protection. The new micronizing process at BYK-Cera (see also page 41) will also contribute to reduced transport needs.

Among our specific environmental measures is also a new policy for company vehicles that was introduced in 2011. It specifies company subsidies for vehicles with emission values below 140 g CO<sub>2</sub>/km as an employee incentive to choose environmentally friendly models.

For further information on our transport logistics and supply chain, please see the performance indicators on page 64.





## Great show of trust

Emotional overload, overly high personal expectations, and mounting problems at work or in private life in the worst case all have the potential to lead to emotional illnesses such as depression, anxiety, or burnout. ALTANA has stepped up prevention efforts in recognition of this increasing problem.

The management of BYK initiated measures for boosting the emotional health of employees in 2011 and a new program was added to the occupational health management at BYK in November. "Not everything goes smoothly in life. Almost everyone reaches a point where multiple problems are coming together. BYK wants to support its employees by offering a new advisement center," says HR employee Raphaela Wolberg, who, together with Frank Dederichs, led the effort to establish psychological counseling as part of the "Feels Good" initiative. "We want to address stress at an early stage and discuss challenging situations with experts before the health of an employee is at serious risk," explains Dederichs, who has been the head of market communication at BYK since 2003. "Anyone who feels affected or stressed can visit our new counseling center."



pro homine in the House of Health in Wesel

All employees in Wesel or Kempen are entitled to five annual counseling sessions of 50 minutes each at the expense of BYK. The company cooperates with "pro homine," an experienced provider of occupational health services that has been called upon in the past for other company fitness concerns. "All counseling meetings will be kept strictly confidential.

## "The new counseling center is open to everyone."

BYK will not tell anyone that an employee came in at a specific time or with a specific concern," says Dederichs, addressing potential skepticism. In the mind of the 49-year-old employee, this is "an incredible show of trust on the part of the employer."

The goal is to offer any employee who requests counseling services an appointment within four days. The purpose of the

advisement is to develop long-term solutions to help cope with crisis situations. A total of twelve counselors are available to employees in the House of Health in Wesel. They include physicians and advisors along with labor experts, psychologists, psychiatrists, and psychotherapists with many years of experience dealing with emotional stress and mental illness. The sessions are based on scientifically recognized methods and external advisors such as addiction or debt counselors can be called in to help as needed.

The number of appointments has shown how great the need for the new offer is among the employees. In the first six months, forty employees scheduled over 160 counseling sessions. In severe cases, access to further therapy was arranged without delay, "which is an essential advantage for cooperating with pro homine, since affected people often find it difficult to find a suitable therapy opening," explains Frank Dederichs.

## Employee survey

The commitment of our employees is an essential factor of the past success of ALTANA. Consequently, we carry out a global employee survey every three years to find out what the mood is among employees and to hear their important suggestions for improvement. During the last employee survey in 2008, respondents brought up concerns and action areas pointing at potential improvement. Since then, we have been working in the Divisions and local companies to develop and implement the corresponding measures with the assistance of employees.

This made it all the more important to carry out another employee survey in 2011 to find out whether and how the attitude of employees about the company changed, including in light of the economic crisis since 2009. We also wanted to find out whether the initiated improvement measures met the approval of employees and where there might be further room for improvement. In May 2011, all employees around the world received a questionnaire in their corresponding national language.

The response rate of 79 percent was significantly higher than three years earlier (71 percent). We are pleased to report that the survey values improved significantly in all Divisions and in most companies. Employee commitment to the Group and identification with the company again rose since 2008 and the survey results underscore that the commitment of ALTANA employees is clearly above the average

of the chemical industry, but also above the industry-specific average. At the same time, the responses demonstrated the need for further improvements in some companies and in the functional units of the companies.

ALTANA will continue to make every effort to improve the survey results of local companies and the Group. The most important effort now is to initiate the right improvement measures in shared workshops, meetings, and projects with employees and management on the basis of the survey results. The feedback of our employees encourages us to consistently keep working on improvements to be among the best employers in the industry.



## Supporting junior talent

ALTANA recognizes that its employees are its most important asset. As a consequence, it is a core concern to continuously support their qualifications and competencies and to secure junior talent with targeted educational activities in schools and cooperation with universities.

To get young people into sciences from an early age, BYK has launched the "Little scientists' house" project in cooperation with a child daycare facility and two elementary schools in Wesel. At the end of successful project weeks in the schools, some 120 children met in July 2011 for a joint research project at ALTANA. With this initiative BYK is investing in youngsters from the daycare facility through to high school, joining other ALTANA companies for many years now in offering young people a wide variety of internships and supporting science projects in schools.



## Close cooperation with universities

ALTANA uses its participation in the NRW Scholarship Program as an opportunity to meet highly motivated junior



chemists and to present itself as an attractive employer. To create a lasting bond between ALTANA and chemistry scholarship recipients, we offer a one-year framework program in addition to financial support. Students are encouraged to submit proposals of their own to shape the program, which will provide opportunities to meet other scholarship recipients in the future and tour companies. Another aspect of learning about specific work areas involves shadowing an ALTANA employee for a day.

Our own apprenticeship program remains one of the most important strategic tools for covering our future human resource needs. Our German sites alone provided apprenticeship opportunities for 162 young people in nineteen different professions in 2011. This number was 138 in the year before. The apprenticeship quota was 5.2 percent in late 2010. We continue to successfully attain our goal of maintaining an apprenticeship quota of at least five percent in spite of growing employee numbers to ensure qualified junior talent in the future.

## Talent management

The Talent Evaluation Process (TEP) was introduced in late 2010 in addition to the annual progress meeting between employees and executives. TEP targets employees who are planning a career change in the foreseeable future and helps them analyze these plans in a structured way with their supervisor to initiate the necessary next steps. The process focuses on employees who exceed the requirements for their current work in defined competency areas and are willing to take over more or different responsibilities. Employees may also initiate the TEP process on their own. Participants



undergo a clearly structured process with defined criteria of potential and management competencies to make their development as targeted as possible. This is then followed by planning suitable development measures.

The Talent Evaluation Process helps our company identify, develop, and retain promising employees who are interested in advancing their career. Employees who show suitability for multiple jobs or vertical transfers will be contacted by ALTANA when the corresponding vacancies occur. Furthermore, TEP promotes a culture of open feedback, which ultimately benefits all employees and executives in the company.

## Women in management positions

The share of women in management positions at ALTANA increased from 16.5 percent in the past year (as of December 31, 2010) to almost 18 percent (December 31, 2011). To increase this share further, we are making targeted efforts to develop female managers and to hire even more qualified women for entry-level positions. However, the relevant study fields continue to be male-dominated, which does not make the search for female candidates who are suitable for ALTANA any easier. In this light, it is particularly important to us to support qualified women in their life and career paths and to create a family-friendly environment.

The female employees of ALTANA established an internal women's network at the Wesel site at their own initiative. A pilot project to be continued until the end of 2012 will develop the potential goals and activities of this network and coordinate further steps with the Management Board, which supports the project.

