



Markets and Companies

Environmental industry's impact

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THE NEWSPAPER

FOR THE CHEMICAL AND LIFE SCIENCES MARKETS

Markets and Companies

The chemical industry's challenge

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Newsflow

Novartis has elected to fully exercise its current right to purchase 213,888 unregistered shares of **Alnylam Pharmaceuticals'** common stock in accordance with the terms of the Investor Rights Agreement between Alnylam and Novartis, dated September 6, 2005. In connection with the execution of the 2005 agreement, Novartis previously purchased approximately 5.3 million shares of the RNAi therapeutics company's common stock, which currently represents an ownership position of about 13%.

Bayer Schering Pharma and **Currenta** signed a agreement to further optimize the disposal and re-use of substance streams between the Bergkamen, Germany site and the Chempark sites over the next five years. Under the agreement, Currenta will handle the marketing of capacities of the power station, the incineration plant for special waste and the distillation plant. Currenta, formerly Bayer Industry Services, will acquire additional quantities of substitute fuels for the power station on the external market, as well as iodine-containing waste for the special waste incineration plant and specific solvents for the distillation plant in order to achieve optimum capacity utilisation of the plants.

Celesio has declined to comment on a newspaper report saying that the German drug distribution company has held talks with Poland's three biggest drug distributors to discuss possible tie-ups. Celesio spokesman Rainer Berghausen reiterated that the company in general is holding talks, also in eastern Europe, as it seeks to identify acquisition targets and potential alliances, but he would not comment on the article. Polish daily Parkiet cited unnamed industry sources as saying that Celesio has been in contact with Torfarm SA., Farmacol and PGF on possible mergers. The three companies each control around 20% of a rapidly growing drug market in the country of 38 million people. Celesio's Chief Executive Officer Fritz Oesterle has said in the past that the German company, which also operates pharmacies, is eyeing investment opportunities in eastern European countries.

Roadmap – What is the relevance of competition law with regard to the registration of chemical substances under Reach? **Marc Besen** from **Clifford Chance** provides guidance as to how respective risks can be mitigated.

Reach represents a remarkable departure from the previous registration system of chemical substances within the EU. The registration procedure under Reach is designed to introduce a new standard of registration, the key elements of which aim at ensuring a high level of protection of human health and the environment by promoting the development of alternative methods for the assessment of intrinsic properties of chemical substances. One of the core elements of the new registration system is the joint submission and sharing of information on substances which is meant to increase the efficiency of the registration procedure and, at the same time, to reduce costs and

testing on vertebrate animals. For this purpose, the respective legal framework provided by Reach contains a number of mandatory tools, including formation of consortia and participation in so-called Substance Information Exchange Forums (SIEF). From a political and an ethical standpoint, the statutory data sharing system may constitute a significant step towards a curtailment of studies and consequent cost savings for the chemicals industry. However, from a competition law perspective, it bears a number of significant risks which warrant careful consideration.

Basic Principles of Competition Law

The main competition law rules governing undertakings' business activities in the EU can be found in Art. 81 and 82 of the EC-Treaty (EC), which are – more or less – identical to the respective national legislation of the Member States.

Pursuant to Art. 81 EC, agreements and concerted practices between undertak-

Registration Under Reach

Unavoidable Risks of Competition Law Infringements



Marc Besen
Partner at Clifford Chance

ings which have as their object or effect the prevention, restriction or distortion of competition are prohibited. As cooperation agreements under Reach, either on a contractual or a legal basis, are usually implemented by direct competitors, such arrangements are per se sensitive and can easily raise anti-competition concerns under Art. 81 EC. Moreover, since Art. 81 EC is also designed to safeguard the principle of secret competition, even the "mere" exchange of business secrets and other confidential information is also generally prohibited. This fundamental principle obviously conflicts with the new concept of mandatory joint use of information and the establishment of SEIF under Reach. Although Art. 25 (2) Reach stipulates that "registrants shall refrain from exchanging information concerning their market behavior, in particular as regards production capacities, production or sales volumes, import volumes or market shares", there remains a considerable lack of legal certainty for the com-

panies involved as to how this conflict can be circumvented in practice without infringing the strict competition law rules.

Finally, Art. 82 EC prohibits any abuse of a dominant position within the common market by one or more undertakings. According to previous decisions of the European Commission and the courts, a dominant position can be also held by a consortium. Hence, a consortium pursuant to Reach holding a dominant market position with respect to a certain substance, may infringe Art. 82 EC if it unjustifiably discriminates against companies willing to participate in the consortium ("access restriction").

Risks

Infringements against competition law may lead to the imposition of severe penalties on individuals and undertakings alike. The antitrust authorities may impose heavy fines (of up to 10% of the worldwide

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Great Expectations

Piramal Healthcare Plans to Become a Major Player

Knowledge, Action, Care

– **Piramal Healthcare**, formerly known as **NPIL Pharma**, uses the guiding principles of the **Bhagavad Gita** for its business philosophy – with success.

NPIL Pharma launched its new corporate identity and its new name, Piramal Healthcare, a few months ago. The company said the decision was driven by a desire to create a value-driven identity that unifies the diverse companies within the Piramal group. Brandi Schuster spoke with Dr. R. Ananthanarayanan, president and head of Piramal Pharma Solutions, Piramal Healthcare, about the company's recent acquisitions and ambitions for the future.

CHEMManager Europe: NPIL's goal is to be in the top three global CMOs (contract manufacturing organization) in the world. What are you plans to achieve this? When do you think this will become a reality?

R. Ananth: Yes, that is correct. We firmly believe in our goal and have been working to make it a reality. This will be achieved through both organic and inorganic, through meaningful mergers and acquisitions and continued investments in current facilities and service offerings. Our organization works on a strategic direction that we set ourselves and has helped us define our roadmap for future. We aspire to achieve our goal over the next 3–4 years.



Dr. R. Ananthanarayanan (R. Ananth)
President and head of Piramal Pharma Solutions

In which areas would you be looking to do acquisitions?

R. Ananth: Any acquisition will have to be meaningful and complement or augment our existing capabilities and provide unique technology platforms, thereby giving us a unique positioning in each category or specialism of services that we offer. We recently acquired Healthline, a Bangalore-based sterile manufacturing unit. We will be investing additional resources at this facility to expand capacity and secure U.S. Food and Drug Administration approvals. This was very meaningful acquisition to us as it broadened the spectrum of services that we offer to our customers.

We invested \$4 million in our existing facility at Ennore, near Chennai in South India to get uniquely positioned in early phase development arena. We set up new cGMP pilot plants, increased our capacities and added R&D capability. We are

further ramping up the early phase offering by increasing a significant number of chemists and creating more laboratories, kilo labs and pilot plants.

We have recently invested in our high potency facility at Grangemouth in Scotland, as it was driven by strong customer demand in the area of high potency. We have set up an additional sixth suite which does cGMP manufacturing of antibody drug conjugates.

What are your hopes for your new acquisition Healthline? What needs to be done to get the site up to FDA standards?

R. Ananth: This is an important acquisition for us, since we have now increased our sterile manufacturing and development capability. This site will be also used for clinical trial manufacturing of sterile drug products. We plan to complete certain upgrades to the facility and get it ready for FDA inspections by early 2009.

What part of the world do you want to add capacity and research facilities?

R. Ananth: I don't think we have any specific geography in mind for acquisitions as long as it is a strategic fit and complements our existing capabilities. However, we are currently increasing capacity of our early phase capabilities (both chemistry and drug product) in a pretty big way in India. We are also currently setting up clinical trial packaging as a service from our Morpeth site in UK.

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Knowing What Matters to Your Customers

Getting Acquainted – Consistent gearing towards the requirements and needs of your customers is a fundamental prerequisite of business success – and of sustainable growth. How well, though, do companies in the chemical industry know the market requirements of their customers and key issues that concern them? And where do companies in the consumer industries see their priorities?

At www.chemanager-europe.com/c3x, executives of European chemicals companies can become members of the C3X top management panel of CHEMManager Europe and the consultancy firm A.T. Kearney, and put their customer orientation to the test. Executives of the most important customer industries can also register as members – and thus make a crucial contribution to being better understood by their suppliers in future.

It is particularly true of the chemical industry, which supplies products to a wide variety of customer industries, that if you want to be successful you have to understand your customers and their needs. This, though, in a market environment subject to constant change, is becoming increasingly difficult: Global trends, such as diversification, individualization and the growing importance of sustainability bring changes to customers' requirements in their wake. In associa-



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tion with this, value chains are becoming more complex and in some cases even have to be interpreted differently from one region to another.

At the same time, chemicals companies are also faced with ever-increasing demands from their customers. They are competing with other supply structures that continuously adapt their services to match the changed customer expectations. The consequence is a wealth of new possibilities – including entirely new competitive structures and business models.

Anyone who wants to outperform their competitors under these circumstances and achieve lastingly value-enhancing growth has to be working constantly to optimise their business strategies, overhaul their business portfolio and improve their operating efficiency.

"It is just as important however – and this is frequently underestimated – to focus systematically on the market requirements and expectations of your customers – and on those of your customers' customers, and ultimately those of the end consumers. And it is not only today's needs that matter, but also those in the future. A lot of industry players have still got

considerable room for improvement in this respect," said Thomas Rings, vice president and head of global process industries practice at A.T. Kearney.

New C3X Top Management Panel

How well do companies in the chemical industry know the market requirements of their customers? Is this knowledge reflected in corresponding product and process innovations? And does the suppliers' strategic alignment match the customers' actual priorities?

To get to the bottom of these questions, the management consultancy A.T. Kearney and CHEMManager Europe have decided to set up a top management panel: the Chemical Customer Connectivity Index (C3X Index). The aim is to produce a highly detailed picture of the issues surrounding the customer-supplier relationship in the European chemical industry today and in the future.

Within the context of the C3X index, top executives of leading European chemicals companies and companies in customer industries will be surveyed about customer-related matters at regular intervals. Each round

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SALES & PROFITS

Sabic's Proposed Sukuk-III Assigned 'A+' Standard & Poor's Ratings Services assigned its 'A+' local currency senior unsecured debt rating to the proposed Sukuk-III maturing 2028 issued by Saudi Basic Industries (Sabic). Under an asset transfer agreement, Sabic has transferred certain rights and obligations for specific marketing agreements, which represent the sukuk assets of Sabic Sukuk, a 100% subsidiary of Sabic. The company will be required to purchase the sukuk from the sukuk holders when they exercise their right to require Sabic to redeem their sukuk. However, Standard & Poor's considers that the sukuk holders benefit from diversification in cash flow streams, strong brand recognition, and cash holdings at Sabic, and therefore equalizes the sukuk rating with that on Sabic.

► www.sabic.com, www.standardandpoors.com

Bayer Long-Term Rating Raised to 'A-' Standard & Poor's Ratings Services raised its long-term corporate credit rating on Bayer to 'A-' on reduced debt from 'BBB+', owing to its strengthened financial policy and reduced debt. The 'A-2' short-term rating was affirmed. "We now expect that Bayer will reach and sustainably exceed adjusted funds from operations (FFO) to net debt of 35%, our financial requirement for upgrade to 'A-'," said Standard & Poor's credit analyst Olaf Toelke. On March 31 Bayer's total financial debt was €14.4 billion including its €2.3 billion mandatory convertible bond and €1.3 billion hybrid bond-compared with €19.8 billion at the end of 2006.

► www.bayer.com, www.standardandpoors.com

Lyondellbasell: 'B+' Rating affirmed Standard & Poor's Ratings Services revised its outlook on the Netherlands-based Lyondellbasell Industries and related entities to negative from stable. The 'B+' long-term corporate credit rating was affirmed. The outlook revision reflects the increased risks Lyondellbasell faces in 2008, including weaker economic growth in the U.S. and Europe and a significant increase in oil prices. Propylene prices even declined in Europe and were unable to offset the significant increase in naphtha prices. In addition, the company spent about \$800 million on acquisitions in the first few months of 2008, further increasing its liquidity needs.

► www.lyondellbasell.com, www.standardandpoors.com

Greenpeace Ignores Fire Safety for Electronics

Ignoring the significant fire danger that electronic products can pose if they overheat, Greenpeace has stepped up its campaign against electronics manufacturers that use brominated flame retardants to provide fire-safe consumer electronics. Greenpeace wants to force the manufacturers to stop using the best scientifically documented flame retardants, which have been proven to be safe from an environmental and human health point of view. On the contrary, the Bromine Science and Environmental Forum urges electronics manufacturers to act responsibly and to use brominated compounds. Recent incidents with music players, computer batteries and game consoles bursting into flames illustrate the danger.

► www.bsef.org

Lanxess: Demand for 'Green Products' in China

Lanxess is banking on growing demand for more environmentally compatible products and systems solutions in China, its most important Asian sales market. "Sales of our 'green' premium products in China have risen significantly in the past twelve months. We expect this trend to continue and to have a positive impact on our business in China," stresses Lanxess-Chairman Axel C. Heitmann. The company's analysis indicates that growth of this "green business" could provide double the rate of overall market growth in China. Lanxess already has an extensive range of environmentally compatible products. For example, the Functional Chemicals business unit manufactures heavy-metal-free dyestuffs for plastic bottles.

► www.lanxess.com

Lewa Is Growing

For the purpose of continued growth, Lewa is expanding its international presence. As a result, the company is currently restructuring its after sales sector. In North America, Lewa is improving its offer, and with the purchase of Capital Process Equipment in Houston, is strengthening its competence in the oil and gas sector.

► www.lewa.com

Predicting Future Accidents

Trevor Kletz said that human error is the most likely cause of industrial accidents in the next 15 years. He spoke at the Institution of Chemical Engineers' (IChemE) Hazards conference, where over 300 international safety experts have gathered. The 85-year-old Kletz, who worked for chemical giant ICI for over 40 years as one of the UK's first process safety advisers, said that lessons from the past can highlight the likely problems of the future: "While designs may have changed, people have not. All errors are human errors. We must talk to each other about how to prevent accidents. Discussion is more effective than lecturing."

► www.icheme.org

DSM Opens PA4T Plant

Royal DSM has activated a market development plant for PA4T, the new polymer for use in electronics and other applications. The plant is located in Sittard-Geleen, the Netherlands, where DSM has its worldwide R&D center. PA4T answers market trends that call for miniaturization and the convergence of electronic devices. In particular it addresses market needs for lead free surface mount devices such as circuit boards used in personal computers, as well as the current move towards halogen free electronics. In lighting, such as LEDs, DSM expects PA4T to support requirements for high reflectivity, high temperature resistance, high mechanical strength and low out gassing.

► www.dsm.com

Changes At Penta

At Penta, a cooperative venture of European independent chemical distributors, the election of the company advisory board resulted in a change of generations: Günter Späth (CFC Jäkle Chemie), long time chairman of the advisory board, and Uwe Klass (CG Chemikalien), also a long-term vice-chairman of the advisory board, both retired from the council. For the first time in the 40-year history of Penta, the newly elected advisory council will be chaired by a non-German shareholder, namely Franz Christ from Thommen-Furler. Manuel Fischer-Bothof (A.+E. Fischer Chemie) will support him as vice-chairman, as well as board of members Jürgen Martin (Hugo Häffner) and Peter Stockmeier (Stockmeier Chemie).

► www.pentachem.de

Unleash Your Pricing Power

Be Determined, Confident and Disciplined

Weapon of Choice – Pricing is seldom an area that business managers talk about with great enthusiasm. Pricing is often the centerpiece of tense negotiations with their largest customers.

Pricing is the favored weapon competitors use to steal market shares with. Internally, pricing is often the source of conflicts between different functions within the company. Those people with the spread sheets, income statements and responsibility of costs have usually different pricing ideas from the customer contact people. Pricing is seldom a "friend." The following article describes how managers get prepared to manage prices more professionally in the current market environment and what it takes to get from "good to great" in pricing.

*The good news is that prices are going up in many markets.
The bad news is that costs are rising even faster.*

Looking at pricing today, there is good news and bad news: the good news is that prices are going up in many markets. The bad news is that costs are rising even faster. This means price management does not have to deal with prices only, but also with steering and controlling of margins. The strongest pressure point today is the transformation of raw material cost increases into higher prices. This is why pricing has moved to the top of executive agendas, and, of course, because of the leverage of prices on profit which is highest among the four profit drivers price, variable cost, fixed cost and volume. Furthermore, pricing works in two directions: no lever can increase profits more quickly than raising the price a percentage point or two, but at the same time nothing will drop profits through the floor faster than letting the price slip down a percentage point or two.

Some Observations In Pricing

In almost all major companies in the chemical industry global pricing initiatives are in place. In our experience, these initiatives develop a company's pricing capabilities over a three-stage roadmap.

Pricing initiatives usually start with gaining more transparency into pricing. Are all our prices right? Do we charge our C and D customers more than our A and B customers? Is the price spread across customers too big? These are the questions typically addressed. Pricing tools for internal data analysis are installed. Internal benchmarking and outlier analyses are performed to detect the "low hanging fruits" in pricing. Efforts are made to gain a clear view on cost-to-serve and activity-based costing to identify unprofitable customers and derive corrective actions.

As a next step, companies start giving a more structured, internal guidance on prices to the sales force in the form of differentiated limit and target prices. These guidelines are based on value considerations. Product and service values are investigated and customer segmentation approaches



Andrea Maessen
Simon-Kucher and
Partners

are used. Do we differentiate our service offerings and our prices for the "want it all" or "want the product only"-customers? Are we competitive enough in pricing our commoditized, me-too products and do we fully capture the value for our specialties?

Furthermore, companies introduce price corridors to align prices on a global scale in order to slow down price harmonization trends and coordinate cross-border pricing. The biggest challenge here is to raise prices in low price countries. As these countries are usually the largest volume ones, it is easier said than done.

The guideline development is followed by an enhancement of sales capabilities and the pricing skills in sales. Companies train their sales force in new processes in pricing and value selling. Sales force incentives reward special pricing performance with bonuses or variable compensation schemes.

Finally, pricing is finding its ways into organizational structures as well. Dedicated pricing functions are installed in order to support informed price decision making. So called "Pricing Officers" or "Pricing Marshalls" manage broad price information systems and support and facilitate the pricing process. It is important to note that the "Pricing Officers" are not pricing managers. They are not making prices, but supporting price decisions. Their responsibility is to make sure that the pricing process keeps on running.

Key Success Factors: Get From 'Good to Great' in Pricing

Having done all this, is success now just a question of time? This is not the case. There are three success factors in pricing in order to get from "good to great": First, to be determined, second to be confident and third to be disciplined.

To be determined means that targets in pricing must be crystal clear. Of course, the ultimate target of any (pricing) strategy is to increase profits. However, in practice we frequently find that some managers are unwilling to make hard decisions about price because the decision could result in a loss of market share. Other managers are unwilling to lower margins even in the face of severe competition and declining market share. Either approach on its own is rationally not profit-driven. Profit is driven by percent margin and volume. This means both, margin and volume, need to be managed together. Setting targets in pricing requires managing the trade-off between margin and volume. This trade-off involves the willingness to lower prices in the case market opportunities can be exploited and volumes increased. This trade-off also involves the willingness to give up volume by raising prices. One has to balance both – and you need to know what you want.

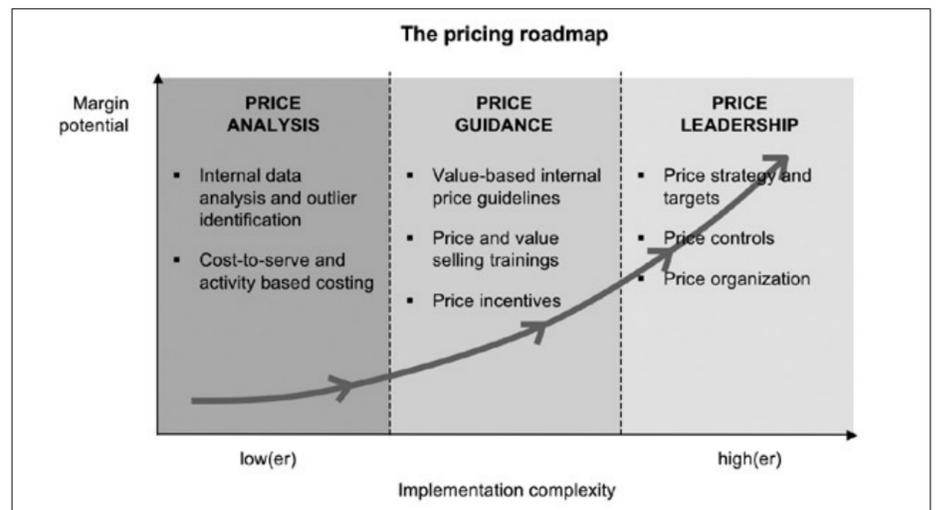
To be confident in pricing means to have the "we get what we deserve"

Strategy Forum

Simon-Kucher & Partners will conduct its 32nd strategy forum on June 11 in Cologne, Germany. The topic will be "Cost increases: Friend or foe in pricing? Price management in dynamic environments." For further information please contact Renate Prokesch (e-mail: renate.prokesch@simon-kucher.com).

mentality and the confidence to be able to go for it. How to achieve price confidence? Price confidence is achieved by being well prepared. It is about knowing how important the customer is to us and knowing how important we are to the customer. It is about understanding our competitive performance and having a predefined argumentation line in place. It is about having a clear walk-away point defined and a deep understanding of how to create a balance of power at the customer. Checklists for preparing customer visits, Q&A documents, a presentation document for the customer or even rehearsals for important negotiations are needed. One has to be prepared if one desires confidence in pricing.

