



# **On the way** to 2015

Sustainability Report 2010 **Dow Benelux**



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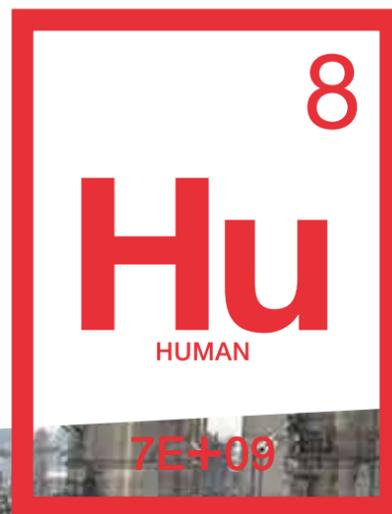
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**About Dow** Dow combines the power of science and technology with the 'Human Element' in order to make improvements that are vitally important to human progress. By integrating chemical science and innovation with the principles of sustainability, the company is helping to resolve some of the world's most pressing issues, such as the need for clean drinking water, saving energy, generating sustainable energy and increasing agricultural output. The various divisions dedicated to specialty chemicals, advanced materials, agricultural sciences, and plastics are at the forefront of the industry. They provide technology-based products and services to customers in approximately 160 countries and in high-growth industries such as electronics, water, energy, coatings, and agriculture. In 2010, Dow reported revenue of USD 53.7 billion and employed 50,000 people worldwide. The company's more than 5,000 products are produced at 188 sites in 35 countries across the world.



# Dow in the Benelux

Dow Benelux operates seven sites in Belgium and the Netherlands, and employs a total of 1,959 people. In addition, hundreds of employees of subcontractors work on our sites on a daily basis.

**Netherlands** Dow's largest site in the Benelux region – and the company's second-largest site in the world – is located in Terneuzen. The main part of the site consists of cracking plants that convert the raw materials naphtha and LPG into ethylene, propylene, butadiene, and benzene – the main ingredients used in many plastics and chemicals. Polystyrene, for example, is used in the manufacture of household appliances; polyethylene is used for the coating of beverage cartons, and Styrofoam™ serves as an insulation material for roof, floor, and wall applications. The Terneuzen site is also home to the largest Research and Development department in Europe, which is the driving force behind many of our innovations. Another one of Dow's Dutch production sites is located in Delfzijl.

**Belgium** Dow operates five sites across Belgium, including three production sites. In Tessenderlo, the company manufactures plastics used in the production of a variety of packaging materials and pipelines, as well as the insides of refrigerators and television sets. The Zwijndrecht site processes Cellosize™, which is used in the manufacture of products such as paint, building materials, and personal care products. The Tertre site is dedicated to the production of polyol, an ingredient of polyurethane foam, which is used in the manufacture of cars, refrigerators, and beds, as well as in the construction industry. Edegem is home to the service center and sales office for the Benelux region, while the site also includes a sales office of Dow AgroSciences. In Brussels, we operate the Office for EU Government Affairs & Public Policy, which represents Dow's interests in its dealings with European Union institutions.

## Management and Supervision

The Board of Directors of Dow Benelux B.V., which is responsible for general management, is comprised of the following members: Gerard van Harten\* (President), Peter Holicki (Vice-President), Dieter Schnepel (also general manager of the Terneuzen site), Dré Galle\* and Marc Sloot\* (Secretary). The Supervisory Board of Dow Benelux B.V. is responsible for supervising the management of the company and for advising the Board of Directors, which includes the following members: Bart Groot, President (former Vice President, Central & Eastern Europe, and General Manager of Dow Central Germany), Don Taylor (Vice President of Dow Advanced Materials, Manufacturing & Engineering and Environment Health & Safety) and Mauro Gregorio (Commercial Vice President of Base Plastics for EMEA).

\* Also responsible for managing the Belgian sites





Dear reader,

The economic recovery that first became evident in 2009 continued in 2010, both globally and in the Benelux. Although several of our plants benefited from this revival, others continued to struggle. Products that closely depend on the construction industry remained badly affected by the crisis in 2010. Plant production was strongly industry-related, but the overall picture was more favorable than in 2009. So it seems that the economy is getting stronger and we can start anticipating opportunities for future growth again.

#### **The face of the transformation**

In 2010, we said goodbye to 15 percent of our workforce – these employees were transferred to Styron Netherlands B.V. The arrival of Styron marked the establishment of the Industriepark Terneuzen (I-Park). Along with the launch of the Business Process Services Center (BPSC) – which officially opened in February 2010 – this resulted in a fundamental change for Dow Terneuzen. I'm proud that Terneuzen has proven to be the best location for BPSC. In a little over a year, the number of employees increased from 150 to 255, and this growth is set to continue in 2011 – not just in terms of the workforce, but also in terms of the number of services that will from now on be provided by the BPSC in Terneuzen. The sale of several business units from the styrene, polycarbonate, and latex chains and the subsequent establishment of Styron and transfer of Dow employees to the new company all proceeded smoothly. This is certainly to the credit of Styron's employees, and there was great willingness on both sides to turn the partnership into a success. And that

is the way it should be, as we are each other's customers and need each other to achieve success.

The development of the Maintenance Value Park (MVP) in Terneuzen is currently well under way. The Value Park will provide clients and contractors with the opportunity to collaborate and exchange knowledge. In addition to Dow, other industrial companies, including Yara and Cargill, based in the Kanaalzone (Canal Zone) have also committed to the project. The Maintenance Value Park is a resource in achieving innovative maintenance, which will allow us to keep our plants competitive in the long term and make maintenance work appealing to talented young people. We believe it is better to achieve that goal together rather than separately. The MVP will be a center of excellence, which is exactly the image we would like to project. All these developments give the transformation an identity: the I-Park – the partnership between several entities on the Dow site – is designed to support and facilitate the growth of Dow and the other companies as effectively as possible. In this process, it is important that we position ourselves in such a way that any interested party can settle here and develop according to their own needs and requirements.

**From global to local** The option to respond even better to local needs and requirements has increased following Dow's transformation. We have determined that geography will once again be a key priority in our strategy. The shift from global to local gives us the opportunity to meet local needs and requirements even more so than before. Dow Terneuzen has maintained its own site strategy for many years, which we will review more thoroughly in

this Sustainability Report. In 2011 we will also be working to develop a country strategy, which will explore Dow's opportunities and possibilities in the Benelux countries.

**Strict goals** We did not make any major investments in the Benelux in 2010. Instead, we used the past year mainly to assess potential future investments, i.e., what is needed to further consolidate our position within Dow both globally and regionally? However, we did construct an all-new building to accommodate the BPSC employees.

Our safety record at the end of 2010 was good, with the total number of accidents limited to five in the Benelux. While five accidents was still five too many, after a poor start to the year worldwide, the final result was nevertheless decent. Our contractors did an even better job: for the first time since 2005 they caused fewer accidents than Dow in absolute numbers. We have congratulated them on this excellent achievement. In addition, they have shown that it is possible to achieve the strict goals set by our company. Dow maintains the target of zero accidents, believing that any accident is one too many. I am convinced that, if we did not set those goals, we would see another rise in the number of accidents. Strict targets require us to motivate each other every day again and keep us on our feet.

**Dow and chemistry: more visible than ever** In late 2010, Dow announced it would be entering into a partnership with the Olympic Games for the next ten years. The reason behind this partnership is clear: for those engaging in professional sports, chemistry is more or less inevitable.

Everything related to sports, from the poles used for pole jumping to the clothing, shoes, and artificial grass used by athletes, are products of the chemical industry. Chemicals enable athletes to take the next step that allows them to set new records. Our partnership with the Olympic Games is a unique opportunity to demonstrate this to the public at large. However, we won't have to wait until the 2012 Olympics in London, as 2011 has been designated the International Year of Chemistry by the United Nations. Dow was the first global partner in this initiative, which is supported by UNESCO. The International Year of Chemistry (IYC) raises awareness among the public at large of the central role chemistry plays in our day-to-day lives. It shows that chemistry plays a vital role in finding solutions to issues related to sustainability, energy, and climate. Since Dow shares this mission, we fully support this initiative, as it allows us to increase awareness of the chemical processes at Dow and the technologies that drive them among a larger audience. We also do this with an eye to the future: we hope that an increasing number of young people will take math and science in school, which makes it more likely that they will pursue science and technology-related subjects in college.