## Development for better cooperation

ECKART America resorted to an unusual teamwork training measure as part of its management meeting. Two teams of six employees each were charged with assembling bicycles under difficult conditions. Two persons were allowed to view a completely assembled bike and then had to give instructions for assembly to two "couriers," who in turn passed the information on to the two "technicians." The objective of the training session was to strengthen teamwork and communication, while having a good time. The results were truly impressive, also in light of the fact that the bicycles were given to children of needy families. That prompted both teams to do their work even more carefully. In the end, participants all felt they had learned something new with a lot of fun, while also doing a good deed.



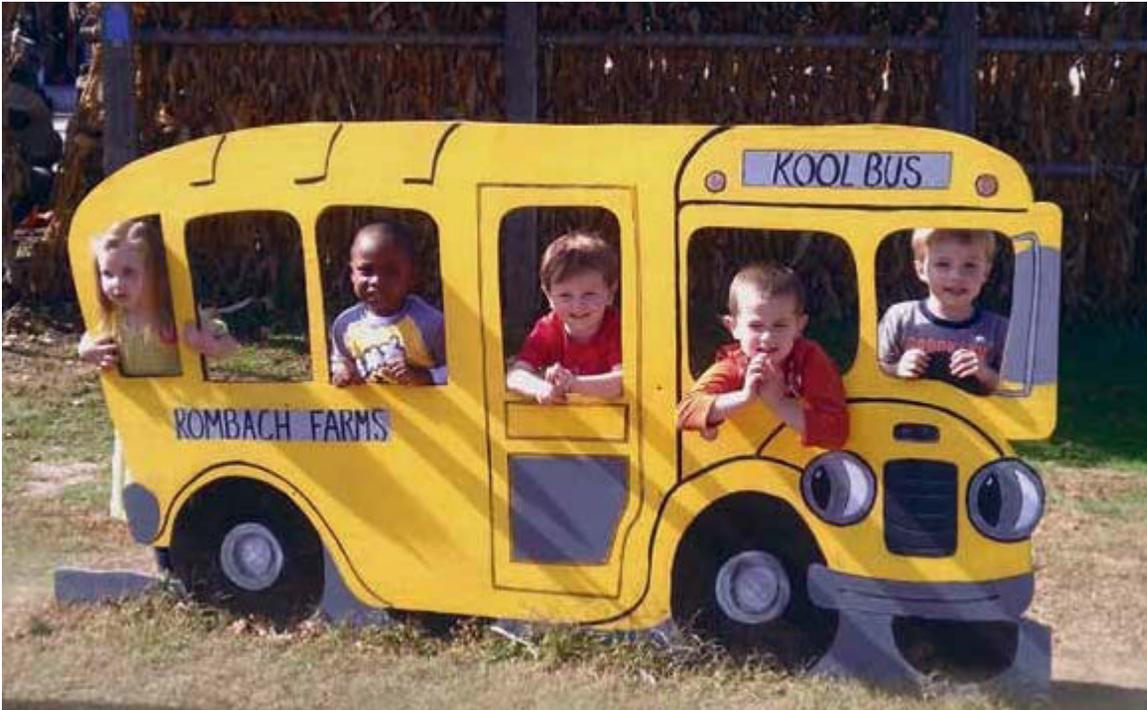


## Only professional support is helpful

When children displayed behavioral problems in the past, parents, psychologists and doctors were usually at a loss, particularly in the case of autistic children. Fortunately, much has changed and it is now widely understood that these children need special support in a professional environment. The Howard Park Center in Ellisville, Missouri, has been confronting this challenge for more than forty years. ALTANA is supporting a new early intervention program that specifically targets autistic children.

The Howard Park Center serves about a hundred children and their families. The broad offers include three preschool classes for children age two to five with special needs and three elementary school classes, two of which focus specifically on autistic children. "Autism is a complex impairment of the nervous system, which statistically occurs in one of a hundred newborns," says Dr. Thomas Murray, the

head of Research & Development at ELANTAS PDG, who has volunteered as the chairman of the Howard Park Center for a long time. He knows that ALTANA employees are among those who confront the challenges of autism in their own homes. "The earlier the children receive help, the better their therapy chances."



Children at Howard Park Center in Ellisville

When Howard Park Center searched for sponsors for a new program to serve autistic children in 2011, ALTANA came forward to offer its support. The Early Intensive Behavioral Intervention Classroom (EIBC) is specifically designed for autistic children between the ages of two and five. Research has shown that intensive individual intervention such as the services provided by EIBC has the best learning results for children with autism.

in its founding year and two subsequent years. The funds will be used to hire specially trained teachers and to provide scholarships to families who cannot afford to pay full tuition. "We are convinced that this type of support is the best assistance we can provide to the affected children," says Murray, himself a father of three.

**"The earlier the intervention, the better the therapy chances"**

"ALTANA is involved in a number of projects and initiatives, both at the regional and the international level. Our clear focus is on education, science and research," explains Murray. The sponsorship initiatives of ALTANA follow the same guidelines. Some €30,000 will be invested in the promising EIBC project

**Howard Park Center**

Howard Park Center was founded in 1971 as St. Martin's School for Special Children and was renamed in honor of its founder, Howard Park, in 1992. The non-profit organization addresses the needs of mentally disabled children and their families. Children with minor to severe disabilities receive intensive support with their scholastic and physical development to attain their highest potential later in life. The Center is funded by charitable contributions and donations.

## Sponsorship projects

As part of the nationwide German initiative "Boss for a day," ALTANA is supporting the development of junior leadership talent. In cooperation with a business journal, our company invited a high school student from the Euregio High School in Bocholt to take a look behind the scenes of our operation, where he served as a symbolic "boss for the day." The purpose of the initiative is to familiarize students with the working reality of industrial corporations and to address their reservations. In addition to ALTANA, seven other German companies took part in the nationwide campaign.

Appealing to the research spirit of preschool children is second nature to ALTANA because fresh knowledge is a precious source of innovation, and the "House of Junior Researchers" foundation recognized ALTANA for its commitment with a partner prize. After a few successful project weeks in schools, some 120 youngsters met for a joint research session at ALTANA and BYK in July 2011. The project work of BYK in Wesel shows the practical side of this commitment. BYK offers a number of

internships to young people and also supports school projects in the natural sciences. In addition, local employees have committed to teaching children, from the day-care center to secondary schools, to get them excited about natural science phenomena. The "Adventure Land" day-care center in Wesel is one of the beneficiaries of this commitment.

### Support junior talent at an early time

BYK also set up a booth at the job fair of the Lauerhaas Comprehensive School in Wesel, with presentations about the dual study course to earn a bachelor of engineering degree or apprenticeship opportunities to become a chemical or coatings laboratory assistant. As another sign of our commitment to junior talent, BYK took part in a job course for students at Konrad-Duden vocational high school in Wesel.





ALTANA also sponsors the Junior Academy, a special program of the Museum Schloss Moyland for cultural education of elementary school children. Art classes are based on the curriculum of the various ages and are offered on site in the museum. The direct exchange about original art gives children insights into history and origins without time or performance pressure.