To be disciplined in pricing means to consistently follow the pricing targets irrespective of the hard fights with the customer when increasing



the price and the fear to lose a customer. A disciplined pricing means having rules and guidelines and a set of response patterns in place in order to manage prices over time towards the targets. Everyone in the organization has to stick to these rules and "walk the talk." Disciplined pricing is a prerequisite of being predictable in pricing. This also means: no price concessions! Price contamination

has to be avoided. Price contamination occurs when one price concession prompts other customers to ask for similar concessions when they sit down at the negotiation table, prompting again other customers to ask and so on.

This is what it takes to get from "good to great" in pricing: be determined, be confident and be disciplined. This is easier said than done.

Seneca once said: "Per aspera ad astra." This is true for pricing: "To the stars through difficulty."

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Lanxess: Strong First Quarter



Axel C. Heitmann
Chairman, Lanxess
board of management

Specialty chemicals group Lanxess had sales of €1,535 million in the first quarter of 2008 (Q1 2007: €1,711 million). Adjusted for portfolio and currency effects, sales grew by 8.1% year on year. Reported sales declined as expected, coming in 10.3% below the prior-year quarter.

Ebita pre exceptionals rose by 0.5% to €220 million (Q1 2007: €219 million), with selling price and volume increases more than offsetting adverse raw material price and currency developments. The prior-year

figure contained earnings of roughly €10 million from the since-divested Lustran Polymers activities.

The Ebita margin before special items rose by a substantial 1.5 percentage points to 14.3%. Net income improved significantly, moving ahead 13.2% to €103 million (Q1 2007: €91 million).

"Through our strict alignment toward premium products with leading market positions, we once again achieved above-average corporate success in a challenging market environment," commented Axel C. Heitmann, chairman of Lanxess' board of management. He said group sales benefited from 3.8% higher prices and 4.3% volume growth. "We succeeded in passing on the increase in raw material costs in all segments," Heitmann added.

▶ www.lanxess.com

Evonik. Power to create.



Registration Under Reach

Unavoidable Risks of Competition Law Infringements

Continued Page 1

turnover of the undertaking). In this respect, it has to be taken into account that the European and national competition authorities have been extremely active in the chemical sector over the last couple of years in imposing record fines on the

Any consortia under Reach should – under no circumstances – be used to agree on engaging in any form of anti-competitive conduct.

transgressing undertakings. Additionally, competitors and customers detrimentally affected by the anticompetitive behavior may sue the companies involved for civil damages. Some jurisdictions provide for disqualifications for the individuals concerned or even criminal penalties. Apart from that, agreements which infringe these rules are void and, thus, cannot be enforced in practice.

What To Do?

Apart from clear-cut cases such as price fixing, market/customer allocation or limitation of output or sales, the legal assessment as to whether a certain activity under Reach constitutes a breach of Art. 81 or 82 EC depends on a number of criteria, such as the overall market volume or the market shares of the undertaking involved. Thus, there is no patent remedy for every single conceivable case. However, as a first step towards prevention of infringements of

the relevant competition law regulations, undertakings are advised to adhere to the following basic principles:

- As a general rule, any consortia under Reach should – under no circumstances – be used to agree on engaging in any form of anti-competitive conduct.

- The companies should implement appropriate preventive measures, such as involving internal or external legal counsels or agreeing on a specific code of conduct at the very outset of the registration procedure.

- Any consortium activity should be extensively and properly documented (e.g. by the legal department). Transparency provided by exhaustive documentation is certainly one way of safeguarding against accusations of anticompetitive agreements or concerted practices.

- All employees involved in the implementation of Reach should receive competition law compliance training on an ongoing basis.

- Clear lists of dos and don'ts usually provide invaluable guidance to employees who are inexperienced in recognizing and handling competition law matters on a day-to-day basis.

- The exchange of information (e.g. in SIEF) must not en-



compass any competitively sensitive information (such as prices, margins, capacities, strategies, etc.). In other words, any exchange of data should be reduced to a bare minimum required by the regulatory requirements under Reach (i.e. mainly technical data with no relevance to the companies' behavior in the market). Any such data received should not be circulated internally and especially not to the business units.

- In order to further mitigate the risk of an unlawful exchange of data, the data collecting and compilation process could be performed by an independent third party (e.g. a neutral agency). The same would apply to the allocation of costs if the companies did not choose a pro capita al-

location but an allocation on the basis of sales or market shares.

- Access to consortia should be kept open to all interested undertakings irrespective of the concrete market situation. An open consortium based on transparent and fair conditions (access, costs, etc.) is very unlikely to raise suspicions of discrimination against potential competitors. Especially with regard to an abuse of a dominant market position, the consortium members would be able to disprove the suspicion of boycotting or squeezing out undesirable competitors.

Conclusion

The new registration system established by Reach bears a

number of significant risks from a competition law standpoint. This applies especially to the mandatory activities of chemical producers in consortia and in SIEF. Due to the complexity of competition law pitfalls, the undertakings should implement necessary measures at an early stage in order to adequately handle and monitor the anticompetitive risks of the registration within the legal framework of Reach.

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COLLABORATION

Songwon, Nitto Kasei Form Strategic Cooperation Songwon has announced the cooperation with Nitto Kasei for the long term supply of organotin intermediates in Japan. Following a recent agreement between Nitto Kasei and Sankyo Organic Chemicals of Japan, who have decided to stop the activities of their chemicals division to produce organotin stabilizers and catalysts as of April 1, all production will be transferred to Nitto Kasei. Songwon, who was previously appointed as the supply partner to Sankyo Organic Chemicals, has signed a long term agreement with Nitto Kasei to support their demand for intermediates, mainly di-alkyl tin oxide, for the production of tin based PVC stabilizers and catalysts.

► www.songwonind.com
► www.nittokasei.co.jp
► www.sankyo.com

Ashland Updates Joint Venture Name in India In an effort to present a clear vision to customers in India, Ashland is changing the name of one of its joint ventures in that country. Chembond Dretreat is now Chembond Ashland Water Technologies. According to the company, the joint venture will continue to serve India's industrial water treatment market with its products for cooling tower and boiler water treatment.

► www.ashland.com

BP, Santelisa Vale and Maeda to Invest in Biofuels BP intends to take a 50% stake in Tropical Bioenergia, a joint venture established by Brazilian companies Santelisa Vale and Maeda Group, which is constructing a 435 million l/y ethanol refinery in Goias State, Brazil. The joint venture, in which Santelisa and Maeda would each hold 25%, also intends to build a second ethanol refinery, investing a total of approximately R\$1.66 billion (\$1 billion) in the two refineries. BP will pay around R\$100 million (\$59.8 million) for the 50% stake, subject to working capital adjustments, and provide funding for agreed future investment in line with its shareholding. This investment should also be a significant step in delivering BP's strategy for biofuels that do not impact on food supplies.

► www.bp.com
► www.maeda.com.br
► www.santelisavale.com.br

Linde Signs Supply Agreement with Arcelor Mittal The technology company the Linde Group has signed a long-term supply contract for industrial gases with the world's largest steel producer Arcelor Mittal. The agreement involves the construction of a new air separation unit (ASU) at Arcelor Mittal's site at Galati, Romania, and refurbishment of existing assets with a total investment exceeding €100 million. Linde will start to implement improvement measures after taking over operation of the existing industrial gas production in mid 2008 and will start construction of the new ASU. It will produce 2,000 t/d oxygen as well as smaller quantities of nitrogen and argon for Arcelor Mittal's local steel production.

► www.linde.com
► www.arcelormittal.com

Praxair Expands Supply to Samsung in Korea Praxair and Samsung Electronics arranged that Praxair will increase production capability of industrial gases to 3,300 t/d for line 8 at Samsung's advanced thin-film-transistor, liquid-crystal-display factory in Tangeong, South Korea. To meet this demand, Praxair will build a new air separation plant with a capacity of 2,000 t/d, scheduled to start up in the third quarter of 2009. "This project is an extension of the strong relationship Praxair Korea has enjoyed with Samsung for more than 15 years," said K.H. Lee, president of Praxair Korea.

► www.praxair.com

Ashland to Represent Teknor Apex PVCs in China

Ashland Distribution, a division of Ashland, agreed with Teknor Apex to distribute their PVC compounds in China, with an emphasis on the medical market. Ashland Distribution operates warehouses in key manufacturing areas throughout China and provides customers with a trusted source for branded thermoplastic resins and other products and services. Teknor Apex is a diversified material science company using complementary technologies to serve common markets, and operates the divisions Vinyl, Thermoplastic Elastomer, Engineered Thermoplastics, Teknor Color Company, Chemical, Specialty Compounding and Lawn and Garden.

► www.ashland.com
► www.teknorapex.com

Symrise and Cutch Launch Biotech Joint Venture Symrise is launching a biotechnology joint venture with Italy's Cutch that will offer screening services for cosmetic raw materials as well as for pharmaceuticals and nutraceuticals. The joint venture will be called Scoutech and is retroactively operational from April 1.

Cutch is specialized in designing highly informative skin and hair follicle screening models to be used as an alternative to animal testing, whereas Symrise is experienced in developing active ingredients.

► www.symrise.com
► www.cutch.it

Great Expectations

Piramal Healthcare Plans to Become a Major Player

Continued Page 1

You mentioned ADCs as being an up- and coming drug component. What other components are gaining popularity?

R. Ananth: We do see a lot of traction and interest in the ADCs area as innovator pipelines have a lot of focus in the oncology segment. We also find opportunities in sterile dosage forms – both liquid as well as lyophilized products and clinical trial packaging. Among the growing therapeutic areas we find projects in the cardiovascular, including hypertension, anti-diabetes oral hypoglycaemic agents and central nervous system segments.

What's the major focus of your product portfolio? Where do you expect above-average growth?

R. Ananth: Since we are a CMO, rather than products, our services or capabilities are more important as offering to our customers. We focus on both chemistry as well as finished drug product across the life cycle, such as pre-clinical through to Phase III and commercial manufacture from launch and post launch right up to end of life. Our offerings also include services niche areas like high potency APIs, hormonal and female healthcare products and clinical trial packaging for European trials. Our expectation of significant growth will be from early

phase projects – intermediates, APIs and finished drug product – high potency APIs and clinical trial packaging.

NPIL's Worldwide Locations

India:

Digwal, AP (near Hyderabad in South India)
Pithampur, MP (near Indore in Central India)
Ennore, TN (near Chennai in South India)
Bangalore, Karnataka (South India)
Mahad, MH (near Mumbai on the West Coast of India)
Baddi, HP (North India)

United Kingdom:

Morpeth, Newcastle
Huddersfield, near Manchester
Grangemouth, Scotland

Canada:

Aurora, Ontario

What does Europe have to offer your company? Are you looking for more investment opportunities here?

R. Ananth: Europe is certainly a big and an attractive market both in terms of market size and our customers. We also have three important facilities in UK at Morpeth, Huddersfield and Grangemouth. So we will continue to invest and expand at these sites as the requirement for capacity grows. Two of our key investments have been in highpotency APIs and clinical trial packaging for European trials, where we see a lot of opportunities.

► www.npil.com

Chemical Customer Connectivity Index (C3X)

Knowing What Matters to Your Customers

Continued Page 1

of interviews will consist of recurring questions and will additionally be devoted to a special topic that is right at the top of the chemical customers' agenda, such as the repercussions of a possible economic downturn, innovation or sustainability. With empirical facts to back it up, over the medium term the C3X index will generate a reliable picture of the issues that are crucial for executives at the interface to the customer.

Too Little Account Taken of Customer Requirements

There is no doubt that there is need for investigation: only recently, A.T. Kearney took a close look at customer-supplier links in the German chemicals sector as part of a study survey among companies in the key

customer industries. Companies took part from a range of industries: automotive, construction, consumer goods, cosmetics, medical technology, packaging, and pulp and paper. The finding from this stock-check was that the respondents unanimously consider the contributions made by their suppliers to satisfying the requirements of their direct customers to be important or very important. Despite that, on average no more than 20% of current product or process innovations on the part of the customer industries have been initiated by suppliers.

What the consumer segments miss most of all is consistent addressing of the long-term needs of their customers. For example, two thirds of those questioned consider the contribution made by suppliers to satisfy current customer requirements to be "good," while in relation

to future requirements not even a fifth of them do so.

Furthermore, the survey reveals that although suppliers from the chemical industry in the main have satisfactory knowledge of the requirements of their direct customers, this knowledge diminishes significantly along the value chain through to the end consumer. As to awareness of the requirements of end consumers, about 70% of those surveyed consider the appreciation of this to be "in need of improvement" or at best "adequate."

While these results primarily apply to Germany, it is likely that the picture in other European countries is barely any different.

Registration Begins On June 1

If you are interested in becoming a member of the C3X

panel, you can register on the website www.chemanager-europe.com/c3x, from 1 June onwards. Following receipt of the confirmation mail, you can then simply go online to take part in the survey, which will be supported by a renowned market research company. Answering the questions will not take longer than ten to fifteen minutes. All of the information will be treated in strict confidence. Only anonymous information will be included in the overall evaluation.

Those eligible to take part are executives and managerial employees in customer-oriented roles in chemicals companies, and buyers for and representatives of the development departments of the key consumer industries, such as automotive, consumer goods and pulp and paper. Subsequently, all participants will receive an anonymous

detailed evaluation of the results of the survey edited in a form exclusively for them. They will also receive a copy of the book "Competing against Scale" by Andrej Vizjak, vice president at A.T. Kearney, and a book from the range published by Wiley.

Register today at www.chemanager-europe.com/c3x to take part in the first survey, and benefit from the opportunity to measure yourself against the competition with your customers in mind.

The results of the first survey are expected to be published in September in CHEManager Europe.

► www.atkearney.com
► www.gitverlag.com

European Environmental Industry

How Greentech Will Become and Remain an Economic Factor

Europe's Competitive Edge
– Already in 2005, the world market for environmentally friendly technologies achieved a market volume of €1 trillion.

Environmental protection is developing into a global growth market and a key economic factor. The European environmental industry has an excellent global position and considerable market share in several fields, but is now facing increasing competition. This means this favorable position must be leveraged (including governmental support) to strengthen and extend Europe's competitive edge and continue to play a key role in this growth industry of the future.

Environmental Systems: A Key Business Factor

Environmental protection is a global issue. Ecological issues – such as climate change and pollution – are developing into serious problems in many parts of the world. At the same time, due to increasing scarcity of raw materials and their rising prices (such as energy and steel), the importance of efficiently handling resources is growing.

GreenTech is a growth industry that combines ecological and economic needs in a special way and has emerged from the shadow of the traditional industries to become a key economic factor.

World Market for Environmental Systems Enormous

The global market for environmentally friendly technology is huge. For instance, the global market volume amounted to €1 trillion in 2005.

This diverse industry can be divided into six main markets: environmentally friendly energy production and its storage; energy efficiency; raw-material and material efficiency; waste management and recycling; sustainable water management; and sustainable mobility. Energy efficiency accounts for by far the largest share of the world market volume, about €450 billion.

Global Environmental Industry Growing Fast

However, the market is not only big, it is also booming enormously. Since it is growing at a rate of over 5% per year, by 2020, the global market volume will have risen to over €2 trillion. Overall, environmental technology is developing into a growth market and a major economic factor; it thus looks set to become a leading industry of the future (fig. 1).

The environmental industry is doing well not only because of increasing environmental awareness in Europe, but also in America and Asia.

European Environmental Industry Excellently Positioned

The environmental industry in Europe is set up better than anywhere else in the world to profit from these developments. European companies have stable market positions and enjoy global market shares of up to 50% (fig. 2).

Environmental-technology companies in Europe benefit from the fact that ecology topics, such as resource scarcity and environmental pollution, have been of interest in Europe for many years now.

In biodiesel plant production for instance, European companies such as Lurgi and Balestra cover over 70% of the global market's current needs. Spanish Gamesa and Enercon from Germany are successful, for example, in the wind energy segment. Overall, European environmental-technology companies have a global market share of almost 70% in this segment. In the area of water treatment, multinational enterprises of European origin such as German Siemens or French Suez enjoy a global market share of approx. 60%.

In light of these developments, it is no wonder that in Europe environmental technology is considered an industry of the future. According to the European Commission, the market for environmental technologies grew annually by 7% between 1999

and 2004. These growth rates exceeded even the most optimistic forecasts. In Germany, environmental technologies accounted for roughly 4% of the German industry's total revenues in 2005. This figure is forecasted to increase fourfold by 2030.

Environmental Technologies: Core Job Creator in the EU

In Europe, the number of employees in traditional industries such as car or machine manufacturing are falling, experts expect two million new jobs in the area of renewable energies between 2000 to 2020.

European growth in this segment is also being driven by political targets. For example, 10% of energy needs and 20% of electricity used are to be supplied by renewable energy sources by 2020. The corresponding investment volume is estimated as equalling a sizeable €250 billion.

The current climate debate in Europe is also picking up speed in all areas. Modern power plants, energy-saving cars and better insulated buildings are designed to meet ambitious climate-protection goals set by political decrees and initiatives. For instance, current EU climate-protection rules stipulate a 20% reduction in emissions in Europe by 2020. At the G8 Summit in June 2007, it was ultimately agreed to reduce carbon dioxide emissions by 50% by 2050.

Europe Has to Defend Its Strong Position

European companies continue to play a key role in the leading markets of environmental technologies. However, this strong position is at risk as other countries are closing the technology gap. International competition is being driven especially by international government initiatives to promote environmental technologies. For instance, in the U.S. in 2006, \$6.4 billion tax dollars were used to fund photovoltaic development and help cut greenhouse gases. Especially the "Million Solar Roofs Bill" from 2006 is considered to be a success.

Japan, on the other hand, is making huge investments in fuel cell technology and is already a market leader in the area of hybrid vehicles. Australia is channeling its efforts into biofuel development by providing production guidelines, tax breaks and investment subsidies.

Internationalization Key for Most European Companies

Environmental protection is a topic that is not just restricted to Europe. In order to participate in the global market's strong growth, the European environmental industry must shift its focus to more international needs. This applies especially to the dynamic markets in Eastern Europe and Asia. Companies in the environmental industry predict that by 2020, the sales markets of Eastern Europe will be almost on a par with Western Europe, ahead of India, China, Russia, North America and far ahead of Japan.

The European environmental industry is also still highly fragmented. The share of smaller companies with sales under €10 million is high in all leading markets. However, the beginnings of a consolidation process can be observed in the environmental industry as companies can no longer single-handedly tackle ever-increasing international projects.

Europe Must Build a Strong Position in 'New' Environmental Technologies

GreenTech is technology designed to reduce emissions and lessen the burden on the environment, and in particular includes "new" innovative technologies. Examination of the expected worldwide potential on the level of individual key technologies shows that especially young technologies, such as bioplastics and biopolymers, solar thermal and CO₂-reduced power plants and fuel cells, are set to experience the strongest growth (with over 20% annually in some cases).

But it is in exactly these technologies where Europe risks falling behind or being overtaken. For example, Europe still leads in synthetic

Fig. 1

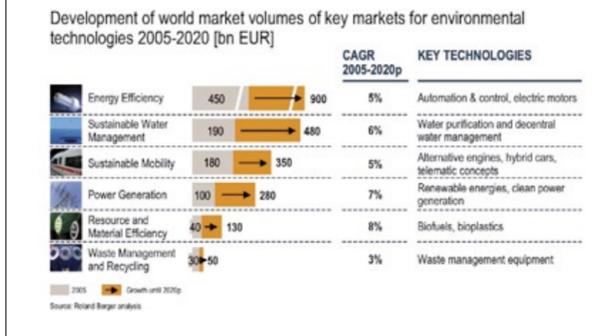
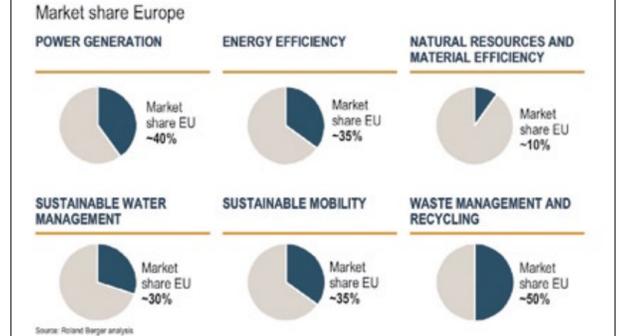


Fig. 2



biofuels, but the U.S. is investing heavily in biofuel research. Europe is not only lagging behind Japan in hybrid car development, Japan is also a fierce competitor in the fuel cell industry. Furthermore, Japanese and U.S. companies have set ambitious targets and are committed to developing bioplastics.

European Environmental Industry: Learning from Other Industries Key

To help deal with the threats the industry is facing, successful models from other industries should be transferred to the environmental industry. Besides having a global presence and

establishing a global brand, being able to react to local market trends is key to becoming more international and staying competitive.

It must be possible to finance growth, especially for piloting projects and launching "new" technologies on the market. Not only does R&D require huge investments, building and piloting demo installations is very expensive. This is where government can play an active role by subsidizing R&D and helping provide favorable financing by promoting market launch through public sourcing, incentives and commercialization programs. Private equity companies are also showing increasing interest. Thanks

to state subsidies, guaranteed prices and purchase commitments, investors can count on trusted business models and calculable risks.

