

Annual Report  
**Europe**  
2004/2005

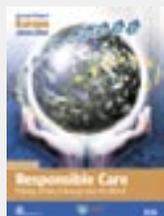


# Responsible Care

Making strides in Europe and the World



Report presented with  
**ECN**



## Annual Report EUROPE 2004/2005

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# High performance

The newly invigorated Responsible Care programme will bring increased benefits, says José Maria Bach

LAST YEAR we completed a major review of how Responsible Care operates in Europe. I am pleased to say that this was accepted by the board of Cefic and that implementation is now the task before us. But the review should not be seen as an end in itself. In future, Responsible Care must continue to change with the times and be modified as part of an evolutionary process.

The review was needed to bring Responsible Care, now 20 years old, up to date. We needed to raise the bar for performance and bring participants up to a higher level

#### COMPETITIVE ADVANTAGE

At the core of the review, as I have already indicated, is the goal of improving performance, in terms of HS&E achievements, efficient use of the planet's resources, product stewardship and communication and recognition by the public. It encourages companies to set goals that should not only drive further improvements in traditional and new areas, but also bring competitive advantage and business value as well as a greater understanding and appreciation from those outside the industry.

**“We will succeed, of that I'm certain”**

José Maria Bach, Chairman, Cefic Responsible Care

across Europe. This will involve all national associations drawing up a schedule to the review. One example of implementation already established and agreed has been on the very important adoption of a management system approach, which should be fully operational, along with the introduction of the self-assessment process, by the end of 2008.

The goal is to achieve greater consistency of Responsible Care management across Europe and to present Responsible Care as a concerted programme. To this end, going forward, Cefic will take the leading role in the initiative in Europe, although national associations will still be responsible for running the programmes in their own countries.

The management system framework – based around the ‘plan, do, check, act’ cycle – is consistent with existing standards. Thus, it should not be too much of a change for large companies and should assist smaller companies in their Responsible Care implementation. The system has the capacity for third-party verification, consistent with the review's eventual aim to move from self-assessment to periodic external assessment.

We need to earn credibility and a better reputation and the rejuvenated Responsible Care should enable this. The review stressed this aspect particularly. It calls for improved engagement and communications – especially by electronic means – both between companies and associations and between the industry and society.

As part of communication agenda, we have already established and carried through a Responsible Care Award scheme, to promote best practice cases. And we are in the process of setting up a European Advisory Panel, to drive better understanding about the initiative within and outside the industry.

But the flagship of the ‘new’ Responsible Care will be its emphasis on product stewardship, whereby chemical producers will have to participate up and down the supply chain to take responsibility for and ensure the safe use and disposal of the chemicals they manufacture. In this Cefic is actively engaged in the Global Product Strategy being developed by the International Council of Chemical Associations (ICCA). But for Europe, we would like to see a wider implementation of current product stew-



ardship codes next year, followed by the development of a global strategy.

The review sets itself two further aims: to increase the number of associations and companies signing up to Responsible Care and to spread the message about the business benefits that can be derived from adopting the initiative. Cefic, as the umbrella association for Europe, has programmes in place to work with the new EU member countries to run effective Responsible Care programmes, and to encourage member companies everywhere to join in, especially the smaller and medium sized enterprises.

On business value we have made a start with a brochure setting out what can be achieved in the way of cost reductions, safer operations, improved product developments and economic benefits of stakeholder recognition.

### GLOBAL ASPECTS

On the whole, I am happy with what we have achieved. The small obstacles that still lie in the path we can overcome or navigate round, I'm sure. The pan-European nature of Responsible Care going forward is a great strength and will enable the initiative to drive much greater consistency and higher performance.

But we must not forget that Responsible Care is a global initiative, encompassing no fewer than 52 countries. At the ICCA level, there has also been much effort expended to revitalise the initiative. A strategic review was launched in May 2003, and this year a Global Charter has been agreed and is currently being rolled out around the world, with first adoptions in Latin America. Alongside the Global Charter, the ICCA has produced a ceo Declaration of Support, which it is encouraging all ceos of multinationals to sign, giving the Charter and Responsible Care credibility at the highest level of the industry.

All of this is encouraging news for our industry. We need to press on with Responsible Care, not only to ensure it is the voice of the industry but also the credo; we need to expand its scope, and we need to drive it into the business units of our companies, so it does not just reside in the HS&E support functions.

**José Maria Bach**

**Chairman**

Cefic Responsible Care





# Harmony and consistency

The move to a management system approach to Responsible Care, and introduction of self-verification, will enhance its value

BY MARCH 2007 a new Responsible Care management framework will be rolled out across Europe. And by the end of 2008 self-assessment of the implementation of that framework will begin.

Cefic's pan-European management framework for Responsible Care, endorsed by the Responsible Care Core Group this June, aims to provide increased harmonisation and consistency, together with improved performance for the initiative throughout Europe.

The framework also meets the expectations of the International Council of Chemical Associations (ICCA), which agreed a set of global principles for the Responsible Care programme last year (see page 20).

Colin Chambers, head of the operations and assurance group of the UK Chemical Industries Association (CIA) and chairman of the Cefic taskforce charged with preparing the framework document, says the intention is to provide a support tool for the implementation and management of Responsible Care across the length and

breadth of Europe. The framework aims to provide the basic requirements for applying a systematic management approach to the elements of Responsible Care.

Chambers is keen to point out that the aim is not to have a new management system or one single management system for Responsible Care throughout Europe. The framework provides the basic guidelines for a systematic management approach – but companies can use it as applicable to their operations. 'We have set out what needs to be addressed, but we do not prescribe or check how they do it.'

Although the introduction of the framework may be perceived as a big step by some, Chambers says that Cefic recognises that formal management systems have been around for a long time and that most companies already have formal or informal management systems in place. He adds: 'The framework is not something totally separate or new. Companies and associations need to review their position and integrate Responsible Care into the core of

their operations. We want them to build on what they have got, and see there are lots of ways the desired outcomes can be achieved.'

Chambers notes that Cefic has tried to keep the right balance between providing a generic framework that can be used by all companies and cultures and laying down specifics to provide guidance and potentially more credibility with external stakeholders. 'It is also flexible so that associations and companies could take on and use whatever parts are applicable to them and they can meet local stakeholder needs and expectations. One size does not fit all.'

## DETAILED OUTLINE

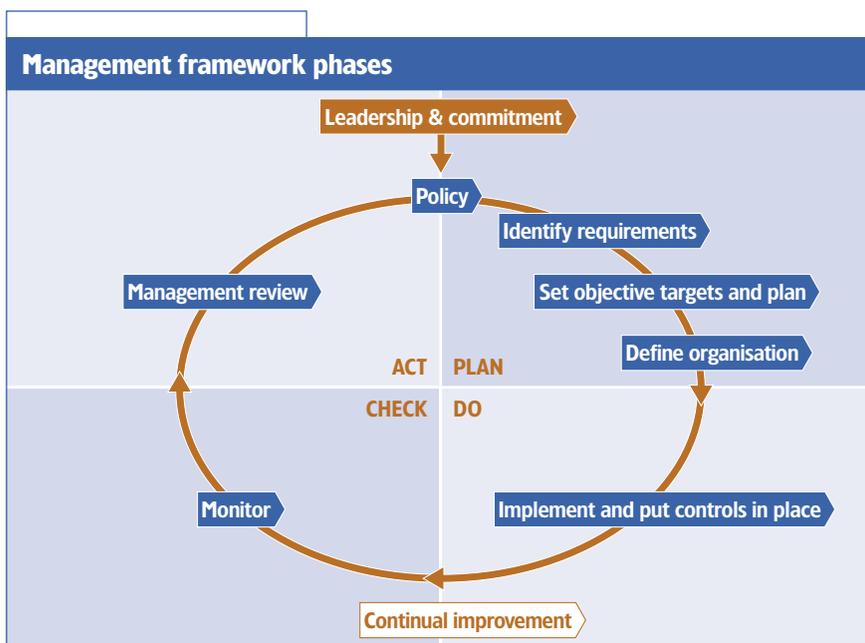
Importantly, the document provides a detailed outline of how Responsible Care measures up to Seveso II and recognised systems for health and safety and environmental management in Europe. In this way a company could use the framework for gap analysis to check if its existing approaches – say ISO14000 or ISO 9000 – meet the Responsible Care management framework requirements.

If deficiencies do exist between the systems that are implemented and those expected for Responsible Care, companies only need to address the gaps for themselves.

For Cefic there are three main objectives in bringing in a management systems approach. The first is to help companies and make sure that they adequately implement Responsible Care to get better performance. 'It fits in with our vision of Responsible Care. Everyone's objective is now a common objective,' says Harry Spaas, director of environment, health and safety at Dow Europe, and a member of the Responsible Care Core Group.

Second, the process will allow greater transparency. 'We all say we do Responsible Care, but we all do it differently.' Third, through assessment it will be possible for associations and Cefic to see where the problems and barriers lie and, where there are common issues, to address them.

Regarding potential problems, Spaas



**Implementation timetable**

Action	Date
RCCG endorses draft	June 2005
Federations start adoption process (i.e. start planning for implementation)	July 2005
Cefic publishes final version (pdf & print)	Oct 2005
Each federation provides Cefic with an implementation plan	Sept 2006
Framework rolled out by federations (Federation documentation ready for use by member companies and explained to members)	March 2007
Implementation of assessment starts	Dec 2008

says the main one is paradoxical. 'It is assumed that everywhere we have a large degree of implementation of Responsible Care and you could ask, why are we developing such a framework? But companies are at different stages, and this is one way to get some convergence.'

In addition, he says, some large companies, including his own, find it difficult to see if they have to take additional action. 'If companies are advanced in their implementation of Responsible Care, maybe this is not what they are after, but the answer maybe that the framework approach allows companies to work in a common language – especially important across Europe.'

'Dow has an internal management system, the question is "have we fully internalised Cefic's expectations?" It is not easy to demonstrate – to be able to report in the manner asked for will need some work. The way we monitor and track our operations does differ across Europe.'

Chambers adds: 'When you have been doing something for a long time, you think you are doing everything. Many chemical companies in western Europe have been practising Responsible Care and implementing management systems for 10 years or more. It could be that everything is covered but without a reference point it is difficult to prove, and as such the new framework may be a timely opportunity to look at implementation from a different perspective to demonstrate that we have not become complacent in our familiarity with Responsible Care.'

Implementation of the framework will

# WHAT NEEDS TO BE DONE

SO WHAT does the framework look like? The 34-page document currently circulating around European chemical associations includes: an introduction covering the scope of the framework, its implementation and verification and a section listing the framework requirements. The bulk is given over to guidance regarding use of the framework.

The framework is based on Deming's plan-do-check-act cycle – the common core management principle underpinning formal management systems, providing an effective and practical means of delivering performance improvement.