ALTANA uses these opportunities to meet highly motivated junior natural scientists and to present itself as an attractive employer. We are part of the NRW scholarship program, which provides ten particularly talented chemistry students at Niederrhein University of Applied Sciences with a stipend of € 150 per month for two semesters. We have also initiated a one-year framework program for our scholarship recipients to optimize the know-how transfer. ALTANA has also been a member of the booster club for the Rhein-Waal University of Applied Sciences and organized a speed dating event for interns under the guidance of ALTANA CEO Dr. Matthias L. Wolfgruber. Over a hundred students attended the event to find out more about the regional companies.

### Venture capital

Expanding competencies and opening up new markets with innovations are two essential components of the ALTANA corporate strategy. For this reason, we invest €2.5 million in the second high-tech venture capital fund (HTGF) of the German Federal Ministry of Economics and Technology and the state-owned KfW bank. This initiative allows us to provide targeted support to technology start-ups and gives new entrepreneurs the opportunity for specialized networking to guide their ideas to economic success. In addition to ALTANA, eleven other German companies currently support the venture capital fund.

ALTANA is also a proud sponsor of an unusual architectural concept. We sponsor the illumination that has been lighting up the new Rhine Bridge in Wesel in the ALTANA colors blue and cyan at night. We see this investment as a visible commitment to our region because innovative ideas, modern technology and high-quality aesthetic solutions are a perfect reflection of our entrepreneurial philosophy. The overall investment in the brightly lit project is about €200,000, with a sponsorship agreement for 30 years.

As good corporate citizens, we also are dedicated to cultural events in the region. We joined the support organization Friends of the Duisburg Philharmonic Orchestra in 2009 and have again turned the lobby of our ALTANA headquarters in Wesel into a concert hall. The chamber music concert with the brass quintet of the Duisburg Philharmonic Orchestra offered a completely new acoustic delight in an extraordinary environment for music lovers from all over the region.

### Non-bureaucratic help for emergency situations

As a globally active and responsible company, ALTANA also is ready to help victims of natural disasters and people in need all over the world. For this reason, we again engaged in national and international charity projects in 2011. We gave €30,000 to the victims of the drought disaster in East Africa to ease the suffering in refugee camps in Somalia, Kenya, and

Ethiopia. ALTANA also sent a donation of €90,000 to the Japanese Red Cross to assist Japanese people affected by the earthquake and tsunami in that country.

At the same time, ALTANA also supports employees who volunteer for charitable projects. Employees of the HR departments of BYK and ALTANA again used an opportunity to volunteer at the International Peace Village in Oberhausen in May 2012. ALTANA donated the work materials that were required to renovate the children's playground.

**Donations for charity**

The employees of BYK in Wesel took part in the 9th Light Run at the Wedau Sport Park. The City of Duisburg used the proceeds to fund lighting along the popular regatta track running

trail. The donations collected at the first-ever "BYK Open" at the Weselerwald Golf Club in the amount of €2,500 went to the palliative care unit of the Lutheran Hospital in Wesel. ALTANA also demonstrated its commitment to regional aid projects with donations to food pantries in Wesel and Kempen in the amount of €6,900, which had been collected on the occasion of the Open House Day for Chemical Companies (see also page 12).

Donations of ALTANA also were used to fund a movie event for one hundred children attending the full-day Lutheran elementary school Böhschule Wesel and employees of ECKART in Wackersdorf donated €9,000 to a society serving cancer patients and disabled children (VKKK). Among other purposes, the funds are earmarked for assisting the siblings of sick children served by the society.



## Key performance indicators

The following pages provide an overview of our corporate activities in the period from 2006 or 2007 to 2011 on the basis of various key performance indicators, which are grouped into the areas environment, production, safety, and human resources. We will continuously expand the recording of key performance indicators for future sustainability reports.



## On the environmental indicators

This section presents selected environmental data in aggregated form for ALTANA and its four Divisions. We make a particular effort to compile data on the areas of climate protection and energy consumption, waste, resource efficiency, and water consumption. Emissions into water (chemical oxygen demand or heavy metals), emissions of ozone-depleting substances, or climate-relevant gases from production processes play no or just a minor role.

Our environmental data are recorded, reviewed, and released at the individual production sites in accordance with internal specifications. Key environmental data are shown as a volume (e.g. in kWh) with reference to gross value added (cost of labor plus EBITDA in Euros). In their compressed form, the environmental indicators reflect tendencies in the development of the entire environmental burden of the Group. Overall, we collect environmental data at 31 sites that were part of the ALTANA Group prior to Dec 31, 2010. We only consider data that make reference to gross value added relevant for our objectives and the corresponding degree of attainment.

The following sites or Group companies were not included:

- Companies acquired during the reporting period
- Production sites of Instruments
- Non-production companies (e.g. administration, laboratories)

We have switched the reporting period for environmental KPIs to October 1 through September 30. Because of this switch, only nine months of data were available for 2011. The absolute values were projected for twelve months for easier comparability. The shorter period is not relevant for the values associated with gross value added.

In summary, ALTANA has met or even exceeded its own goals. Please refer to Section 4, Environment from page 36 for more information on the measures that led to changes in our environmental performance indicators.

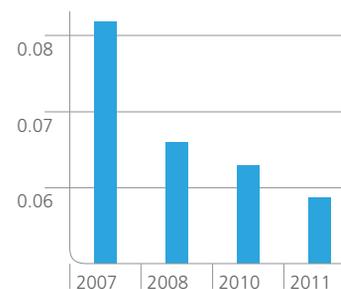
## Energy consumption

Although absolute energy consumption is of course heavily dependent on produced quantities, we were able to achieve significant improvements for all energy sources in terms of gross value added.

### Oil

Year*		BYK	ECKART	ELANTAS	ACTEGA	ALTANA
2007	MWh	73	25,083	13,626	806	<b>39,588</b>
2008	MWh	32	24,967	4,171	1,105	<b>30,275</b>
2010	MWh	129	28,818	5,424	1,158	<b>35,529</b>
2011	MWh	67	25,384	5,747	996	<b>32,194</b>

### Oil (in KWh/Euro)

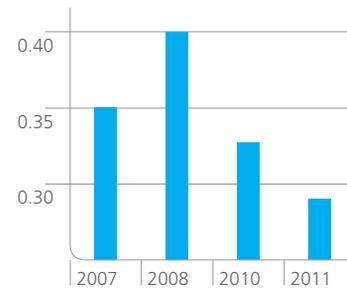


\* For a complete overview of key performance indicators since 2006 or 2007 and additional environmental performance indicators, please visit [www.altana.com/sustainability](http://www.altana.com/sustainability)

Natural gas

Year*		BYK	ECKART	ELANTAS	ACTEGA	ALTANA
2007	MWh	33,852	52,542	71,339	11,302	<b>169,035</b>
2008	MWh	48,171	53,673	70,194	10,701	<b>182,739</b>
2010	MWh	49,944	45,270	78,789	11,194	<b>185,197</b>
2011	MWh	44,647	37,429	75,917	8,220	<b>166,213</b>