**Chemical industry: a top industry** In early 2011, the Dutch government designated the chemical industry as one of nine "top industries." This shows that the government recognizes the importance of our sector. It is now up to the industry to set the agenda, and we must take advantage of that opportunity in order to raise the issues we feel are important. As

Dow, we can also propose specific items for the agenda, and show what is important to us. One example is fair management of the emission trade. This system has a major impact on the industry in which we operate: we would like to maintain our competitive position, and in order to achieve that this system must be well-organized.

In this Sustainability Report, we report on results achieved related to people, the environment, and the economy in 2010. We will also look ahead to the coming years. The year 2010 was a major milestone for Dow from a variety of perspectives. Specifically, we are now halfway towards achieving our Sustainability goals for 2015. Are we on the right way? Will we achieve the targets set? We invite you to read this report and find out.

Gerard van Harten,  
CEO, Dow Benelux B.V.

*"Although other chemical companies also set goals and objectives, Dow was one of the first to show this degree of ambition. And that is deliberate – we need that ambition in order to achieve outstanding results. Goals provide us with direction; they show us where we're headed and what we feel is important. For example, zero accidents should not just be the objective of Dow, but of each of its employees as well."*

# Dow's Sustainability Goals

In 2005, for the second time in its history, Dow defined a number of resolutions towards contributing to a better and more sustainable world: the 2015 sustainability goals. Where are we now, halfway towards completing this journey? What might be improved, and what must be improved? Also, where do we go from here? It's time for an interim assessment.

In 1995 Dow set goals for the first time, for the year 2005. These 10-year goals were mainly designed to improve our safety performance and reduce our environmental impact. When the 2015 goals were announced, it immediately became clear that Dow was now more focused on the outside world. The reason for this is clear: Dow aims to become the world's most respected chemical company. A view from the outside to the inside; that is, from Dow's neighbors, customers, investors, and community in the broadest sense, is very important. There is also the fact that our world has changed dramatically. Challenges such as climate change and the management of finite energy sources are more visible than ever. Dow believes that these ambitious targets will help us become the most respected chemical company, the best employer, the best neighboring company, the most attractive company for investors, the best supplier and – of course – deliver the best products to our customers.

## Global goals

These are the global 2015 Sustainability Goals:

### Local protection of human health and the environment

Dow aims to achieve an average improvement of 75 percent from 2005 in terms of accidents, spills, and process safety incidents, among other factors.

**Contributing to community success** Dow sets specific goals for all its sites designed to achieve acceptance in communities.

**Product safety leadership** By 2015, Dow will have made all safety assessments of its products publicly available.

**Development of sustainable chemistry** By 2015, 10 percent of Dow's revenues must be derived from new or improved products that provide additional benefits related to sustainable chemistry.

### Developing products that help solve world challenges

In 2015 Dow will have created at least three products that play a key role in solving world challenges. This might involve contributions to affordable and sufficient food supplies, decent housing, sustainable water supplies, or improved personal health and safety.

**Energy efficiency and conservation** Between 2005 and 2015, Dow will reduce its energy intensity by 25 percent per ton of product.

**Addressing climate change** Between 2005 and 2015, Dow will reduce the intensity of its own annual greenhouse emissions by 2.5 percent per ton of product. The goal is to reduce absolute emissions within the company by 2025.

## Local priorities

Although the goals for 2005 initially seemed highly ambitious, it turned out that the strategy worked. By 2005, Dow was significantly safer and more environmentally friendly, and used significantly less on a proportional basis. How can we do even better? That is the basis of our 2015 goals. Not all goals that Dow sets worldwide apply to the Benelux sites or – even more specifically – to the Terneuzen site. The global goals have therefore been translated into local goals for Terneuzen, Dow's largest production site outside the United States. These plans are ambitious too, and so they should be: as a major chemical company located in the Netherlands Dow needs to think big.

## Terneuzen's targets

Dow Terneuzen defined five sustainability goals for 2015 (2005 was used as a reference year).

### 1. Reducing industrial accidents by 75 percent

The target for the Terneuzen site, measured in the number of accidents for every 200,000 working hours, is higher than for Dow globally. This is because Terneuzen's accident rate has been exceptionally low in recent years. In order to continue to improve in this area, the behavioral programs will be further developed over the next several years. Through these programs, Dow makes its employees even more aware of the importance of workplace safety – this includes wearing personal protection devices and correctly handling procedures and machines. This is part of the company's attempt to further reduce the number of accidents.

### 2. Reducing the number of spills by 75 percent

There is a leak or spill if more than 50 kilos of product – or an equivalent of this amount – accidentally escapes from the processing systems or storage tanks. This might involve either fluids or solids. As before, this represents a very stringent standard. While a number of divisions have already been performing very well in this area, other departments, particularly those with more complex processes, have proven to be somewhat more vulnerable to chemical leaks. Dow intends to further reduce the number of spills and leaks in those areas over the next several years. To this end, other divisions will provide assistance, and we will also be developing and organizing specific activities and initiatives.

### 3. Improving energy efficiency by 10 percent

We have accomplished a great deal in this area in recent years. Flaring at the Terneuzen site was down 70 percent from several years ago. This is better for the environment, as the less is incinerated uses flares the fewer carbon emissions are released. The flare gas that is not incinerated is now used to fuel the furnaces, which is more efficient on top of everything else. And the immediate environment gets to benefit as well, as they experience less inconvenience from noise and light. One of the key actions of Dow's Terneuzen site in 2010 was the preparation of an Energy Efficiency Plan for the Dutch sites. This plan describes the energy-saving projects that will be implemented in the coming years. Since Terneuzen already gained a 20 percent efficiency yield during the period 1995 – 2005, it will not be easy to achieve any

further, larger reductions in this area by means of 'small-scale' projects. Nevertheless, we will continue to evaluate whether, and how, we will be able to implement key improvements in this area. We will also be checking whether any additional energy savings can be made in the chain from raw material extraction to delivery to the customer. This form of 'chain efficiency' has already resulted in some fine examples of good cooperation with our customers.

### 4. Reducing greenhouse gas emissions by 10 percent

As a major energy consumer, Dow also produces large quantities of greenhouse gas emissions. Worldwide, this amounts to approximately 40 million tons of carbon equivalent, of which approximately 8 percent is produced at the Terneuzen site. Although the reduction of these emissions requires substantial investments, we also regard this target as an opportunity to tap new markets or increase sales opportunities in existing markets. In 2010, we made an assessment of which projects at the Benelux sites may still result in a significant reduction of CO<sub>2</sub> emissions.

### 5. Helping to resolve world challenges

A global solution for Dow is to make three major breakthroughs that could potentially provide a solution to the world's challenges. As one of Dow's largest production sites worldwide, Dow Terneuzen believes it can contribute to this process. The reuse of wastewater by the Municipality of Terneuzen as industrial water – a project that has earned the company several international industry awards – is an example of one area where

we can make a difference. It is currently being investigated how this project might be implemented more comprehensively, so that even more water streams from Zeelandic Flanders might be reused.

### **Mexico Climate Summit**

A second climate summit was held in Mexico at the end of 2010. Many of the 190 participating countries were relieved that this summit did produce some results, after the failed summit in Copenhagen in 2009. The agreements made by the countries in attendance included the establishment of a green fund and the implementation of measures against deforestation. In addition, they made commitments regarding the exchange of technology. As one of the world's largest chemical companies, Dow feels responsible for tackling the climate problem, and it used the Mexico conference to promote its innovative, energy-efficient products, including insulation materials and solar panels, and to meet with key political and business leaders.

### **Continuing to push boundaries**

Is Dow on the right way? Yes. Although there is a lot of work still to be done, we can establish, at the halfway mark, that a great deal has been accomplished, and that we can look back at those achievements with satisfaction. The results have been strong, in particular in terms of safety, although the increase in the number of accidents at the Benelux sites from 3 in 2009 to 5 in 2010 shows us that safety is one area where we need to be on the ball all the time. It is important that we never lose focus. We also made significant progress in terms of climate and energy compared to 2005. In doing so, we need to remember that Dow is not the same company it was five years ago. Whereas the focus used to be on productivity and efficiency, we are currently more focused on growth in terms of the value we can add to market segments and in our wide range of products. Our message is: yes, we can achieve these objectives. Partly thanks to this continuous development of new technologies and innovative products, we can continue to push our boundaries.

## Sustainability in practice

Dow Terneuzen is working hard on achieving the 2015 sustainability targets with smaller and larger projects from which Dow, local residents and customers all stand to benefit.