Over the last 15 years, the number of management system models has grown significantly, covering areas such as quality, safety, health, corporate social responsibility and sustainability. Now, the same model will be applied to current and future elements of the Responsible Care initiative, such as occupational health, occupational and process safety, environment, product stewardship, emergency preparedness, distribution and stakeholder engagement.

Another benefit of using the Deming cycle is that the phases of the proposed framework can be aligned with each stage of the cycle, as shown opposite. This makes it easier for users and stakeholders to see how the system works and aligns to the normal business process of managing an issue – be it writing a report or handling a major plant improvement, or new product.

This also gives the framework an in-built capability of covering elements that may arise in the future, without significant modification. For example, other aspects such as security can be incorporated by simply applying the plan-do-check-act cycle and framework phases to that functional topic.

## EIGHT AREAS TO ADDRESS

Companies will have to address eight specific areas:

- Leadership and commitment, to develop the business case for Responsible Care issues and secure the essential commitment from senior management to integrate Responsible Care into core processes and decision-making.
- Policy, to define the organisation's direc-

tion and long-term objectives for Responsible Care in terms of performance and the conduct of its activities.

- Identifying requirements to determine regulatory and other requirements affecting the organisation, to identify the significant risks of the activities and materials within the organisation's control and influence, and to establish requirements based on the significance of those risks.
- Planning, to formulate long-term strategies, develop tactical plans that prioritise the significant requirements for improvement and control, and to set goals and targets and to document plans to achieve them.
- Organisation, to define the structure of the organisation and responsibilities, the type and extent of resources and the documentation required to implement the policy, control and objectives, including documentation of the management system.
- Implementation and control, to put into practice the plans to meet the organisation's policy and objectives and improvement plan. To identify the controls that should be in place for the activities that are defined as significant.
- Monitoring, to generate and maintain efficient internal and external feedback loops to monitor progress against stated values, strategies, performance objectives and targets of the organisation in meeting its Responsible Care requirements, and to correct deficiencies.
- Management review, to meet the information needs of internal and external stakeholders and incorporate feedback into effective strategic and tactical reviews, including the effectiveness and suitability of the management processes and organisational performance in achieving the goals, objectives and targets, culminating in appropriate change.

Overall, it is important for companies to define the vision for Responsible Care and ensure leadership support for it; decide what needs to be done to improve performance; improve performance; and check that performance is improving and communicate the results.



CEFIC'S RESPONSIBLE Care Core Group has made verification an essential element of the programme, both to raise levels of achievement and performance within the industry and to demonstrate transparency to stakeholders outside the industry.

While self-assessment by companies on their implementation of Responsible Care is to be a mandatory requirement, the group says there should also be a commitment to move to periodic external assessment in order to increase credibility and raise stakeholder confidence.

Harry Spaas says external verification can be carried out through a number of approaches to allow flexibility and meet national and cultural differences in the EU member states. Assessments could be done by national federations, provided they have the resources and skills to do it, through peer review, provided that the assessors have the necessary qualifications and are approved by the national federations, or through the use of fully independent external specialists.

Spaas notes that Cefic is initially concentrating on self-assessment. In addition to the development of the framework document, Cefic is looking to introduce tools that would allow companies to self-evaluate their approaches. He notes that companies could already look at the framework and do a gap assessment to see if they need to do additional work.

'It is not a standard as such, but a reference', he says. Cefic will in addition develop a tool for self-assessment, but Spaas reiterates that companies do not need such a tool – they can just do it.

As well as an internal tool, assessment against the framework will show how companies have implemented their systems to align with the framework.

'By doing this, associations will be able to see their members are committed to a management systems approach that reflects the framework', says Spaas. This is the basic concept, and the details will be developed over the coming year.

'Our approach will be aligned as much as possible with systems already utilised, and we should be clear on how that will be achieved by the second half of next year', adds Spaas.



**“ We have set out what needs to be addressed, but we do not prescribe or check how they do it”**

Colin Chambers, Chairman, Management Systems Taskforce

**Scope of framework and other management systems**

Responsible Care key elements	RCMF	EMAS	ISO 14001	OHSA S18001
Environment	Covered	Covered	Covered	Not covered
Occupational safety & health	Covered	Not covered	Not covered	Covered
Transport & distribution	Covered	Not covered	Not covered	Not covered
Process safety	Covered	Not covered	Not covered	Not covered
Stakeholder engagement	Covered	Partial	Not covered	Not covered
Emergency preparedness	Covered	Partial	Partial	Partial
Performance improvement	Covered	Partial	Partial	Partial



probably be most difficult for those companies and countries that have not been part of the European system for very long. 'You can see they are in an accelerated state of implementing Responsible Care,' says Spaas. Companies that do not as yet have management systems can implement the framework.

Chambers spoke at a CIA meeting attended by chemical association representatives from nine accession countries in March this year – no-one saw the proposed management system framework approach as a problem – possibly it is useful when you are starting something from scratch, he says.

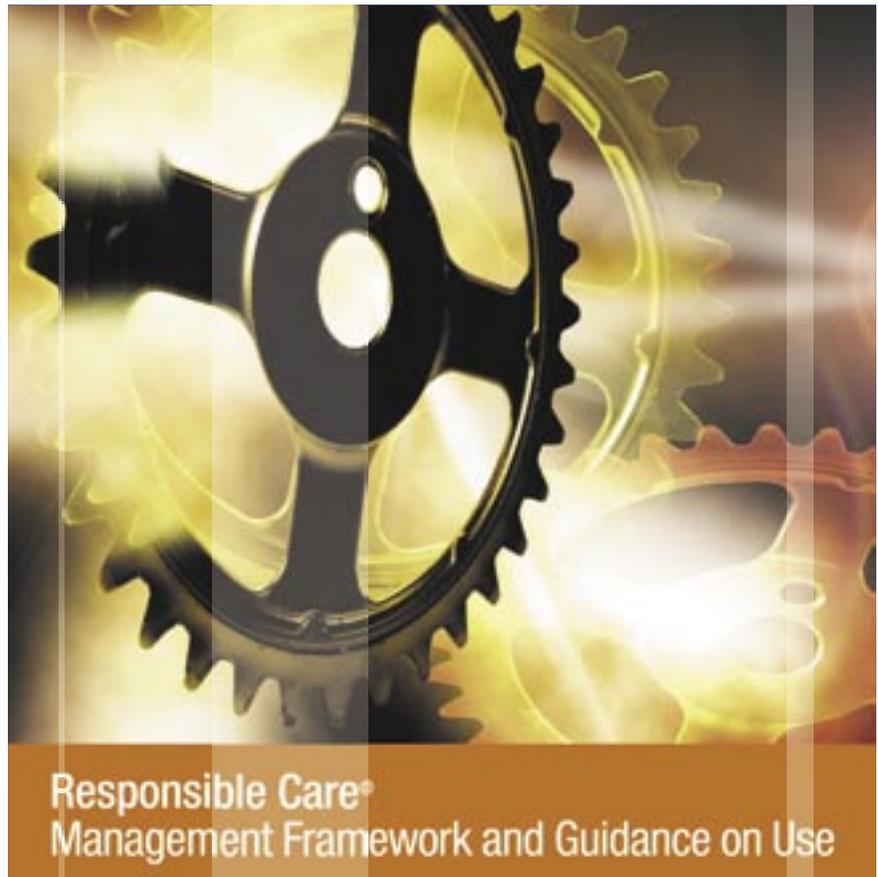
At present, each national association is assessing the framework document and deciding how they intend to implement it. All national associations will report their plans back to Cefic for agreement next summer. The Council will provide overall coordination, with national associations keeping responsibility for implementation of the initiative with their member companies. In practice, each national association may use the framework directly with their members or enhance it with additional guidance to reflect the needs of its membership.

They could also use it to update existing Responsible Care management system documents. Cefic will monitor implementation by associations; review guidance on use of the framework in 12-18 months and review and if necessary update the framework within a maximum of three years.

Cefic will support implementation of the framework. Dick Robson, Cefic's director for Responsible Care, says: 'Responsible Care is part of a self-help organisation. Those national associations linked into the Cefic network can get support in running workshops or events. We can provide expertise and help with some organisation; it is the sort of process that everyone can participate in. It is an evolutionary process and Cefic is here to provide support.'

He adds that within many accession countries the old mindset did not encourage companies to think for themselves – he says this has to change, but Cefic will support associations with specific requests for assistance.

Robson adds that two important aspects came out of Cefic's recent review of Responsible Care – which partly led to the development of the framework: First, clear mechanisms for implementing



**“ The framework allows companies to work in a common language – especially important across Europe ”**

Harry Spaas, Director of Environment, Dow Europe

Responsible Care management systems need to be identified. 'It is largely about education,' he believes. 'We are not trying to impose something on top of what companies are already doing, we are saying these are the types of things we expect you to do running Responsible Care as a management system.'

'Where you find a gap in your current systems, fill it. Other competing systems are a fact of life. The drive for Responsible Care has to be adding value without adding bureaucracy. It is an ethic and a spirit to fire the desire to improve performance. By

using management systems you can better manage your activities than if you do not have them in place.'

Second, Robson says there has to be a continuous move to verification. 'At last we have got everyone to agree that we need self-assessment. Then we plan to move to external assessment. That is important for meeting public expectations. The main objective is to have a stronger, focused Responsible Care programme, which should benefit member companies individually and increase the reputation and credibility of the chemical industry as a whole.'



# Proving the business value case

THE BACTERIAL stability of some dyestuffs, while effective in binding dye to fibre, causes difficulties for disposal, particularly responsible disposal. By their very nature these special dyestuffs do not biologically degrade well and cannot be discharged directly into a biologic wastewater treatment plant.

However, Ciba Specialty Chemicals has found a way of recycling the dyestuff back into the manufacturing process, thus saving resources, reducing chemical waste

This is just the kind of practical example of Responsible Care in action that Peter Bissig, Ciba's safety and risk management expert, wants industry to hear about. He wants to show that it makes good business sense to follow the Responsible Care programme.

The business benefits and value of Responsible Care have not been brought to the fore, but if the global initiative is to be strengthened it needs to win the buy-in of those that run business, and the best way to achieve this is to demonstrate its value to the bottom line. With this in mind, Bissig has been heading a Cefic Responsible Care group tasked with developing the business case for Responsible Care.

One outcome of this is a new brochure that discusses and demonstrates the business case for Responsible Care,



chure argues that Responsible Care 'reduces costs and increases profits. It reduces accidents and environmental damage. And it improves the chemical industry's reputation.'

'Business value is essential to the continuation of Responsible Care and we need to convince and give examples,' explains Bissig. Ciba has other examples, but so do many other practitioners. The working group has identified and published a host of value-creating examples (see box, below), grouped under reduced costs, positive impacts on business environment and better deals when talking to financial institutions and insurers.