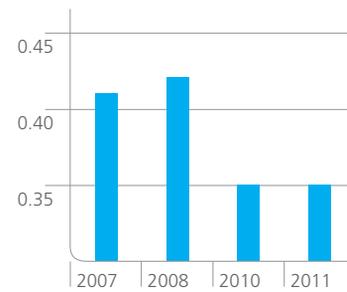
Natural gas (in kWh/Euro)



Electricity

Year*		BYK	ECKART	ELANTAS	ACTEGA	ALTANA
2007	MWh	22,732	131,848	28,077	15,759	<b>198,416</b>
2008	MWh	25,696	124,619	26,472	14,946	<b>191,733</b>
2010	MWh	24,330	128,950	28,575	16,743	<b>198,598</b>
2011	MWh	24,613	135,281	30,949	17,011	<b>207,854</b>

Electricity (in kWh/Euro)



## Emissions

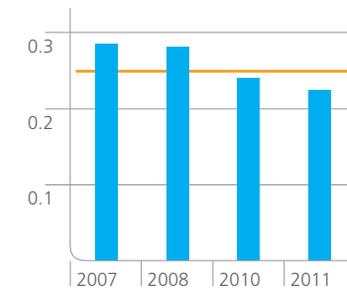
The CO<sub>2</sub> emissions of ALTANA can be calculated from the energy consumption shown above. They are compiled in accordance with the international "Greenhouse Gas Protocol" standard and the provisions of the "Carbon Disclosure Project." Accordingly, we always use the values published for national grids (International Energy Agency), although we use

electrical power with a renewable share of at least 50 percent in Germany, which would reduce our CO<sub>2</sub> emissions by approx. 45,000 metric tons. We clearly exceeded our reduction goal of 10 percent in the period 2007 to 2012 with a total reduction of 18 percent in 2011.

Total CO<sub>2</sub> (Scope 1 + Scope 2)

Year*		BYK	ECKART	ELANTAS	ACTEGA	ALTANA
2007	t	18,429	75,867	33,153	9,751	<b>137,200</b>
2008	t	21,269	69,135	28,619	8,915	<b>127,938</b>
2010	t	21,328	71,828	32,963	9,782	<b>135,901</b>
2011	t	20,364	69,933	33,983	9,069	<b>133,348</b>

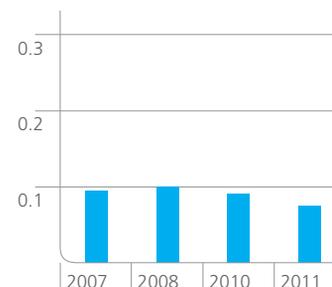
Total CO<sub>2</sub> (in kWh/Euro)



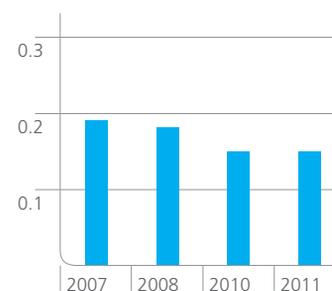
The orange line indicates the goal set for 2012.

CO<sub>2</sub> (Scope 1)

Year*		BYK	ECKART	ELANTAS	ACTEGA	ALTANA
2007	t	7,729	17,767	17,441	2,498	45,435
2008	t	9,774	17,915	15,329	2,456	45,475
2010	t	10,741	19,377	18,364	2,711	51,192
2011	t	9,593	15,019	17,835	2,030	44,477

CO<sub>2</sub> (Scope 1 in kWh/Euro)CO<sub>2</sub> (Scope 2)

Year*		BYK	ECKART	ELANTAS	ACTEGA	ALTANA
2007	t	10,701	58,099	15,712	7,253	91,764
2008	t	11,495	51,220	13,289	6,458	82,462
2010	t	10,587	52,451	14,599	7,071	84,709
2011	t	10,770	54,914	16,148	7,039	88,871

CO<sub>2</sub> (Scope 2 in kWh/Euro)

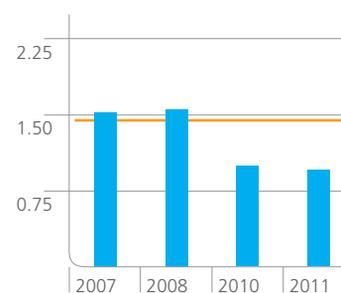
## Water

Absolute drinking water consumption was particularly reduced by measures taken at our Finnish site. We far exceeded our goal for the year 2012 with a reduction of 37 percent.

Drinking water (not including use of raw materials)

Year*		BYK	ECKART	ELANTAS	ACTEGA	ALTANA
2007	m <sup>3</sup>	46,082	514,824	152,570	23,649	737,126
2008	m <sup>3</sup>	47,007	534,856	95,838	32,038	709,739
2010	m <sup>3</sup>	65,199	384,613	85,134	24,739	559,685
2011	m <sup>3</sup>	76,512	295,121	155,006	36,231	562,870

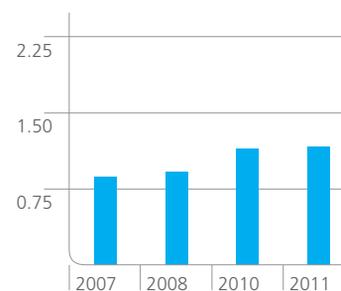
Drinking water (in liter/Euro)



Surface/groundwater

Year*		BYK	ECKART	ELANTAS	ACTEGA	ALTANA
2007	m <sup>3</sup>	30,486	358,382	30,937	0	419,805
2008	m <sup>3</sup>	27,024	349,712	42,523	0	419,259
2010	m <sup>3</sup>	26,017	593,361	25,307	0	644,685
2011	m <sup>3</sup>	32,340	630,987	28,233	0	691,560

Surface/groundwater (in liter/Euro)



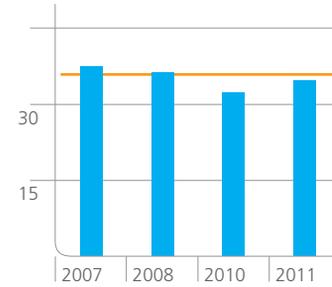
## Waste

Absolute waste volumes are of course heavily dependent on produced quantities, but we were able to significantly reduce waste volumes for disposal. We far exceeded our goal for the year 2012 for data related to gross value added.