### **> Fewer emissions of VOC**

At train 3 of the Dowlex plant in Terneuzen, the residual product (i.e., non-reactive raw materials) was released directly into the atmosphere at the end of the production process (through vent pipes on the silos), resulting in the emission of Volatile Organic Compounds (VOCs). In order to reduce these emissions and comply with the stricter environmental regulations related to VOC emissions, a new emission reduction program was launched at Dowlex in mid-2009. A closed pipe system was installed on top of the silos, which directs the residual product from all silos to the furnace of the Dowlex plant. VOCs are no longer released into the atmosphere, and are used as fuel for the furnace, which means we score on two points. The project was completed in February 2011. The reduction program has helped reduce VOC emissions by 20 to 30 percent. Dowlex operates a total of three production trains. At the end of 2012, a capacity increase is scheduled for train 3 that will increase production by approximately 20 percent. The fact that the emissions remained at zero despite this extension is an excellent result. The emission-reduction project involves an investment of EUR 3 million.

### **> The flexibag**

For the export of fluids, the Site Logistics Chemicals department of Dow's Terneuzen site uses two traditional transportation methods: storage in ISO containers and storage in barrels that are subsequently stacked inside a box container (the familiar rectangular steel containers). The department recently also began using a more sustainable technology: the flexibag, which is a good alternative to barrel containers.

The flexibag is a large flexible bag made from the basic materials polyurethane and polyethylene. The bag is hung inside the container and well stocked with product. The flexibag is designed mainly for the transportation of non-dangerous, liquid products such as beer, wine, coconut oil, and paint. One year ago, Dow's Terneuzen site started using flexibags for the transportation of polyol originating from the polyurethane plant. The direct carbon yield related to this technology is due mainly to the amount of product being shipped. A flexibag can contain up to 23.5 tons of polyol. By way of comparison: an ISO container can hold 21 tons; a container with barrels can transport a little less than 17 tons. Additionally, the container can be refilled on the way back with materials, which means it need not return with empty barrels. This multi-flex technology is not new; however, Dow wanted to prevent the risk of leaks as much as possible. With the materials used having been improved so significantly, Dow has been taking full advantage of these new benefits. There have been no leaks at the Terneuzen site since the flexibag system was implemented.

## People are our **best ambassadors**

In February 2010, the Business Process Services Center (BPSC) was officially opened. The BPSC is a new company with an all-new business structure that is nevertheless the property of Dow. There are familiar faces at the company, but above all many new faces. We also witnessed the establishment of Styron Netherlands B.V., another new company that operates separately from Dow. However, it is not completely independent, due to the integrated production facilities on the site and, consequently, shared rules related to health, safety and the environment. All these 'new families' in the I-Park in Terneuzen resulted in the implementation of a diversified Human Resources (HR) policy in 2010 that was all about highlighting the specific needs and requirements of these new companies.

### BPSC: boost for employment

At its official start the BPSC employed approximately 120 people, 90 of whom were new hires. The new administrative center provides high-quality support services to Dow and joint ventures of the company across Europe. The center's responsibilities include making payments to suppliers, planning the storage of stocks, transportation to and from customers, and product documentation such as health and safety regulations. The arrival of the BPSC provided a much-needed boost for employment in the Zeelandic Flanders region. The Centre now employs around 300 people. The BPSC was relocated to a new building in the I-Park.

### Facilitating growth

The emphasis for the period 2011-2015 will be on growth. Dow Terneuzen intends to hire more than 300 new employees over the next five years. Meanwhile, we are seeing another new development: the shortage of technically skilled people in the job market. In order to counter this shortage and be able to achieve the required growth, the HR department will be devoting time in the immediate future to developing a more consistent job marketing strategy, both in the Netherlands and internationally. In recruiting new employees, Dow will focus in particular on ongoing campaigns online and in social media,

thereby ensuring that the focus on new talent will be permanent rather than occasional. The current strong relationships with strategic universities, universities of applied sciences, and regional schools in the Netherlands and Belgium will be further improved in order to be able to recruit the most talented graduates. In the coming years we will focus on recruiting people whose talents make them the right fit for the company – they will be able to further facilitate Dow's transformation. Our current employees play a key role in this process, being the best ambassadors Dow could have and being able like no other to pass on the Dow message.

**Employees** At year-end 2010 Dow employed 1,959 people at its Benelux facilities. The number of jobs at the various sites has remained level or even increased. However, the composition has changed somewhat: 62 people from Dow are currently employed by the BPSC. Approximately 340 employees from the Netherlands and 45 employees from Belgium were transferred to Styron, while around 90 employees transferred from the Kallo site in Belgium to Monument Chemicals.

### Locations

Delfzijl	84
Terneuzen	1.574
Home office workers NL	32
<b>Totaal Netherlands</b>	<b>1.690</b>
Brussels	5
Edegem	93
Zwijndrecht	7
Tessenderlo	109
Tertre	43
Home office workers B	12

**Total Belgium 269**

**Total Benelux region 1.959**

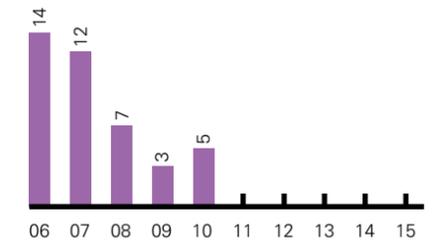
**Diversity** Dow Terneuzen and the new BPSC employ people from 35 different countries.

Citizenship	Dow 2010	BPSC 2010
Albania	1	
Belgium	367	7
Bolivia		1
Bulgaria	1	
Canada	1	
China		1
Denmark		1
Germany	12	1
France	13	
Greece	1	
Honduras	1	
Ireland	2	
India	4	1
Indonesia	1	
Iran	1	
Italy	13	
Japan	1	
Luxembourg	1	
Morocco	3	
Mexico	1	1
Netherlands	1427	42
Pakistan	3	
Panama		1
Poland	3	1
Portugal	3	
Russia	1	
Serbia	1	
Spain	12	1
Thailand	1	
Turkey	2	1
United Kingdom	13	2
United States	3	1
South-Africa	1	
South-Korea	1	
Sweden	2	

**TOTAAL 1897 62**

*The 62 employees of the BPSC were former Dow employees.*

**Accidents** The number of accidents at Dow Benelux in 2010 was down from 2009. Compared to the rest of the chemical industry the number is still low, but it remains below the target of zero accidents.



# Health and **Safety**

EH&S (short for “Environment, Health & Safety”) is a key acronym at Dow. When it comes to health and safety, the company simply aims for its employees to be able to return home healthily and safely at the end of each working day.

**Personal safety** We fell just short of the target for personal safety in 2010. At Dow Benelux a total of five accidents occurred: four at the Terneuzen site and one at the Delfzijl site. The following accidents were involved in Terneuzen: fracture of the left thumb caused by contact with a drill (this was the only accident that was followed by a period of absence); a cut in the finger, a broken arm caused by a fall and a broken ankle caused by a fall from the stairs. At the Delfzijl site, an employee fell off a tank container. The main risk would therefore appear to be in day-to-day work performed by people. In 2011, the safety campaigns will therefore urge employees to increase their safety awareness even further, particularly during “routine” work. Dow’s target for 2011 is a maximum of 0.12 accidents at the Benelux sites for every 200,000 working hours.

**Process Safety** Dow also aims to prevent process safety incidents. Only one incident occurred at the Benelux sites in 2010. The incident involved the accidental release of light hydrocarbons after a valve at one of the plants at the Terneuzen site became defective. Other than the environmental impact of this release, there were no other effects. Dow has a detailed program in place to prevent process safety incidents, including an extensive preventive maintenance and inspection program, design standards and procedures for changes to existing systems and for new systems, training programs for maintenance and operational staff,

and so on. Another important part of preventing incidents is reporting on and investigating near-incidents. ‘Near-incidents’ are situations and events that could potentially lead to process safety incidents. By investigating these near-incidents more closely, we can make our plants even safer without needing to learn from an actual accident. In 2010, the number of near-accidents reported was up 30% from the previous year. Dow is extremely pleased with this result, as it shows the commitment of all our employees in this area.

**Working on behavior** By aiming for zero accidents, Dow fosters and cherishes a culture in which safety is a permanent value – not just today or during the course of a specific project, but always. “Drive to Zero” is the name given to Dow’s global EH&S initiatives. On 1 March 2010 a new, more personal Drive to Zero campaign was launched: “Drive to zero – I commit.” The Safety Behavior Observation Program is an example of a program specifically designed to encourage employees to point out safe and unsafe behavior to each other. In 2009, Dow set out to update the program. Four departments at the Terneuzen site participated in a pilot project. The update resulted in a number of changes. For example, new training materials became available in 2010, including a video instructing employees how to inform others of unsafe behavior and a video on receiving feedback.