## “Business value is essential to the continuation of Responsible Care”

Peter Bissig, Ciba Specialty Chemicals

and improving product yield. By collecting the filtration liquor and separating out the lower molecular fraction, the high dyestuff concentrate is returned to the production process, increasing yield by 3-5%.

and gives plenty of examples of just why companies can benefit both financially as well as through improved HSE performance and public image. Called *Responsible Care - delivering business value*, the bro-

### SUSTAINABILITY

Bissig's long experience with Ciba – 33 years in total, including 13 spent on various types of production processes and four as safety and risk management expert, with time spent in the US and Mexico as well as Switzerland – has taught him to be aware of the impact of health and safety issues on the business, and also the impact on the environment of the company's activities.

'Implementing a Responsible Care programme leads to continuous improvement in environment, health and safety, and all of this contributes to sustainability. But companies need to see how there is business value as a by-product if they are going to be convinced to take it up,' argues Bissig.

Each year, Ciba reviews all its sites in countries where Responsible Care has been adopted. At Ciba's four sites in Switzerland, for example, which employ around 4000 people, lost-time accidents have been reduced by 73% between 2000 and 2004. At the same time, the number of lost days/year was reduced by 80%. And CO<sub>2</sub> emissions have been reduced by 22% over this time period, from 24 914 tonne in 2000 to 19 375 tonne last year.

Bissig says these results have been achieved by following the requirements of Responsible Care – by taking measures and alerting employees to safe working practices, making risk analyses of processes and improving technical procedures that reduce risk. All of this involves a certain investment and commitment to improvement, says Bissig, but much of that is recovered.

### Responsible Care can benefit your business in clearly identifiable ways:

#### 1. It helps you avoid unnecessary costs and improve operating results by:

- Avoiding costs associated with accidents and illness
- Reducing disruptions and lost production
- Encouraging safe use of products
- Preventing shutdowns by authorities
- Optimising manufacturing
- Reducing energy and raw material consumption
- Preventing transport and distribution incidents
- Meeting customer requirements
- Improving employee satisfaction

#### 2. It helps positively influence your business environment, by:

- Strengthening neighbours' confidence and building trust
- Reinforcing your image as a responsible employer
- Bringing all employees more opportunity for participation
- Offering new marketing opportunities

#### 3. It is an asset when dealing with financial institutions:

- Keeping the cost of credit and insurance from spiralling



# Product stewardship is Cefic's flagship

Product stewardship is a vital component of the renewed Responsible Care programme



**“Product stewardship issues will increasingly shape the Responsible Care initiative in future years”**

Dick Robson, Director, Cefic Responsible Care and Sustainable Development

PRODUCT STEWARDSHIP may not have been a term that the chemical industry used regularly, but it is a practice that producers and distributors have been engaging in for some time.

During the 2004 Responsible Care conference in Rome, Cefic made it clear that product stewardship was to move to the top of the Responsible Care agenda. Over a six-year period Cefic would oversee a concerted push to improve links up and down the supply chain. Last month's Responsible Care conference in Dublin provided an opportunity to hear about the benefits of and best practice associated with implementing and maintaining a product stewardship programme.

The development by Cefic of guidance notes and action points on product stewardship has made brisk progress. Now, the industry is set to move to a phase where it will implement quickly. The speed of change that Cefic is proposing may seem a little harsh, especially in a sector where change has previously been measured. But Cefic believes that putting in place a number of basic principles for product stewardship will not only allow industry to deal with the imminent European chemicals legislation, but also improve its public standing.

## SHAPING THE INITIATIVE

'Product stewardship issues', explains Dick Robson, Cefic director for Responsible Care and Sustainable Development, 'will increasingly shape the Responsible Care initiative in future years'. In 2006, the International Council of Chemical Associations (ICCA) will put in place a strengthened global product



### Key elements of a successful product stewardship programme

- Senior management commitment
- Business commercial ownership
- Attitude of continuous improvement
- Networking product stewardship expertise
- Continuous training for staff and customers
- Effective communication and earning trust
- Establishing performance metrics.



**“Product stewardship helps us and our partners to meet increasing demands for safe and environmentally sustainable products”**

Trevor Kilner, Lyondell, Chairman Responsible Care Product Stewardship Group

strategy to evaluate and manage chemical-related risks and benefits by developing a unified product stewardship management system approach. This will be achieved through national associations, working with their member companies.

Product stewardship is a challenging practice, encompassing science, government policy, the marketplace and the public. A product stewardship programme will provide useful information to customers, suppliers, distributors and consumers alike. At the same time, product stewardship is not intended to create more work for businesses, but is meant to build on, and be consistent with existing management systems.

Indeed, many of the overarching themes of product stewardship are at the heart of Responsible Care. Elements such as support and leadership from senior management and processes to implement, maintain and improve the programme along with practices such as annual reviews are all seen as essential for a product stewardship strategy.

### PROTECTING PEOPLE

‘By adopting product stewardship, states Cefic, ‘companies of all sizes can play their part in protecting people and the environment from potential harm’. And while companies are technically liable only for that part of the supply chain that they themselves manage, they need to be concerned with everything that happens to their products from start to finish.

Speakers at the 2005 Responsible Care conference in Dublin echoed these sentiments and highlighted that an effective product stewardship programme allowed businesses to respond to an array of issues and organisations from legislators, through to NGOs, the media and public. At the same time product stewardship is something that has to be implemented across all sectors of a business, from the factory floor through to sales and marketing and up to senior management.

It is Cefic’s intention that such a scenario will encourage an open dialogue within an organisation and up and down the supply chain. This is something Cefic firmly believes is possible. And being initiated by the chemical sector, such a move would go a long way to lay to rest the image the industry has of being closed and inaccessible to ordinary people.



# MOVING DATA ALONG THE SUPPLY CHAIN



to find some sort of common ground. But Newport explains that there are some simple steps that can be taken which can be applied across the supply chain.

Product stewardship is one of the pillars of Responsible Care and support from senior managers is essential to an effective strategy. At the same time there has to be a network to ensure the effective training of staff and stakeholders'. The benefits, stresses Newport, are many but an important one is that the process of implementing product stewardship not only allows the identification, assessment and management of risk, but enhances company reputation. 'As much as anything else, product stewardship establishes a strong and equitable contract which leads to trust.'

It need not be an arduous task for a distributor or producer to put product stewardship into practice, as it is possible to

whole of the business accountable.'

Trebert explains that Shell's product stewardship system has been developed over a number of years and covers product-specific health, safety, security and environment (HSSE)-critical aspects of all business processes involved in marketing, supply and distribution of products. Other benefits to Shell of the system, says Trebert, include definition of processes for managing risk associated with business activity and clarity around specific policies and strategic objectives.

These overarching or 'high-level' aspects of Shell's product stewardship system have very practical applications in the way the company is able to operate its businesses. Quoting one example of product stewardship in relation to isocyanates, Trebert explains that the company adopted the European Diisocyanates & Polyol Producers' Association's (Isopa) 'Walk the Talk' product stewardship initiative.

Originally focused on Europe, Shell took the programme to its sites world wide. In addition the scope was widened from isocyanate customers to polyol customers with training and assessment being delivered as part of the expanded programme.

Another simple, but important example of the Shell system is the company's emergency response preparedness. This includes fact sheets with information on products than can be used if the media needs to be briefed, and documentation that can easily be used as a first point of call in an emergency situation.

Trebert states that these measures, among many others, make it easy to see the business case for product stewardship. As well as business benefits product stewardship by its very nature is embedded in the prevailing legislation and by implementing best practice the supply chain is better able to meet the challenge legislation may bring.

'Product stewardship practices certainly help Shell meet regulatory requirement, but these practices will be challenged and influenced by future legislation', says Trebert.

**“Product stewardship is the way we work and communicate with our partners along the supply chain”**

**Peter Newport, BCDTA**

PRODUCT STEWARDSHIP can mean different things to different people. But as Peter Newport of the UK's BCDTA explains there is a central theme that must be common to manufacturers and distributors.

'Product Stewardship is the way we work and communicate with our partners along the supply chain to manage existing partners and new products and meet the increasing demands for health, safety, environmental protection and sustainability', says Newport.

This straightforward statement encompasses a much more complicated exercise, one where many different areas of expertise, knowledge and understanding have

operate at a number of levels, from the very basic to the more sophisticated. 'What is important is a willingness from all involved to want to see product stewardship work and a realisation that there are sound business benefits', stresses Newport.

Putting such principles into practice does have to be underpinned by effective management systems, says Shell Chemicals' Susanne Trebert, a member of the product stewardship task force within the European Responsible Care Core Group. 'With effective management systems', she says, 'product stewardship can be interfaced with functions such as sustainable development and R&D. This makes the



While product stewardship is at the top of Europe's Responsible Care agenda, many European producers have global operations and are therefore likely to implement such a strategy across all geographical businesses. Global implementation has many benefits according to Urban Jacobsson of ExxonMobil Chemicals. 'The numerous benefits are not only reflected in improved reputation, but are also seen in the businesses financial performance.'

During the Dublin conference Jacobsson spoke of ExxonMobil's role in product stewardship as one which not only sought to ensure good practice in its supply chains, but also included active par-

ticipation to train and support its partners. Support can cover a number of issues', he explained. 'This includes training of internal staff on product and SH&E information, external communication, incident and emergency preparedness as well as issue management. These all help to improve our position with a wider number of stakeholders.'

Capacity building and sharing best practice were also important aspects of ExxonMobil's product stewardship programme which Jacobsson says 'promotes excellence to improve trust and reputation for chemical products.'

These principles, among others, applied on a global basis add up to com-

petitive advantage asserts Jacobsson. While ExxonMobil's experience is based on many years of practice the company points out that it isn't about having complex processes in place. Indeed, Jacobsson stresses that good communication is the key driver for a successful product stewardship programme.

Providing compliant, accurate, timely safety data sheets and other relevant SH&E product information, and conducting customer surveys to better understand and proactively meet their SH&E needs are among some basic steps that ExxonMobil believes are useful in implementing a product stewardship strategy, beyond Europe's borders.

## VIEW FROM MAJOR CUSTOMERS

THE RETAIL sector is vitally dependent on consumers trusting the brands it sells. This in turn means that retailers need to trust the sources from which those brands and their materials are derived.

This is an alliance that could easily be destroyed by negative news concerning any of these links. So product stewardship is central to the smooth operation of this matrix.

Stephen Johnson, sustainable development manager for the Boots Group, a global retailer of personal care products, lays the case for product stewardship very clearly. 'Our stores carry 30 000 product lines based on 5000 suppliers, 5500 raw materials and 15 000 packaging components and we have to be confident about every one of our products.'

As well as customer concerns, the company also finds itself engaging with NGOs and the media. 'Our customers expect Boots to do the right thing, so we have to manage chemicals. In retail there are no second chances,' adds Johnson.