Environmental technology is placing considerable demands on companies. This is because the innovation process is often based on an interdisciplinary approach of developing technologies and actually implementing them in products. This means research institutes and companies must dovetail their work even more closely to ensure a healthy exchange.

Europe can maintain its top market leadership position in environmental technologies by taking a growth

and innovation focus and pursuing an integrated development strategy. This is crucial because environmental technologies are not only necessary to deal with climate change and scarce resources, but are also an economic factor to ensure jobs, prosperity and quality of life.

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reach the end
of the road.

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We create groundbreaking solutions at our more than 35 research and development sites worldwide, inspiring customers with our ideas in such diverse markets as automotive, coatings, cosmetics, plastics and pharmaceuticals. See for yourself: www.evonik.com/ideas



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Industry Report Card

Slowing U.S. Economy Dampens Profit Prospects for European and Middle Eastern Chemicals

Well-equipped – Despite several challenges facing the chemical industry in the coming months, Standard & Poor's says most companies are ready to face the roadblocks.

Deteriorating macro-economic conditions in Europe's chemical industry ahead of the expected downturn in the petrochemical sector in 2009 will reduce profits and cash flows of many of our rated companies over the coming quarters. Nevertheless, most of them are well equipped for the obstacles ahead after several strong years for the chemical industry, as indicated by the stable outlooks on about 80% of them. The six issuers in the B rating category will be vulnerable, however, because their balance sheets do not allow for a prolonged downturn, significant earnings deterioration, or refinancing needs.

Some sectors of the chemical industry are less sensitive than others to general economic growth and supply-and-demand balances. S&P experts said they expect agrochemical companies and industrial gas producers to continue their strong performance, while petrochemical producers will be most exposed to slowing economic growth, high raw-material costs, and a substantial addition of supply coming on stream from 2009.

To weather these difficulties, companies will need to strengthen their existing competitive advantages in technology or service so as to continue to differentiate products and absorb or pass through raw-material cost inflation. S&P also said it expects companies to adopt more conservative financial policies, moving away from the aggressive debt financing of 2006–07, in preparation for the downcycle.

Geographic diversity will also help issuers to withstand a potential downturn. The U.S. accounted for only about 21% of world chemical sales in

2006, while Europe and Asia remained the most important markets, accounting for 34% and 33% of sales, respectively, according to Cefic. What's more, growth was strongest in Asia and Eastern Europe.

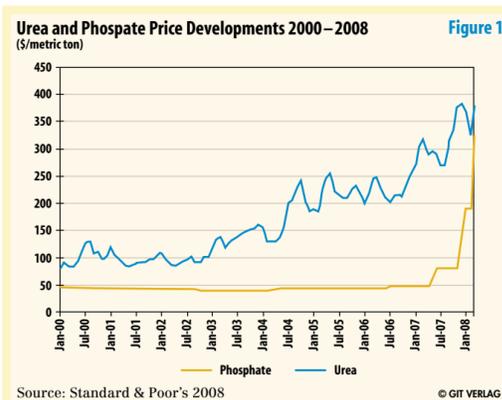
While Standard Poor's Ratings Services expects most companies will still report strong results for the first quarter of 2008, earnings are expected to weaken in the course of the year, reflecting weaker economic growth, high raw-material costs, and unfavorable currency movements.

Weakening Economic Growth: Pressure on Volumes Sold

The downturn in the U.S. economy and weaker growth prospects for Europe will threaten capacity utilization, especially for petrochemical producers and specialty chemical producers in the coming quarters, and therefore their profitability. Performance in this industry is closely linked to economic growth and industrial production. That is why strong economic conditions in recent years have increased operating rates across the industry, supporting the pass-through of higher energy costs to customers. Consequently, a downturn will dampen prospects. S&P said it expects softer demand to impinge on volumes in the coming quarters.

Strong Euro Will Hit 2008 Earnings

The significantly appreciating euro against the dollar will reduce earnings generated in the U.S. and increase competition risk for some specialty chemical firms in Europe. On the positive side, companies can source cheaper raw materials because they are largely dollar denominated. This is why profit declines so far have been moderate, despite the euro's significant appreciation. All in all, though, we expect currency effects to have negatively influenced sales growth for most European chemical producers



in first quarter of 2008 for the seventh consecutive quarter.

New Capacities and Softer Demand Will Weaken Pricing Power

In contrast to the past years, we expect the industry's pricing power to weaken as a result of softening demand and further supply addition. Pricing power is closely linked to the supply-and-demand pattern of products. Therefore, S&P said it only expects agrochemical companies to continue to enjoy strong pricing power in 2008 because their supply-demand balance remains tight.

Rising energy prices could also become a more pressing issue for base and specialty-chemical producers, particularly in the context of a slowing U.S. economy and the gradual weakening of the supply-and-demand balance for petrochemicals in the coming years. Tougher economic conditions are likely to erode demand growth, and the large-scale capacity additions from lower-cost regions will make it increasingly difficult for companies to cope with raw-material spikes.

High Raw-material Costs Challenge Specialty Chemicals' Business Model

We expect European specialty-chemical producers to suffer from raw-material cost inflation

in 2008. They are also more sensitive than other sectors of the chemical industry to the depreciation of the dollar because they export a significant proportion of products to dollar-denominated countries. However, innovation, internal cost restructuring programs, and a likely easing of petrochemical prices in 2009 should help the majority of our rated specialty chemical producers cope with these challenges and maintain their current credit quality. Companies best positioned to ride out these difficult industry conditions are Sika (A-/Stable/A-2), Rhodia (BB/Stable/B), and Royal DSM (A-/Stable/A-2). S&P said it considers these companies to be well positioned within their markets, and to have a cushion in their credit quality to allow for some unforeseen events. S&P said it expects them to continue to show solid performance in 2008 and to benefit from strong global economic activity in past years.

Others, meanwhile, are struggling with significant competition and are not able to pass on the higher raw-material costs to customers. The credit quality of Ciba Specialty Chemicals (BBB/Negative/A-3) and Clariant (BBB-/Stable/A-3) has deteriorated over the past few years, largely because of their unsuccessful acquisitions and high levels of competition in their business segments. We recently lowered the rating on Clariant by one notch and revised the outlook on Ciba to negative from stable on concerns that the softening economic environment could hinder the operating improvements they need to maintain their credit profiles.

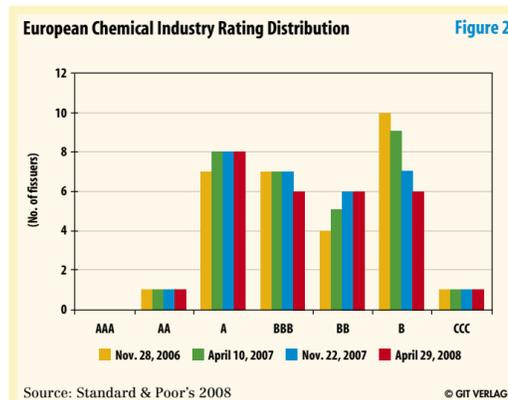
Issuer Review

Air Liquide (A/Stable/A-1)

Air Liquide posted strong results for 2007, with sales increasing by 7.8% and Ebita by 6.2%. In the first quarter of 2008, sales continued to develop strongly. This was aided by good hydrogen demand and increased sales in the health care and electronics sectors. We expect cash flow generation to remain strong in 2008, but FOCF generation will be modest in the coming years due to the company's large capital expenditure plans, acquisitions, and shareholder-friendly policy. S&P said it expects credit protection ratios to improve slightly from the current levels, mainly stemming from improved cash flow generation.

Akzo Nobel (A-/Stable/A-2)

At year-end 2007, on a pro forma basis the combined Akzo/ICI entity had revenues of €14.4 billion, reflecting a 2% increase, with the majority of growth coming from the emerging markets. In the North American markets, however, ICI's decorative segment was negatively affected by the slowdown in the U.S. economy and was down by 6%. The pro-forma results are slightly below our expectations, with pro-forma



funds from operations (FFO) to debt of about 30%. The ratings could be negatively affected should the company's top-line revenues soften, resulting in a deterioration in FFO and credit protection ratios. The company needs to achieve FFO to debt of about 35%–40% through the cycle.

BASF (AA-/Stable/A-1+)

BASF reported a strong first-quarter 2008, with sales increasing by 9% and Ebita by 10.5% compared with first-quarter 2007. Profits were up in oil and gas, agriculture, and plastics, while profits in chemicals were lower, reflecting lower cracker margins. Credit protection ratios were strong, with funds from FFO to debt at about 60% at the end of 2007 and debt to Ebita about 1.2x. S&P said it expects credit protection ratios to stabilize in 2008 due to good operational performance, despite the company's shareholder-friendly policy.

Ciba Specialty Chemicals (BBB/Negative/A-3)

S&P revised the outlook on Ciba to negative because they said they expect the company to face a challenging 2008 due to softer demand in some important end-markets, such as automotives, construction, and paper. First-quarter 2008 results showed a clear weakening. Also, further raw-material cost inflation and the company's weak pricing power will likely put pressure on profitability. Key credit metrics remain weak for the rating and the company has not been able to benefit from the strong economic environment of past years. FFO to debt reached 28% and debt to Ebita 3.1x at the end of 2007.

Clariant (BBB-/Stable/A-3)

S&P lowered the rating on Clariant, reflecting its weak underlying profitability and subpar cash flow coverage. S&P said it expects the company to generate only moderate free operating cash flow over the next two years. Clariant was only partly able to benefit from the strong economic environment in recent years, with volumes supporting revenue growth. Despite increasing its capacity utilization, the company did not cope with the effects of higher raw material costs and intense competition. S&P said it expects weaker economic growth and still-volatile and rising raw-material costs to make it difficult for Clariant to restore its profitability in 2008. FFO to debt is about 30% and is expected to remain about that level in the coming years.

Cognis (B/Stable/-)

Cognis managed in 2007 to largely offset the higher raw-material cost prices, and its profit margin only declined marginally to 10.2% from 10.8% on an unadjusted basis. The adjusted Ebita margin was reported unchanged at about 11.7%. Organic sales growth remained strong, especially in fourth-quarter 2007, at 8.7%.

Cognis is preparing to sell Pulcra chemicals, which, together with Oleochemicals, shows the weakest profitability. Credit protection ratios remain weak, with debt to Ebita of about 8.1x and FFO to debt of about 5% for the 12 months ended Dec. 31, 2007.

Evonik Degussa (BB/Stable/B)

The difficult environment on financial markets does not support Evonik's plan for an initial public offer (IPO) in 2008. However, a minority sale to an investor remains on the agenda. While Evonik Degussa is likely to report clearly improved leverage ratios in 2007 over 2006, the overall leverage remains aggressive in S&P's view and uncertainty about future business and financial strategy are also weighing on the assessment of the company's current credit quality.

Ineos Group (B+/Stable/-)

Ineos posted broadly fair results in the fourth quarter of 2007, albeit still below those of peers in the core olefins & petrochemical segments. This mirrored a good market environment for Ineos although the company faced both planned and unexpected plant shutdowns, which negatively affected earnings. Financials remained in line with the rating at the end of 2007, with material cash and availability under committed lines, FFO to adjusted debt well above 10%, and substantially positive FOCF.

Lanxess (BBB/Stable/A-2)

Lanxess further improved its profitability in 2007, thanks to its initiated restructuring measures, portfolio management activity, solid organic growth, and high capacity utilization for key products. The Ebita margin reached 10.9% in 2007 and a further improvement is expected in 2008 due to the divestment of Lustran Polymers. Lanxess is not expected to be significantly affected by the petrochemical downturn in 2009, as supply and demand for its product portfolio seems not to be affected. However, S&P said it expects cash flow protection ratios to weaken from currently strong levels in the coming years because the company is committed to external and internal growth.

Linde (BBB+/Stable/A-2)

S&P raised the rating on Linde following the strong operating performance and conservative dividend policy in 2007, which allowed it to reduce financial debt faster than we previously expected. Linde exceeded its original debt-reduction target by more than €800 million in 2007. It also reduced its pension deficit by about €600 million by making extra contributions and thanks to the strong performance of pension assets. Linde's cash flow protection ratios already reached levels adequate for the BBB+ rating in 2007, with FFO to debt of 27.5% and debt to Ebita of 2.8x. S&P said it expects the company to

use its operating cash flow over the coming years to support its growth aspirations in industrial gases by making capital expenditures to sales of about 13% per year.

Lyondellbasell Industries (B+/Negative/-)

S&P revised the outlook to negative due to increased risks that Lyondellbasell faces in 2008, including weaker economic growth in the U.S. and Europe and a significant increase in oil prices. S&P said it expects Lyondellbasell to achieve significantly lower profitability in 2008, leading to only modest debt reduction. This would prevent the company from creating a financial cushion ahead of the expected downturn in the petrochemicals industry in 2009. S&P said it expects debt to Ebita to remain below 5x by the end of 2008 for the B+ rating.

Rhodia (BB/Stable/B)

The main news is the one-notch upgrade to BB because S&P expects Rhodia, after the improved operational and financial results in 2007, will continue to improve its financials in 2008 and 2009, with an FFO to adjusted debt at about 20% and positive FOCF. This reflects the continuing good polyamide cycles, and the material carbon credit cash proceeds. For the first quarter of 2008, we expect Ebita to be affected by raw-material and energy prices, but thereafter we believe Rhodia will be able to progressively pass on an important part of these costs.

Royal DSM (A-/Stable/A-2)

DSM displayed overall good operating results in 2007 and in the first quarter of 2008, while the group's cash flow generation and key credit metrics remained strong and well above the levels required for the current rating. Operating business performance is expected to have remained broadly favorable for the first quarter of 2008. S&P said it continues to expect DSM to achieve average FFO to debt of about 45% over the cycle to maintain its current rating.

Sabic Europe (BBB/Stable/A-2)

Sabic Europe posted strong results in 2007, benefiting from the favorable petrochemical cycle and the integration of the U.K. Huntsman assets. Despite a weak cracker margin in the fourth quarter, the company increased Ebita by more than 30%. S&P said it expects credit protection ratios to weaken in the coming years due to a weakening petrochemical cycle and somewhat softer demand in Europe. FFO to debt reached 45% in 2007 and debt to Ebita 2.5x, which clearly exceeded the targets for the rating.

Solvay (A/Stable/A-1)

Solvay reported good 2007 results across its various businesses. In the pharmaceutical segment, TriCor sales continued to perform well, and it remains Solvay's number one drug. The €300 million savings target (on fixed costs by the end of 2010 compared with end-2005) is well on track. The other segments, plastics and chemicals, also enjoyed good profits, owing to efficiency and markets that enabled the pass-through of raw-material and energy prices.

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Recipe For Success

How Do Europe's Top Managers See the Future of the Chemicals Industry?

Ingredients – Take one cup of divestment and mix in a dash of China and the Middle East; finding the right recipe for success in five steps.

The decision makers at the helm of European chemical groups have five main topics on their radars according to the results of a trend study by the consulting firm Management Engineers and the business school Insead:

- Streamlining the business portfolio alone does not generate sufficient growth – what are needed are complementary strategies.
- Until now the focus has been on Brazil, Russia, India and China; the future favorites for regional expansion are China and the Middle East.
- Brussels' legislation Reach is not yet acknowledged as a chance for transparent marketing and an effective strategy for differentiating between competitors.
- Innovations are definitely considered the key to securing the future but internal potential is far from being exhausted.
- The branch has a lot of catching up to do in the area of complexity management – the experiences in the automotive and consumer goods industry may point the way to the future.

The upshot of the study is that there are numerous ways to tackle the issues and good prospects for increasing the growth and value of European chemical companies on a sustainable basis.

The European chemical industry has a realistic chance of remaining the pacemaker of this industry, even in the age of a globally dynamic market development. Historically prospering competitive positions offer at best a pole position in this respect. Basically, the field is wide open as to who will win the race in the coming decade. New competitors are pushing traditional players to the sidelines, and industry parameters are changing drastically. The future of this industry is a "moving target." Everything is in flux: Cost and capacities, portfolios and potential, standards and locations. Therefore, the greatest challenge facing the management of a European chemical company is to accurately anticipate the strategic trends of global development and to manage the increasing complexity of products, processes and structure holistically and efficiently.



THE ROAD TO SUCCESS A study conducted by Management Engineers and Insead have found five topics dominating the agenda of the chemical industry's top managers.



Dr. Isolde Bachert
Management Engineers



Dr. Hanno Brandes
Management Engineers

What motivates the leading minds of this key industry? What trends and tendencies are they forecasting? Where are they self-critical and where is their self-confidence justified? The international consulting firm Management Engineers and the renowned French business school Insead have teamed up to research these questions and have analyzed their findings. They interviewed 47 CEOs and board members from 34 major European chemical companies, whose sales amount to at least €1 billion. From the complex responses and commentaries of the opinion leaders and decision makers questioned, five themes evolved that determine the corporate agenda of the branch's top managers, whereas we will discuss the topic of business portfolio management in detail:

One: Streamlining Business Portfolios

Most CEOs and board members are convinced they can increase their company's profitability

One: Streamlining Business Portfolios

Most CEOs and board members are convinced they can increase their company's profitability

best by focusing on core business. Focussing means higher profitability rather than expensive acquisitions with the risk of never generating the expected return.

In the short term, companies should consider divesting non-core businesses. This will help downsize chemical companies. Consolidation will further be driven by prospective buyers among strategic investors and private equity companies interested in acquiring successful stand-alone businesses that fit into their portfolios.

For future viability, organic growth arising from new product development or acquisition

very successful way of accelerating growth.

Despite these organic growth strategies, CEOs expect that the resulting growth rates will still not be able to satisfy the capital market's high expectations. Strategies of targeted diversification must be pursued and realized at the same time. However, diversification only makes sense if the acquired business is already successful on its own. In addition, even if its original business was different, the processes, markets and technologies should have a common denominator in order to be able to offer synergies.

Two: Growth Regions China and the Middle East

Although China's protection of intellectual property rights does not yet quite meet our expectations of fair play in competition, those at the executive

level in Europe recognize (and acknowledge) that China's governing authorities are taking a closer look at the problem. Laws and sanctions against IP infringements are being consistently enforced. Because they expect the situation to improve in the long run, consolidated chemical companies in Europe are willing to put up with the present risky situation because the window for establishing market leadership is closing.

Four: Innovation Management

There is a dearth of innovation – not only in the product portfolio but also in production processes and in services.

Why has this happened and what can be done? Innovation is still all too often equated with product innovation. Innovation is seen as much less than a creative, continuous improvement of all business processes. Improvements in service and market positioning, for example, do not correspond to the traditional understanding of innovation in the industry. Consequently, innovative processes are not "lived," which results in the innovative potential of a company only being partially realized.

Five: Complexity Management

Growth on the basis of internationalization and diversification means high costs and complexity. Therefore, it is even more important that organizational structures are not simply cloned and multiplied. Not every local company and production facility has to be a blue print of the domestic corporate center. Especially in new regions an unorthodox design for the corporate structure may be a great opportunity for change. And the new design may very well be leaner and more flexible than the traditional structure. This is also true of the product portfolio. Sometimes less is more. Whoever has the courage to streamline their assortment not only creates space on the shelves, but also improves efficiency and increases the profit margin of their product portfolio.

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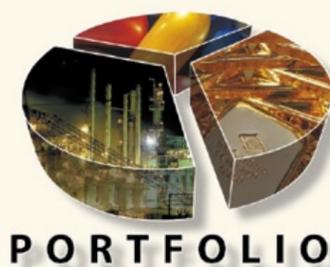
Most CEOs and board members are convinced they can increase their company's profitability best by focusing on core business.

of competitors is possible. Companies will continue to focus on organic growth by developing new products and pushing regional expansion. This is the best strategy to obtain sustainable and profitable growth. However, barriers do exist: although all major chemical companies have implemented market-oriented stage-gate processes for product development, most CEOs still complain that the outcome of these efforts is far from satisfying. Beyond processes, mobilizing the full potential of employees is key. This goal can be achieved by adopting measures of knowledge generation and exchange and needs to be supported by strategic human resources management to ensure the necessary skills and capabilities are available to the companies in the long term.

Organic growth needs to be completed by acquiring companies – competitors that fit into the core business strategy. This challenge is harder to meet as prices for successful companies have risen and many prospective buyers are taking part in the bids. Nevertheless, integration of these businesses is relatively easy and economies of scale are an attractive target to pursue. Regional expansion into emerging markets by acquiring local competitors is one

Three: Competitive Advantages Through Reach

Reach is already in place, but industry does not seem quite certain how it is supposed to live with it. Even top executives are still searching for ways to build something constructive out of the stones that have been laid as stumbling blocks in their paths. A great opportunity, though, lies in the strengthening of the supplier/customer relationship. The complex dossiers generated by



Monsanto to Acquire De Ruiter Seeds Monsanto has signed a definitive agreement to acquire De Ruiter Seeds Group, a Dutch-holding company that owns and operates De Ruiter Seeds, for €546 million, or greater than \$800 million depending on currency exchange rates, less net debt. According to the company, once completed, the acquisition is expected to build on the strength of Monsanto's vegetable seed business as well as enhance the company's growth in the protected-culture segment, the fastest-growing space within the vegetable seeds industry. Monsanto and De Ruiter Seeds believe the acquisition will enable both companies to offer better products to growers and do so faster than either company could have done on its own.

www.deruitersseeds.com
www.monsanto.com

BASF Acquires Austrian BCD BASF acquired the business activities of Austrian company BCD Rohstoffe für Bauchemie Handel on April 1. The acquisition covers BCD's entire expertise, patents and formulations. The company is known in the construction chemicals industry as a supplier of polymer dispersions, above all for cement-based coating systems, and of air-entraining agents for dry mortar and cement.