### Hazardous waste

Year*		BYK	ECKART	ELANTAS	ACTEGA	ALTANA
2007	t	5,114	4,481	5,967	2,426	<b>17,988</b>
2008	t	5,229	3,999	4,961	2,426	<b>16,615</b>
2010	t	6,193	4,274	4,945	2,911	<b>18,323</b>
2011	t	6,073	4,924	6,118	3,303	<b>20,418</b>

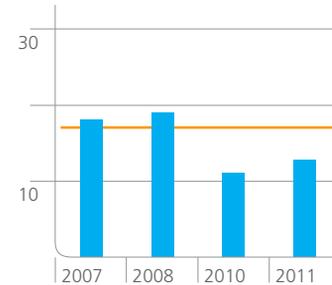
### Hazardous waste (in g/Euro)



### Non-hazardous waste

Year*		BYK	ECKART	ELANTAS	ACTEGA	ALTANA
2007	t	595	5,330	1,254	1,539	<b>8,717</b>
2008	t	1,034	4,455	1,549	1,517	<b>8,555</b>
2010	t	573	3,202	1,048	1,234	<b>6,057</b>
2011	t	1,053	3,662	1,159	1,682	<b>7,556</b>

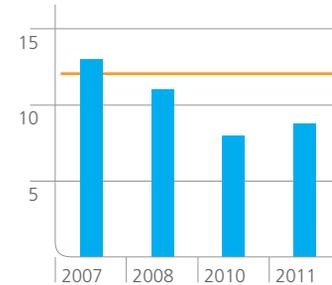
### Non-hazardous waste (in g/Euro)



### Hazardous waste for disposal

Year*		BYK	ECKART	ELANTAS	ACTEGA	ALTANA
2007	t	453	1,141	4,752	134	<b>6,480</b>
2008	t	201	1,100	3,462	250	<b>5,012</b>
2010	t	134	540	3,274	328	<b>4,275</b>
2011	t	407	795	3,564	440	<b>5,206</b>

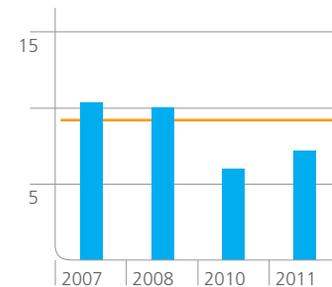
### Hazardous waste for disposal (in g/Euro)



### Non-hazardous waste for disposal

Year*		BYK	ECKART	ELANTAS	ACTEGA	ALTANA
2007	t	31	3,601	561	742	<b>4,935</b>
2008	t	21	3,353	617	747	<b>4,738</b>
2010	t	9	2,132	375	844	<b>3,361</b>
2011	t	127	2,435	603	1,099	<b>4,265</b>

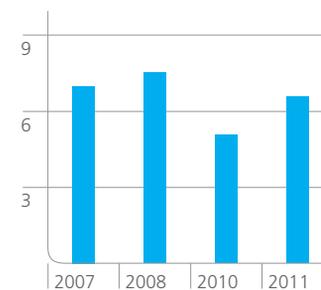
### Non-hazardous waste for disposal (in g/Euro)



## Recyclable hazardous waste

Year*		BYK	ECKART	ELANTAS	ACTEGA	ALTANA
2007	t	132	4	1,060	2,052	3,248
2008	t	208	6	1,159	2,065	3,437
2010	t	428	625	945	867	2,865
2011	t	419	809	1,572	1,074	3,874

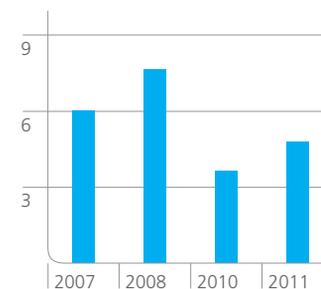
## Recyclable hazardous waste (in g/Euro)



## Recyclable non-hazardous waste

Year*		BYK	ECKART	ELANTAS	ACTEGA	ALTANA
2007	t	262	1,224	693	754	2,934
2008	t	829	982	932	737	3,480
2010	t	113	1,043	662	247	2,064
2011	t	596	1,189	556	504	2,846

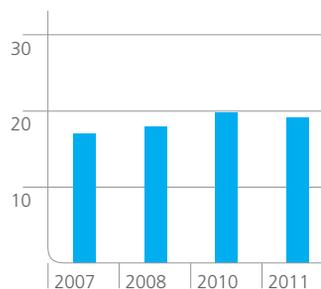
## Recyclable non-hazardous waste (in g/Euro)



## Hazardous waste for thermal processing

Year*		BYK	ECKART	ELANTAS	ACTEGA	ALTANA
2007	t	4,530	3,335	155	240	8,260
2008	t	4,820	2,893	341	112	8,166
2010	t	5,631	3,110	726	1,716	11,183
2011	t	5,248	3,320	983	1,789	11,339

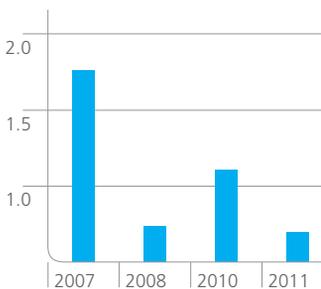
## Hazardous waste for thermal processing (in g/Euro)



## Non-hazardous waste for thermal processing

Year*		BYK	ECKART	ELANTAS	ACTEGA	ALTANA
2007	t	301	504	0	43	848
2008	t	184	120	0	33	337
2010	t	450	27	12	143	632
2011	t	330	37	0	78	446

## Non-hazardous waste for thermal processing (in g/Euro)



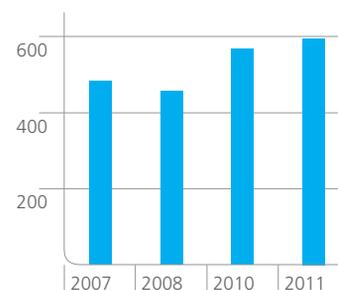
## On the economic performance indicators

Gross value added is calculated from the cost of labor and the EBITDA.

### Gross value added

Year*		BYK	ECKART	ELANTAS	ACTEGA	ALTANA
2007	thsd €	175,659	158,630	86,988	60,537	<b>481,814</b>
2008	thsd €	165,812	149,064	83,431	57,314	<b>455,621</b>
2010	thsd €	218,179	156,599	109,689	82,223	<b>566,690</b>
2011	thsd €	236,316	170,264	101,136	85,097	<b>592,813</b>

### Gross value added (in € millions)



### Finished products

Year*		BYK	ECKART	ELANTAS	ACTEGA	ALTANA
2007	t	88,075	43,059	126,847	92,817	<b>350,797</b>
2008	t	81,703	41,499	101,201	83,187	<b>307,590</b>
2010	t	105,851	36,277	139,694	92,770	<b>374,591</b>
2011	t	118,238	38,424	164,230	101,558	<b>422,450</b>

## Transport

The increase of air transports (highest CO<sub>2</sub> emissions of all transport channels) is undesirable and was related to the urgency of deliveries. We have definite plans to again reduce this figure.