While Boots is certainly not an exception in the retail sector, it is among the leaders in having developed a coherent product stewardship strategy. Johnson explains that Boots maintains a 'priority substance' list, developed through 'transparent stakeholder dialogue'. Key to this dialogue is a language that can be understood by all sides as well as the realisation that facts as well as perception are a part of the discussion process.

'We need to debate the issues such as risk, but it needs to be in a language accessible to all our stakeholders. The relationship that Boots has developed with its supply chain and those interested in our operations is the result of hard work,' says Johnson. But he stresses that while maintaining trust was hard work, it was also the driver for improving supply chain relationships and points out that for each individual their concerns were real and legitimate.

'It is important to recognise that the "chemicals debate" is an evolving one and new and revised thinking has to be taken into account,' adds Johnson.

A high-profile stance on chemicals used in many everyday products could be difficult to manage, but Johnson believes that good lines of communication, a willingness to listen to all parts of the supply chain and its customers has gone a long way to allowing Boots to become engaged in complex issues related to its supply chain relationships. But if the 'chemical debate' isn't engaging all retailers, shareholders are raising the stakes and increasingly linking social and environmental practice to financial returns states, points out Unilever's Petar Sobic. 'Communication within and outside your business is the only way to build and maintain trust... Consumers are more sophisticated, they are demanding and expect responsibility and accountability from big business.'

Sobic concurs with Johnson that a sceptical media is on the hunt for headlines while NGOs and pressure groups see large global brands as legitimate targets for an ever-increasing number of campaigns. 'Our business,' said Sobic, 'operates in a goldfish bowl.'

Taking its commitment not only to its consumers but also its suppliers a stage further, in 2004 Unilever introduced a Business Partner Code. By writing to all those suppliers with which the company had a direct relationship, Unilever sought to understand where its suppliers were in relation to a number of principles that the company believes are essential to good practice. While Unilever's suppliers and customers operate on a number of levels, the initial phase of the company's Business Partner Code has been focused on what the company calls its Tier 1 suppliers, those that provide Unilever with derivatives.

The Code has allowed Unilever to begin working with its partners first to establish how compatible their standards are with Unilever's and then, where necessary, to agree on measures and timescales to achieve the desired performance levels. The 10 basic principles of the Code include compliance with all applicable laws and regulations of the country where operations are undertaken and safe and healthy working conditions for all employees. Also, products and services should meet desired quality and safety levels and be safe for their intended use.

This example of a supply chain relationship is one that not only leads to confidence for Unilever and, in the end, its customers, but has the added benefit of being a catalyst for innovation and continuous improvement. At the same time the reputation of Unilever's suppliers is also enhanced. It illustrates well the powerful potential of product stewardship.

# Setting the agenda in Dublin

This year's Responsible Care annual meeting focused closely on product stewardship

PRODUCT STEWARDSHIP, in its role as the flagship programme of the revamped European Responsible Care initiative, took centre stage at the Cefic/FECC European Responsible Care conference in Dublin on 23-25 October. Delegates heard about the essentials of this vitally important, but hard-to-define concept, and listened to important customers explain their requirements of chemical producers in relation to provision of information up and down the supply chain.

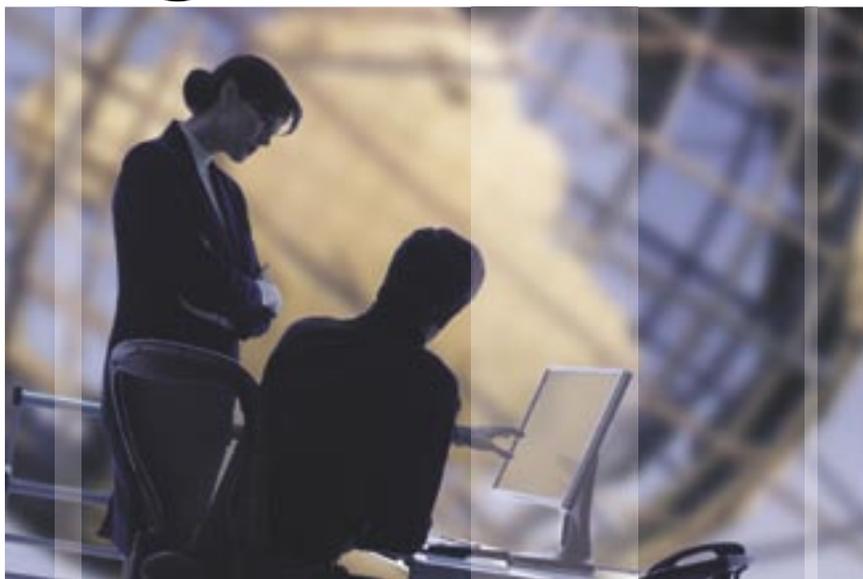
Many companies are already well down the road in implementing product stewardship, but many have not even started on the journey, stated Jim Hopwood, a recently retired member of the Cefic Responsible Care Core Group, as he introduced the final session of the meeting, intended to wrap up the previous day's workshops on the subject.

'There seems to be much talking, but not much doing', was the main conclusion of the exercise, but whether this is due to the perceived difficulties, the unwillingness to be amongst the first movers, or simply because companies are not convinced of the business value of product stewardship is difficult to pin down.

## SETTING THE AGENDA

The workshops were designed to establish an agenda for the implementation of product stewardship programmes as part of a strengthened Responsible Care, and highlight the key steps and requirements. Delegates, numbering about 120 from all across Europe, considered four issues:

- What are the key steps in developing product stewardship in Europe?
- What will be the main business benefits of product stewardship?
- What will be the difficulties of implementing product stewardship?
- What support is needed from Cefic and/or national federations?



A number of topics quickly came to the fore as key steps for development of the programme. First, communication and the need for a set of guidelines and codes so that the concept of product stewardship can be explained both horizontally between producers and vertically up and down the supply chain. Second, the integration of product stewardship into management systems and their use to drive supply chain involvement.

This is essential, as producers and distributors cannot implement product stewardship separately, and not without the participation of customers.

A third major element needed for product stewardship to succeed is in-house commitment, from the ceos at the top, to

business managers and down to all employees. Product stewardship needs to be a part of, and owned by the business, not just those specialists in the health, safety and environment departments.

This in-house commitment needs to be driven by the business case for product stewardship.

These business benefits fall into two main categories: for customers and stakeholders and for the business itself. Producers with active product stewardship programmes will earn the trust and gain credibility with stakeholders and at the same time gain confidence in the use and final fate of products at the end of the supply chain. 'This does not necessarily mean the provision of MSDSs along the supply chain but rather precise position papers outlining properties and concerns.

For the business, there are benefits in increased customer relationships and loyalty, improved supply chain management, increased efficiency and increased sales and profits. Also, incidents and issues can be mitigated and producers can learn more from their customers.

And, as a final incentive, product stewardship is an excellent preparation for Reach, the European Commission's new chemical policy for Europe.

Finally, the workshops highlighted the

### Key steps for development

#### Communication

Guidelines/codes  
Vertically/horizontally

#### Management systems

Integration  
Supply chain involvements

#### In-house commitment

Ceo/business managers  
Employee awareness

#### Other

Data quality  
Understand/anticipate markets



need for good-quality data and understanding and, indeed, anticipation of markets to make product stewardship implementation successful.

### MAIN DIFFICULTIES

So, what are the main difficulties in implementation? As you might imagine, resources emerged from most of the workshop groups as the top issue. This was followed by consistency, in terms of lack of accepted standards, over-complication and where responsibility for implementation actually lies; confusions, in terms of language and the possible overlap with Reach, and finally winning the engagement of stakeholders, the supply chain and the media.

Issues concerning resources need to be addressed through building a business case for product stewardship, through business benefit stories and examples of concrete returns on investment. Also helping to reduce the workload would be the tools and guidelines that will be developed to support the programme, supported by good quality data and

information. The benefits need to be identified. Product stewardship cannot take root if it is seen as simply a nice thing to do.

Support will, however, be needed if companies are to press ahead at the required

Support needed
<b>Capacity building</b>
Facilitate networking
Capture and share best practice
Implementation programme/road map
Vertical supply chain education/involvement
Show added value/business benefits
<b>Tools</b>
Specific pragmatic tools
Computer/web-based training
Stakeholder engagement
Performance indicators
<b>Advocacy</b>
Regulatory dividend
Opinion formers at regional/national/EU level

speed. Capacity building is required to facilitate networking and capture and share best practice.

There will need to be an implementation programme and road map and edu-

cation up and down the supply chain to drive participation.

Specific tools will also be required in the form of computer and web-based training, stakeholder engagement and performance indicators. These need to be 'simple and pragmatic'.

Finally, there will need to be an effort made on advocacy, and more pro-activity to drive the message home to opinion formers at regional, national and EU level, to reap a regulatory dividend.

Who will do what is already being worked out. Cefic and the national federations will look to build momentum through benefit capture and story sharing, while also developing the necessary road map and tools to make product stewardship accessible. They will also have a key input on the advocacy side, in gaining public acceptance for the initiative.

On the business side, companies will have to strive to achieve board/ceo buy in and then get on with the implementation. The conference agreed, 'keep it simple and just do it!'

# THIRD-PARTY BENEFITS

## External verification of Responsible Care brings public trust and business benefits

THIRD-PARTY verification of companies' Responsible Care performance would strengthen the industry's global initiative and lead to business benefits, Steven LePoole, president of the International Council of Chemical Trade Associations (ICCTA) told delegates in Dublin.

The advice was backed by Terry Yosie, of the American Chemistry Council (ACC), who added that the move to externally certificated management systems for Responsible Care 'has been a "difference maker" for Responsible Care in the US'. Government bodies, he explained, are now recognising the voluntary initiative and members are reaping benefits from lighter regulatory requirements.

In Europe, Responsible Care is moving to a management systems approach, but only requires self-assessment at present. There

is provision to introduce external verification, but this is proving contentious. Third-party verification is not a requirement under the new Global Charter, now being introduced by the International Council of Chemical Associations (ICCA), but this does stress the need to strengthen verification processes. This point, says José Maria Bach, chairman of the ICCA Responsible Care Leadership Group, 'is considered especially important by our stakeholders and customers and is one that we cannot ignore'.

ICCTA is actively looking to strengthen and support the practice of Responsible Care/Responsible Distribution through third-party verification. Already, the US, Canada and Ireland are mandating this as part of membership requirements.

LePoole said ICCTA set a goal in 2005 of having all countries signed up to third-party verification by 2009, 'a lofty goal considering the various phases of implementation in the world... progress is still too slow'. He dismissed arguments that it was too costly and of little benefit, but did admit that the absence of chemical producer support was an issue. 'If producers made third-party verification part of their agreements with distributors, it would help the business case'.