"We want to expand our raw materials business for the construction chemicals industry. We will achieve this first of all by investing in research and development and with the help of our comprehensive technology platforms," said Jan-Peter Sander, head of the regional business unit Dispersions for Adhesives and Construction Europe.

www.basf.com
www.bcd.at

KD Feddersen Buys Swedish Materialdepån KD Feddersen has bought Materialdepån Norden of Anderstorp, in Sweden, for an undisclosed sum. The deal covers all of Materialdepån's employees, its branch offices as well as warehouses in Sweden, Denmark, Finland and Estonia. According to managing director of Hamburg-based Feddersen, Karlheinz Schuster, the move is just the first, "in a series of further strategic expansions." Established in 1981, Materialdepån has 18 employees and turned over €15 million last year from the distribution of polymers from DSM, Evonik and Dyneon as well as equipment from Negri Bossi, Piovani and Bekum. The business will be renamed KD Feddersen Norden. Feddersen's distribution business generated sales of some €110 million last year and the company has already established a subsidiary in Shanghai and gained a presence in France through a 2003 acquisition.

www.kdfeddersen.com
www.materialdepan.se

DSM Acquires PTG Through the arranged acquisition of privately-held PTG (The Polymer Group) of Berkeley, Calif., Royal DSM obtains a leading position in the field of biomedical polymers, one of DSM's future key growth areas. The transaction price will be about 10 times Ebitda. In 2008 PTG expects to realize approximately \$40 million in net sales. The company counts on more than 20% annual sales growth in the next 3-5 years, based on existing business and the pipeline of new products. DSM sees promising potential in the cross-fertilization between Life Sciences and Material Sciences. With already an established presence and a broad portfolio of products and services for the healthcare industry, DSM aims to establish over €100 million in sales by 2012 in the Biomedical Materials market.

www.dsm.com

Tikkurila to Sell its Stake in JV Sto-Tikkurila Tikkurila, the company that is responsible for Kemira's paints and coatings business, will sell its 50% stake in OOO Sto-Tikkurila to the other party, Sto of Germany. The joint venture was established in June 2006 in Moscow, Russia, with the business idea of production and project sales of various coatings systems for facades. Now Sto wishes to continue the business on its own, while Tikkurila will continue operating in the Russian facade coatings market under its own brands. The markets for facade systems are developing rapidly due to the strong growth in the construction activity.

www.tikkurila.com
www.sto.com

Univar Buys Marnic Netherlands' chemical distributor Univar has acquired Marnic through RW Greeff (RWG), Univar's Industrial Consumables Division. Marnic is a specialist distributor of tape and protection products for the construction sectors based in London, UK. As Mark Hughes, RWG managing director said, "The purchase of Marnic is consistent with our aggressive growth strategy and expansion into key new market sectors such as construction. Through Marnic, our entry into the construction consumables market greatly enhances our status as a niche technical distributor, portable at a Pan European level to both customers and suppliers." The Marnic business will continue to operate as a separate trading entity.

www.univareurope.com
www.marnic.com

Vopak Gets Terminal in Malaysia Netherlands' Royal Vopak, engaged in liquid bulk logistics, came together with Mitsui and Tejana Trading to acquire 100% of the shares in Intercontinental Terminals in Malaysia. The terminal is located in the free trade zone within the Johor Port at Pasir Gudang in southern Malaysia. It consists of 17 tanks with a total capacity of 20,600 m³, which are currently fully utilized by a number of global petrochemical companies. The facility will be named Vopak Terminal Pasir Gudang. The region is seeing rapid growth in the production and export of palm oil and related oleochemical products, biodiesel and petrochemical products. Therefore Vopak intends to expand the terminal's capacity.

www.vopak.com

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Production

Condition management optimizes production processes

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Production

The value of project management in R&D

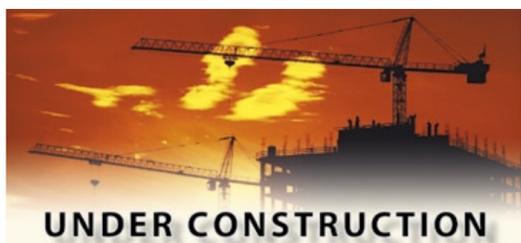
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Chemicals

Colored concrete materials make the world more attractive

Page 13



UNDER CONSTRUCTION

Carbogen Amcis Expands High Potency Offering Switzerland-based Carbogen Amcis said its Indian subsidiary, Carbogen Amcis India, plans to open a high potency facility in Bavla, India. The facility will be located on the Bavla site of its parent company, Dishman Pharmaceuticals & Chemicals. The facility is being designed and will be operated by the Carbogen Amcis team to take advantage of the expertise and experience gained from high potency operations that already exist at the dedicated Swiss high potency facilities. The building's framework has already been erected, and fit-out of the facility is already underway. The facility is expected to be operational by Q1 2009.

► www.carbogen.com

Braskem Starts New Polypropylene Plant in Paulínia Braskem inaugurated its polypropylene unit in Paulínia, São Paulo, Brazil, adding 350,000 t/y to its resin production capacity, which is undergoing one of the highest growth rates in consumption. "This growth strategy consolidates the company's leadership in the Latin American polypropylene market and confirms its position as the third largest producer of resins in the Americas," said José Carlos Grubisch, president of Braskem. The Paulínia unit, in which nearly R\$700 million were invested, combines global scale, cutting edge technology and its located in the middle of the country's main consumer center, which adds differentiated competitiveness to the project.

► www.braskem.com.br

Dupont Counts on Growing Solar Energy Dupont will soon begin construction on a research center in Hong Kong and a manufacturing facility in Shenzhen to support the rapidly growing photovoltaic (PV) solar energy industry. The company expects growth in the PV market to exceed 30% in each of the next several years. Accelerating its capability to meet emerging materials requirements is critical for Dupont, which has long been a leading supplier of materials primarily serving the crystalline silicon (c-Si) cell and module markets. The expansions in Hong Kong and Shenzhen will provide new offerings to serve the amorphous silicon (a-Si) thin film market. Thin film technology is well-suited for large-scale utility applications such as "solar farms" and industrial installations. The growth rate for thin film is projected to be approximately twice as high as demand for c-Si.

► www.dupont.com

Eco-Friendly Solvent Rhodia has launched production of Rhodiasolv Iris, a solvent with eco-friendly properties. It's designed for applications such as industrial cleaning, foundry resins, paints and coatings formulations, is non-toxic, readily biodegradable, non-flammable and low VOC. The solvent, a dibasic ester, is manufactured at Santo Andre, Brazil, in a new plant developed to meet rapidly growing demands for eco-friendly solvents. This investment will allow Rhodia to increase its worldwide production capacity of dibasic ester solvents by 15%. The company makes 30% of its sales with solutions that respond to environmental concerns.

► www.rhodia.com

Dow Corning Opens Silicone Rubber Plant in China Dow Corning has opened a new silicone rubber plant to support growing demand from customers in Asia. Located at Zhangjiagang, in Jiangsu Province (China), the plant is the largest investment the company has made globally in silicone rubber in the last 10 years. The 6,000 m² site will manufacture High Consistency Rubber (HCR) and Liquid Silicone Rubber (LSR).

► www.dowcorning.com

Uhdenera Receives Order from AO Kaustik Uhdenera received a contract from AO Kaustik for the new membrane chlor-alkali plant to be erected in Pavlodar, Kazakhstan. The plant will have a capacity of 91 t/d NaOH and is scheduled to come on stream in May 2010. Together with its main contract partner OAO Uhde Dzerzhinsk, Russia, Uhdenera will supply the basic and detail engineering and will also ensure the engineering service (HAZOP) for the local authorization. Included in Uhdenera's supply will be all the necessary equipment and materials for the complete plant. The company will also supply the supervision service for the commissioning and start-up of the plant. Assembling of the BM 2.7 cell elements as well as the catalytic layer of the electrodes will be performed by Industrie De Nora in Germany.

► www.uhdenera.com

Online, Real Time

Corrosion Monitoring Brings New Perspectives to Industrial Operations

Money Erosion – For decades, corrosion and its costs have been of high interest for the chemical process industry. However, the real amount of money it is losing due to corrosion processes still remains somewhat elusive.

The major influence of corrosion on the business is hidden in the indirect costs associated with lost of production, employees' health and safety and environmental costs. Several studies performed in highly industrialized countries showed that direct and indirect corrosion costs across industry could reach even 5% of the gross domestic product (GDP). Additionally, when focused on just chemicals, petrochemicals and pharmaceuticals, a major cost of corrosion study in the U.S. estimated that the corrosion cost in this sector was approximately \$2 billion annually. To put this figure into perspective, it has been estimated that this is in the range of 8–10% of the total annual capital expenditures in this industrial sector.

The fact that corrosion monitoring and protection issues have been in the center of industrial and scientific studies for years clearly shows that our current concept of corrosion strategy and management still is far from being perfect. Of course, in many industrial operations engineers have been trying to utilize more or less sophisticated corrosion monitoring techniques, sometimes as a part of complex corrosion management system but still without repeatable success or linked to key process variables. There are many reasons why we are still "one step" behind corrosion.

Corrosion: Not Constant and Stable

One of the most important aspects of this problem is that most chemical process engineers still think about corrosion as constant and stable process. From this point of view, corrosion is an "always-on" process leading to a more or less fixed rate of corrosion over time. Unfortunately, in real industrial life, the opposite situation is actually to be much, more likely in an amine unit – commonly used in the oil and gas and petrochemical industries for removing H₂S and CO₂ and related compounds from hydro-

carbon streams. Case studies have been developed that show that corrosion can appear due to changing process conditions even after several years of stable service.



Slawomir Kus
Honeywell Process Solutions



Russell D. Kane
Honeywell Process Solutions

carbon streams. Case studies have been developed that show that corrosion can appear due to changing process conditions even after several years of stable service.

Moreover, engineers do not usually realize that severe pitting corrosion can appear suddenly in the system as a result of even small changes in process parameters and can destroy the pipe or vessel's wall within a few weeks. Usually, they call corrosion specialist only when a problem has become critical and once it is solved, everything goes back to "normal" with its same routine ways until the next "unexpected" corrosion related incident occurs.

Facing Market Demands

From the other side, still many plant managers and financial officers see corrosion monitoring as a cost generator (due to inspection costs, man-hour lost, equipment costs etc.). In most cases, decisions on corrosion monitoring are made based on the cheapest off-line methods like corrosion coupons or periodic ultrasonic testing (UT). Even when online methods are used such as electric resistance (ER) probes or older linear polarization resistance (LPR) probes, they are sent to a data logger for viewing on periods of weeks or months and do not provide information on the process variables that typically relate to corrosive conditions. These techniques are still suitable for some routine applications like assessment of deposit's formation rate in cooling water systems using corrosion coupons.

However in modern industry, the main goal is to be ready to face market demands and its fluctuations with real-time, online approaches compatible with mainstream plant process control and automation. This implies sudden changes of process parameters, whereby



chemical plants and refineries can change feedstock every few days or weeks based on market crude oil or other feedstock opportunities, which have been shown to dramatically influence on stream corrosivity. For example, lower-cost feedstocks with higher impurities levels or varying moisture levels can make significant changes in corrosion rates, sometimes leading to over two orders of magnitude increases in corrosion rates (from 0.1 to 1 to 10 mm/y). It is obvious that under such conditions, every minute in delay plays crucial role in corrosion assessment.

Staying One Step Ahead of Corrosion

The first important change is to stop thinking historically. This means that information obtained via coupons or other off-line methods over long time intervals are useless for assessment of current process conditions and assessment of pending corrosion issues. This is because off-line corrosion measurement techniques indicate only accumulated damage and average corrosion rates over weeks of months. Hence, any periods of high (peak) corrosion rates will not be captured. Moreover, based on off-line techniques, it's impossible to find any correlation between corrosion incidents and the fluctuations in the main process parameters that will influence stream corrosivity.

The second change necessary for successfully reducing corrosion risk is the implementation of new technologies e.g. SmartCET, which allow corrosion changes to be visualized within minutes or even seconds. With such on-line and real time corrosion monitoring capabilities, corrosion data is handled like other process variables and

"opportunity" really is an opportunity).

- Improved asset reliability and availability,
- Enhanced process operator's effectiveness by bringing the corrosion data online into the control room as a process variable – leads to improved decision making with improved issue resolution time,
- Better cost savings due to process optimization and handling of chemicals treatment.

Having on-line and real time availability for corrosion detection, all engineers can start to build a better awareness of corrosion and its impact to operations and better participate in the overall plant corrosion management strategy.

Conclusions

Corrosion is a dynamic process and has a number of influencing factors that can fluctuate over time and cause unexpected corrosion damage and failures. Studies have shown that the direct and indirect costs of corrosion are higher than expected and thus negatively impact on business operation in a major way. The long intervals associated with conventional inspections and off-line corrosion measurements makes process operators only the passive observers of historical corrosion trends and events. By implementing on-line and real time corrosion monitoring through the plant DCS, allows engineers and plant managers to better manage industrial processes and integrated with proactive corrosion prevention strategies. These new work processes are aimed to minimize corrosion upsets, failures and unexpected downtime with maximizing the availability of the plant assets with the additional benefits of improving safety and operational efficiency.

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Boosting The Treasure

Condition Management Optimizes Production Processes

Asset Management in Trend – As a part of the whole, condition management makes a contribution to the improvement of production processes. It helps users to complete the changeover from preventive maintenance to predictive maintenance and thereby minimizes the occurrence of unplanned downtimes, protect their investment and increase plant safety.



Rolf Panzke
Director Industry Marketing Chemie HPI O&G, Siemens Industry Automation

variety of sectors and to present them transparently as part of the system information – from the first initial definition to the final target of process optimization. Likewise, it is essential to prepare status messages or internal algorithms for the user as comprehensible information and diagnostic functions with intelligent definitions and interpretation.

1,001 Possibilities of Intelligent Technology

Condition management includes measures for extending and optimizing the maintenance intervals of machines, plants and their components. One of the objectives is maintenance-free operation or operation that is self-monitoring or initiates maintenance automatically. In this way, for example, problems arising from contamination can be reduced by the use of contactless measuring systems, e.g. clamp-on ultrasonic flow meters. Furthermore, additional process information can be used to start active cleaning of the components (echo amplitude for the control of flushing systems).

Eroded valves, defective seals and leakages are the commonest causes of pump faults. Siemens devices, such as the Sitrans DA400 diagnostics system for continuous status monitoring, recognize these conditions at an early stage and help to reduce the number of unplanned downtimes. Likewise, the Sipart PS2 positioner, the Sitrans LR



The Sipart PS2 positioner features intelligent, extended diagnostic functions.

250 radar level transmitter, the Pointek CLS 300 capacitance level switch and the Sitrans P DS III pressure sensor have intelligent, extended diagnostic functions. With 18 application-specific diagnostic functions, the positioner heads the list of devices with diagnostics capability. For example, it senses sticking valves, pneumatic leaks, clogged pipes and caking on valve seats and cones.

With the aid of the partial stroke test (PST), the device detects caking, encrustation or corrosion and removes it, even on open/close and safety shutoff valves. In this way, the PST can raise the safety integrity level (SIL). The radar level transmitter reports encrustations on the antenna, which can be

removed during operation if necessary with a self-cleaning device. The capacitance level switch is capable of differentiating between measured value deviations caused by caking or corrosion. The pressure sensor provides information about the duration, frequency and extent of limit violations and about the quality of the processes. On the basis of the measured value violations, the user can determine the status of the transmitter and of the entire process.

Possible future applications of condition monitoring could be bearings, drives, leak detection, compressors or other pumps.

Innovative solutions contribute toward utilizing the existing optimization potential with even greater efficiency.

- Acoustic diagnostic systems for pump and valve monitoring, detection of particles in gas flows and detection of leaks
- Foam detection in process containers by evaluating and ultrasonic reflection signals
- Level measuring systems
- Signal attenuation at flow metering sensors caused by caking of the flow lines
- Deviations in the valve initialization (partial stroke test) caused by caking on the valve seat, valve wear and leakage in the air supply or valve diaphragm.

You can tap into further potential for optimization by monitor-

ing possible sources of faults or states such as internal electronics, energy supply, ambient temperature, as well as short-circuit or break in communication. Deviations in the applications and interfaces can have just the same negative effects as contamination, caking and erosion or corrosion. The process conditions are often also incompatible with the measurement method. The monitoring must meet the following three criteria:

1. The NE107 has top priority.
2. It must be very reliable.
3. It must use existing sensor information.

Advantages Of Integration

The asset management integrated in the Simatic PCS7 process control system provides consistent maintenance information and functions and helps to reduce the total cost of ownership. The asset management is integrated seamlessly into the process control system as a sector-independent software package. As the asset management uses the hardware and software components of the engineering system and operator system, no additional costs are incurred for hardware or software. The plant operator can use the operator station to retrieve all process-relevant information, and can intervene at specific points in the process. The system interface for maintenance engineers is the maintenance station based on the engineering system. Via this, they have access to the complete hardware structure of the process control system, and can attend to diagnostics messages and process maintenance requests. The self-monitoring of the field devices is simple to operate, independent of the installation location and the conditions of use, is extremely reliable and can be put into service very quickly. As the intelligent function uses existing information from the sensor or actuator and no additional devices are required, the additional costs are minimal. By contrast, the customer gains genuine added value at a very low price.

Extended asset management functions increase the availability of the process control system and of the entire plant. The integrated Plant Asset Management System (PAMS) from Siemens enables numerous real-time functions to be implemented online: monitoring of components, notification on change of current status,

Definitions: Condition Monitoring/Management

- Components of asset management condition monitoring regularly records meaningful data and information on the machine status (machines, plants and their components). The focus is on: abrasion, wear and contamination. The device should report its current status in good time before it fails.
- Supports "status-based" or "predictive maintenance"
- The aim is to make status data of the assets available on a continuous basis
- Condition management collects the data and information, coordinates it, creates courses of action and manages the data.
- Maintenance
- The combination of all technical, administrative and business-management actions during the life cycle of an object in order to preserve it or restore it to such a condition that enables it to continue performing its original task.
- Diagnostics
- Identification of faults in the assets (machines, systems and their components)
- Locating faults/evaluating the cause of faults
- Log of individual faults and causes of faults
- Asset
- Plant components: apparatus, boilers, machines, pipes and process control instruments
- The term does not include infrastructure that do not concern the production systems: buildings, roads, rails...
- Plant Asset management
- Comprises a "health check" of all assets, condition monitoring and diagnostic functions with the associated decision-making aids. In addition, the system predicts the remaining life and suggests appropriate maintenance measures to the user.

The Sitrans P DSIII pressure sensor provides information about the quality of the processes and reports on the duration, frequency and extent of limit violations.



When implementing the Simatic-PCS7 asset management, Siemens paid consistent attention to the conformity with international standards, specifications and recommendations and takes the following requirements defined by Namur into consideration:

- Namur recommendation NE91 (requirements for systems for asset management at plant level)
- Asset management is part of the DCS
- Separation of maintenance and process information
- Namur recommendation NE 105 (requirements for the integration of fieldbus devices in engineering tools).
- Future-proof development of the device integration
- Standardized integration of new devices
- Namur recommendation NE107 or VDI/VDE/NAMUR/WIB 2650 (status alarms of field devices – "Device failure," "Function check," "Outside the specifications").

The aim of Siemens is to provide its customers with competent advice and support from the planning process of the production plants through to the commissioning, and to continue this over the entire life of the plant. This minimizes consequential costs and thus the total cost of ownership (TCO), reduces production downtimes and avoids unexpected modifications necessary for further optimization.

The key tasks of condition management in raising efficiency are:

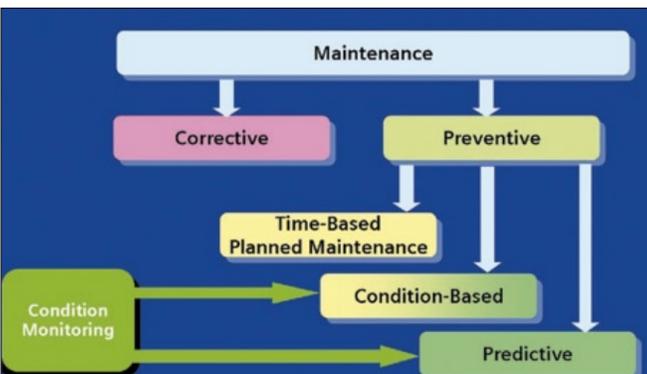
- minimizing unplanned plant downtimes
- improving quality and quantity
- raising production efficiency and reproducibility
- protect equipment and components
- improving safety
- reducing the amount of unnecessary preventive maintenance.

With a change from reactive, preventive maintenance measures to predictive strategies, as can be implemented with condition management, the financial results can be significantly improved. This is because as much as 50% of the expenditure on preventive maintenance is superfluous. These costs can account for up to 20% of the overall maintenance costs. These figures clearly indicate that it is high time for a paradigm shift in maintenance.