**BRZO Safety Report revised and redrafted** In 1976 an accident occurred in the Italian town of Seveso during which the toxic substance dioxin was released. Although there were no victims, many local residents later experienced health problems. This accident prompted new European legislation aimed at preventing and controlling these types of incidents involving hazardous substances. The Major Accidents (Risks) Decree of 1999 (Dutch acronym: BRZO) is based on these regulations. Under the decree, companies are required to describe all aspects of their safety system in a Work Safety Report. At Dow Terneuzen, more than 25 employees from various departments worked on the report for more than two years, and ten copies of the report were submitted to the Province of Zeeland at the end of April 2010.

**Strong results** The average rate of absenteeism in the Netherlands was 4.45 percent in 2010. At Dow’s Dutch sites, this rate has not exceeded 3.5 percent for the past 15 years, which is an excellent result. The wellbeing of employees at Dow’s Terneuzen and Delfzijl sites is tested annually using the wellbeing-stress-prevention program. After one year, the participation rate for this program is back at the former level of 70 percent. By way of comparison: the rate for 2009 was still 62 percent. The average wellbeing score was 70 percent, which is around the same level as last year.

# Everyone in **the right place**

With Dow always on the lookout for new talent (particularly technical talent), it makes sense that, as one of the largest industrial employers in Zeeland, the company aims to take a leading role in regional cooperation with other companies in order to improve access to technical education.

**Technasium classroom** Dow has been investing substantially in regional technical education, including vocational education. Scholengemeenschap De Rede in Terneuzen received a contribution in 2010 to set up a new classroom in the technasium, a technical high school. Technasium schools give students the opportunity to combine theory with practice and experiment with technology, allowing them to discover that working in technology can be fun and exciting. In the coming years, Dow will remain committed to maintaining good educational facilities in the region. As part of these efforts, the Education Initiative Group (EIG) was established at the end of 2009. This group is responsible for coordinating Dow initiatives related to education, training, and accessibility in technical education.

**Commitment** Each year, all Dow employees are given the opportunity to participate in the global Employee Satisfaction Survey. Dow Benelux would like to achieve a higher score in employee commitment and inclusion, and the continued development of the company’s Diversity & Inclusion policy should help facilitate this.

**Diversity pays off** Organizations benefit from employees who have different points of view and are creative. We therefore foster a culture of diversity by employing men and women from different educational backgrounds, different nationalities, and different socioeconomic backgrounds. Dow is committed to employee diversity, as is reflected in its Diversity & Inclusion (D&I) policy. This policy is based on the conviction that people with disabilities can make a valuable contribution to the organization. For this purpose, Dow is making every effort to make workstations accessible and to support employees with disabilities. These employees are united in the Disability Employee Network (DEN), which was established in 2010. Since the DEN was founded, Dow has been increasingly involved in creating specially adapted workstations, as exemplified by the new BPSC in Terneuzen. This building is wheelchair-accessible and features special lavatories for the disabled and an elevator. Like the Edegem site, Dow Terneuzen has acquired an

escape chair designed to transport the disabled downstairs quickly and safely in the event of an emergency. The number of ledges and fringes in the building has been reduced to a minimum in order to prevent the accumulation of dust, and the partitions between workstations absorb noise, which is favorable for those with hearing difficulties. DEN Benelux has set a number of objectives for the coming years. One of these objectives is to share the experiences of co-workers in order to learn from them. In 2010, the staff magazine *Jouw Dow* and the Benelux intranet site published a number of accounts from employees with disabilities. These accounts showed that they make an effort every day to perform their best and that they are accustomed to coming up with creative solutions to problems they encounter on a daily basis.



## Recommendation of **the Works Council**

Dow's transformation required considerable efforts from the Dow Terneuzen Works Council.

Following the Works Council elections in late 2009, a new Council was instituted on 1 January 2010. Of the 17 members of the Council, 8 also served on the previous Council, while 9 members are new. In October 2010, interim elections were held following the sale of Styron Corporation to Bain Capital. These many changes presented a significant challenge to the members of the Works Council, partly due to the complex issues involved. In 2010, the Works Council issued a favorable recommendation regarding the sale of Styron Corporation. Following the sale, around 350 employees were transferred to Styron from Dow and 50 contractors, subject to the same or equivalent employee benefits and working conditions regulations. Plans to outsource the central maintenance facilities and, in 2013, relocate the other central maintenance groups to the Maintenance Value Park to be established were disclosed in 2010

as well. Following these developments, the Works Council held round-table sessions with all employees concerned, in order to learn about their concerns and questions in order to submit these to the management and subsequently provide the individuals involved with feedback in early 2011. The Facility Management activities for which we were previously responsible have been outsourced to a third party, ARCADIS AQUUMEN Facility Management (AAFM). Under the contract, our partner AAFM will manage and coordinate all Facility Management services for Dow's Benelux sites. These services include the maintenance of buildings, labs and roads, along with catering and cleaning services. The small number of Dow employees who were employed in the Facility Management department have all been transferred to AAFM. As before, the Works Council issued a favorable recommendation for this move.

## Growth and integration in practice

Achieving growth and promoting the integration of the former Rohm and Haas employees – how does Dow accomplish this?

### > Integration of Rohm and Haas; new jobs in Edegem

In recent years Dow's Edegem site lost a fair number of employees due to the transfer of administrative positions to other locations in Europe and India. However, the addition of 20 new employees in 2010 has revitalized the site. The increase is mainly the result of the integration of ten former employees of Rohm and Haas (ROH), the US chemical company that Dow acquired in 2009. A large number of employees are physically present at the Edegem site, while they also have the opportunity to work from home intermittently. As a way of welcoming new employees and promoting integration, the two companies initially exchanged information about their activities on a monthly basis. This allowed them to share knowledge and experience, and ensured a smooth and efficient integration. The initiative was so much appreciated by all parties involved that these meetings continue to be scheduled on a regular basis. Furthermore, the staff of the Customer Services Center (CSC) in Edegem was expanded: ten new people joined, many of whom are employed in the Home and Personal Care business, which was centralized in Edegem in October

2010. This will give Edegem the opportunity to become one of the larger European CSC hubs. Five of the ten new employees were transferred from the Customer Interface Group (CIG) after it was announced that this department would be outsourced to the BPSC in Terneuzen.

### > Building a fully operational facility

With the MDI and SBH plants (the former Rohm and Haas facility) in Delfzijl each maintaining their own production processes, it is quite a challenge to transform the two units into a single, fully operational entity. The current goal at the Delfzijl site is to overcome these differences and find similarities. A great deal has been accomplished since the acquisition of the SBH plant. The first step was to implement Dow's operating processes. This came as something of a shock to the Rohm and Haas employees, who were accustomed to their company's somewhat hierarchic structure and often rigid style of consultation. In contrast, Dow works with empowered teams, where employee self-reliance and team independence are a given. We no longer take detailed minutes during meetings; instead, we work on the basis of a list of action items. The complexity of the various systems and tools used led us to recertify to Lloyds ISO 9000 – this will allow both plants to further optimize the process within the same time frame. The plants are already working closely together in a number of areas. For example, the head of the Maintenance department is responsible for maintenance at both plants, while there is also a single EH&S

manager for the two facilities. Dow's global EH&S targets have meanwhile been communicated to the former Rohm and Haas employees as well. In addition, the two staff associations have merged and the plants hold their Works Council meetings together. We are very pleased that the integration is truly starting to take shape.

### > Recognition for health policy

In May 2010, Dow Terneuzen was recognized and awarded for achieving 'Silver' status on Dow's Healthy Workplace Index. It achieved this milestone in its health policy thanks in part to the fact that all Dow's Benelux sites have been smoke-free since 1 January 2010. The Healthy Workplace Index consists of a number of factors that together determine how a particular site scores in terms of health. The objective is to achieve the highest degree of health and productivity, as well as to prevent and reduce health risks. The index also includes participation in the health survey, the creation of a healthy work environment, the availability of healthy food in the company restaurant, and attitudes and policy with regard to smoking. The implementation of the smoking ban was controversial, and was preceded by many heated discussions. Nevertheless, Dow stuck to its guns and gave smokers eighteen months to become accustomed to the idea and find a solution. Those who wanted to quit smoking received assistance and support from the occupational health and safety service.