### ALTANA distribution channels for finished products

Year*		Water	Road	Air	Rail
2007	t	83,742	291,193	9,687	2,723
2008	t	77,491	227,594	1,477	2,773
2010	t	98,404	323,883	2,405	1,422
2011	t	109,682	320,293	7,052	1,236

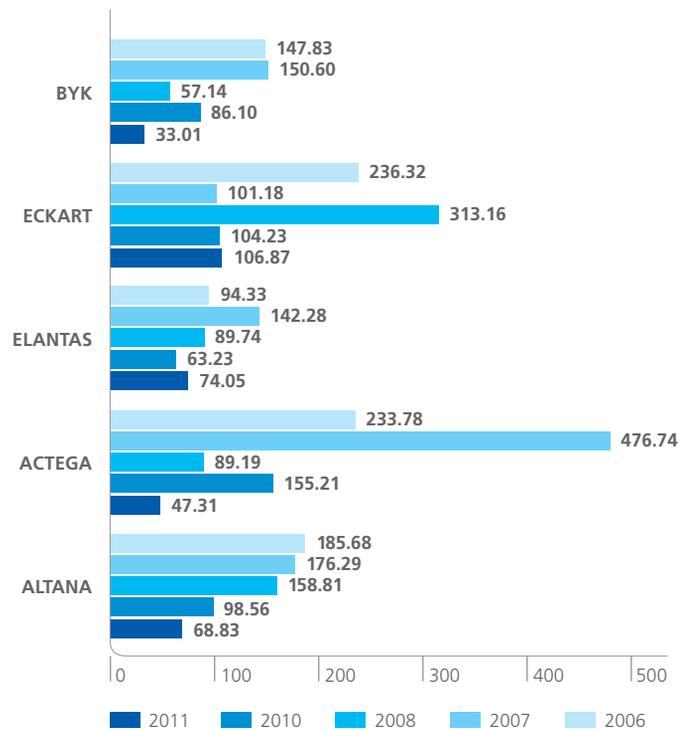
## On the safety performance indicators

Thanks to the measures discussed in Section 3 and earlier initiatives, we were able to reduce WAI 1 (number of occupational accidents with lost work time of more than 1 day per million working hours) from 185 (2006) to 68 (2011) and exceeded our goal of bringing WAI 3 to 80. This is a particularly positive development because the number of severe accidents declined, resulting in financial savings in occupational safety.

(number of lost work days due to occupational accidents per million working hours) from 185 (2006) to 68 (2011) and exceeded our goal of bringing WAI 3 to 80. This is a particularly positive development because the number of severe accidents declined, resulting in financial savings in occupational safety.

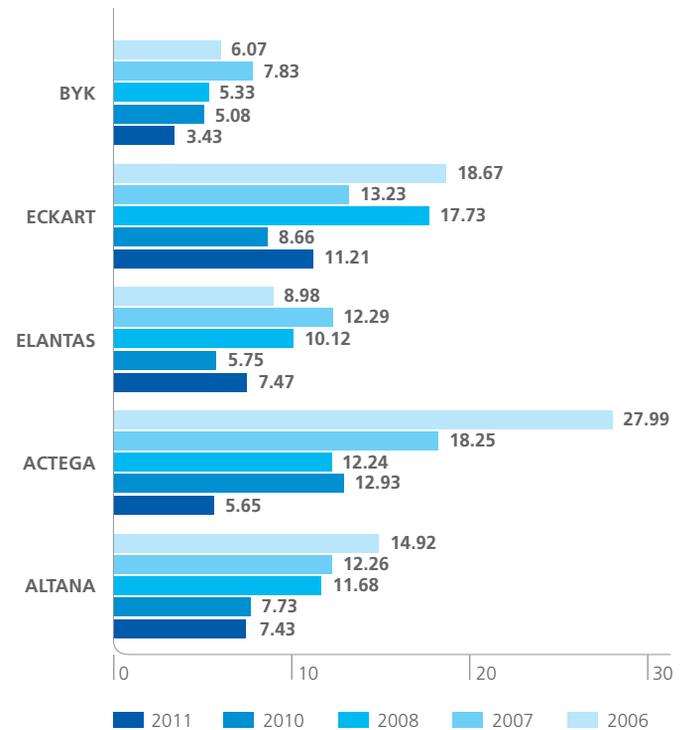
### WAI 3

(Number of lost work days due to occupational accidents per million working hours)



### WAI 1

(Number of occupational accidents with lost work time of more than 1 day per million working hours)

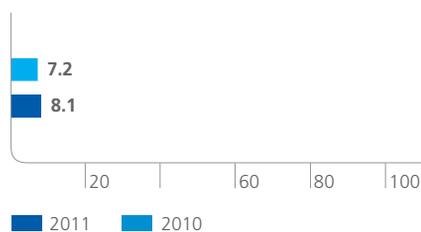


## On the human resource performance indicators

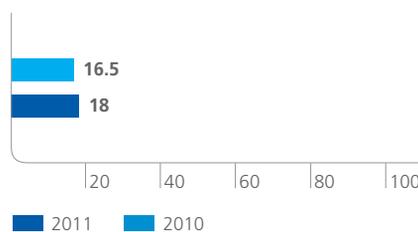
As of the closing date of this report (Dec 31, 2011), the ALTANA payroll included 5,313 employees. This represents an increase of 7.6 percent compared to 2010, and is due to the positive economic

situation during the reporting period. Compared to the previous year, the number of apprentices and interns in the Group has also increased. The share of female employees at ALTANA declined by 0.2 percentage points to 26.5 percent in 2011 compared to 2010.

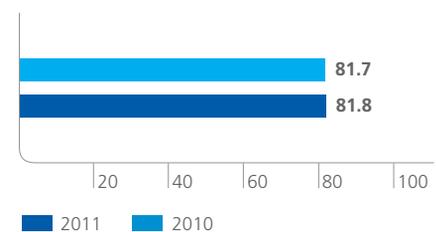
Share of part-time employees (in %)



Share of women in management positions (in %)



Share of employees with access to company retirement plans or company-funded pension plans (in %)



## Highlights

- ALTANA met all of its environmental performance goals and in most cases significantly exceeded them.
- The ALTANA Group started operating its first co-generation power plant.
- We achieved the goal of remaining below 80 lost work days due to occupational accidents per million annual work hours (WAI 3) in 2011.
- BYK Additives & Instruments reached the goal of remaining below 4.5 occupational accidents with more than one lost work day per million annual work hours (WAI 1) in 2011.
- ACTEGA DS successfully launched PROVALIN.
- ALTANA met the terms of its voluntary commitment to the Global Product Strategy.
- The first operational lighting systems were equipped with energy-saving LEDs.
- The new laboratory of BYK-Chemie was pre-certified in accordance with the requirements of the Green Building Council.
- ALTANA introduced new Guiding Principles worldwide.
- ACTEGA did not experience any significant incidents for 14 months.
- ECKART did not experience any significant incidents for 27 months.
- Numerous preventive health activities were initiated.
- IReflex by ECKART offers significant energy savings potential for our customers.
- ALTANA developed numerous products to help our customers preserve the environment (see Section 2).
- The first eco-balances were certified.
- ECKART GmbH introduced a new production procedure with significant energy savings potential.