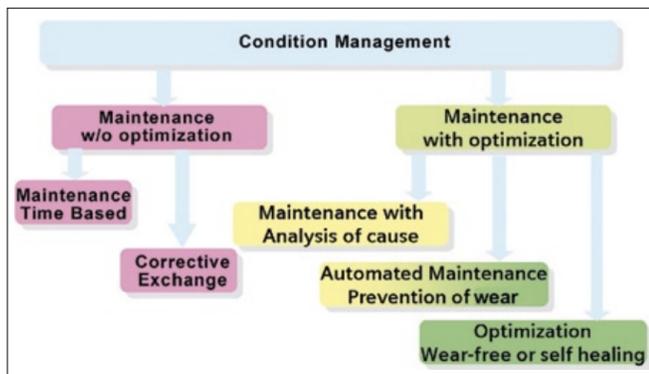
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Asset / Application	Acoustic emission	Vibration	Oscillating path	Pa	cos φ	Rotation speed/torque	Temperature	Pressure	Path	Flow	Complexity	Amount of channels
Turbine	x	x	x		x	x	x					
Compressor	x	x						x	x	x		
Wind Energy Plant		x	x				x	x				
Mills	x	x	x				x					
Gears / Drives		x	x	x	x	x						
Oscillation Piston Pump	x					x					x	
Centrifugal Pump	x			x	x		x	x				x
Particel / Material Flow	x											
Agitator / Centrifuge			x	x								
Drive protection				x	x		x					
Tube Corrosion / Leakage	x											
Valve Leakage	x					x	x					

Possible applications of condition monitoring: bearings, drives, leak detection, compressors or other pumps.



Predictive maintenance can minimize unplanned standstills, protect investments and raise levels of plant safety.



Optimization of the production processes with condition management.

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display of diagnostic information, generation of maintenance requests and tracking of maintenance measures.

All assets have a standardized visualization (symbols, standard operating displays). In addition, the diagnostic displays for the asset management can be created automatically in a very short time from the configuration data. This is a smart feature that saves a lot of time, because the displays no longer have to be programmed individually.

Predictive Maintenance Minimizes Costs

The functionality of automation components is essentially dependent on the application know-how of the system integrators and automation suppliers in the planning process and the interpretation of additional system information. An increasingly important role is also being played by the communication between user and supplier, e.g. with reference to future demands for process optimizations or the attempts to operate a plant for as long as possible with maximum output and at maximum levels of quality. For this reason it is absolutely essential to obtain information about the process and the production conditions during the production process, i.e. "In Process, Online, Realtime," without any interruption to the production or sampling. The trend toward "miniature plants," specifically in fine chemicals, biochemistry and pharmaceuticals, is also a technological challenge for all manufacturers.

Linde Wins Safety Award

Linde North America has been recognized by the Compressed Gas Association (CGA) for excellent safety performance in 2007. For the third consecutive year, Linde received the CGA's Fleet Safety award for the safe driving of its cylinder trucks in the over 3 million-mile category. This award is given by the industry trade group to a member company with the lowest number of recordable vehicle incidents. Linde North America, a member of the Linde Group received the award at the CGA's annual meeting in Florida.

In 2007, Linde's fleet of some 450 trucks in Canada and the U.S. covered 20.7 million miles. These drivers supply customers in all 10 of Canada's provinces with a range of industrial, medical and specialty gases for use in applications ranging from welding to healthcare and laboratory testing. In the U.S., drivers deliver helium, hydrogen, packaged and electronic gases as well as medical oxygen, breathing mixtures and related devices for Linde's LifeGas business.

► www.linde.com

Increasing the Lifetime for Fiber Lasers

Researchers have found new methods for optimizing glass in order to increase the lifetime of fiber lasers. The trend is to produce fiber lasers with higher output powers, which places great demands on the optical fiber. This has been shown at Mid Sweden University.

The interest in fiber lasers has increased dramatically in the last decade. The main driving force is coming from the industry, where these lasers are used for different kinds of materials processing such as cutting, drilling, and welding. The fiber laser offers many advantages compared with conventional lasers in terms of better beam quality, lower prices, and a more compact design. However, it turns out that the glass material in the optical fiber loses its transparency with time, a phenomenon called "photodarkening." This effect considerably shortens the operational lifetime of the fiber laser.

"This is primarily a concern at high output levels associated with applications using a pulsed laser configuration," said Magnus Engholm, a doctoral candidate in fiber optics. One example of such applications is marking, where part of the surface material has to be burnt off from the object to be marked.

Fortunately the glass material can be optimized to extend the lifetime of these lasers. By choosing a proper composition and optimizing the synthesis conditions, scientists can now attain higher output powers and longer lifetimes. This will also open up for new areas of industrial application.

This research has been carried out collaboratively by Mid Sweden University and Acreo FiberLab.

► www.acreo.se
 ► www.miun.se

Chemtura Expands Capacity

Chemtura Corporation announced the expansion of manufacturing capacity for its HybaseOverbased Calcium Sulfonate production line in West Hill, Ontario, Canada.

According to Kirk Schlup, global industry leader, Marine and Fuels, "This expansion increases our capacity by over 25% and is driven

by growth in the marine and industrial areas. This expansion demonstrates our ongoing commitment to supplying our customers and we expect it to be completed by November of 2008."

► www.chemtura.com

Fullerene Size Matters

Luis Echegoyen and co-workers at Clemson University, U.S. and Luna Innovations in Danville, Va. (U.S.), have uncovered the reactivity of the higher trimetallic nitride endohedral metallofullerene cages (TNT EMF). Endohedral metallofullerenes (EMF) are fullerenes that have metal atoms enclosed within their inner spheres. The U.S. scientists explain that as the fullerene cage gets larger, the HOMO-LUMO gap decreases so that the reactivity also decreases.

In order to demonstrate how the size of fullerene cages affect the reactivity of the cyclopropanation reaction with bromomalonate also known as the Bingel reaction, Echegoyen compared the reactivity differences of Gd3N@C80, Gd3N@C84 and Gd3N@C88. They found that Gd3N@C80 gives rise to a mono- and bis-

malonate adduct with apparent regioselectivity. Gd3N@C84 gives solely a mono-malonate adduct, while Gd3N@C88 which has the smallest HOMO-LUMO gap, is completely unreactive. "Up to now, there have been no reports of the reactivity of the higher TNT EMF cages (larger than C80)," Echegoyen said.

Echegoyen and colleagues believe that new types of MRI contrast agents based on these TNT EMFs will soon be available. The U.S. team is currently working on placing different functional groups (beyond the diethyl malonates described in this work) on the fullerene cages which will impart the desired water solubility required for MRI contrast agents.

► www.lunainnovations.com
 ► www.clemson.edu

Belden Expands Line of DataBus Cables

PRODUCT Belden has introduced new FieldBus Type A multi-pair cables and foil/braid cables which provide installation flexibility in many different environments and where multiple or extended cable runs are required.

The number of devices possible on a Fieldbus link will vary depending on factors such as the power consumption of each device, the use of repeaters, signal attenuation, type of cable used and distance. Because of the superior features of Belden DataBus cables, standard distance limitations can be exceeded without any system enhancements or any sacrifice in system performance.

Belden FieldBus cables are suitable for use in class 1, div. 2 applications and compliant with FieldBus Specification IEC 61158-2 (ISA/SP-50). They are also RoHS compliant

and CE approved. Features include excellent electrical characteristics and low capacitance for long runs.

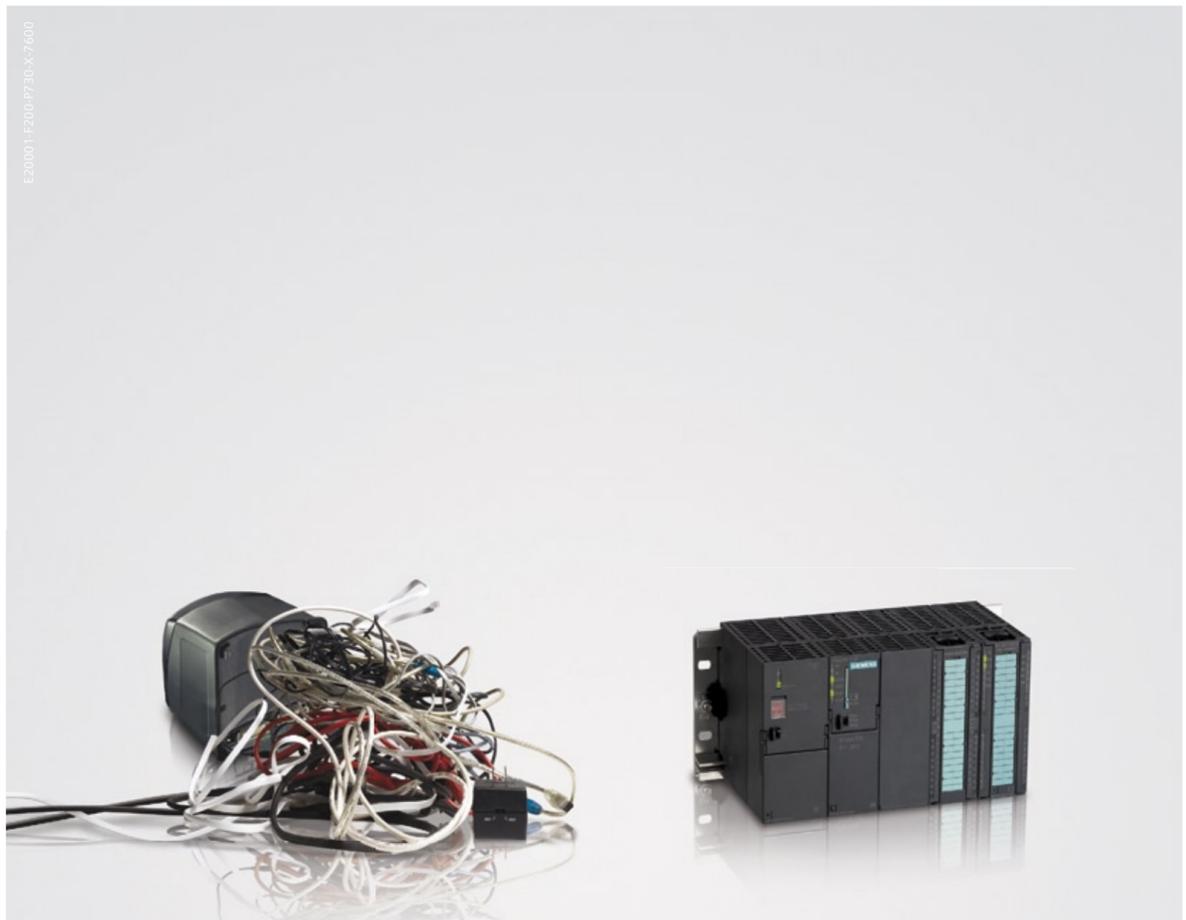
Cables are available with 22, 18, 16 and 14 AWG stranded tinned copper conductors, and as multi-pair cables available in 2 to 24 pairs. Versions are available with Beldfoil shields and Beldfoil plus Braid shields.

For specific applications, custom cable constructions are available with 600V, TC rated; aluminum or steel interlocked armor; CPE jacket or LSOH jacket; various jacket colors; alternate black and white color-coded pairs; multi-pair type B 22 AWG, PLTC-rated, individually and/or overall shielded; and multi-pair 18 AWG, TC-rated, individually and/or overall shielded.

► www.belden-emea.com



Going The Distance High heels made of Terblend N, BASF's ABS/PA blend, are now available on the Chinese market and ensure that spike heels that are up to 10 cm tall can withstand extreme conditions. This plastic stands out for its excellent impact resistance even at freezing temperatures. In comparison to high heels made of standard styrene plastics, those made of Terblend N display considerably better mechanical properties. www.basf.com



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Planning Innovation?

The Value of Project Management in R&D

Professional Approach

– Once adapted to the particular needs of innovation, a professional approach to project management can increase efficiency in research significantly. The use of this discipline can save cost and time considerably and it can provide an improvement in the impact of an innovation portfolio.



Dr. Thomas Stährfeldt
Ciba

to a leaner type of organization that requires an entirely different work method. Now employees often come together in small, cross-functional teams for a limited period in order to achieve well defined targets.

Subsequent to the successful adaptation of professional project management as an independent discipline in IT and engineering, it has found its way into the chemical industry during the last decade with accelerating pace. First adopted in pharmaceutical and petrochemical companies, here a systematic project management has been extended to the development departments. Which particular aspects must be recognized, when we want to fully exploit the value of project management in the field of innovation?

Using Resources Efficiently

As global economic competition grows ever more heated, businesses must find more efficient ways of using their resources, not least their people. In the past, employees at most large companies were organized in big departments with many hierarchical levels, but today many companies are turning

New Type Of Leadership

With the significant involvement of multiple departments, including research; marketing; process and application development; product safety and registration; and patent, the cross-functional aspect is very much pronounced particularly in innovation projects of the chemical industry. This cross-functional collaboration calls for a new type of lead-

Project Managers At Ciba

The background of our innovation project managers at Ciba is not necessarily from research but in several cases from process development, product management or marketing. Prior to receiving their first project to manage, they are given a practical and well targeted training in project management. Ciba has applied this education concept

ership: Leadership responsibility will increasingly shift from traditional vertical line management to lateral project management, and the project manager is set to become a key success factor for our organization. For this type of leader, interdisciplinary thinking is crucial. A project manager has to orchestrate all activities within his project. In particular, sound planning and monitoring help him or her to take corrective measures and to get the entire chain of actions completed on schedule and on budget.

A good project manager must ensure that the personnel aspect of all stakeholders, in particular of all individuals in the team is properly valued and recognized. Tools and methods cannot resolve issues which cause conflict between line management and project work but they can make them transparent. A project manager is to a large extent an interface manager and he devotes a big part of his time to communication and conflict management.

Cooperation Between Marketing and Technical Crucial

Furthermore, at Ciba, we have seen that a close cooperation between technical and marketing is key for any project success. When marketing remains involved after the preparation of the initial business case, staying with a running innovation project through all its phases, it can draw an increasingly more precise picture of the future value of a new product as it is developed. The more often any product concept, lab sample or prototype gets validated through targeted customer contacts, the more precise we can

Fig. 1 Success = deliverable produced within time & budget

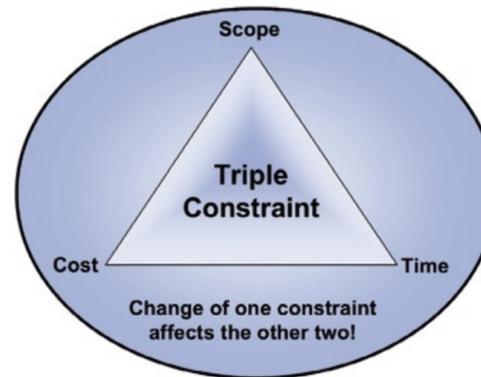


Fig. 2 The Project Management Framework

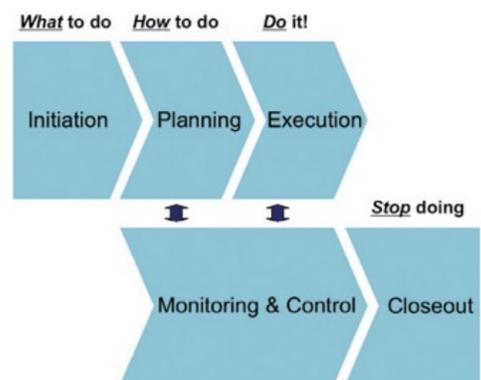
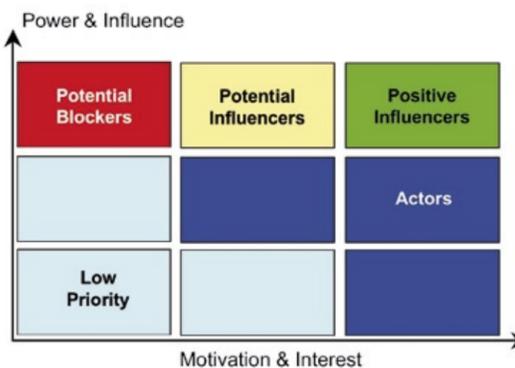


Fig. 3 Stakeholder Management



address the future market of the new product and the better we can understand the value of our new product itself. This increasingly better understanding of the product is called progressive elaboration, which is a key aspect of project management.

Regarding the triple constraint (fig. 1) – the mutual relationship between time, cost and scope – there is an important consideration: In all innovation projects, change management is particularly important. The extension of project scope (scope creep) reduces the probability of project success, when the impact on time and cost gets not properly addressed. Therefore, it must be clear who is the decision making body which has the authority to authorize change requests and how pro-

posed scope changes will be evaluated.

Apart from scope creep, another typical mistake in innovation projects can result from the omission of important steps in the logical chain: initiation – planning – execution – closeout (fig. 2). The premature start of incompletely planned actions is avoided at Ciba as these steps are embedded into a phased global innovation process which provides guidance for our skilled and experienced project managers. Project management must be well anchored into the innovation process.

Furthermore, it is important to identify in a stakeholder analysis (fig. 3) all relevant individuals who are impacted by the project or by its result and from that construct a commu-

nication plan. Overlooking of an important stakeholder can significantly affect the course of an innovation project.

It can be stated that the principles of project management are applicable to innovation projects in the chemical industry, and can lead to an increased efficiency and more realistic forecasts. Even though, the use of this approach will lead to success only if the “human factor” stands in the center. Methods and processes can not create motivation, they can only multiply it!

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Alliance to Develop Climate-friendly Biofuels

Süd-Chemie and Linde have agreed to cooperate to develop and market plants for the production of second-generation biofuels. This will involve a biotechnological process to extract fuels such as ethanol from plant matter containing cellulose, such as wheat and maize straw,

grasses or wood. Based on these renewable resources, second-generation biofuels offer an improvement in terms of climate and energy balance compared with the first-generation biofuels. Besides, they do not compete with the cultivation of either food or animal feed. Süd-Chemie will

be contributing its know-how in the sectors of biocatalysis and bioprocess engineering. Linde will provide engineering expertise in the areas of biotechnology and chemistry.

www.sud-chemie.com
www.linde.com

Profibus Counts Installed Nodes

With more than a million nodes already installed, Profinet has established in the field of industrial automation. To get an overview of the definite number of Profinet nodes already on the market, Profibus&Profinet International tasked a notary to determine the number of in-

stalled nodes. The initial count covered the time period from 2002 to 2007 and yielded that by the end of 2007, 1.14 million nodes had been installed in various applications. Joerg Freitag, deputy chairman said, “We estimate that 3 million Profinet nodes will have been installed

by the end of 2010.” In 2007, the number of Profibus nodes grew to 4.5 million. This means that 23.3 million Profibus nodes had been installed by the end of 2007.

www.profinet.com

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Chemicals

The bulk chemicals race

Page 14



Chemicals

Biocides network has made progress since 2007

Page 15



Chemical Distribution

The chemical distribution's 3Es challenge

Page 16

When Color Interacts with Architecture

In Bridge Construction, Colored Concrete Must Fulfill Many Requirements

Iron Oxides – The largest application field in terms of quantities of iron oxide pigments is in building materials. Colored concrete materials nowadays make an important contribution to making our environment more attractive, and they are widely accepted by the general public. With these materials, builders are able to combine technical functionality with an aesthetically pleasing appearance.



For the red-brown coloring of the concrete, 350 t of iron oxide pigments were used, a special blend based on Bayferrox 640.

Stockholm's new 833 m-long Årsta Bridge, which runs parallel to the existing railway bridge built in 1929, sweeps across Årstaviken Bay, its rhythmic contours interacting with the existing bridge 45 m away. The organic waveform of the new Årsta Bridge is beautifully integrated into the surround landscape, in part because of the

traditional "Falun-Red" color that matches the color of Swedish country homes that has been used since the 16th century. Thus, the structure, designed by the architect Lord Norman Foster, Foster + Partners, is not only a bridge between landscape and architecture, but

also between traditional and contemporary design. The body of the rail system deck, with its elliptical underbelly, stretches out in a long sweeping curve over ten supporting columns. Architecturally, the sedate, calming geometry of the Årsta Bridge reflects the tranquility of the Årstaviken Bay and blends harmoniously with the environment.

Following the design concepts of Norman Foster, the forms for the bridge were manufactured according to traditional building methods using solid wood planks. This created a natural patina, which, in combination with the traditional "Falun-Red" color, enabled a cultural integration of the bridge with the local environment. In addition to how the bridge looked, the architects were concerned about noise pollution. Therefore, both railroad tracks were equipped with noise control devices on the bridge decks. And to keep vibration to a minimum, the trains run on specially padded rails.

The bridge, which is 19.5 m wide and 26 m high, stands on ten columns that support a span of 65 to 78 m. Six of the columns are built on bedrock, two in the Årstaviken Bay, and

two are anchored at the base of the bay, each with 35 rods that are 80 cm in diameter. The columns have been reinforced with seven additional layers of steel. The entire construction project consists of 23,000 m³ of colored and 6,000 m³ of uncolored concrete.

Since the concrete had to fulfill numerous technical requirements, it took nearly six months for the engineers to develop the correct concrete mix. First of all, since the spans are long, the concrete had to be pumpable with good flowability and processability, and distributed evenly throughout the structures. It had to be consistent from batch to batch, strength could not be compromised, and it had to be free from cracks. Last but not least, for good color consistency, the pigment had to be evenly distributed in the mix.

Pouring the concrete was carried out in sections on a 130 m long building platform which was attached to the already completed sections, and then mounted to two supporting columns. In order to avoid major color variations, the wood boards of the forms were covered with red-pigmented cement slurry. Each 24-

hour pour was continuous, with more than 300 m³ of concrete pumped into the mold.