## Delivering on **our promises**

How would we like the world to look 10 years from now? And what role might Dow play in this scenario? These are just some of the questions we ask ourselves at Dow. And that is by no means all – we then translate our answers to those questions into ambitious 10-year objectives and communicate them to the outside world. This is because we feel that people should hold us to those promises; we want to show that we're not afraid to take on a commitment. We don't make things easy for ourselves, either: we choose our goals in such a way that we must make significant efforts to achieve them.

### Results at Dow and Styron

A lot can happen in a decade. For example, the global financial and economic crisis that took hold at the end of 2008 caused production volumes at our plants to decline in 2009. Two years later, the majority of our plants are operating at full capacity again, resulting in both higher volumes and higher emissions. During the challenging period, we decided to adhere to the strategy we had implemented earlier: transforming our company into a high-quality, multifaceted chemical company focused on growth. This resulted in the integration and eventual sale of the styrene, polycarbonate, and latex chains. These were transferred to Styron Netherlands B.V., which has continued operations in the I-Park. Both these companies have continued to operate under the same environmental permit (Wm-vergunning) following the break-up. The following pages include a report on the environmental performances of Dow and Styron.

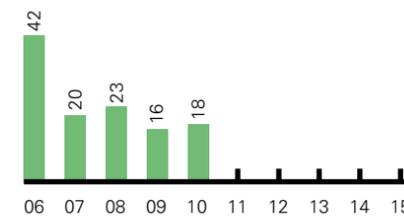
### The positives...

When we review the results of the Terneuzen site, we can conclude that we were able to benefit in a number of ways from the positive effects of several substantial investments. For one, we again made significant progress in 2010 with regard to the release of priority emissions, including ethylene oxide (EO) and benzene. This is a direct result of the conversion of the EO plant and the closure of the Ethyl-Benzene 3 and Styrene 3 plants in 2009. In 2010 we saw an increase in greenhouse gas emissions, including carbon dioxide. This is mainly the result of the economic recovery, which caused production capacity to increase sharply from 2009. The long-term goal of the Terneuzen site to reduce greenhouse gas emissions by 10 percent was achieved despite this increase: these emissions were down 12 percent from 2005.

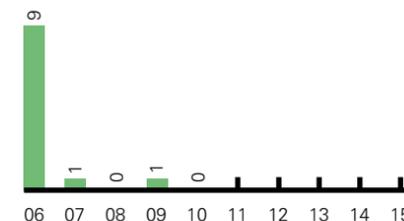
### ...and the negatives

A disappointing aspect has been the result of the waste content of wastewater flowing into the Western Scheldt estuary: this content increased for the second consecutive year. Efforts to discharge less freshwater into the estuary and absorb as little fresh water as possible again did not produce the desired result in 2010. The amount of waste from a number of plants has varied greatly; in some cases it was substantial, making the quality of the wastewater unsuited for reuse on a number of occasions, as a result of which it needed to be dumped. While the natural purification system did perform well, it was unable to deliver the required quality effluent to facilitate reuse. The waste content of the overflow points during extreme rainfall was a factor in increasing overall waste content. Dow expects to achieve better results in 2011, as it intends to tackle these problems at the source. Several studies and projects have already been launched for this purpose.

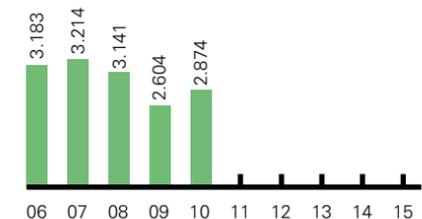
**Number of environmental incidents** 18 environmental incidents (defined as emissions or spills in excess of 50 kilos) occurred at Dow's Terneuzen site in 2010.



**Number of external complaints** The Terneuzen site did not receive any external complaints in 2010.

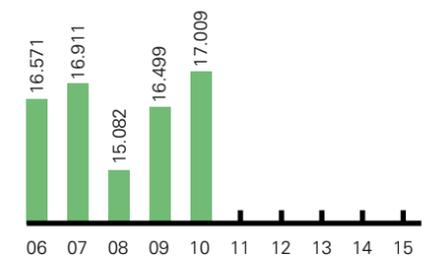


**Contribution to the greenhouse effect** The contribution of Dow Terneuzen to the greenhouse effect is expressed in kilotons of carbon dioxide equivalents (CDEs). One CDE is equal to the effect of the emission of 1 kilogram of carbon dioxide.



**Waste content of wastewater flowing into the Scheldt estuary**

The disposal of wastewater from the Terneuzen site into the Scheldt estuary is expressed in resident equivalents, where one resident equivalent is equal to the biological oxygen consumption of the substances contained in the wastewater of a single resident during one 24-hour period.



# Environmental performance in the I-Park

The I-Park in Terneuzen continues to improve its environmental performance, with several of the 2015 sustainability goals having already been achieved. The company remains committed to achieving all the targets, for which it will expend considerable effort over the next several years. We have included an overview below.

**Energy performance** Energy efficiency improved slightly in 2010 from the previous year, due mainly to the larger number of people employed in the plants. In relation to the 2015 goals, energy performance remains slightly below the projected annual improvement of 1.0 percent, despite the closure of the Ethyl-Benzene 3 and Styrene 3 plants and despite recent projects, such as the expansion of the polyurethane plant and the conversion of the EO plant.

**Greenhouse gases** In 2010, Dow released 8 percent more carbon dioxide than in 2009. Styron's carbon emissions were also up from the previous year: by approximately 15 percent. At both companies, the increase in carbon emissions is the direct result of an increase in production levels. Compared to the reference year 2005, absolute emissions declined by 12 percent. In fall 2011, train 4 of the LDPE plant at the Terneuzen site will be converted in order to increase its processing capacity for ethylene and start producing a wider variety of products, while maintaining the current energy consumption levels. Other projects on the site include the installation of a new tank; the renewal of the pipework; and the installation of new grout pumps and capacitor banks. The latter are installed to recover heat in order to produce our own condensate. Many of these adjustments will play a key role in reducing carbon emissions at Dow Terneuzen.

**NO<sub>x</sub> emissions** Nitrogen oxide emissions in the I-Park in 2010 were up slightly from 2009, also as a result of the sustained economic recovery. These NO<sub>x</sub> emissions must be reduced, as they are a major factor in determining the Terneuzen site's contribution to controlling acidification problems. In the coming years (that is, up to 2015), the old LHC 1 furnaces will be fitted with LowNO<sub>x</sub> incinerators. (The first furnace was already equipped with such an incinerator in 2010). Initial measurements have shown significant reductions in NO<sub>x</sub> emissions. The conversion of the old furnaces involves a total investment of roughly EUR 20 million.

**Volatile organic compounds (VOCs)** The company did not reduce its VOC emissions (i.e., substances released through release points, torches, the sealing of stopcocks and pumps, etc.), showing, rather, an increase in these emissions by 12 percent compared to 2009. Styron's emissions increased as well, which was primarily the result of increased production volumes. However, current emission levels are down 28 percent from 2005, which means the 2015 target of a 30 percent decrease is nearly met. We expect better results for 2011 as a result of the reduction in silo emissions at the Dowlex plant. (see page 9) Performance is set to further improve in 2012 due to the elimination of the Regenox unit from the EO plant, which is scheduled for late 2011.

**Priority emissions** Both Dow and Styron showed a strong performance in the emission of the "priority chemicals" EO and benzene, which in 2010 were down 24 percent from 2009. Compared to 2005, the decline is a staggering 55 percent, thereby greatly exceeding the 2015 target of 50 percent. This main reason for this result was the conversion of the EO-EG plant into an EO plant.

**Waste** In 2010, Dow and Styron combined produced approximately 63,000 tons of waste – this figure includes waste streams processed both onsite and offsite. Although on the face of it this represents only a modest improvement from 2009, when the site produced 66,000 tons of waste, due to the increase in production volumes we can be proud of this result. The more noteworthy contributions by Dow included the reduction of flare-drum waste and the reduction in sludge disposal by the water purification system. Styron reduced its waste production as well, mainly due to the reduced amount of waste released by the EB 4 and Styrene 4 plants via the LHC 2 torch.

**Wastewater** In 2010, the amount of waste disposed by Dow and Styron into the Western Scheldt was at the highest level since 2005, which was disappointing. However, the decommissioning of the EB 3 plant marked the elimination of a consistent, direct discharge flow. Both companies are committed to tackling this problem at the source and to more effectively controlling the biological purification system.