## Lowlights

- An explosion in a pilot plant at BYK-Chemie in Kempen caused material damage. The exothermal chemical reaction caused an accumulation of source materials because of an absent catalyst effect. Such accumulations will be prevented with analytical controls in the future.
- Repair work performed in the production of BYK-Chemie in Wesel caused a false alarm and triggered the automatic CO<sub>2</sub> fire extinction system. One employee of a contractor firm and a firefighter were injured. Various technical and organizational measures were put in place to prevent false alarms in the future.
- An explosion occurred in the dust filter of the aluminum atomizer at ECKART America in Louisville. Two employees sustained injuries. Although the extent of destruction makes it difficult to determine the cause, it is suspected that accumulated moisture may have reacted with the aluminum dust to form hydrogen. To prevent similar occurrences, the plant was optimized and the maintenance schedule has been intensified.
- A deflagration occurred at ELANTAS Tongling when a powder in solvent was added to a tank. One employee suffered severe burns. The analysis of the cause and countermeasures has not yet been completed.
- A similar incident occurred at BYK-Cera, where another employee suffered severe burns. The facility will be restructured to prevent similar occurrences in the future.
- At ELANTAS Beck, the use of a scraper while cleaning a pipeline caused the leak of some 250 kg of liquid at the scraper station. The material was fully captured and contained with a chemical binding agent. The cause, an erroneous switch in the control station, will be eliminated with a change in programming. The space around the incident site has been given sufficient retention volume.
- ECKART America in Louisville was fined US-\$ 700,000 for a reporting violation associated with permit requirements.
- Two waste reduction projects at ELANTAS PDG and ACTEGA Terra have not yet produced the expected results.
- With 7.4 occupational accidents, we fell short of the goal of remaining below a maximum of 4.5 occupational accidents with more than one lost work day per million annual work hours (WAI 1) in 2011.
- ALTANA still does not have enough women working in management positions.

## Programs/Objectives

Core management tools for increasing performance include the measurement of performance indicators, the definition of goals, the development and implementation of action plans, and the review of target attainment. The latter is part of the target evaluation that determines the variable income components of executive managers. We switched the reporting year from the calendar year to the period from October 1st to September 30th to have the necessary data available at the right

time. Because of this switch and for better comparability with previous years, the data for 2011 were projected for one year on the basis of nine months.

The list below shows our objectives for performance indicators and various measures. The individual ALTANA companies also have detailed action plans in the context of their respective management systems.

### Management

Certification according to ISO 14001 or similar standards of a few companies that are not yet certified	End of 2012
Certification according to ISO 14001 or similar standards of additional non-certified companies	End of 2013
Certification of the energy management system at ECKART GmbH according to ISO 50001	End of 2012
Implementation of an energy management system at BYK-Chemie according to ISO 50001	End of 2013
Certification of the safety management system at BYK-Chemie: by professional trade association (corresponds to ISO 18001)	End of 2012
Implementation of an emergency management system at BYK-Chemie	End of 2012
Open House event at all German companies	Sept. 2014
Global Product Strategy: Safety summaries for the substances to be registered in 2013	End of 2013
Continued communication of ALTANA requirements for suppliers in the context of supplier visits and audits	Ongoing

### Products

Expanded development of water-based coatings, especially at ACTEGA	Ongoing
Use of renewable resources (without quantification)	Ongoing
Additional lifecycle assessments	Ongoing
Development of further additives and pigments for water-based coatings	Ongoing
Development of products for resource efficiency	Ongoing
Development of products for energy efficiency	Ongoing
Additional products with FoodSafe seal	Ongoing

### Safety

WAI 1: below 3 or WAI 2 below 2.1 occupational accidents	By 2013
WAI 3: below 50 days of lost work	By 2013

Reduction of significant incidents; no significant incident in any Division	Ongoing
Safety improvement measures from the Best Practice project	End of 2013
Training to avoid and communicate significant incidents	End of 2013

## Environment

Reduction of specific environmental contamination (in terms of gross value added):

CO <sub>2</sub> emissions	2007 - 2012	- 10 %
CO <sub>2</sub> emissions	2007 - 2020	- 30 %
Drinking water	2007 - 2012	- 5 %
Hazardous waste	2007 - 2012	- 5 %
Non-hazardous waste	2007 - 2012	- 5 %
Hazardous waste for disposal	2007 - 2012	- 10 %
Non-hazardous waste for disposal	2007 - 2012	- 10 %

Specification of environmental goals (except CO <sub>2</sub> ) until 2017	End of 2012
Rainwater collection and utilization at ELANTAS Beck India	End of 2012
Start-up of a new energy-efficient administrative building at ELANTAS Beck India	End of 2012
Various measures to conserve water	Ongoing
Various measures to reduce waste	Ongoing
Switch from fuel oil to natural gas for heating and process heat at ECKART in Güntersthal	End of 2013
Various measures for energy efficiency and renewable energies from individual action plans	Ongoing
Energy generation with a co-generation plant at ELANTAS Italia in Ascoli Piceno: regular operation	End of 2013
Energy generation with a co-generation plant at BYK-Chemie	End of 2013
Result of the finished-product logistics project in Germany	End of 2013
Revised cooling water supply at BYK-Chemie	End of 2012
New warehouse at ACTEGA Rhenacoat	End of 2012

## HR

Implementation of a global e-recruiting system	End of 2012
Plans for systematic recording of illnesses with details about focus areas and functions for occupational health	End of 2012
Implementation of new Guiding Principles	Early 2012

# GRI index

The ALTANA Sustainability Report 2011 follows the G3 guidelines of the Global Reporting Initiative (GRI). The index below provides an overview of all GRI indicators that were applied

and their status, i.e. the extent to which ALTANA covered these indicators in this report.