Instead of painting the concrete, those responsible for the project decided to use colored concrete since it offers advantages in terms of maintenance and durability.

The requirements expected of pigments for coloring concrete can be satisfied by inorganic oxide pigments like Lanxess' Bayferrox grades. One of the main demands made on the pigment is that it is absolutely resistant to alkalis because due to the formation of calcium hydroxide, cement that is freshly made up with water is highly alkaline. Furthermore, the pigment must be neither destroyed nor washed out through the effects of the weather – especially sunlight and the constant changeovers between heavy rain, heat and frost.

Iron oxide pigments from Lanxess are weather stable, become firmly integrated in the cement matrix and are environmentally safe. Iron oxides (e.g. the Bayferrox grades) are available in the colors yellow, orange, red, brown and black, with the intrinsic color determined by the chemical modification:



red – α -Fe₂O₃, Hematite, yellow – α -FeOOH, Goethite black – Fe₃O₄, Magnetite brown – Blend of red, yellow and black

Iron oxides occur naturally in a variety of minerals. They are the principal components of red soils and are responsible for the typical reddish-brown coloration of rock formations like the Grand Canyon or Ayers Rock. Yellow, black and brown minerals based on iron oxide also occur in nature and, as evidenced by the Stone Age cave paintings in Lascaux, France, or Altamira, Spain, have long inspired the artistic side of man. Whereas it was primarily natural iron oxides that were used in the past, they have gradually been displaced by synthetically manufactured iron oxide pigments from the late 19th century

onwards due to their greater purity and superior and more consistent quality.

With an annual global demand of approximately 1.1 m t, synthetic iron oxides are easily the largest group of color pigments in terms of volume. In summary, iron oxide pigments remain a sophisticated product group undergoing constant refinement with respect to manufacturing processes and applications, despite more than 100 years of industrial-scale synthesis.

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More than just rust

Characterized by a broad color palette and high tinting strength (which means high coloring power in the application medium), good chemical resistance, high weather stability, toxicological safety and – last but not least – a relatively low price, iron oxide pigments boast a diverse range of applications. The main fields of application are:

Color pigment applications:

- building materials
- paints and coatings
- plastics
- laminates

Technical oxides:

- toner oxides
- arsenic adsorbers
- airbag oxides
- magnetic pigments
- miscellaneous (ceramics, catalysts, etc.)

The largest field of application in terms of quantities is in building materials. An important factor for building material customers is a variety of supply forms. Powders, granules and waterborne slurries are all manufactured and are commercially available.

BASF's 2008 Chemspec Focus

The M, O, C. Munich, Germany, will be hosting this year's Chemspec Europe on June 18 and 19, providing attendees access to fine and specialty chemicals industries top suppliers and buyers. BASF plan to focus on three business aspects: its inorganic portfolio; chemical intermediates; and catalysts.

Apart from the BASF's stand at the Chemspec trade show the company is also giving presenta-



tions. Dr. Uwe Vagt, BASF's Ionic Liquids Project Manager, will be giving a presentation on BASF's ionic liquids solution to highlight

the company's customer- and application-specific products and processes. Dennis Kluever, THF Product Manager, will present tetrahydrofuran (THF) solutions for the pharma industry as BASF is expanding its chemical intermediate THF offer specifically

for its pharmaceutical industry customers in Europe.

► www.basf.com

Helsinn Healthcare Streamlines Quality Assurance

Helsinn Healthcare said it has selected TrackWise to standardize quality assurance practices in all of its companies and sites across Switzerland and Ireland. The goal is a singular, centralized standard for quality assurance and compliance management corporate-wide.

TrackWise, made Sparta Systems, is the market leader in enterprise quality and compliance management software.

The company plans a staged rollout of TrackWise across the organization to support a number of core processes including unplanned devia-

tions, change control, corrective and preventative action (CAPA), out of specifications (and out of trend), complaints, audit, training and supplier qualification.

► www.helsinn.com
www.sparta-systems.com

Chemspec Europe 2008



Munich, the capital of Bavaria, will be a first time host for Chemspec Europe.

support services and facilities for the manufacture of complex fine chemicals.

The Colors Village is a dedicated area focusing on all forms of colors, and continues to prove more popular each year with buyers and specifiers who wish to meet and identify exporters and producers.

New for 2008, Pharmaspex Europe will be a targeted area of Chemspec Europe grouping specialised suppliers of fine chemicals and other chemistry

services to the pharmaceutical industry.

Munich has not previously hosted a Chemspec event. However, Bavaria is the third largest chemicals region in Germany in terms of employment. Wacker-Chemie and Süd-Chemie are both based here; Evonik, BASF, Ciba Specialty Chemicals and Clariant all have research and/or production facilities and some 250 small and medium enterprises are also active in the industry.

Much of the action is to be found in the so-called 'Bavarian Chemicals Triangle' between the rivers Inn and Salzach. This includes the very large sites at Burghausen and Trostberg, among various others. Other smaller chemical agglomerations – some of which are in the form of integrated chemical parks – are to be found in the areas of Munich, Starnberg & Weilheim and Nuremberg/Erlangen (in both of which pharmaceuticals and specialty chemical products are core), as well as in Ingolstadt, Mühlschloß & Kelheim and in the Augsburg area.

Munich is also an attractive location for Chemspec Europe due to its proximity to chemical industry sites in Austria and the Czech Republic, as well as to Eastern Europe in general.

► www.chemspec-europe.com

Bio-based Bulk Chemicals

The Race Is (Back) On

Born to Run – Industrial biotechnology – or white biotechnology – has a long history in the production of chemicals. Fermentation, enzymatic conversion and extraction of natural compounds have been means for the more effective and efficient production of various substances for many – in some cases hundreds – of years.

In 2005, about 7% of all chemical sales were generated using bio-based feedstock and/or biotechnological production methods. These products include food and feed ingredients such as vitamins or amino acids, APIs, enzymes, oleochemicals, flavors and fragrances, and ethanol. A few years back, the hope was that bio-based bulk chemicals was going to be the next big thing. However, due to the sudden boom in the bioethanol industry, R&D resources and attention shifted towards optimizing first generation and pioneering second generation biofuels. Activity in the chemicals sector decreased somewhat, even though a positive aspect of the biofuels hype was the increased overall visibility for industrial biotechnology and the larger amounts of funds dedicated to basic biotech research.

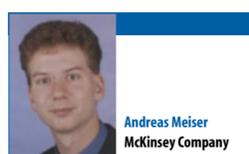
Recently, however, activity in the sector has surged again, and the growth outlook is positive. Five major factors are driving higher investments: the increase of fossil feedstock costs; technological advances; the search for product innovation; regulatory support; and the green consumer trends moving up the supply chain. Most chemical companies as well as several biotechnology companies and agribusinesses have started to engage in bio-based bulk chemicals (again). Recent announcements of major investments, include Braskem/ETH, Solvay/Copersucar, Dow/SantelisaVale, Cargill/Novozymes, and DSM/Roquette.

Billions of dollars have been invested, and many more will be for developing and commercializing bio-based bulk chemicals. What does it take to make sure these investments have a good payback? We believe that you have to answer to three critical questions:

1. Which are the right molecules/compounds to produce?

Several systematic assessments have been conducted by public institutions to find the most promising candidates for novel bio-based intermediates out of biomass-derived product trees (e.g., by the U.S. Department of Energy and the European Commission). However, even though the research represented breakthrough insights at the time, only few of the compounds identified have proven to be commercially promising (e.g., succinic acid, 3-HPA, lactic acid), while others will likely remain niche products (e.g., levulinic acid, lignin-derivatives like furfural).

In the past two years, we have developed and applied a more sophisticated screening methodology that combines



Andreas Meiser
McKinsey Company



Jens Riese
McKinsey Company



Nicolas Denis
McKinsey Company



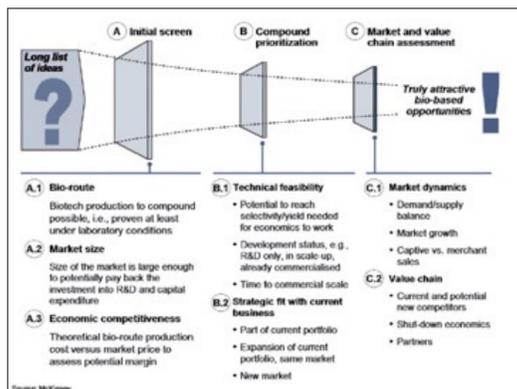
Ulrich Weihe
McKinsey Company

the latest insights on technological possibilities with a realistic assessment of the compound's commercial potential. It obviously needs to include a detailed estimate of both bio-based and the competing fossil-based production costs, but what production cost is the right one to compare the bio-route against? Which oil and sugar prices do you assume? Are we competing for growth, in which case we can look at the investment returns versus a state of the art conventional route? Or do we need to compete against shut down economics, which means we need to undercut variable cash cost of existing assets? What kind of production cost needs do we need to succeed if the bio route addresses a molecule for which the conventional production process and economics are substantially integrated with other products? Or if the market for the compound is largely captive? These questions demonstrate that just being lower cost than a conventional route is often not good enough, which is why many of the candidates from the academic screens have failed in the economic realities of the chemical industry.

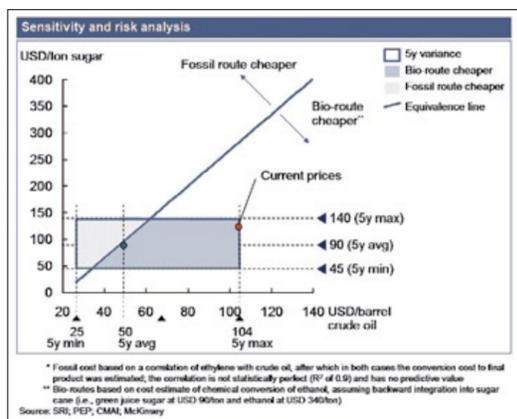
2. What is the right choice for my company?

The core criterion to answer this question must be strategic fit. If you are already a producer of a certain compound, you will already have good market access and the possibility to integrate the bio-based chemical into your value chain. You may decide to expand your production volume, go for a more economic process or merely choose to diversify your risk by having access to a production method relying on an alternative feedstock and therefore reducing your exposure to rising raw material prices. Conversely, if you are currently sourcing the compound in question, you may want to backward integrate to capture additional value. Again, your position in the value chain and access to the market will be secure.

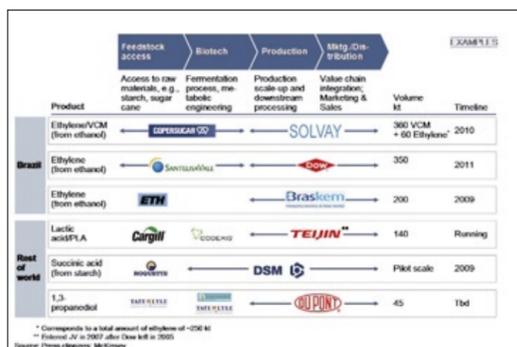
As a new entrant, however, the play will be much more difficult. You need to have at least one of proprietary knowledge/IP, core capabilities for the development of a bio-route, a superior fermentation skills and assets, or the possibility to integrate the new compound into your business to qualify as a natural owner. Given that many bio-based intermediates represent the origin of entire product trees, this could mean to use the intermediate for own production purposes as well as selling it into segments currently not occupied. One good example for such an intermediate is succinic acid. Succinic acid itself and its derivatives can be used as a co-polymer in polyesters (e.g., PBS) or polyamides (e.g., PA64). Additionally it provides the possibility to produce a number of interesting bio-based solvents (e.g., THF, NMP, esters) and could be the starting



Methodology for the systematic technical and economic assessment of bio-based opportunities.



Sensitivity and risk analysis for production of a bio-based chemical – alternative feedstocks provide a mechanism to reduce production costs and to hedge the exposure to oil prices.



Chemical players have started to form partnerships and JVs along the value chain to get access to the necessary feedstocks and capabilities.

point for multistep conversion into higher chemicals. However, unless you have access to at least one insertion point in the value chain, this will be a tough game. We would consider raw material access per se as a strategic advantage but not as a superior reason to engage in a bio-based bulk chemical, which you have no other links to.

3. How to set it up?

Establishing a bio-based business requires a breadth of capabilities: access to feedstock, metabolic and genetic engineering, fermentation process know-how, downstream processing and integration, and marketing and distribution. Additionally, the amount of investment into R&D and production assets is substantial. Thus, only very few companies have decided to pursue these opportunities on a stand-alone basis – an endeavor of this size simply cannot be tackled by the majority of play-

ers. Most companies active in the field have instead decided to partner along the future bio-based value chain, represented by agribusinesses, biotech companies, and chemical players. They have structured supply agreements, partnerships, or JVs for the development, production and marketing of bio-based chemicals. The core questions here are: when should we partner, who is the right partner, where should we invest and how should we structure the deal? There can't be any general answers, but in any case, a sound assessment of a company's own capabilities and the willingness to take risks needs to precede a decision about entering the bio-economy. For a technology company, it would be optimal to push a project until at least proof of concept stage to ensure satisfying royalties (which before that phase tend to be low), but you need the insight into markets to

identify the right compounds, money and the willingness to take some risk.

And where should we go? While many of the efforts have traditionally been focusing on Europe and North America due to the strong presence of R&D centers in these regions as well as substantial government support, several recent projects in China and Brazil indicate that the center of gravity may be shifting. Chinese policy, focusing on energy security and development of a domestic industry, may make it difficult for western players to obtain a significant position. However, Brazil (and to some extent South-East Asia), with its superior sugar cane economics and well developed infrastructure make the country highly attractive for bio-based businesses. Africa's vast potential is still largely untapped, mostly due to a lack of infrastructure. However, first foreign investments to produce bioethanol in Mozambique based on sugar cane show that East African countries should be watched carefully as potential hubs. It is especially the access to sugar cane (or "green") juice, which companies need to secure now. Green juice is arguably the optimal fermentation feedstock as it is very inexpensive to produce and – as opposed to starch or lignocellulosic biomass – does not have to be processed. On the other hand, it cannot be transported over anything but small distances due to auto-fermentation and high water content. Thus competition for suitable sugar cane land close to the industrial centers and to ports is becoming fierce, exacerbated by the fact that the bio-fuels and bioenergy sector will partially be competing for the same land. Prices have substantially increased, and some of the major sugar cane producers have already entered long-term exclusive supply agreements or even full JVs with chemical companies (e.g., Braskem, Dow, Solvay).

Will the promise of biotechnology finally deliver in bulk chemicals? It is too early to say, but the conditions have never been better than today. It is clear that bio-based building blocks sitting at the root of broad product trees have the potential to generate sales of multiple billion dollars per year. It is also clear that there will be not much more than a handful of compounds that will make it in the end. And another thing is clear: the race is (back) on.

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IMF: Slow Economic Growth in Europe

Europe's economic growth is expected to slow down due to the subprime fallout in the U.S., according to the International Monetary Fund (IMF). While the housing sector fairs better in Europe than the U.S., IMF officials indicate they are still lowering their European forecasts. However, although the region's unemployment rates are expected to rise, IMF Director of the European Department Michael Deppler says he anticipates Europe's economy to remain more resilient than the U.S.'. Deppler says while the IMF is not sure how big of an economic shock Europe may face, they do know regional countries will not be able to avoid a general slowdown.

► www.imf.org

Borealis Increases Gearing Ratio

Borealis, a provider of plastics solutions, announced net profit of €130 million for the first quarter of 2008, a 15% increase over the same period last year. Net interest-bearing debt increased by €194 million during the quarter, and the gearing ratio grew to 36%, up from 27% in the fourth quarter of 2007.

Borealis' sales revenue rose by 14.5% to €1.696 billion. The first-quarter results were achieved by growth in the polyolefin target market segments of infrastructure, automotive and advanced packaging as well as positive contributions from the newly formed base chemicals business and from Borouge, Borealis' joint venture with the Abu Dhabi National Oil Company.

► www.borealisgroup.com

BASF Further on a Successful Path

BASF's first-quarter sales rose by almost 9% to €15.9 billion, while income from operations (EBIT) before special items increased by more than 11% compared with the same period of 2007 to almost €2.4 billion. The sales rose significantly in the Chemicals segment due to higher volumes and prices, but the strongest sales growth was again posted in the Oil & Gas segment. All divisions contributed to the increase in sales by double-digit growth rates. The excellent earnings level achieved in the same quarter of the previous year was not reached. This was due to a decline in margins for cracker products and decreased plant availability in the Petrochemicals division.

BASF's Chairman Jürgen Hambrecht said, "Our strategy is not to try to achieve improvements over just a few quarters. Instead, we strive constantly to keep ahead of the global competition over the long term."

► www.basf.com

Biesterfeld's Most Successful Year

In 2007 the Biesterfeld Group achieved an increase in turnover over last year of 21.2% to €836.5 million. The operational result (Ebita) increased by 28.5% compared with the previous year to €34.6 million. All three business divisions recorded considerable sales growth and clearly improved their results. With retroactive effect of Jan. 1, 2007, Biesterfeld Plastic completely took over Biesterfeld Iberica and thus further extended its leading market position in Europe. Due to the regional expansion and the diversification of the product portfolio in special field like electronics, automotive and construction industries, Biesterfeld Spezialchemie grew above the market and thus continuously strengthened its market position especially in Central Europe.

► www.biesterfeld.com

EFSA Rates BASF's Lycovit as Safe

The European Food Safety Authority (EFSA) has assessed BASF's lycopene formulations marketed under the brand name Lycovit as safe for use in foods and food supplements. In this way, the authority is confirming that BASF's synthetically produced Lycovit is an alternative to natural lycopene. Lycovit has been marketed globally for years – except for the markets of the EU. In the US it has been recognized as safe for use in food supplements and foods since 2003.

► www.basf.com

Lyondellbasell's Success

Lyondellbasell's world-scale Hostalen Advanced Cascade Process (ACP) 320,000 t/y HDPE (High Density Polyethylene) plant, located in Wesseling, Germany, has produced one million t of prime HDPE grades since start-up in 2004. Hostalen resins are the materials of choice for use in pipe, high performance film and blow molding applications. According to Elke Damm, Lyondellbasell's Hostalen technology manager, the company's largest HDPE facility "utilizes a versatile combination of reactors which result in products exhibiting a combination of properties that are not achievable with conventional unimodal or bimodal HDPE grades."

► www.lyondellbasell.com/Schierloh

Süd-Chemie Continued Profitable Growth in 2007

Compared to 2006, Süd Chemie's consolidated revenue rose by 7.2% to €1.075 billion, although negative currency effects reduced total revenue by some €40 million. The profit from operations (Ebit) rose by 20.7%, reaching €100.8 million. All core areas of activity contrib-

uted to grow in earnings. The Ebit margin was improved by 1.1% points to 9.4%. Earnings before interest, taxes and depreciation (Ebita) climbed by 16.1% to €142.2 million, representing an Ebita margin of 13.2%.

Consolidated profit of €47.4 million for the year 2007 was

down €8.1 million on the previous year. Account must be taken of an earnings contribution of €10.2 million from operation and sale of the pet products business that was included in the profit reported for 2006.

► www.sued-chemie.com

Outlook Deteriorates in Finnish Chemical Industry

will continue, but the increase in personnel will come to a halt.

Weak demand for paper in Europe and North America and high wood prices in Finland curb production in the Finnish pulp and paper industry, which is the most important customer

of the Finnish basic chemicals industry. The production of paints and colouring materials has been increased for years, now there are signs that the upward trend in demand will be disrupted, but the need is expected to remain at a satisfactory level. Output of the plas-

tic products industry has been increasing since summer 2007, because growth in construction has boosted the demand for plastic construction materials. Now the growth in construction has started to stall.

► www.chemind.fi

Hand In Hand

The European Biocides Information Network Brings Together Industry, Authorities

Cooperation – The network has made a lot of progress since the Biocides 2007 meeting.

As announced at the Biocides 2007 conference in Vienna, Austria, last December, the European Biocides Information Network – an initiative by industry and authorities – has been online since April 2008.

With the first active substances on the Annex I and Ia of European Directive 98/8/EC, the application phase for the biocidal products containing those substances is about to start. Quick and easy access to relevant information and the knowledge about deadlines and other important facts are therefore just as crucial as to know who could be of support.

The fact that during the transition period member states can still apply their existing national schemes for the regulation of biocidal products does not make the situation easier for the companies – or people – dealing with this matter.

In addition, the review of the EU biocides' regime is in progress and was supposed to be finalised by 2010 but has recently been prolonged until 2012. The key issues are still under discussion and valid information about the details it is not easy to get.