**Soil** Soil in the I-Park in Terneuzen has been contaminated in the past, and the company has been actively cleaning up the site since 2005. As part of the agreed outline remediation plan, a number of technologies are currently being implemented in order to further improve these cleaning efforts. (For more information, please see page 20) Due to the increased focus on soil-protection measures and because new product spills are immediately cleaned up, every effective cleaning effort results in a decline in accumulated soil contamination and, by extension, in an improvement of soil quality.



## Innovation in practice

Dow is always developing new technologies that make work easier, more efficient and more environmentally friendly. As part of these efforts, the company works in partnership with the best specialists – both in-house and external – to develop new applications and implement new technologies, all as part of its initiative to achieve its 2015 targets.

### > Nature's cleaners

The Bodemsanering (Soil Remediation) department is dedicated to cleaning pieces of land that have become contaminated over the years at Dow sites worldwide. Soil can be cleaned up in a number of ways, including through excavation, groundwater extraction, and purification, or through natural erosion. In 2010, Dow was the first chemical company in the Netherlands to perform a test using a new method, known as phytoremediation. This process involves using willows to prevent shallow organic soil contamination. A total of 33 young willows were planted on a plot of land (40 by 60 meters) on the Terneuzen site. Through their roots, these trees release oxygen and sugar into the soil, which ensures that both the soil and the groundwater become clean again through organic processes. Our colleagues at Dow in the United States and Canada have more than 10 years of experience with this method, which they have implemented successfully. The company expects to be able to accurately assess the results of the test in a little more than three years' time. It will accomplish this by taking air, soil, and groundwater samples and comparing them to the values of previous samples. In addition, a foil was attached to the base of the trees, which means they are unable to absorb rainwater and will allow their roots to grow towards the groundwater. As a result, both the groundwater and the soil will be cleaned more effectively, which is expected to result in cleaner soil. By comparing the samples taken at this site with other, related samples, it is possible to determine the actual effect of the willows on soil remediation.

The consultancy and engineering firm Tauw has been assisting Dow with this experiment.

### > Less dependent on freshwater

The water project, for which Dow uses domestic wastewater discharged in Terneuzen on a large scale, is under continuous development. Dow is currently focusing mainly on optimizing streams and reuse, an effort that requires continuous attention. In 2010, the sewage treatment plant implemented a membrane bioreactor. Wastewater pollution is decomposed by bacteria inside the reactor, while the use of ultrafiltration membranes prevents that bacteria and sludge components are discharged along with the purified water. Two objectives are achieved by this process: a) the system can process a larger amount of water and b) the water is of a higher quality. Dow has been instrumental in the implementation of the reactor, and consumes this water from Evides. The membrane bioreactor ensures that Dow is even less dependent on the scarce water from the Biesbosch nature reserve. The company also continues to search for new freshwater sources in Zeelandic Flanders. In conjunction with Evides, the Water Board, and Zeeland University of Applied Sciences, Dow launched a feasibility study 18 months ago into the possibility of making this wastewater and rainwater reusable for industry and agriculture after filtering and treatment. The first stage of this study has now been completed. A number of layers were identified in the Kanaalzone area that provide information on the condition of the soil, desiccation, town and country

planning, nature, and water conditions. During the second stage of the study, water supply and water demand will be analyzed. The project has received financial support from the EC03 grant program of the Province of Zeeland.

### > First stage of REACH successfully completed

REACH is the system for the registration, evaluation, and authorization of chemical substances produced in, or imported into, the European Union. This European regulation came into effect on 1 June 2007. Over the past three years, hundreds of Dow employees worldwide have worked hard on completing the first stage of REACH: the registration of all chemical substances produced and imported by Dow's European sites in quantities in excess of 1,000 tons per year. Approximately 250 substances are involved altogether. A chemical safety assessment was prepared for each of these substances, where it was considered whether the substance was "hazardous" (which applies to approximately two-thirds of the substances registered.) If this question is answered in the affirmative, the risks of exposure are established, and measures are identified that must be implemented in order to reduce those risks. All this information is subsequently recorded in exposure scenarios included in the Chemical Safety Report. This first stage of this process was completed in late November 2010. The final step of the REACH process is communication with the users – these may be the manufacturers that process the semi-finished products produced by Dow into end products; compa-

nies that use the substance in the manufacture of end products; or consumers. These communications are conducted by means of the data sheet (Material Safety Data Sheet) for each substance, to which a sheet showing the exposure scenarios is attached. This is a requirement for all producers of chemical substances. All companies – including Dow Terneuzen – must subsequently establish whether the use of the substance and the conditions for use correspond to those contained in the safety data sheet. The procedures for this method will be developed and implemented in 2011. The Terneuzen site created a database containing safety data sheets in 2010, which might be used for this purpose. This database is accessible to all employees through the corporate Intranet. Product safety has always been a key priority for Dow, and as part of the REACH program all safety assessments were converted into product safety documents. This means that REACH is fully in line with Dow's global sustainability target of making all safety assessments of its products publicly accessible by 2015.

### > Use of sustainable raw materials

Dow's production volume increased markedly in 2010, and the company intends to continue this increase over the next several years. Over the longer term, this means that Dow will need to partially convert to other raw materials than the current fossil fuels, such as oil and gas. For this purpose, the Research & Development (R&D) department at the Terneuzen site has been working on several projects, one of which involves exploring the

possibilities of alcohols as a raw material. Dow Brazil is currently growing sugarcane for the production of bio-based polyethylene. Another example is the extraction of castor oil (a vegetable oil that is sometimes referred to as "miracle oil") from beans. Chemical modification makes it possible to convert this oil into eco-friendly lubricating oil. This project is currently at the testing stage, as "green" alternatives to these processes must produce the same result as the regular versions. Research at the Terneuzen site focuses mainly on reducing the energy consumption of the naphtha crackers, since lower energy consumption means both reduced costs and reduced carbon emissions. Dow also investigates a more sustainable way of producing Polyethylene. Another example is an improvement process at the Dowlex plant. This involves investigating the use of a new molecule in order to neutralize acids. This would lead to both less waste and less corrosion in the pipes, thereby resulting in a superior end product and a longer lifespan for the plants. However, it is clear that these types of research projects tend to be complex and therefore time-consuming, and that the investigation into the use of sustainable raw materials involves more than simply choosing one alternative over the other. Instead, the new alternatives mainly represent an effective addition to the existing ones.

## Room for new investment

In 2010 we sold one of our Belgian sites, a decision that was part of Dow's portfolio management strategy of selling off non-strategic divisions. This has created room for new investment in Terneuzen, both onsite and in the region.

**Sale of Dow's Kallo site** The sale of Dow Haltermann Custom Processing was completed on 1 June 2010. On 1 April, the company reached agreement with the Indianapolis-based company Monument Chemicals, Inc. regarding the acquisition of all the shares in the Haltermann Custom Processing site and the associated business in the Belgian town of Kallo. Dow's decision was prompted by the fact that the Kallo operations were not sufficiently in line with the new strategy. The Kallo site is part of the Haltermann Custom Processing Group, which processes specialty chemicals on behalf of its clients. In mid-2006, the Kallo site also began producing biodiesel. The sale of the site marked the end of the nine years during which Haltermann was part of Dow Benelux.

**Room for social initiatives** Dow's Terneuzen site has long played a part in improving the quality of its living environment, including by supporting initiatives and projects through a financial contribution from the donation budget. Dow spends an average of around EUR 300,000 a year on donations. A substantial portion of this budget is earmarked for strategic projects (many of which are long-term projects) that improve the quality of life. One organization Dow has been supporting for many years now is Stichting het Zeeuwse Landschap, which is dedicated to nature preservation in the Province of Zeeland. Another portion of the budget is allocated to meet requests for smaller contributions and donations, including the organization of events, anniversaries, festivals and the purchase of new materials. One of these donations was provided to Stichting Wonen en Psychiatrie, Zeeuwse Gronden at the end of 2010. This organization provides integrated care to people with long-term mental disabilities. The donation was used to fund the acquisition of a multifunctional bus; this bus is currently used by the Zeeuwse Gronden home improvement team, allowing them to help their clients perform useful work during the day.

## Dow's global results

Since Dow Benelux is an integrated part of The Dow Chemical Company, the Benelux operations are closely linked with those of the global Dow Group. The performance of the various divisions can best be assessed on the basis of the consolidated results of the group as a whole.