In the US, 99.6% of all third-party verifications have been completed on time, said Yosie, with verification bringing external acceptance and credits for Responsible Care. For instance, the US EPA is now recognising Responsible Care in its Performance Track initiative and OSHA is considering the same in its Voluntary Protection Program. Also, companies exporting from Canada to the US can benefit from expedited border controls under the C-TPAT agreement, as long as they are signed up to Responsible Care.



# Responsible Care Reporting 1996-2004

Responsible Care is the chemical industry's commitment to improve continuously its health, safety and environmental performance and to report on the progress made. This is our eighth successive year of reporting.

IN 2005, Cefic updated its Responsible Care HS&E Reporting Guidelines (1998) to ensure that the pan-European indicators of performance continue to be relevant to issues perceived as important by governmental bodies, legislators, politicians, the media, pressure groups and other influential bodies.

The new Cefic Responsible Care Guidelines (2005) also take into account the health, safety and environmental (HSE) data which operating sites and associations in central and east European countries are already collecting in order to comply with regulations, and to help achieve performance and economic targets. The updated Guidelines therefore continue to concentrate on a consistent set of parameters which remain focused on the environment.

All federations are encouraged to develop their own Responsible Care

reporting strategy that may go beyond the European Core Parameters and to address national or local concerns.

The Core Parameters are reviewed regularly and other indicators will be developed over time. Of particular importance will be measures to assess performance in product stewardship.

Data are being collected from the European federations against these indicators to help in the management of operations, to assist federations and companies in sharing best practice and to enable them to benchmark their performance against others.

The chemical industry continues to be one of the safest manufacturing sectors in Europe. Among chemical companies, those adopting Responsible Care have better health, safety and environmental performance than those not committed to the initiative.

## Core Parameters (2005)

### Safety and occupational health

- Number of fatalities (for employees and contractors)
- Lost time injury frequency rate (for employees and contractors)

### Environmental protection, including climate change

- Hazardous waste for disposal
- Non-hazardous waste for disposal
- Sulphur dioxide
- Nitrogen oxides
- Volatile organic compounds
- Carbon dioxide
- Nitrous oxide
- Hydrofluorocarbons
- Chemical oxygen demand
- Phosphorus compounds
- Nitrogen compounds

### Use of resources

- Use of energy, specific energy consumption
- Water consumption

### Transport

- Transport incidents

THE GRAPHS in these sections use matched samples of national data to demonstrate the evolution of the emissions using specific years as the baselines. The data used to compile the charts will be located on the Cefic website [www.cefic.org](http://www.cefic.org).



## HEALTH AND SAFETY AT WORK

DATA DISPLAYED cover direct employees of the European chemical industry. Contractor data are now starting to be collected at the European level and will be reported in due course.

### Fatalities

We are very sorry to report that among the 1m employees of the European chemical industry covered by the survey, 22 employees lost their lives at work in 2003 and a further 11 lost their lives in 2004. Every fatality is regarded as one too many and underlines the need for continuous vigilance. All fatalities are investigated and actions taken to avoid similar occurrences from happening again. The fatality rate based on number of cases per 100 000 employees is 2.23 for 2003 and 1.14 for 2004.

### Lost Time Injury Frequency Rate

The lost time injury frequency rate (LTIR) continues to show year-on-year improvement and in 2004 was the lowest on record (7.00). The LTIR is reported as the number of accidents resulting in one day or more out of work per million worked hours. It is expected that this number will show further improvement in future through the widespread adoption and implementation of a management system approach by Responsible Care companies across Europe.

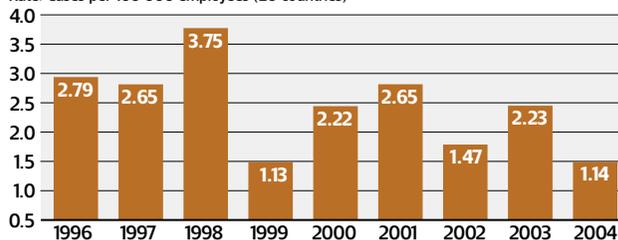
## ENVIRONMENT

MANY CHEMICAL companies have already succeeded in significantly reducing emissions from their operations and so help reduce their potential environmental footprint. Further major reductions may therefore be difficult to achieve.

It is also possible for the amount of emissions to change as a result of new companies joining the initiative, the introductions of regulations and to the changing profile of the European chemical industry.

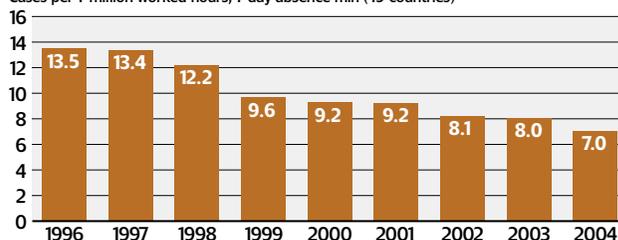
### Fatalities 1996-2004

Rate: Cases per 100 000 employees (20 countries)



### Lost Time Injury Frequency Rate

Cases per 1 million worked hours, 1 day absence min (19 countries)





## EMISSIONS TO AIR

### Non-methane volatile organic compounds (NMVOCs)

NMVOCs reflect the potential for photochemical ozone creation that is implicated in respiratory problems and ecological damage to plants. The matched sample from 14 countries is lower by about 19% since 1999 and is unchanged from last year. These emissions represent 20% of the 567 000 tonne reported by EPER in 2001, the main contributor stated by EPER as being refineries.

### Nitrogen oxides (NOx)

NOx gases contribute to atmospheric acidification and have the potential to contribute to photochemical ozone creation. Our matched sample shows a reduction of 16% since 1999. According to EPER the chemical industry is a small contributor (3.8%) to the 2.9m tonne it reported in 2001.

### Sulphur dioxide (SO<sub>2</sub>)

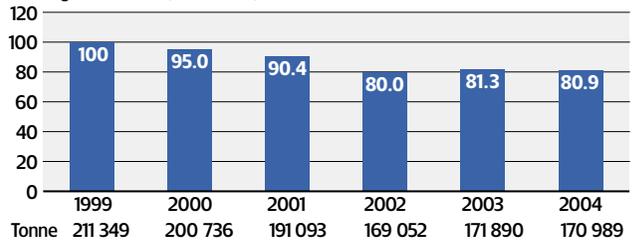
Sulphur dioxide contributes to atmospheric acidification, the main contributors being combustion plants and refineries. The chemical industry contributes <3% to the total reported by EPER. Our matched sample shows a reduction of 34% since 1999.

### Greenhouse gases

In addition to carbon dioxide, data are collected on emissions of nitrous oxide (N<sub>2</sub>O) and hydrofluorocarbons (HFCs). In Europe, the chemical industry is responsible for about 75% of nitrous oxide emissions generated from the production of nitric acid and adipic acid which is used in the manufacture of nylon 6.6. Our matched sample of nine countries shows a reduction of about 9% since 2002. A more complete matched sample covering all countries reporting nitrous oxide emissions will be available for reporting in 2006. Six countries record HFC emissions which totalled 489 tonne in 2003 and 466 tonne in 2004. This represents a 9% reduction.

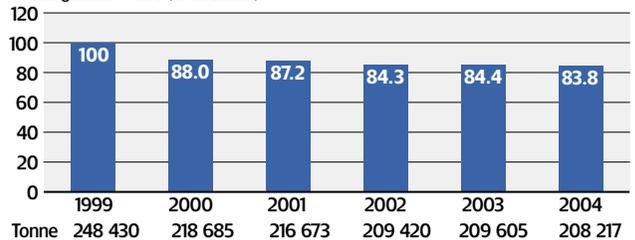
### NMVOCs

% change base = 1999 (14 countries)



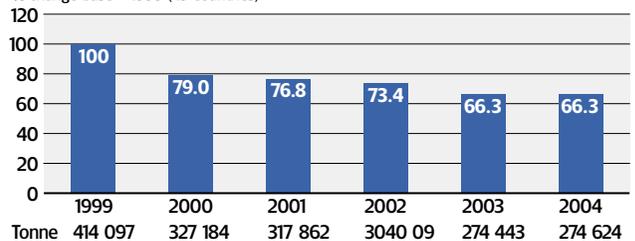
### NOx emissions

% change base = 1999 (18 countries)



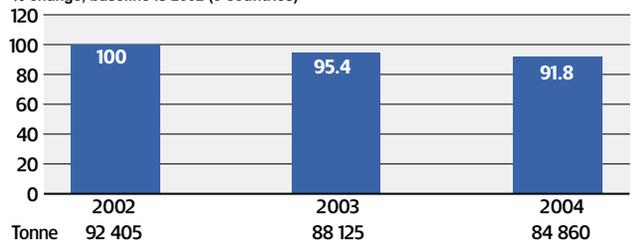
### SO<sub>2</sub> emissions

% change base = 1999 (19 countries)



### N<sub>2</sub>O emissions

% change, baseline is 2002 (9 countries)





## EMISSIONS TO WATER

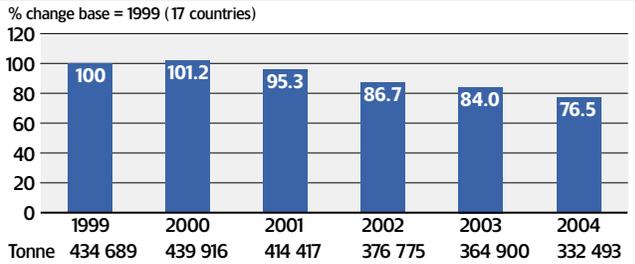
### Chemical oxygen demand (COD)

COD is the potential of chemical emissions to water to remove dissolved oxygen that would otherwise support fish and other aquatic life. In our matched sample there has been a reduction of about 24% since 1999.

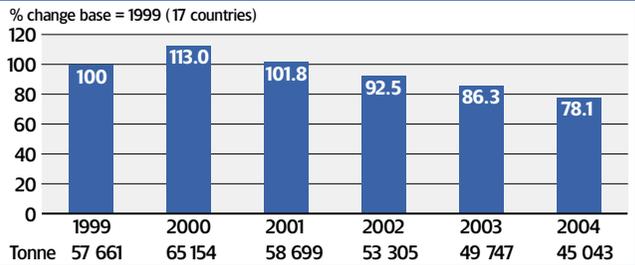
### Nitrogen and phosphorus

Release of these two elements into water has the potential to result in eutrophication. Chemicals are a major source of these emissions. In our matched samples nitrogen emissions to water are down by 22% and phosphorus emissions are down by about 47% since 1999.