The European Biocides Information Network is a non-profit network initiative for industry and authorities that intends to be continuously enlarged and updated on a regular basis and such performs as a time saving one-stop-shop platform with pre-selected and commented hyperlinks, articles and documents to provide:

- background, guidance and information on current and upcoming issues concerning biocides under the EU regime such as the status quo of annex I and Ia listings together with their relevant "sunset" dates or the listing of substances which are in the pipeline to be listed there;

- well-structured information about member states, contact details of the relevant competent authorities and poison information centres as well as relevant and publicly available regulatory inventories and sources of electronically available legal texts resulting also in up to date national profiles of individual member states of the EU explaining also the national schemes in place during the transition period where applicable;
- contributions from authorities and industry experts aiming at a European wide harmonised understanding and handling of biocides' regulations especially the different procedures and exemptions as well as supporting information for applicants;
- an overview on testing laboratories, specifying their conducted tests and countries of operation and the relevant contact details;
- contact details of specialised consultants and overviews of their services;
- extracts of scientific journals highlighting articles relevant to the risk assessment or management in relation to the supported active substances;
- listings of books of relevance to the biocidal scientific and regulatory world;
- information concerning helpful and publicly available databases providing information on risk assessment, risk management, exposure etc. of biocidal products;
- highlights and information of international organisations with relevant impact on the biocides' regime in Europe such as the Organization for Economic Cooperation and Development (OECD) and the United Nations;
- with news and facts on meetings and trainings related to the biocides scientific and regulatory world;

"We want to create a full service package where users will find online



information throughout the year, as well as personal discussions with their peers at the annual conference of this network," said Robert Feierl, managing director of the platform. "In addition, we created the user group meeting back to back with the conference to develop the network

further and enable users to discuss new features that should be integrated in the platform in future and such guarantees a steady adaptation to upcoming needs."

Due to the involvement of industry and authorities, statements published on the website commence to a wide

extend a common understanding of relevant issues and such lead to a better harmonisation in this field of regulation.

The aim is to create a community for a fast information access and transfer between both industry and authorities.

An advisory committee, the members of which are all experts in the field of biocidal regulatory and scientific issues, advises and controls and such ensures the quality and high level of information and continuous development of this network. The current head of committee, Dr. Karl Hruby, is the head of the Austrian Poison Information Centre. Deputy head of committee, Dr. Edmund Plattner, is head of department V/3 (Biocides) of the Austrian Ministry of Environment and is the head of the OECD Biocides Task Force as well.

By registering to the platform, the user will have access to the European Biocides Information Network as well as free attendance at the annual user-group-meeting in Vienna on Dec. 3 and free attendance at the annual conference Biocides 2008 in Vienna from Dec. 4–5. Group/company discounts are available as well.

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What is the European Biocides Information Network?

The network is the first comprehensive information exchange platform for European biocides; applying a one-stop-shop principle for gathering of and linking to all relevant information regarding the European biocides regime based on Directive 98/8/EC.

Evonik Widens Product Supply

Evonik has presented the two new silicas, Aerosil 200 SP and Aerosil 300 SP. Aerosil fumed silicas from Evonik serve as reinforcing fillers in silicone rubber applications improving mechanical properties and ensures that the rubber has good transparency. These new SP grades can create greater transparency in the end products. The applications include use in

silicone articles for medical technology, the electrical industry, sports accessories and the food sector, for example in silicone rubber nipples. Both the silicas can be rapidly hydrophobized in situ and are easily processed at lower temperatures than have been used in the past.

► www.evonik.com

Zero VOC Amine

Angus, a wholly owned subsidiary of Dow, has introduced an enhanced primary amine, AEPD Vox 1000. It has a non-VOC designation in Europe and Asia Pacific, making it applicable for VOC-free paints in these regions. It has low odor, a highboiling point, a non-yellowing character, and a low vaporpressure. Chemically similar to the Angus product, AMP multifunc-

tional amine (2-amino-2-methyl-1-propanol), AEPD Vox1000 demonstrates similar functionality. However, it exhibits an additional hydroxyl functional group, which allows for increased open time and wet-edge improvements without lowering the scrub resistance.

► www.angus.com

Rhodia Launches Eco-friendly Solvent

Rhodia has launched the production of Rhodiasolv Iris, a solvent with eco-friendly properties, at a new unit located on the group's Santo Andre site in Brazil. Rhodiasolv Iris, designed for applications such as industrial cleaning, foundry resins, paints and coatings formulations, is non-toxic, readily biodegradable, non-

flammable and low VOC. "This new solvent was developed by Rhodia's international innovation platform of R&D centers in Brazil, France, United States and China," said Jean-Pierre Clamadiou, Rhodia's chairman and CEO.

► www.rhodia.com

Reaxa Introduces New Catalyst

Catalysts technologies company Reaxa enlarged its product range of encapsulated metal catalysts with PolyTTP30, a form containing bound polymeric phosphine ligand, that give low levels of palladium and phosphine contamination in crude pharma products. It shows catalytic activity in many C-C bond forming reactions and is adaptable to high-throughput medicinal chemistry processes to

deliver purity product libraries. In addition to use in batch processes, its properties enable deployment for flow reaction processes. PolyTTP30 has also been employed under microwave-enhanced conditions, delivering both low metal and low ligand contamination of crude products.

► www.reaxa.com





SHARED VALUES - SHARED SUCCESS

Brenntag Personal Care Europe shares your desire to sensitively develop innovative products and solutions.

Anticipating the products for tomorrow
From the intimate knowledge gained with our business partners we provide innovations and solutions on an international basis. We contribute to your success using our knowledge and experience within the Personal Care industry and across markets. Carefully and with a clear strategy we select quality brands.

Innovating solutions
Our technical experts optimise your formulations based on an extensive product

portfolio and the knowledge of our skilled people. We also share our access to the technical excellence and specific support of our suppliers in order that we are able to provide comprehensive advice.

Practising a common language
Brenntag Personal Care Europe builds and maintains confidence in the knowledge we share. Our techno-sales team transforms visions into realities and converts cost-consciousness into high performance. With attentive ears and one voice we understand the challenges and needs of our customers.

Taking a step ahead
Delivering reliability, integrity and safety

in the value chain is the mission of our highly trained and committed staff. We provide dedicated logistical systems, which facilitate seamless production. Sampling capabilities, GMP refilling and secure transport interfaces will further enhance your competitiveness.

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Demand For Excellence

Distributing Cosmetics Ingredients for the Personal Care Industry

Personal Care – Conspicuous placement of its products in supermarkets, TV commercials and print advertisements means the Personal Care industry features very prominently in our everyday lives. Innovations accommodate the incessant demand for products that make us feel and look better.

The ingredients that make this all happen are primarily developed and provided by the specialty chemical industry. What role does chemical distribution play in this sector? Brenntag Personal Care Europe offers a complete range of products from the most traditional ingredients to the latest innovations. A sales network providing blanket coverage throughout Europe combined with technical expertise, an international marketing concept, and a high standard of quality control and safety makes Brenntag the partner of choice, for both customers and suppliers. Michael Reubold asked Aline Serre, Business Development Manager Europe Personal Care at Brenntag, about market trends and the role of chemical distribution in catering for these trends.

CHEManager Europe: The personal care market is highly competitive. What are critical success factors involved in the distribution of ingredients for the personal care industry?

A. Serre: The market demands excellence and a high degree of specialization. Brenntag Personal Care provides both technical and knowledge based support via a complete top quality and innovative product portfolio. Added to that, we have



Aline Serre
Brenntag

logistics and storage capabilities throughout Europe comply with the European Cosmetic Directive. Last but not least, our team of 50 highly skilled Personal Care specialists in Europe provide valuable expertise to our business partners on a daily basis. This complete and unique offer makes us a strategic partner for the whole industry.

Does a market that is largely governed by brands also require a special branding and marketing competence at the ingredients level?

A. Serre: Top quality cosmetics ingredients provided by reliable partners are key criteria for this industry and have a direct influence on our products and how we select our partners. Brenntag's policy here is to work with "top preferred" partners with an excellent reputation and high quality products. We require strong technical and marketing support from our partners, and that includes joint visits to the customers, detailed dossiers on each product, complete documentation, sample stock etc. We sell cosmetic ingredients exclusively under the original brand names and promote them accordingly – that is why we are so keen on selecting the right ones.

What are the most important product segments in terms of volume and revenue?

A. Serre: Toiletries, hair care and skin care are by far the most important cosmetics applications. As far as Bren-

ntag Personal Care in Europe is concerned, large volumes are driven by surfactants, emulsifiers and emollients. In terms of revenue we have to include a wide range of "top class" cosmetics ingredients, as actives, perfumes, essential oils and specific silicones.

What are other important trends at the moment?

A. Serre: Specific consumer groups are driving the market, such as the teen & twen segment, active in fragrances for instance. Ethnic brands are also very popular now, particularly in the UK. Men's grooming is a key trend. Convenience products are very much appreciated, as are single-use and sample-size packs due to new flight restrictions and at-home spa treatments.

Natural and organic products such as exotic flora or mineral make-up are becoming increasingly popular as are high-performance products offering several features in the same application, for instance an anti-pollution and sun-protection hair care product or an anti-ageing and anti-cellulite skin care product.

How does Brenntag work with its customers and suppliers to satisfy these trends?

A. Serre: Part of our job is to be aware of such trends, to be proactive and anticipate the trends of tomorrow, and here I have the European Brenntag team of cosmetics experts to rely on. I myself use the media and exhibitions etc. to make sure I am always fully up-to-date on new trends. Then we apply the knowledge we have gained to select the most dynamic and innovative partners, and insist on a know-how exchange with them so that they too can



"Natural and organic products are clearly a mainstream."

improve their innovation capacity.

Of course, it's not just our innovative portfolio that attracts customers. We also organise marketing events focused on the latest trends. On top of this, we organise email campaigns and marketing letters to highlight attractive products.

Last but not least, we take advantage of Brenntag's presence in other markets, such as the food ingredients market or the pharmaceutical market, to use also cross over innovations

and get ideas of new ingredients for our industry.

There is an increasing demand for natural and organic cosmetics. Cosmetics companies are experimenting with natural preservatives, surfactants and colorants as they move away from synthetic chemicals. How do you see this trend?

A. Serre: Natural and organic products is clearly a mainstream. As a chemicals distributor Brenntag has taken

this into consideration, and we offer a wide range of natural based emollients like oils, butters, special esters, PEG-free surfactants, natural colorants, etc.

We have noticed a strong demand for natural preservatives as most formulators want to move away from parabens, phenoxyethanol and formaldehyde donors. Finding an ideal replacement with the same cost-efficiency is a complex task. However, we now have excellent alternatives in our product portfolio. Overall, it is imperative to ensure that the ingredients we select are safe for health and for the environment.

From a global perspective we notice significant regional differences in consumers' requirements for the effects they can expect personal care products in terms of textures, colors, fragrances and so on. How diverse is the European market in this regard?

A. Serre: We do not see major differences in consumers' demands within Europe. Differences will come more from other parts of the world. Latin America will have specific expectations, as will Asia and Africa.

In Europe, we see stronger product segments in several countries but no fundamental differences. That means Italy on make-up, France on top-class skin care products, Germany and UK on toiletries and hair care. We should also bear in mind that the cosmetics multinationals are usually the trendsetters.

Product quality as well as safety, health and environmental protection are fundamental prerequisites in the Personal Care market. What action do

you take to guarantee full compliance with requirements and regulations?

A. Serre: Delivering reliability, integrity and safety in the value chain is the mission of our highly trained and committed staff. We provide dedicated logistical systems which facilitate seamless production. We offer variable packaging, sampling capabilities, GMP refilling and secure transport interfaces. The European Cosmetic Directive is our key driver also in terms of logistics and storage, and all our cosmetics ingredients are treated "apart" as they must be.

Do you think that the market is 'over-regulated' and 'over-legislated'? How does the European chemicals legislation Reach affect your business?

A. Serre: I do not see the European cosmetic market as being "over-regulated." First, the European Cosmetic Directive provides clear guidelines and fundamentals. Second, the GMP regulation is widely implemented in the pharmaceuticals market and is increasingly broadening its reach to cosmetics manufacturers as well.

We welcome Reach because it ensures a high level of protection from exposure to chemicals in order to safeguard health and the environment. Reach will definitely have a major impact on the consumer side and will provide reassurance, especially for particular products. By the way, the most important natural ingredient in cosmetics formulations in terms of volume is simply "water."

► www.brenntag.com

Distributors Must Tackle the 3Es

Report Sees Chemical Distribution Facing Profound Challenges

EEE – The challenges for chemical distribution are the environment, energy and economy.

According to the findings of a new study from Chemagility, the UK chemical distribution sector will experience positive growth over the next five years but, along with the rest of the EU, will have to overcome some tough challenges ahead. Distributors will have to address the 3Es: environment (Reach, climate change, sustainable development); energy (oil and gas, petrochemicals, transportation); and economy (globalization, impact of emerging Asian economies). Increasingly these factors will be shape the future development of the European chemical distribution industry.

The chemical distribution industry in the UK has been growing fast over recent times thanks to a favorable combination of outsourcing trends, restructuring of the chemical industry, increased international trade and the market entry of Asian producers. Overall the UK (€3.65 billion) represents approximately 11% of the total European chemical distribution market, worth around €35 billion in value terms, making it the third-largest market behind Germany (€8 billion) and Italy (€5 billion). Excluding the subsidiaries of the large multinationals, there are 225 chemical distributors in the UK compared to 1,850-1,900 for Europe as a whole (figs. 1-2).

Growth In Chemical Distribution

The report, titled UK Chemical Distributor Market Report 2008, forecasts the value of the UK chemical distribution market to grow from €3.65 billion in 2007 to €4.95 billion by the end of 2012 – a growth rate of over 6% per annum. Similar growth is expected for the EU chemical distribution sector in the Eurozone. Although this looks favorable underlying sales growth will be inflated by significant increases in chemical prices resulting from the rising costs of energy and petrochemical production, the high costs of Reach compliance, and the increasing likelihood that China will eventually start to export inflation not deflation with respect to chemicals shipped to the EU.

David Brown, marketing director at Chemagility, said he sees sharp rises in input prices becoming a major issue for the industry. He points out that "increasing oil and gas demand in both Western and emerging economies is forecast to Reach an unprecedented level by 2012, creating a run on world energy reserves and higher prices. Reach and increasing energy and distribution costs won't always be fully recoverable from customers, so there could well be pressure on distributor margins."

Environment

In Chemagility's survey of UK chemical distributors, Reach

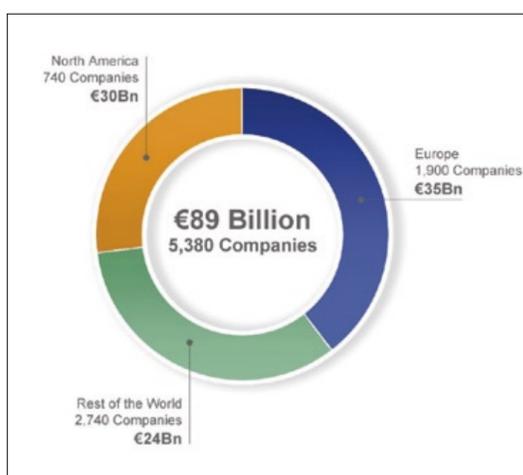


Fig. 1: World chemical distribution industry by market value.

Source: Chemagility

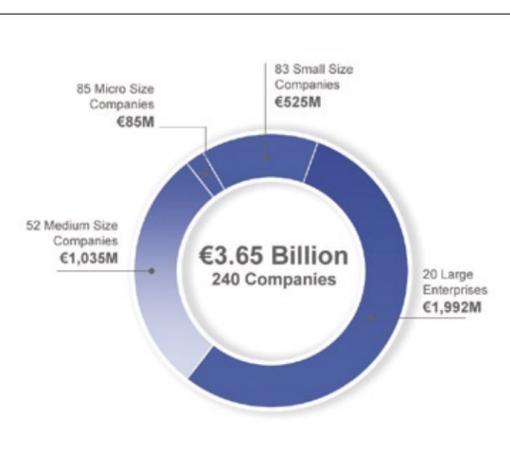


Fig. 2: UK chemical distribution industry by market value.

Source: Chemagility

was overwhelmingly seen as the greatest threat to the future prosperity of the industry. Companies believe it will burden them with additional costs and bureaucracy thereby affecting downstream manufacturing with higher prices. Reduced raw material choice and supply options will certainly be a major negative outcome of Reach for many users. Many also feel the legislation has failed to satisfactorily address the issue of imported preparations and finished articles which could further encourage manufacturers to move production capacity outside the EU.

On the positive side, the market transformation brought about by Reach will be an opportunity for those chemical

distribution companies that are able to respond by providing new products and services to downstream users. Reach will encourage a raft of product substitution projects as formulators look to replace lost ingredients with registered substitutes. However, the increased amount of bureaucracy and costs associated with the implementation of Reach will disadvantage smaller distributors and, as a consequence,

some distributors may exit the market. For this reason several of the larger multinational distribution groups cite Reach as contributing to a positive easing of the competitive environment.

In Chemagility's survey of UK chemical distributors, Reach was overwhelmingly seen as the greatest threat to the future prosperity of the industry.

– UK Chemical Distributor Market Report 2008.

starting to feedback up the supply chain from consumers, retailers and manufacturers to chemical producers and distributors. The use of products with low total carbon footprints, and from sustainable sources, will begin to be preferred over materials with a high environmental impact.

Pressure to reduce carbon dioxide emissions will make distribution efficiency and performance a matter of strategic importance for chemical distributors even for speciality distributors who have traditionally focused more on marketing expertise and less on logistics. Emissions and carbon footprinting will also contribute to increased out-sourcing in favor

of distributors with highly efficient, integrated supply chain networks/hubs.

Speculative long-term positions in the crude market are betting on oil reaching prices in excess of \$200 by as early as 2010; extreme levels not seen for many years. So on top of significant concerns over supply, there is a very substantial speculative element giving added impetus to price increases. The latest annual survey of the International Energy Authority (IEA) publicly acknowledged that there could be a supply "crunch" in the next five to seven years as planned new oil production coming on stream struggles to keep pace with rising demand from India and China and the decline in a large number of existing oil fields.

Even allowing for speculation over-inflating prices and the weak dollar it is clear we are entering a new energy era. Chemical distributors are likely to face substantial increases in raw material and logistics costs as oil prices inevitably rise over the next 5-10 years. Security of supplies, rigorous cost control, adaptable product and pricing strategies as well as tangible improvements to supply chain efficiency will become critical to future success in the industry.

One silver-lining for distributors will be that rising feedstock

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Rhetoric Vs. Reality

Collaboration In Outsourcing

Working Together – Collaboration in logistics is important, but there are certain points to consider.

As outsourcing logistics activities has grown into a near necessity, the issue of how to manage the relationship between customer and logistics service provider has become key to any major company's supply chain strategy. For several decades, the fashionable rhetoric has been to push the attractions of supply chain partnership, yet the reality of the logistics market is quite different.

Sometime during the 1980s, the notion of supply chain partnerships emerged. The argument went along the lines that if client and provider could agree to cooperate, they would both benefit from better information flow and a more certain investment environment ensuring a steady supply of capacity and better prices.

Providers of road transport in particular grabbed at this idea. The profits from running road freight services are often meagre and the prospect of partnership offered the possibility of higher margins.

The example supply chain partnerships most frequently cited was that of the consumer goods company Unilever and the logistics service provider Tibbett & Britten. The latter had been spun-off from Unilever alongside contracts for a large proportion of Unilever's huge logistics requirements.

During the 1990s, the idea gained momentum and was further elaborated by the management consultants to become fourth-party logistics (4PL), which suggested that a logistics service provider (LSP) could partner with a customer in order to provide management capability rather than physical assets.

Infamous Collaborations in the Automotive Sector

A particular test-bed for these ideas was the automotive sec-

tor which came-up with a raft of projects.

For example, at one stage Ford was trying to make the United Parcel Service (UPS) responsible for its finished vehicle logistics in North America and its inbound supply chain in Europe. But probably the most ambitious 4PL project was Vector SCM. This was joint venture between General Motors and Menlo, which was tasked with the redesign of GM's transport planning and procurement worldwide. GM's performance in this area was inadequate and Vector infused a level of rigour into operations that were holding back GM's assembly activities. Vector SCM appeared to have a good future, exploiting the synergies of GM's huge purchasing budget. Until that is, GM decided to exercise its op-

In practice, supply chain partnerships all too often ended in rancour.

tion to terminate Vector early, reaping the rewards of a better transport department whilst stripping Menlo of one of its promising business opportunities.

In truth over the long-run much the same was seen at Tibbett & Britten. Unilever and Tibbett & Britten fell-out and Tibbett & Britten was swallowed-up by Exel. In practice, supply chain partnerships all too often ended in rancour.

The Chemical Sector is Different

In the chemicals industry, the up-stream logistics is frequently dedicated, with bulk storage and terminal operations physically integrated. This means that manufacturers and LSPs are forced to get along. Matters may also be improved by the clarity of different roles – it is fairly clear if a bagging facility is doing its job or not and so the opportunity for disagreement is less.

This is probably why there is also a tendency for longer contracts between chemical

manufacturers and logistics service providers. For example Vos Logistic's 10-year contract with Henkel would be unusual in other industries.

Despite this, single sourcing deals are rare where the chemical producers have an option. To quote a one of the most powerful figures in the sectors logistics: "I will go for three suppliers or even two suppliers, but never one."

The Structure Of Partnership

The contrast in logistics requirements between the chemical sector and others such as automotive industry might explain why these partnerships so often go bad.

The automotive sector has a poor record of brutal relationships with its suppliers. For example, it has trashed parts of finished vehicle logistics sector. A major reason for this is that vehicle manufacturer regard logistics providers as eminently replaceable enabling them to focus on price. Indeed logistics companies are often not viewed as providers of expertise, rather they offer the opportunity to access assets at lower prices than would be the case if the vehicle manufacturer owned them itself. In contrast the chemical sector is often buying specialist assets such as parcel tankers or bulk storage, that the chemical producers would find difficult to provide themselves.

Therefore, the fate of partnerships is dependent on market fundamentals. If the supplier has something you need, you will value him more.