### Financial results of The Dow Chemical Company and its subsidiaries (overview of consolidated results, mln \$)

	31-dec.-2009	31-dec.-2010
Net revenue	44.875	53.674
Net profit (mld \$)	0,3	2,3
Net income	336	1.970
R&D expenses	1.492	1.660

### Sales (per geographical area, mln \$)

	31-dec.-2009	31-dec.-2010
United States	15.257	17.497
Europe, Middle-East and Africa	14.834	18.464
Rest of the world	14.784	17.713

**Regional Expenditure** Dow is one of the leading companies in the Benelux countries, and the Terneuzen site in particular, with its 18 plants, more than 1,500 employees and hundreds of contractors, maintains a strong presence in the region. This is evidenced by many related activities initiated by third parties, as well as by active communications with the regional community through Dow's donations and Community Advisory Panel.

### Key indicators for Dow Benelux (mln \$)

	'05	'06	'07	'08	'09	'10
Capital investments	44	96	126	183	146	71
Depreciation and amortization	155	156	163	173	174	175
Expenditures in the Zeeland-Flanders region	88	133	155	202	156	154

### Expenditure (mln \$)

	'05	'06	'07	'08	'09	'10
Contractors	29	32**	46	57	56	53
Salaries	165	173	194	217	190	159
Donations*	0,5	0,4	0,4	0,4	0,2	0,3
Total amount paid in taxes	65	97	128	130	98	102

### Production (mln tons)

	'05	'06	'07	'08	'09	'10
Production volume in the Benelux region	7,8	7,9	8,2	6,9	6,0	5,7

\*2005 including anniversary donations

\*\*Four years ago, in incorrect numer was provided here



# Dow Terneuzen **ready for the new Dow**

Setting goals both gives an organization direction and provides clarity. This is important to employees, in order to ensure that everyone is working towards the same goals, but also for other stakeholders such as neighbors, clients and investors. Dow's 2015 goals give direction to all the company's sites worldwide. In 2010, Dow's Terneuzen site determined how it would achieve these global objectives and what its priorities were in that process. This resulted in the Terneuzen Site Strategy 2011-2015.

In achieving these targets, the Terneuzen site intends to go as far as it can. The world around us is changing rapidly, which means that achievements may vary significantly from one year to the next. At the end of the process, all parties must have done all they could to succeed, and Dow must have found the most effective solutions, both on behalf of and together with the client.

## **Responsible care**

Dow's Terneuzen site sets the standard when it comes to sustainability and safety. We aim to reduce our environmental footprint by reducing the impact of our non-operational activities. The main objective for Dow's Terneuzen site continues to be zero accidents, and we can only achieve this target if we are all aware of it and believe in it. The key is to foster the appropriate safety culture – a culture that is represented by our people.

## **Making a difference together**

Another target for the coming years is to hire more than 300 new employees. In recruiting these new people, Dow will be focusing on diversity in terms of sex, age, and nationality, as well as making sure that the new workers are a good fit for the company. Do they support Dow's goals and can they help achieve those goals? After all, Dow's success depends on its people. Making a profit is essential for a company's *raison d'être*, and in order to make a profit a company must maintain stable operations. But whereas we used to talk of "operational reliability," we now refer to "highly reliable organizations." Not only the plants must have reliable operations – this reliability applies to the site as a whole.

## **Generating growth**

In order to continue playing a key economic role in the future, Dow's Terneuzen site must continue to grow. This may be accomplished by investing in the existing plants, in order to ensure that they can continue to perform at the highest level, and by aiming for the construction of at least one new plant. The expansion of the site will be further facilitated by concepts such as the Maintenance Value Park, the Business Process Services Center, and the I-Park. The profits generated by these operations are subsequently invested in new semi-finished products and products that can provide solutions to global problems. Terneuzen continues to be Dow's leading European site when it comes to Research & Development.

# Made in Terneuzen

Success is achieved through a combination of factors: a product must meet the customer's needs, which means it must be of a high quality, be delivered in time and in the agreed quantities. Even more so than in the past, Dow Terneuzen is developing customized specialties.

## **> Core Composite Styrofoam®**

Core Composite Styrofoam® is a highly refined version of the standard IB-2 insulation materials normally produced in the Terneuzen Styrofoam® plant. The plates can have a maximum width of 0.1 to 0.3 millimeters (the standard width is 2 millimeters), must be fully dust-free, and may not be damaged. Separate packaging was created for transportation purposes. The customer turns the three plates into panels and covers them with a layer of plastic on each side. The panels are used for plastic frames, refrigerated trucks, offices, and homes. The existing machines were altered in a number of ways to facilitate the production of the new material. In addition, the finishing equipment must also be properly cleaned in order to prevent the build-up of dust, and the blades are changed on a regular basis, since the surface must be ultra-smooth. The production of Core Composite Styrofoam® generates a large amount of waste, which is not a problem, as it is all recycled. For example, the waste is used to manufacture new plates or serves as additional protection during transportation. Core Composite Styrofoam® is the result of close cooperation between the client and the plant. The Terneuzen site currently produces more than 20,000 cubic meters of the material per year.

## **> Specialty Polyols**

Mattresses can roughly be divided into three categories: traditional mattresses, the slightly harder kind (made from hard foam), and soft, Tempur-like mattresses (viscoelastic). The Polyurethane plant in Terneuzen already supplied standard polyols to the Belgian-based mattress manufacturer Polypreen for the production of traditional mattresses. However, Polypreen also produces hard mattresses using special polyols, and it turned out the company was looking for an additional supplier of polyol for the production of harder foams. That is when Dow entered the picture, offering its services. In early 2010, Polypreen tested the substances of various polyol producers in its laboratories, and after an in-depth industrial screening process it was announced that Dow was the favorite. Polypreen then went on to perform the production tests, and once again Dow's polyol turned out to meet all the requirements. On 1 August 2010, Dow became a qualified supplier for Polypreen. The excellent quality of the product was obviously a key factor, along with the commercial aspect and the strong relationship between the two companies. The short distance between the PU plant in Terneuzen (which in 2009 became the largest of its kind in the world) and Polypreen, based in the Belgian town of Lommel, also worked to the company's advantage. In addition to traditional polyols, Dow has also begun supplying a number of specialty types. The market for bulk products is increasingly under pressure, and these specialties allow Dow to make the difference.

## Styron Netherlands B.V.: our successful neighbor

On Friday 18 June 2010, the employees of Styron Netherlands B.V. celebrated the official launch of their new company. The arrival of Styron to Dow's Terneuzen site also marked a turning point in the site's history: for the first time in the 45 years since its establishment Dow has expanded its operations beyond the plant site. Styron's newly independent status represents a significant step in creating the Terneuzen Industrial Park, which can accommodate multiple companies. During the last three quarters of 2010, Styron and Dow implemented the agreements they made earlier to build an effective partnership.

**Clear agreements** Unlike the BPSC, Styron is the first non-Dow occupant of the I-Park that maintains operational activities. Styron Terneuzen includes the following business units and products: Styrenics Naturals, Compounding & Blends, Latex, Styrene, and Ethylbenzene. In addition, Styron also operates the IPG and Cumene plants on behalf of Dow. In order to be successful on an integrated site such as Dow Terneuzen, it is essential for the two companies to cooperate smoothly, as the companies depend on each other for the delivery of raw materials and services. Dow and Styron are currently working under a single environment permit. This means that Styron has committed to the standards set by Dow, which in some cases are more stringent than the government's requirements. A document is currently being prepared containing all the rules

related to Health, Safety and the Environment, ensuring that all parties involved are aware of the commitments made. A number of agreements have been signed for day-to-day activities, for example related to technical services and the use of the buildings. In order to ensure that the cooperation agreements are complied with, two Relationship Managers were appointed: one for Dow and one for Styron. Additionally, a Governance Board ensures effective cooperation between the various companies within the Industrial Park concept. The members of the Governance Board include Dieter Schnepel, Dow Terneuzen Site Leader, and Frans Kempenaars, Director of Styron Netherlands B.V. The same cooperation structures and agreements are in force at Styron's site in the Belgian town of Tessenderlo.

**New opportunities** The transition to independent status of the business units in the Benelux countries involved the transfer of around 340 Dow employees at the Terneuzen site and 45 Dow employees at the Tessenderlo site to Styron. These employees immediately showed that they believed in the opportunities the new company has to offer. For example, during the remaining months of 2010 the company's safety performance was exceptional, with only a single product spill at the Terneuzen site. The effective programs operated by Dow related to Health, Safety and the Environment will be continued under the Styron banner.

**Keyword: growth** Styron has energetically embarked on its first full calendar year as an independent company. The company's top priority for 2011 is to stabilize the Styron organization. When the company was established, it was agreed that Dow would support Styron in setting up its own services, including Human Resources and Finance. Styron has also been exploring opportunities to further increase the value of its business, both by expanding its current businesses and by extending the current product range. The construction of a new latex plant in China and a new rubber plant in Schopau, Germany should help facilitate this.