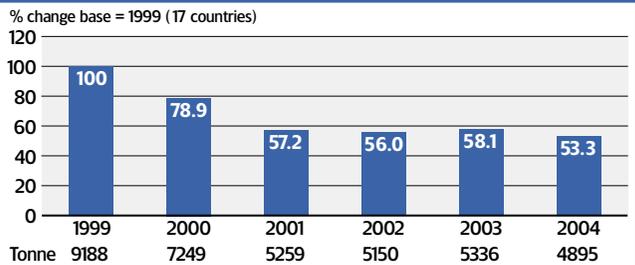
### COD



### Nitrogen to water



### Phosphorus to water





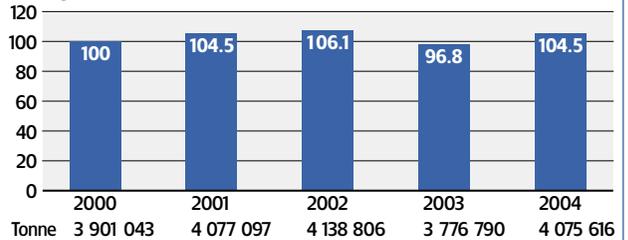
## WASTES TO LAND

### Hazardous and non-hazardous wastes

The collection of data covering wastes to land shows variability year-on-year. The numbers do not include wastes that are confined to company landfills such as from phosphoric acid and titanium dioxide production. Non-hazardous wastes are down by about 23% since 2000 when data were first collected.

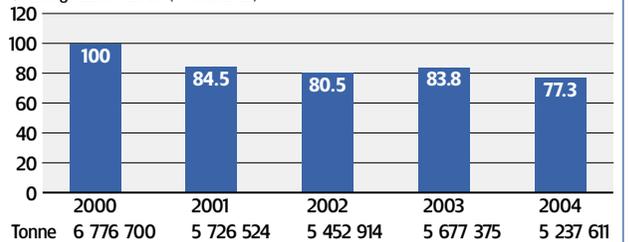
### Hazardous waste

% change base = 2000 (14 countries)



### Non-hazardous waste

% change base = 2000 (14 countries)

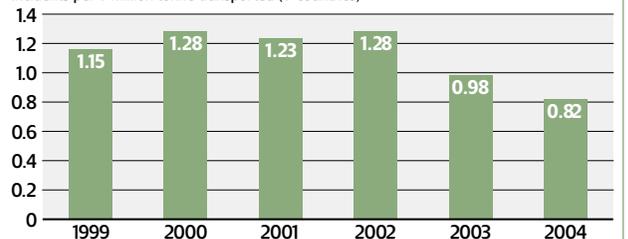


## CHEMICAL TRANSPORT INCIDENTS

THE NUMBER of incidents during the transport of chemicals by road per million tonne of product transported was down by 17% in 2004 compared with 2003 and down by 36% compared with 2002. Overall, the rail transport incident rate remains flat at 0.50 in 2004 compared with 0.56 in 1999.

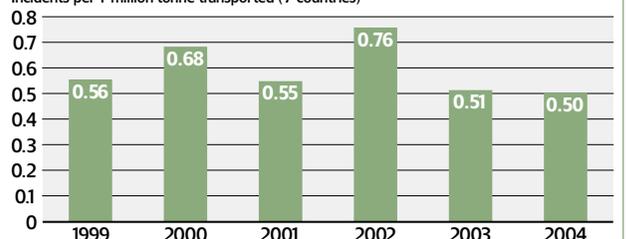
### Road Transport Incident Rate

Incidents per 1 million tonne transported (7 countries)



### Rail Transport Incident Rate

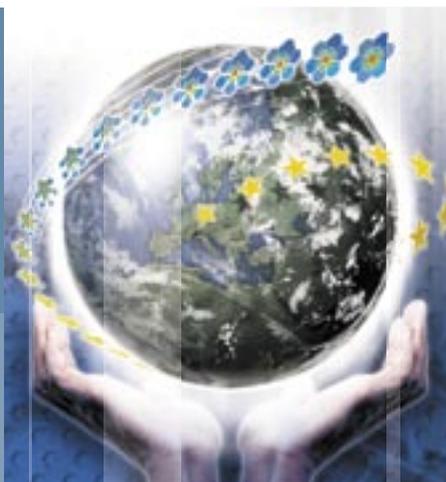
Incidents per 1 million tonne transported (7 countries)





# Charting the way

A new Global Charter will strengthen Responsible Care worldwide



THE LATEST ICCA meeting in Nice, France, this October saw the green light given to the Responsible Care Global Charter, designed to strengthen and invigorate the Responsible Care initiative, now in operation for over 20 years. The global review has many parallels with the changes now being implemented in Europe, after its review.

The Nice meeting also agreed to an associated initiative in the form of a declaration of support for the Global Charter, to be signed by chief executive officers (ceos) of multinational companies. This is the first time that the heads of major producers will have shown global support for Responsible Care, rather than regional managers in the various countries.

Responsible Care is now practised in 52 countries around the globe and although the Charter sets out to achieve greater harmonisation, it has also been designed to preserve implementation flexibility, making allowance for distinctive aspects of national laws and cultures, and business needs.

Although the Charter was finalised in January this year, and several regional events have been staged, the main international launch will be in February next year in Dubai, when the United Nations Environment Programme meets to discuss international chemicals management at ministerial level. José Maria Bach, in his role as chairman of the Responsible Care Leadership Group (RCLG) of the ICCA, admits that the pace of progress has been frustrating, but adds that it is important to maximise the opportunities to present the Charter in the most effective and responsible way. 'Clearly, there is much to be done

between now and the Dubai meeting, so the ICCA has put together a special launch team to concentrate on the task.'

The Global Charter is the result of a major strategic review of the global Responsible Care initiative, launched in May 2003 with the intention of focusing on enhanced industry performance, sustainable development and the industry's reputation. It was expected to result in the development of more consistent core commitments that can be implemented at the same level by all nations that adopt Responsible Care, and this is indeed what has been achieved.

## CORE PRINCIPLES

The Charter sets out six core principles that describe Responsible Care as 'a partnership between national chemical associations and their member companies, working together continuously to improve safety, health and environmental performance of their processes and products and make efficient uses of resources and minimise waste'.

Through the core principles, associations and companies are also expected to ensure they openly report on performance, have an ongoing communication with people inside and outside the industry, cooperate with governments and national bodies, and foster the responsible management of chemical products by all those that handle and use them along the product chain.

The Charter contains eight other key elements, including commitments to: advancing sustainable development, continuously improving and reporting performance, enhancing product stewardship worldwide and extending the use of Responsible Care along the industry's value chain, and supporting national and global governance processes.

Bach describes the take up of product stewardship and the extension of Responsible Care as key parts of the Charter. 'Increasingly, many of the challenges we face go beyond our factory gates into the value chain. The goal of the Charter is to extend the ethic, principles and practices of Responsible Care throughout the value chain. This should lead to improved transparency with our customers and stakeholders, and facilitate partnerships with governments and NGOs in providing information that solves rather than poses problems.'

The Charter has already seen national and regional launches in Brazil, Chile and Argentina, and more are planned over the coming months in Spain, Canada and Japan and at the Asia-Pacific conference in the Philippines. A range of information and materials has already been developed to assist in the running of these events and will be developed by the RCLG and the launch team for the UNEP Dubai summit.

As Bach stresses, 'the Charter represents a unique opportunity to strengthen and revitalise Responsible Care.'

### Global Charter core principles

- Continuously improve the environmental, health and safety knowledge and performance of our technologies, processes and products over their lifecycles so as to avoid harm to people and the environment
- Use resources efficiently and minimise waste
- Report openly on performance, achievements and shortcomings
- Listen, engage and work with people to understand and address their concerns and expectations
- Cooperate with governments and organisations in the development and implementation of effective regulations and standards and to meet or go beyond them
- Provide help and advice to foster responsible management of chemicals by those who manage and use them along the chain



# Responsible Refrigeration

## “Refrigerant choice is the best way of delivering future improvements”

Nick Campbell, Arkema, Chairman of EFCTC

THE MONTREAL Protocol on substances that deplete the ozone layer was a landmark environmental agreement resulting in the phase-out of chlorofluorocarbons (CFCs).

The chemical industry played an important part in developing and testing alternative products in unprecedented time, to enable the phase out of Ozone Depleting Substances. Despite the tight deadlines, these new products became the most rigorously tested industrial chemicals ever in terms of their safety, health and environmental performance.

The group of chemicals selected to replace CFCs (and later hydrochlorofluorocarbons, HCFCs) are known as hydrofluorocarbons (HFCs). These products are non-flammable, of very low toxicity and are highly energy efficient for refrigeration and insulation. Their widespread use has enabled the phase out of CFCs and HCFCs. At the same time they have also dramatically reduced industry's contribution to worldwide greenhouse gas emissions.

Whereas CFCs in 1990 represented about 25% of global greenhouse gas emissions, HFCs used today are responsible for around 0.5% of such emissions. That said, some environmental groups have targeted the refrigeration and air conditioning

industry, claiming that as HFCs are greenhouse gases they should also be phased out.

However, analysis of the global warming 'impact' of these products has shown that, as a rule, when used responsibly, their energy efficiency more than offsets their direct global warming potential (GWP). If their benefit are to be maximised and their environmental impact minimised, as with any chemical, it is important that they are used responsibly; a message that the European Fluorocarbon Technical Committee (a sector group of Cefic) has been promoting for the last 10 to 15 years.

### MAINTAINING CHOICE – DRIVING INNOVATION

The cooling carried out by CFCs and to an extent HCFCs, is now being replaced by a whole range of technologies, including HFCs, ammonia, carbon dioxide (CO<sub>2</sub>) and hydrocarbons. In addition, systems are now designed to contain less refrigerant than comparable systems of 10 years ago. Refrigerant use has also been improved with emissions significantly lower and system monitoring for both performance and leakage becoming more common.

Maintaining refrigerant choice is the best way of delivering future improvements in performance. Newer HFC systems are demonstrating improved energy efficiency and containment across a range of refrigeration and air-conditioning applications and equipment designers are taking advantage of these gains. For example in Japan, between 1995 and 2004, room air conditioners have become twice as efficient, which translates into approximately 10m tonne of CO<sub>2</sub> prevention.

### AN EMPHASIS ON CONTAINMENT

Whatever the refrigerant chosen, all need to be contained effectively. HFCs contribute to global warming if released, hydro-

carbons are flammable, ammonia is toxic if released and CO<sub>2</sub> operates at relatively high pressure. Globally, HFCs are considered by many as the most appropriate choice of refrigerant based on their overall technical performance, environmental impact and safety.

Containment has been shown to work and will soon form a basis of much of the regulation on HFCs in Europe. In the Netherlands, a scheme is already in place, called STEK, which has shown that containment of refrigerant can be enforced. From leakage rates of 30% in the early 1990s, emissions in the Netherlands are now at an average of 4.8%, with 92% of installations having no emissions in 1999. Costs did increase initially for end users but these have been compensated for by lower running costs and reduced downtime through equipment failure.