GRI standard disclosure	Reference	Status	GRI standard disclosure	Reference	Status
<b>1 Strategy and Analysis</b>					
1.1 Preface of the CEO	4		4.6 Mechanisms to avoid conflicts of interest	n.r.	
1.2 Description of key impacts, risks, and opportunities	9-11		4.7 Qualification of executive bodies for sustainability	10	
<b>2 Organizational Profile</b>					
2.1 Name of the organization	C, 8		4.8 Guiding principles, company values and codes of conduct	7, 8	
2.2 Primary brands, products and/or services	C, 8		4.9 Procedures of the executive/supervisory board level for overseeing the organization's sustainability performance	10	
2.3 Divisions and operational structure	C, 1, 8, 10		4.10 Process for evaluating the sustainability performance of the executive board	10	
2.4 Location of organization's headquarters	C, 8		4.11 Implementation of precautionary approach	10, 11, 15-27	
2.5 Countries with major operations	AR		4.12 Support for external initiatives	4, 12, 13, 26, 31, 43	
2.6 Ownership structure	C		4.13 Memberships in associations and interest groups	13	
2.7 Markets served	1, 8, 9		4.14 List of stakeholder groups engaged by the organization	12	
2.8 Scale of the organization	C, AR		4.15 Stakeholder selection	12	
2.9 Significant changes during the reporting period	9, 10		4.16 Approaches to stakeholder engagement	12, 13	
2.10 Awards received in the reporting period	13		4.17 Key topics of stakeholders	9	
<b>3 Report parameters</b>					
3.1 Reporting period	C, 59		<b>5 Performance indicators</b>		
3.2 Date of last report	October 2011		<b>Economic</b>		
3.3 Reporting cycle	C		Management approach	10-12	
3.4 Contact point for questions regarding the report	73		EC1 Direct economic value generated and distributed	1, AR	
3.5 Process for defining report content	10, 12, 13		EC2 Financial implications of climate change	11	
3.6 Boundary of the report	C, 59		EC3 Benefit plan obligations	n.r.	
3.7 Limitations on the scope of the report	59		EC4 Financial assistance received from government	n.r.	
3.8 Joint ventures, subsidiaries, outsourcing	10, 45		EC6 Spending on local suppliers	n.r.	
3.9 Data measurement	59		EC7 Proportion of managers hired from the local community	n.r.	
3.10 Changes to the statement of information provided in earlier reports	1, 59		EC8 Investments in infrastructure and services provided for public benefit	43, 44, 53-57	
3.11 Changes from previous reporting periods in the scope, boundary, or measurement methods	1, 59		<b>Environmental</b>		
3.12 GRI Content Index	70, 71		Management approach	10, 11	
3.13 External assurance of the report	n.r.		EN1 Materials used by weight or volume	43	
<b>4 Governance, Commitments and Engagement</b>					
4.1 Governance structure	8, AR		EN2 Percentage of materials used that are recycled	n.r.	
4.2 Independence of supervisory board chairman	8, AR		EN3 Direct energy consumption by primary energy source	59-61	
4.3 Supervisory board or independent members of the executive board	8, AR		EN4 Indirect energy consumption by primary energy source	60, 61	
4.4 Mechanisms for shareholders and employees to provide recommendations or direction to the executive/supervisory board	8		EN5 Energy savings	39-41, 59-61	
4.5 Linkage between executive compensation and company performance	AR		EN6 Energy-efficient products and services	19, 20	
			EN8 Total water withdrawal by source	42, 61	
			EN11 Use of protected areas	N/A	
			EN12 Impact of company activity on biodiversity in protected areas	N/A	

## Status Legend

	Completely covered
	Partly covered
	Not reported (n. r.)

C = Cover  
 N/A = Not applicable  
 AR = ALTANA Annual Report 2011  
 Internet = [www.altana.com/sustainability/indicators](http://www.altana.com/sustainability/indicators)

GRI standard disclosure	Reference	Status	GRI standard disclosure	Reference	Status
EN14 Strategies for protecting biodiversity	10, 14		HR4 Incidents of discrimination and actions taken	11	
EN16 Direct and indirect greenhouse gas emissions	60, 61		HR5 Operations in which the right to exercise freedom of association and collective bargaining may be at risk	n. r.	
EN17 Additional relevant greenhouse gas emissions (e.g. due to business travel)	45		HR6 Operations at risk of incidents of child labor	10	
EN18 Reduction of greenhouse gas emissions	37-43, 60, 61		HR7 Operations at risk of incidents of forced or compulsory labor	N/A	
EN19 Emissions of ozone-depleting substances by weight	N/A		<b>Society</b>		
EN20 NO <sub>x</sub> , SO <sub>x</sub> and other significant air emissions by weight	22, 23, 42, Internet		Management approach	11, 12	
EN21 Water discharges	42, Internet		SO1 Impacts of operations on communities and society	n. r.	
EN22 Waste by type and disposal method	43, 62, 63		SO2 Business units screened for risk related to corruption	12	
EN23 Number and volume of significant spills	N/A		SO3 Percentage of employee trained in anti-corruption policies	11	
EN26 Initiatives to mitigate the environmental impacts of products and services	15-27		SO4 Actions taken after incidents of corruption	12	
EN27 Percentage of products and their packaging materials that were reclaimed by category	n. r.		SO5 Policy positions and participation in public policy development and lobbying	13, 24-27	
EN28 Fines/sanctions for non-compliance with environmental laws and regulations	67		SO7 Legal actions for anti-competitive behavior	N/A	
<b>Social</b>			SO8 Fines/sanctions for non-compliance with laws and regulations	N/A	
<b>Labor practices and decent work</b>			<b>Product responsibility</b>		
Management approach	31-35		Management approach	23-27	
LA1 Workforce by employment type and region	n. r.		PR1 Lifecycle stages of products in which safety and health effects were assessed	24	
LA2 Employee turnover by age group, gender, and region	n. r.		PR3 Principles/processes for product identification	24, 26	
LA4 Percentage of employees covered by collective bargaining agreements	n. r.		PR6 Programs for adherence to laws and voluntary codes in advertising	n. r.	
LA5 Notice periods regarding significant operational changes	n. r.		PR9 Significant fines for non-compliance with laws and regulations concerning the use of products and services	N/A	
LA7 Injuries, absenteeism, and fatalities	29-35, 65, 66				
LA8 Risk-control and programs regarding serious diseases	23, 24, 26, 31-33, 48				
LA10 Average hours of training by employee category	n. r.				
LA11 Skills management and lifelong learning	51				
LA12 Performance and career development reviews	51				
LA13 Composition of senior management and employee structure (e.g. age/gender/culture)	51, 65				
LA14 Ratio of basic salary of men to women by employee category	n. r.				
<b>Human rights</b>					
Management approach	11, 12				
HR1 Investment agreements with review or human rights clauses	n. r.				
HR2 Percentage of suppliers that have undergone screening on human rights and actions taken	12				

# Progress Notes on the Global Compact

By participating in the U.N. Global Compact, we commit to respecting human rights, creating socially compatible working conditions, promoting environmental protection, and fighting corruption.

Principle	Page	Measure taken
<b>Human Rights</b>		
<b>Principle 1</b> Businesses should support and respect the protection of internationally proclaimed human rights	13, 29-35, 65	Corporate management, occupational health management, occupational safety
<b>Principle 2</b> Make sure that they are not complicit in human rights abuses	12	Supplier management, supply chain management
<b>Labor</b>		
<b>Principle 3</b> Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining	12	Self-obligations, employee representations
<b>Principle 4</b> The elimination of all forms of forced and compulsory labor	N/A	
<b>Principle 5</b> The abolition of child labor	5, 10, 12	Selection of raw materials; support for education initiatives
<b>Principle 6</b> The elimination of discrimination in respect of employment and occupation	11, 12	Compliance management system, Code of Conduct
<b>Environment</b>		
<b>Principle 7</b> Businesses should support a precautionary approach to environmental challenges	10, 11, 26, 27, 68, 69	Environmental management systems
<b>Principle 8</b> Undertake initiatives to promote greater environmental responsibility	13, 37-45, 68, 69	Changed production, technical updates, programs and goals
<b>Principle 9</b> Encourage the development and diffusion of environmentally friendly technologies	15-27	Management, product innovations, use of renewable resources
<b>Anti-corruption</b>		
<b>Principle 10</b> Businesses should work against corruption in all its forms, including extortion and bribery	11, 12	Compliance management system, Code of Conduct, legal compliance

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