In autumn 2011, the Terneuzen site will be investing heavily in further improving both its performance and the sustainability of the styrene plant. The investment involves a total of nearly EUR 6 million. Another new development is that Styron will change its name to 'Trinseo' in 2011. This decision was prompted by the fact that the current name is too closely associated with the company's polystyrene business, when in fact its operations are much more comprehensive than that. The new name communicates that the company is involved in a wide range of activities, products, and technologies, as well as highlighting its aim to continue to grow and innovate.

**Good step** Styron is pleased with the steps it has taken towards independence, particularly due to the new opportunities this opens up for the company's further development. The new situation of two companies sharing an integrated site shows that clear commitments can result in a successful partnership agreement.



# Maintenance Value Park Terneuzen

## Cooperation as a driver of growth

The Maintenance Value Park Terneuzen (MVP) has a clear objective: to facilitate cooperation and innovation in order to further improve the reliability of the processing industry in the Kanaalzone region. This is important, as smarter, more efficient and more cost-effective maintenance is vital in order to remain competitive. The first stage of the MVP is scheduled to be completed in the next few years.

**Value Case** The Maintenance Value Park Terneuzen (MVP) is a place where entrepreneurs, educational institutions and government agencies work together to provide education and innovation and increase efficiency and economic growth. The initiative launched by Dow, Yara, Cargill, and Zeeland Seaports was investigated in 2009 for economic feasibility, funded by a 'Pieken in de Delta' grant. The feasibility study showed that a large number of maintenance companies and educational institutions in the region are interested in the establishment of the MVP. In 2010, the next step was completed in drafting a Value Case, a document that describes how the MVP can add value for stakeholders. The case clearly shows that the MVP differs from other contractor parks in that it maintains its own expertise and innovation center, operates joint business projects, provides practical training and education, and manages shared facilities and

services. The Value Case, which was funded in part by the European Regional Development Fund (ERDF) as part of the OP-Zuid project and in part by contributions from various regional companies, brought about a cultural shift. Companies and institutions – both inside and outside the region – which had previously been cautious, began to show a more definite interest in the park. More than 20 companies are currently involved in the design of the MVP. In 2010, it was also assessed how cooperation can actually result in innovation and creation; this included an investigation of trends in this area in other regions. Meetings were held with educational institutions such as Zeeland University of Applied Sciences and initiatives such as NV Economische Impuls Zeeland and the Dutch Institute World Class Maintenance. This study clearly showed what resources are required to turn the MVP into a successful company.

**Expertise and innovation Centre** The Expertise and Innovation Centre (KI<) will be the main player in the park. The Centre will deal in a practical way with a number of issues relevant to the maintenance sector, because it is more efficient to work on solutions together, rather than separately. The Expertise and Innovation Centre focuses on three issues: technology, operating processes, and cooperation. The Centre, working in partnership with companies and educational institutions, explores these issues for subjects it can tackle. The first of these topics have already been disclosed: cooperation between customers and suppliers, condition-based maintenance, working at heights, industrial cleaning, digitization, and staff availability. The companies set the priorities, while the role of the Expertise and Innovation Center is to support and facilitate. The result of their efforts might be a new technology, a new operating process or a new form of collaboration.

### Cooperation

In order to facilitate the continuous flow of innovations aimed at improving the effectiveness and efficiency of maintenance processes, cooperation is essential – both within and outside the company. This is the only way for innovations to be created even faster and more efficiently. In addition to providing expertise and services to Dow, the maintenance companies located in the MVP will also be serving other industrial processing companies, including Cargill and Yara. This will increase the synergy between the various participants, as well as making them more competitive. The Western European processing industry tends to be far more established than the newer industries that have emerged in the Far East. Smart maintenance helps maintain reliable production facilities for the processing industry in this area. Another one of the MVP's objectives is to interest more people in working in technology in general and the maintenance industry in particular. The park will therefore have a modern look and feel: a place designed to attract young people, featuring modern buildings and training programs that make use of the latest resources and technologies. Students can apply their newfound knowledge immediately at one of the maintenance companies located in the park.

### Schedule

The design stage was completed in 2011, with construction slated to begin in 2012. Until that time, the zoning plan needs to be amended and the plans need to be developed in detail. The Maintenance Value Park in Terneuzen hopes to welcome its first occupants in 2013.



## Also in 2010...

### 2010: the Year of Biodiversity

The United Nations designated 2010 as the International Year of Biodiversity – an excellent opportunity for Dow to raise awareness among its employees and local residents of the importance of biodiversity in the region. Several years ago, Dow's Terneuzen site commissioned a flora and fauna survey, which showed that the Terneuzen operations have virtually no negative impact on the plant and animal species occurring in Zeelandic Flanders. In fact, some new species have settled in the area, including the peregrine falcon and several protected species of orchids. Thanks to the survey, Dow knows exactly where a particular species occurs on its site, and it tries to be as mindful of this as possible. For example, the grass is not cut during brooding season, while other patches of grass are kept longer if possible. Furthermore, the Terneuzen site has drafted a Biodiversity Action Plan (BAP), and in November 2010 Dow, along with several other Zeeland-based organizations, signed an agreement to preserve – and, where possible, increase – biodiversity in Zeeland.

**Our crackers turn 40!** The LHC-1 (LHC is an acronym for Light Hydro Carbons) complex on Dow's Terneuzen site was launched in 1970. It marked the beginning of a success story that has continued to this day. The LHC complex, which includes three naphtha crackers, has been a leading example at Dow for 40 years now. All crackers operate extremely efficiently, which means at a low cost, with relatively few breakdowns, and good safety and environmental results. The LHC complex is currently

the largest fluid cracker complex in the world, making Dow Terneuzen one of the main drivers of economic development of the Dutch chemical industry in general and in Zeelandic Flanders in particular.

### Dik Schipper: Plant Manager of the Year 2010

Dik Schipper has been the manager of the LHC complex in Terneuzen since 2001. At the Deltavisie 2010 conference, an event for industrial companies in the Rhine/Scheldt estuary, he was elected Plant Manager of the Year. Dik was praised by the jury for his excellent technical and organizational insights and his coaching leadership style. As part of this election – an initiative of the trade journal Petrochem and the Association for the Dutch Chemical Industry – the organization each year looks for participants who have made a significant improvement in the past year in an innovative way that relates to health, safety, the environment, productivity, and quality. Having won the competition, Dik will be representing the processing industry to the outside world for the entire year.

### Maintenance Day on 18 September

The national kickoff of Maintenance Day (Dag van het Onderhoud) took place at the Terneuzen site on 18 September. Young people between the ages of 8 and 28 were given the opportunity to discover innovations in technology in general and in maintenance in particular. Dow and Verenigde Dow Partners (VDP) used a number of activities to show what makes the maintenance profession so interesting, exciting, and fun. All the major regional maintenance

companies and the main Zeeland-based educational institutions were represented at the information market.

### Disclosure of water innovation sites

Dow is not the only company to deal with water innovatively: several organizations are working together to increase safety and the quality of life in the Zuidwestelijke Delta area. Problems are handled in an innovative way, with examples of such innovations including flood-catchment dikes, the re-entry of salt water, or reuse. The Province of Zeeland has designated thirteen innovation sites in its operating area, having installed information signs to make them more accessible and more identifiable for locals and tourists alike. The water reuse project launched by Dow, Evides and Waterschap Scheldestromen (Scheldestromen Water Board) was equipped with a panel in two locations. One of these panels is located at the source, namely the sewage treatment plant of the Terneuzen Water Board. The other panel is located near Spuikom. On 7 December, Deputy Frans Hamelink officially unveiled the new panels. All panels feature beautiful photographs of the area in question, along with a description of the innovation and a QR code. Interested visitors can scan the code using their mobile phones with internet access to read more about the innovation in question.

### Vision

To be the most profitable and respected science-driven chemical company in the world.

### Mission

To passionately innovate what is essential to human progress by providing sustainable solutions to our customers.

### For Dow in Terneuzen, this means

Dow in Terneuzen is and will be the most strategic site for Plastics and Hydrocarbons. We will further grow in performance and market facing business. By excellence in EH&S, reliability, productivity, quality and innovative partnerships, our committed and talented employees in manufacturing, services and R&D add significantly to Dow's value creation and growth.

### Values

- > Integrity
- > Respect for people
- > Protecting our planet

### Strategic Themes

- > Reliability and financial success
- > Responsible Care
- > People
- > Growth



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