### REDUCED USAGE

'Reduce', 'recover', 're-use' are now very much watchwords of an industry, that continues to make strides to improve its environmental performance. New technology is designed to work refrigerants harder, which means less is needed to achieve the same duty. And because HFCs have very low toxicity and are non-flammable they are being easily recovered, recycled and re-used.

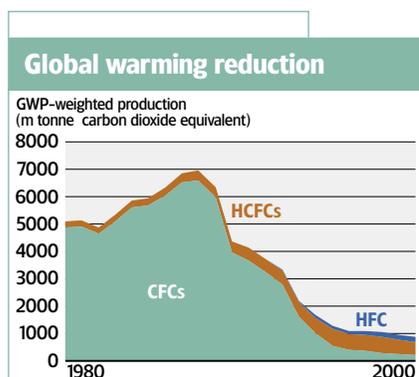
### F-GAS REGULATION

The European Commission's proposed F-Gas Regulation puts the focus on containment and monitoring of emissions. It will provide a comprehensive framework for the reporting of data on refrigerant emissions to provide a true picture of impact of HFCs that will enable informed decisions to be made on their future use.

### Medical propellants

This article focuses on refrigeration but HFCs are also the product of choice for the pharmaceutical sector as propellants used in the treatment of asthma.

HFCs have been approved by the US FDA, European countries and elsewhere in the developed world. The low toxicity and non-flammability of HFCs have made them ideal for the replacement for CFCs, traditionally used in metered dose inhalers.





# Pacopar

## wins 2005 award

**For the first time Cefic has run a pan-European award competition. The deserving winner was the 'Pacopar' initiative in Portugal**

THE DESIRE by operators of the Estarreja chemicals complex in Portugal to improve relations with the local community led them to create a multi-company community advisory panel (CAP) in 2001, called Pacopar. It was to play an important part in building increased confidence in the operations at the site.

This year, the efforts by the five companies involved in Pacopar – Air Liquide, AQP, Cires, Dow Chemical and Quimigal – have been judged unanimous winner of Cefic's first pan-European Responsible Care Award, launched in 2004 as part of its effort to strengthen and revitalise the Responsible Care initiative across Europe.

motivate other companies and sites to follow their approach anywhere in Europe.

The entry had a number of winning attributes, including the length and breadth of engagement, the fact that it was a multi-company effort and that 'there are now clear signs of success in establishing and sharing a climate of mutual trust and confidence.'

### SHARED FORUM

The decision in 2001 to go ahead with an invitation to local selected stakeholders to create a shared forum for discussion has meant that many of the local leaders have the opportunity to be in regular direct contact with the top managers of chemical



and make comments to those responsible for chemical plants. They can receive answers directly from them, as well as commitments in regard to matters under discussion,' say the winning companies. 'This free debate, together with visits to plants and observation of emergency drills, has played an important role in increasing confidence.'

### FAILURES

Earlier initiatives had largely failed prior to 2000, so companies in the complex set about forming Pacopar with a systematic approach to create an identity in which the industry would 'speak with one voice, and listen at the same time and on the same frequency'. It decided on a step-wise implementation and identified the industry's capability to deal with an emergency response as the first priority to tackle.

At this stage, and with the forum already set up, the companies decided on a few basic rules: quarterly meetings in alternate locations; each company would run the secretariat for a two-year period, and the moderator/facilitator of each panel meeting would be someone from outside the complex, with recognised authority.

It was also decided that initial Pacopar membership would one day include more local representatives. Thus, from the initial panel of mayor, fire brigade and security services involved in the emergency response structure, Pacopar has added school representatives, commerce and industry associations, and the sanitary authority.

The success of the process can be assessed, says Pacopar, by the fact that there is 'more and more receptivity to organising activities between industry and community institutions'.

**“The outreach programme was an outstanding example of good practice which could motivate others”**

Responsible Care Award judging panel

The award was presented at the Cefic annual meeting in Nice in October. The independent judges commented that the development of an innovative and effective outreach programme with the local community was 'an outstanding example of good practice, which could be used to

companies. These include the local mayor, the chiefs of the fire brigade and local security corps, as well as healthcare professionals, teachers and heads of other commercial and industrial associations.

'Membership of Pacopar has allowed them to raise questions, ask for information,



**Pacopar representatives** Washington Dantas Ribeiro of Dow Portugal and João Fugas of Quimigal receive their award in Nice from Peter Elverding, Cefic president, and Alain Perroy, Cefic director general

In the following pages, we offer a glimpse of the variety and scope of the other **25 award entries** received from nine countries

#### Team work reaps rewards

With a challenging accident target set for 2004, Schering Plough Bray in Ireland focused efforts on the poorest performing area of the site, setting up a dedicated accident reduction team. Main issues were prioritised using a 'most impact, least effort' matrix, and together with buy-in from the shop floor this ensured impressive health and safety performance improvements. The team also took an effective reporting tool – the 'safety comment' system recording all unsafe acts, conditions and near misses – and applied it company-wide. The overall exercise, which can be applied to any company or process, has contributed to real improvement in health and safety performance and awareness, as well as improved employee morale. The company has also seen clear business benefits, not least from cost savings in terms of medical follow-ups and lost time illnesses.

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#### Innovation brings advantages

Roche Ireland hails innovation as the only way to continue to meet the needs of a growing population without causing environmental damage – as demonstrated in a project to re-engineer a pharmaceutical production process based on its HS&E impacts. The project also exemplifies Roche's Responsible Care strat-

egy to reduce the potential for safety incidents and reduce exposure to harmful substances. Roche amalgamated two previously separate processes for mycophenolic acid purification and mycophenolate mofetil production. The resulting changes led to a reduction of waste and organic solvent usage, improved yields, and reduction in the number of risk exposure points. It was a win:win situation in terms of bringing environmental, safety, production and financial advantages.

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#### Sounds like a good idea

Ashland Belgium has developed a new way of treating microbiological growth in water systems using ultrasound thereby eliminating the potential hazards associated with handling and use of chemical biocides. Recirculating cooling water systems are used in many industrial processes, and conditions mean microorganisms can thrive, causing slimes that result in blockages and corrosion. They also offer the potential for growth of the bacteria that cause Legionnaires Disease. Sonoxide technology uses low power, high frequency ultrasonic sound to alter the environment in which bacterial cells can multiply, thereby creating a series of alterations within bacterial and algae cells resulting in their death. Ashland describes the system as a 'truly envi-

ronmentally friendly alternative for effective microbiological control.'

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#### Transforming hydrocarbon waste

Belgium's WOS Hautrage has developed an innovative technology with the flexibility to treat all types of liquid hydrocarbon waste and produce a range of finished oil and fuel products including biodiesel. The cracking process generates gases, which are reused, thus making the process eco-efficient and sustainable. The company exercises a rigorous safety, health and environment policy as part of its Responsible Care activities.

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#### When employees make a real difference

A company's own workforce can be an invaluable source of ideas for performance improvement. Under ExxonMobil's workforce suggestion scheme, its Meerhout Polymers plant in Belgium implemented a number of ideas involving simple, low cost changes resulting in a steam consumption reduction of 6.6 tonne/hr, and saving the company over €500 000/year. In a separate initiative, employees implemented ideas that reduced energy consumption and led to a significant drop in both emissions to air and the risk of test bin fires.

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#### A question of behaviour

Strong management sponsorship and wide-



# SPECIAL MENTIONS FOR CYPLUS AND PHARMAVISION

During the final assessment, the judges singled out two entries for a special mention of commendation.

## CyPlus

German company CyPlus, a fully-owned subsidiary of the Degussa Group, has developed a strong product stewardship and responsible management programme for cyanides throughout the entire supply chain. The judges regarded this submission as 'a super example of product stewardship', and it was acclaimed for its rigour in 'looking at everything from cradle to grave'.

CyPlus supplies cyanides, technologies and services to the mining, chemical, pharmaceutical and surface treatment sectors. Cyanides are highly toxic and require very careful handling at all stages of the logistics chain from production, storage and shipping to use and subsequent disposal. CyPlus shares its valuable experience and knowledge through various initiatives, including a major contribution to an important report by the European Centre for Ecotoxicology and Toxicology of Chemicals (Ecetoc).

Key aspects of the CyPlus approach for cyanides include:

- Intensive training and motivation of workers worldwide to ensure safe handling
- Development and implementation of model solutions to ensure compliance with safety and organisational requirements for safe handling
- Activities to raise public awareness of safe handling
- Active support for substitution by less toxic substances in the worldwide gold mining industry

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## PharmaVision

PharmaVision, based in Istanbul, Turkey, supplies contract manufacturing services to the pharmaceutical industry. Working on a 'people first' principle, the company has a strong focus on society and stakeholders in balance with the environment. The workforce, business partners and clients, neighbouring companies, and NGOs were involved in a scheme to collect and sort recyclable waste – not just from the workplace, but also domestic waste. As well as reducing the burden on the environment, PharmaVision identified the project it would fund with money raised from the recycling effort: building a school in the Duzce region which suffered badly in the devastating 1999 earthquake. The school opened in 2001, with additional facilities added between 2002 and 2004. It has around 300 pupils aged between 6 and 14 years.

The judges described the company's activities as 'inspirational'. The project was liked for the way it highlighted very different aspects of Responsible Care – pollution prevention and outreach – and because it required strong employee involvement and commitment. It was also commended as a demonstration of industry putting something back into society.

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spread workforce involvement helped ensure the success of this safety programme at ExxonMobil's Antwerp Polymers plant. The company's Safety Excellence Programme (SEP) involves analysis of past incidents and near misses and workforce interviews to identify root causes of at risk behaviours and behaviours which contribute to avoiding accidents. A dedicated team took on the task, using humour to get across messages in a poster campaign and developing effective, practical tools and activities to eliminate the root causes and encourage safe behaviours. A high-profile launch to the programme was followed by four 3-day workshops to train 100 key people; 31 SEP trainers then ran one-day workshops for 500 employees and contractors.

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## Cleaner air

Cytec Surface Specialties' Schoonaarde plant in Belgium supplies acrylates for the production of Radcure resins used in quick-dry applications. The process involves reacting a polyol with acrylic acid in a solvent medium. The company opted for an unconventional but effective method for treatment of solvent emissions to air, resulting in an overall reduction from 1140g/hr to just 18g/hr (against a legal limit of 3000g/hr). Cytec was the first to install this kind of air treatment unit on an industrial scale and the supplier has visited the plant with potential customers. Employee health and safety, and yields have also improved since the unit's installation; energy costs are



down; and costs will be recouped within three years. It was the highlight of an open door event held for plant neighbours in 2003.

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#### Making a dramatic difference

Latex foam manufacture needs large quantities of high quality water for the production process and steam supply. Dutch producer Latexco based in Tielst sought to improve on its end-of-pipe solution for the treatment and recovery of wastewater containing latex. Its choice – evaporation – has enabled a 45% reduction in demand for high quality water, recovery of ammonia, reuse of waste sludge, minimal energy consumption, no emissions to air, reduced CO<sub>2</sub> emissions and a big reduction in raw materials consumption. In addition, these environmental benefits have translated into a series of economic and social benefits, from improved working conditions to major reductions in waste loads and environmental levies.

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#### A personal approach

With a presence in Rosignano since 1912, Solvay Italia recognises the importance of good communication with its neighbours. The company has put in place a series of initiatives to familiarise the community better with its plant, promote dialogue with a diverse range of stakeholders, and cooperate with local organisations. The Rosignano Solvay site is piloting social respon-

sibility reporting for the group, which has further focused its engagement with the community. It has published sustainability reports since 2002. A periodic survey measures workforce satisfaction and identifies key areas for performance improvement.

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#### An all-round approach

Health, safety, environment, stakeholder engagement and product stewardship – all elements that DSM Capua in Italy seeks to ensure are driven by continuous improvement under the principles of Responsible Care. At the core of its safety focus, for example, is STOP – a Safety Training Observation Programme, which combined with other initiatives has resulted in over 2300 injury-free days at the site. The holistic approach extends to reputation management: the DSM Capua site has been identified by the local authorities for its safety achievements and events organised to enable the company to share experience with other industries.

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#### Implementation as a joint commitment

Bayer Industry Services' entry illustrates the benefits of working with ones peers. Nearly 20 companies – including non-Bayer businesses – participate in the annual Responsible Care campaign at the Leverkusen Chemical Park under a joint initiative. A detailed Responsible Care intranet site in both English and German supports communications and is accessible to all the

partners. Good examples are shared, with a contact name for follow up. The partnership approach has been in place since 2000 and each year, a particular campaign theme is selected. Competitions with prizes get people involved and motivated, and a dedicated 'campaign day' included displays illustrating Responsible Care implementation for employees, their families and the local community. In 2004 efforts focused on conserving resources.

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#### LCD recycling at Merck

Liquid crystal displays are produced in ever-increasing numbers, and currently the most common legal disposal method is to landfill. Recent legislation such as the EU directive on waste electrical and electronic equipment (WEEE) requires the future reuse, recovery or recycling of LCDs, but the problem has been a lack of an economic or ecological recovery process until now. Roughly 85% of an LCD panel is glass, the balance being polymers and the sealed liquid crystal mixture. Merck in Frankfurt, Germany, has carried out successful trials using both high temperature incineration and metallurgy processes that achieve recovery rates of around 99%. Even though Merck is only involved in producing a minor part of the LCD – the liquid crystal – it has committed itself to an approach that offers an environmentally sound way to deal with the final product.

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### Every drop counts

At its Stade complex in Germany, Dow Chemical produces 1.4m tonne/year of chlorine, with over half used to produce propylene oxide. The primary resources for these processes are 30m<sup>3</sup>/year of river water taken from the Elbe and 5m tonne/year of salt. Under its Responsible Care activities, Dow sought to conserve these resources, improve environmental performance and reduce operational costs. It has achieved a world first with development and implementation of a closed loop process for brine, chlorine and PO production. The project resulted in conservation of 7m<sup>3</sup>/year of river water and 600 000 tonne/year of salt and a 23% reduction of annual salt discharge and of total organic carbon discharge to river Elbe; with €500 000/year savings in waste water fees. Moreover, the €3.3m project costs were recovered by pay back of wastewater fees after approval by the authorities in early 2004.

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### Zeroing in on contractors

Standing for Optimal Partnership, OptiPart is a strategy developed to better integrate Dow Chemical and its contractor companies. OptiPart provides for a team with representatives from the eight main contractors at Stade, Germany, as well as from Dow. The OptiPart Charter sought 'visible improvements for both contractors and Dow in the areas of safety, technology, quality and cost,' with introduction of: dialogue as equal partners, continuous feedback between partners, confidential handling of sensitive information, and frequent dialogue about

progress on improvement proposals.

In just two years, the benefits are clear: improvements in turnarounds, communications; less waiting times; take-up of contractor improvement proposals; and less need for retraining. OptiPart has also helped Dow Stade progress towards the company's global 'vision of zero' incidents, injuries, illnesses, accidents and zero environmental harm.

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### Follow the Torch

As part of celebrations to mark its centenary, DSM introduced 'Follow the Torch' as a means to inspire employees to put forward ideas to improve the world around them. The Dutch company also provides the time and the money to enable them to realise the project. Seen as a way for employees to put their talents and knowledge to good use outside the company, the Torch programme is aligned with responsibility, one of DSM's four brand values. A variety of communications channels are important and link both internal and external stakeholders. Via the sustainability pages on the DSM website visitors can read about projects that have already been completed – from cleaning up a forest in Saltillo City, Mexico, to helping asylum seekers integrate with their local community in Puth, the Netherlands.

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### High Specs for software tool

Elementis Specialties, Delden, the Nether-

lands, developed a software tool to manage substance and product information relating to the Dutch water permitting requirements, the EU's Reach legislation, and labeling and environmental requirements. It enables users to define existing data gaps, identify related costs and generate reports. A valuable tool in helping chemical firms carry out effective product stewardship, it has been made available free of charge to all member companies of the Dutch chemicals association VNCI.

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### In a class of their own

Chemical companies Arkema Vlissingen, Broomchemie, Dow Benelux, Eastman Chemical Middelburg, Thermphos International and Yara Sluiskil joined forces with other Dutch organisations and the local authorities to work on this project, which sought to integrate sustainable entrepreneurship with company strategy. A key activity is the so-called Master Class Corporate Social Responsibility, developed in collaboration with local authorities in Zeeland and Dutch chemicals association VNCI. The VNCI is using the project as a pilot for the whole industry. The Master Class has resulted in development of a useful tool to help the chemical industry shape its CSR agenda and established a valuable company network.

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### Putting CSR into practice

Solvay Pharmaceuticals submitted a selec-



tion of examples to demonstrate its CSR activities, both internal and external. Local residents were consulted on a new building project at the Olst site in the Netherlands, and their objections resulted in various modifications. Local residents were kept informed of coming activities via a weekly progress letter. Solvay also took up suggestions to landscape the site. It is working closely with the local authority on plans to enhance the local river valley and is relocating its car park to enable creation of a cycle path and water recreation activities. Solvay also highlighted a world first in a new technique for sterile filling of hypodermic syringes, which saves energy and reduces solvent emissions. In another project, the company has made substantial savings in syringe packaging material and energy costs.

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### Minimising environmental impact

DuPont has made significant strides to prevent emissions of its *Suva* refrigerants during the entire product lifecycle – from production, through to use and disposal. This has involved efforts at the Dordrecht production site in the Netherlands, plus working with the logistics chain and customers. The main issue is to minimise air emissions that contribute to global warming and represent a financial loss. A package of measures included recovery of residual gases from the storage and mixing tanks and emission-free sampling; recovery of residual contents of containers used for shipment; emission-free unloading of bulk shipments to customers; and replacing

incineration with take-back of used product and cleaning for recycling. This product stewardship initiative not only makes financial sense, but benefits the environment with a reduction of 60 000 tonne of CO<sub>2</sub> equivalent in terms of greenhouse gases, involves distributors and customers, and improves health and safety by reducing worker exposure to product during loading and unloading.

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### A double opportunity

A dedicated group of employees at Engelhard's De Meern plant in the Netherlands realised that proper control of waste-water quality created an opportunity for productivity savings. Several wastewater streams combined into one stream leaving the plant to the sewer. This wastewater was purified and analysed three times a day in order to meet compliance with local permits. The change required moving from a reactive analysis to proactive monitoring before water leaves the site and disconnecting the wastewater streams from the plant to avoid unplanned shutdowns. Online analytical equipment alerts operators if emissions are detected and enables the affected stream to be disconnected and relayed to emergency storage. Additional changes have resulted in further benefits such as heat recovery from wastewater; storage and use of rainwater, and saving on water costs; and lower sewer taxes. Combined savings of around €320 000 have been achieved and the learnings are being shared with other sites.

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### A novel experience sharing

The procedures involved in obtaining any kind of certification require specialist knowledge, money, time and human resources. As one of Poland's largest chemical companies, Zakłady Azotowe Kędzierzyn (ZAK) at Kędzierzyn-Kozle is familiar with those procedures. But it is less easy for others, particularly not-for-profit organisations. When 'Promyczek', a local welfare centre for disabled children, applied for certification to raise and enhance its profile as a provider of a safe environment for these children, ZAK decided to share its certification

experience with the centre. Thus began an innovative partnership whereby chemical company employees acted as consultants and advisors to help the centre obtain its management certificate. Over a four-month period, this involved ensuring quality, safety and environmental protection criteria were met, assisting with document preparation, carrying out risk assessment, and conducting workshops prior to the audit. In addition, ZAK helped negotiate a discount for the centre from the certification body.

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### Building community relations

Turkish soda ash and chromium chemicals manufacturer Soda Sanayii acknowledges that innovation did not have a lot to do with its entry, but stressed the successful of its 'conventional Responsible Care approach.' It has used Responsible Care to focus its outreach efforts on the local community as well as improving health, safety and environment activities. Over the past few years the company has developed a wide ranging and effective community awareness programme which has cemented relations with neighbours and raised awareness of Responsible Care.

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### Practical approach to safety

Steam cracking furnace tubes require periodic replacement, involving a lot of manual work in difficult locations with restricted access. Historically, the process has often involved injuries to employees and contractors. At ExxonMobil's Fife ethylene plant in Scotland, small teams were set up for the latest retube to carry out detailed risk assessments of all the tasks to be undertaken. The causes of unsafe behaviours were identified and steps taken to remove them, involving a number of equipment innovations. The result was 17 000 hours worked without any safety incidents and reduction in downtime of several days compared to previous retubes. Involvement of the workforce in analysing and improving their work environment with real attention to detail was key to success.

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### Cefic Vision for Responsible Care Performance

- No harm to employees, contractors and the general public from our operations
- No adverse environmental or public impact resulting from the operation of our plants or in the distribution of our products
- Continuous improvement in the efficient use of the planet's resources
- Provision of products meeting customer requirements that can be manufactured, transported, used and disposed of safely
- The chemical industry is accepted as an open, honest and credible industry by all its stakeholders and the general public
- General and public recognition that the chemical industry is a responsible industry playing an important role in bringing a wide range of benefits to society

For details of the national Responsible Care programmes go to [www.responsiblecare.org](http://www.responsiblecare.org)

### Cefic – The European Chemical Industry Council

Cefic is the Brussels-based organisation representing national chemical federations and chemical companies in Europe.\*  
Cefic represents, directly or indirectly, around 29 000 large, medium and small companies in Europe which employ about 2 million people and account for more than one-third of world chemicals production.

\* The EU countries, Switzerland, Norway and Turkey

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