However, power in the supply chain is also very important and something that can act against market forces. Big purchasers of logistics services, such as major grocery retailers, are aware that their business depends on the provision of large scale logistics capabilities. If too much consolidation were to take place among providers of these services, the power could shift from the buyer to the seller. Therefore, such major purchasers will often deliber-

ately divide contracts between LSPs, even if the costs of doing this are higher. Surprisingly, a good example of this is Germany, whose powerful engineering firms keep many small- and medium-sized contract logistics providers in business despite the presence of giants such as DB Schenker or Deutsche Post World Net (DPWN)/DHL.

Living in the Real World

For all the talk of win-win, it seems a near universal truth that logistics managers are just too nervous about reliance on an outside company. The model of collaboration put forward in the 1980s is too simplistic. Relationships between customer and sup-

plier continue to be dominated by questions of trust and power and arguments in favour of collaboration do not account for this sufficiently. Customers and suppliers will always have differing objectives in the long-term.

Logistics out-sourcing relationships must be grounded in the realities of supply and

demand not in expression of good-will.

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Distributors Must Tackle the 3Es

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and energy costs will encourage chemical producers to reduce costs in other areas of their operations to remain competitive. This will potentially lead to a greater utilisation of chemical distributors as producers look to further outsource non-core, supply chain activities. Chemagility's study revealed that senior executives of both small and large distributors certainly view downsizing by principals, and the general increase in outsourced distribution services, as a continued opportunity for the industry. Although some distributors were worried about what they see as moves by some customers to deal direct with principals potentially countering outsourcing trends.

Economy

The emerging Asian economies, particularly India and China, are attracting the customers of the chemical industry (manufacturing industries) and also the production of the chemical industry. Additionally production is growing in the Middle East where there is cheaper access to raw materials as petrochemical manufacture is built around crackers and other production units consuming gas at prices delinked from crude oil. However, increased transportation costs, Reach, and drives to reduce CO₂ emissions could partially reverse globalisation

trends that have seen over €30 billion of chemicals imported from China last year alone (up 60% on 2006), buoyed by the sharp appreciation of the euro against the dollar.

Upward price pressures, Reach and growing environmental concerns will potentially have a negative effect on chemical exports from China into the EU in the longer-term. In particular, Reach will lead to a reduction in the number and quantities of chemicals being imported and discourage some of the entrepreneurial sourcing activities of chemical distributors that have contributed enormously to the market penetration of Asian producers. The price of chemicals from China will gradually become less attractive over time as a result of the gradual revaluation of the Yuan, removal of government subsidies and rising production costs (relating to land, wages and addressing environmental problems). At the moment the strong euro has protected EU importers from recent rises in dollar-based commodities but when the U.S. currency recovers this will quickly exacerbate the effect of future increases.

So although chemical distributors have enjoyed a decade of deflation thanks to China this won't last as a partial reversal of the terms of trade between West and East gets underway. In future China will be exporting inflation not deflation along

with its products and China's chemical industry will become more led by rising domestic demand than exports.

Tackling The 3Es

The 3Es present a volatile and complex mix of opportunities and threats that will have a major impact on the future prospects for chemical distribution. Distributors will increasingly find their supply options becoming more restricted as Reach, producer consolidation, less stable principal relationships, rising chemical prices and growing environmental concerns converge leading to many more companies seeking more localised sources of supply which won't always be feasible. This will also fuel continuing industry consolidation trends which will become less dependent on private equity "buy and build" strategies and more related to industry-wide changes. Chemical distribution faces some difficult, complex and profound challenges in the future but there will always be opportunities for professional distributors who can adapt to the dynamics of the new business environment.

Highly Athletic

Modern, High Performance Plastics in Sports

Plastics – Today's highly competitive world of athletics depends ever more greatly on new developments within the plastics industry. Polymers such as Polyurethane have become indispensable.

Large crowds of spectators hold their breath while athletes put on their top performances. Millions of fans around the world follow major sports events, either at live events in packed stadiums, or by television. Sports are more than just physical movement. They are an important element of our culture and leisure. Sports are part of people's life, whether they are playing sports themselves, or watching as spectators.

Decades ago a new member joined the team which became indispensable to sports: plastics. With their durability, impact-resistance and toughness, paired with low weight, plastics have gradually replaced other materials, such as leather, wood, or cotton. Today tailored plastics are a crucial contributor to the performance and safety of athletes. Plastics have become the material of choice for sports gear manufacturers and athletes alike.

Football and the Enthusiasm of Nations

There is no doubt about it – football fever can grasp entire nations. Legions of young people are organized in football teams, and millions of other people of all ages follow football matches as spectators. Especially in a sport played by so many people, the materials must deliver high performance, but they must equally be affordable and usable for everyone. Plastics have no problem meeting both criteria.

But let's have a look at the football itself. The traditional footballs, which were made of leather and sewn, soaking up water like a sponge, are history. Since the 1980s, polyurethanes (PU), a material that absorbs significantly less water and is highly abrasion-resistant, have replaced the outer skin of footballs. In 1986, when adidas launched the first fully synthetic football, the unstoppable rise of the high-tech football began. The next milestone was the development of the seamless, thermally bonded Roteiro by adidas, in close cooperation with Bayer Material Science, one of the world's largest manufacturers of high-end plastics. The next football, the Teamgeist was not only the official match ball of the 2006 World Cup but also a superlative in every technical detail.

The cross-section of the ball reveals its sandwich-like struc-



Thomas Michaelis (left), project manager for ball development at Bayer Material Science, shows football legend Rudi Völler the high tech involved in the "Teamgeist."

ture: two layers of polyester surround the innermost latex layer. The crucial component is the ball casing, a foam layer of the polyurethane Impranol developed by the experts from Bayer Material Science. The polyurethane foam layer under the surface contains tiny air bubbles and millions of gas-filled micro globules that guarantee the special elasticity and outstanding flexibility of the football. After the physical impact of the kick, which occurs roughly 2,000 times in a regular football game, the ball quickly rebounds to its original shape, making an ideal flight curve possible.

The latest ball model, which was developed for the European Football Championship 2008, is the Europass. Like its predecessor, the ball consists of 14 panels but in the Europass, there are both tongue-shaped and propeller-shaped panels, perfecting the round shape of the ball. The new football weighs only 420g and uses the thermal bonding technology. The outer layer surrounding the casing and the air chamber is merely 1.1 mm thick. The outer layer itself consists of five layers. The uppermost layer protects the printed surface from abrasion, the second layer protects it from exterior influences, the third layer provides a high restorative force, the fourth layer creates a bond between the layers and the textile carrier material, and, finally, the innermost layer serves as a carrier material.

The crucial improvement of the Europass over its predecessor is the new, fine "PSC" surface structure. PSC stands for superior power transmission, greater swerve, and increased control in all conceivable weather conditions. Nubs on the surface provided a much better grip, benefiting both the players and the goalkeeper. Bayer Material Science delivers the polyurethane resins to different manufacturers in Asia, which then process the material

into 1.6 m wide endless runs with nub texture. In the next step, the panels are punched, printed, coated with a protective polyurethane layer, and shaped into the finished ball.

Plastics Are Ubiquitous in Today's Sports

There is, of course, more to football than just the ball. Football shoes, too, are high-tech plastic products. Today there is a tremendous diversity in sports shoes. Shoe manufacturers like adidas produce different types of shoes for 26 of the 28 Olympic sports disciplines. Every sport puts a different type of stress on the foot. To prevent injury and allow athletes to achieve top performance, specially designed footwear is an important prerequisite. Football shoes serve as a good example to demonstrate what is crucial in soles and cleats, and why today so many of them are made of polyurethanes. Often it is the combination of product and processing properties that makes plastic the material of choice. Polyurethane soles have given sports shoes a completely new outlook. They are lightweight and elastic but highly dimensionally stable, they effectively absorb impact while being resistant to bending, slip-resistant and abrasion-resistant. Polyurethane soles can be injection-moulded or moulded directly onto the shoe.

Producing sports shoes tailored for different sports is worth the while. In 2007, the worldwide volume of the sports shoe market was 20 billion US-\$. On average, every consumer buys two pairs of sports shoes every year.

What stands out most on the football field is the players' uniform. It not only identifies them as members of a team but its multi-functional material also serves several other important purposes. It leads sweat away from the body, keeping it dry and preventing it from cooling too fast. The uniform also

withstands tugs by other players on the field and rain showers. Latest developments even integrate UV protection into the material, making it unnecessary to apply suntan lotion. The legs of football players must also be protected. Football rules require shin guards. Here, plastic experts have developed truly high-tech injection-moulded gear that can withstand even the strongest kicks. The goalies wear gloves that feel good and have a good grip while absorbing impact. Polyurethane has this ability, making it an important material for football gloves. The goalies always have a firm grip on the ball and can prevent many of the opponent's goals.

As small as it is, the plastic equipment of the referee also plays a prime role. The whistle is made of a highly impact-resistant polymer. And, last but not least, the days of the red and yellow paper cards have been over for a long time, too. Today, the unwelcome alerts are also made of plastic!

The list of polymer materials in sports continues almost without end. These few examples



The "Europass"

demonstrate that today there is no sport without something made of plastics. With their versatility and performance, plastics make sports comfortable and safe. The process of developing and optimizing

plastics is far from being over. Athletes and spectators can expect more ideas from plastics experts that will make sports even safer and more fun.

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BASF: New Directions

Automotive Expansion

BASF has signed an agreement to sell its manufacturing facility in Shreveport, L.A. (U.S.) and the related contract manufacturing business for finished pharmaceuticals to Dr. Reddy's Laboratories, an Indian pharmaceutical company. The financial details of the transaction will not be disclosed. As part of the agreement, approximately 150 employees will transfer from BASF to Dr. Reddy's Laboratories. The Shreveport facility currently manufactures and packages prescription and over-the-counter pharmaceutical products, liquids, tablets and creams. BASF is divesting the site and related business in order to concentrate on core businesses in its care chemicals division.

With investments in plants and technology, BASF plans to expand its automotive industry in India. The company will build a new engineering plastics compounding plant at its existing site in Thane, which is expected to come on stream by the second half of 2009. Engineering plastics are used in the automotive industry as well as in the electrical and electronics industries. BASF has also set up a computer aided engineering lab in Thane where engineers design new engineering plastic parts in close cooperation with customers.

Harvard Research Initiative

BASF has launched its research initiative at Harvard Univer-

sity. The research initiative represents a model for university-industry collaboration designed to drive new frontiers of scientific discovery. The difference of this collaboration from most research initiatives is its integrative nature: BASF researchers from Germany are working closely with Harvard academic research teams, easing scientific exchange on the projects, as well as fostering broader interaction between the two institutions. The initiative also gives students the opportunity to benefit from a close interaction and early exposure to industry.

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Design Innovation – The polymer Polycarbonate allows architects to realise constructional masterpieces. Due to its properties, Polycarbonate, has been used in any number of applications, now it's making its mark on the construction industry.

Transparent Architectural Designs with Polycarbonate Sheets

Polycarbonate is transparent, lightweight, break-proof, withstands high mechanical stress and the weather, and it is scratch-resistant. Thanks to this balanced property profile, the versatile material has established itself in a wide range of areas, including construction. Solid, multi-wall and corrugated sheets made of this versatile polymer material are used in roofs of stadiums, train stations, hangars, pedestrian tunnels, water parks, shopping malls, greenhouses, conservatories and carports. Polycarbonate is also used for break-proof siding, sound protection



Ready for the Olympics: The stadium in Shenyang, China.

walls, roof lights as well as for DIY applications.

Systematic Optimisation

To meet the rising requirements for construction materials today,

new materials with optimised properties are being developed. The focus is on improving the processability and durability of materials as well as on saving energy and resources – properties that conventional building

materials can rarely offer. This is why plastics such as polycarbonates are increasingly used. Combining this high-value raw material with innovative production methods and the long-standing experience of chem-

ists, material developers and specialists in materials science and engineering technology, manufacturers like Bayer Sheet Europe offer a comprehensive range of sheets with a diverse spectrum of properties.

Unlike other transparent materials, polycarbonate sheets offer excellent impact strength, high break resistance, low weight, as well as superior temperature and thermoforming resistance. Polycarbonate sheets also meet high fire protection standards, and their sturdiness ensures hassle-free transport and installation. Based on the high transparency and good processability of the polymer material, it is possible to produce solid see-through sheets with low distortion. Multi-wall sheets also offer high translucence. However, due to their structure, they are not transparent but benefit from an even lower weight than solid sheets. Multi-wall sheets also feature good thermal insulation properties.

To extend the life cycle of sheets used in outdoor applications, a special weather protection coating containing UV absorber concentrates is added. It is applied onto the sheet as a thin, highly efficient layer that almost completely prevents yellowing. Special coatings may also be applied for water dispersion, hail resistance, or energy reflection.

Large-Scale Projects Around the Globe

These properties make the polycarbonate sheets a perfect choice for all types of construction projects. Whenever modern architectural designs call for mouldable, see-through, and lightweight materials, multi-wall and solid sheets are the answer. Buildings in many places around the world have polycarbonate roofs or siding. And many celebrity architects have chosen this versatile material to realise their bold designs. Here are a few examples.

Olympic Stadiums In China

The sports arenas that were built for the Summer Olympics 2008 are unique and impressive, meant to present the host country China as a modern and open country. For that reason, transparency was an important element of architectural design. The gigantic roof structure of the Olympic Stadium in Shenyang, for example, is integrated into the green hills like wings descending to land. For the large, transparent roof over the stands, a special sheet was developed, because in the tender the Chinese contractor required minimal deflexion to make the roof withstand high winds and heavy snow loads. The required strength could only be achieved by an exact combination of wall thickness and X-profile, as well as a perfect coordination of the upper and lower chord. A total of 21,530 m² of roof and façade consist of the polymer material, conveying lightness and providing natural light within the stadium. Another significant advantage was the low specific weight of the plastic sheets. The multi-wall sheets, with a weight much lighter than glass, were fitted through cold-bending into the filigree substructure, which in the Shenyang stadium consists of rectangular aluminium channels. Thanks to this method the tight schedule of the Chinese contractors was met.

A transparent inner ring of 13,000 m² of the high-tech plastic forms and partially covers the stands of the Tianjin Olympic Centre Stadium. The high light transmission rate of the multi-wall sheet of more than 85% was a great advantage, allowing the stands to be extended close to the playing field. This maximises the number of seats without obstructions to natural light, which would affect the growth of the turf. After all, for a stadium that will host Olympic soccer games, an

impeccable turf is of crucial importance.

Multi-wall polycarbonate sheets were also used for the roofing of the stands in the Qingdao Olympic Sailing Centre, and in various parts of the façade of the venues where the weightlifting and the gymnastics competitions will be held.

Dalian People's Football Stadium in Liaoning, China

The covered stands in the Dalian People's football stadium consist of a steel girder structure with a 30 m overhang. The roof is made up of a total of 47 twin-wall sheet panels that are 4.2 m wide and 30.0 m long and have a curvature of approx. 0.85 m (sheet thickness 10 mm). The mechanical stress that develops between the steel structure and the twin-wall sheets in both the longitudinal and transverse direction due to temperature fluctuations (+39°C to -31°C) are offset by special fastenings. The key to the success of this project were the special properties of the co-extruded polycarbonate sheet, including high resistance to mechanical and thermal stress, good light transmission, and high UV stabilisation.

Water Park in Erding Near Munich, Germany

Creating a Caribbean dream under a roof was the design objective for the cupola over the water park in Erding near Munich, Germany. The roof of this popular leisure destination consists of lightweight four-wall sheets with a thickness of 25 mm and good insulating properties. The transparent, UV-stabilised polycarbonate sheet has a heat transfer coefficient K of 1.7 W/m² that helps to minimise heat loss yet at the same time prevents too much heat build-up when the sun is shining. A no drop coating underneath the sheets prevents any dripping of condensation.

Corporate Headquarters of Bayer, Leverkusen, Germany

Transparent materials were also used to realise the design of the new Bayer headquarters by the famous architect Helmut Jahn. A light-filled pergola that matches the style of the building covers the anterior courtyard. It welcomes visitors with a colourful interplay of light (Pic. 1) generated by 378 oblong elements that have been incorporated in the pergola at a height of 16 m. The elements are made of polycarbonate sheets. Each of the elements is 5.5 m long and 40 cm high and suspended horizontally and has a diamond-shaped cross-section. The sheets are hot-chambered into a diamond shape. To ensure that the elements do not sag, they incorporate a

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Pic. 1: Impressive reception: Corporate headquarters of Bayer in Leverkusen, Germany.

Strong Lightweight



Pic. 2: Contrasts at play: The Polymer Technical Centre in Shanghai, China.

Continued Page 19

lightweight, unobtrusive V4A load-bearing structure inside. The inside cavity of each element can be electrically heated to prevent icicles. The spectacular light effects are generated by dichroic glass incorporated at various angles into each of the 378 elements and vacuum-metallised on both sides to refract the sunlight into different colours before projecting it onto the roof.

Polymer Technical Centre in Shanghai, China

Polycarbonate can also create visual highlights in façades, as in the new Polymer Technical Centre in Shanghai. The three buildings have been strategically integrated in the Pudong Jinqiao Export Processing Zone. This was the first time a façade was designed as "black mirror façades" using plastic without aluminium profiles (Pic. 2). The 40 mm transparent sheets are made with a black insulating layer fitted a certain distance behind them. As with dark-glazed buildings, outlines are reflected on the façades during the day. In the dark, the façades take on an impressive look, especially when the giant 9 m

high revolving door elements on the main building are closed (open on the photo). With light additionally being scattered on the ribs inside the panels, the building then takes on the appearance of a giant, flat wall of light.

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Polycarbonate, a Favourite in Many Areas

Polycarbonate, a polymer, started off in 1958 as a material for housings of electrical and electronic appliances. In the 1960s, polycarbonate was used to manufacture indestructible dinnerware, rays, milking pails, housings of traffic lights, taillights and power outlets. Thirty years ago, highly transparent solid and multi-wall polycarbonate sheets conquered the construction sector.

The splinter-proof and break-proof properties of polycarbonate also make the innovative plastic attractive for eyeglass manufacturers. In the early 1980s, polycarbonate entered the field of medical technology, i.e. in oxygen concentrators. In 1982, Bayer, Philips and PolyGram developed a thermoplastic laser-readable, break-proof disk for data storage as an alternative to vinyl records. From the beginning, polycarbonate was the material used in what everyone knows today as the Compact Disc (CD). Today, polycarbonate is the preferred high-tech material for billions of digital data storage media of all types.

Polycarbonate continued to impact a wide range of industries in the 1990s. In automobiles, the splinter-free, break-proof and extremely mouldable plastic sheets increasingly substituted glass headlights. The first five-gallon deposit water containers were launched in Europe in 1992. The plastic material also left its marks on sport. For example, the new Bayer 04 Leverkusen soccer stadium, which was inaugurated in 1997, has a transparent, weather-resistant roof of polymer multi-wall sheets. In goggles and helmet visors, the break-proof material that can be moulded into almost any shape and also includes UV protection, offers great perspectives for athletes.

Attractive Location – Ohio has been awarded the 2007 Governor's Cup, a U.S.-wide contest, awarded annually by Site Selection, recognizing the federal states and regions which attracted the largest number of projects creating new capital investment and jobs.



Ohio claims the 2007 Governor's Cup with 399 projects; with a recent tax reform, new workforce initiatives and Governor Strickland's commitment to a strong business climate seem to be paying off. The award focuses on new corporate location projects with significant impact. New facilities and expansions included in the analyses must meet at least one of three criteria: (a) involve a capital investment of at least US-\$ 1 million, (b) create at least 50 new jobs or (c) add at least 1,858 m² of new floor area.

The region of Cincinnati contributed 111 projects counting towards the Governor's Cup. In 2007, companies from various industrial sectors, such as the biopharmaceutical, transportation, automotive and chemical industries, have invested in the region. For example, prominent investments have been made by the Ford Motor Company, Toyota Boshoku, and Tata Consultancy Services from India. In addition, companies from Switzerland and Germany have contributed to the Cincinnati region, such as Omya or Wild Flavors.

In the top metro regions ranking with more than one million inhabitants Cincinnati can claim a sustainable development. The region has improved over the past three years from a sixth, to a fifth and now to a second place finish. This area, where the states of Ohio, Kentucky and Indiana meet along the Ohio river with the city of Cincinnati as their metropolis, is a great industrial location for European companies.

Neil Hensley, Senior Director Economic Development at Cincinnati USA Regional Chamber said: "The region is an important center for advanced manufacturing, chemical and biopharmaceutical industry, automotive as well as consumer products. Multinationals as well as small and medium-sized companies are represented

Ohio's Most Wanted

Cincinnati – Top Metro Region with European Settlements



Patheon, a global supplier of pharmaceuticals, opened a 46,000 ft² plant in Cincinnati.

here. We believe that Cincinnati USA offers an environment in which companies of all sizes can be successful."

Some of the latest projects in 2007 are three medium-sized companies from Germany: Mauer AG, Flottweg AG and Arku Coil Systems. With their products, they represent the industrial structure of the area.

Mauer's Quick Access to the Cosmetics Industry

Mauer manufactures packaging products using injection molding and blow molding processes. Its principal customers include the cosmetics industry that uses the closures made by Mauer. Not only the proximity to Procter & Gamble, which is headquartered in Cincinnati, was an important reason for Mauer to choose this location, but also the fact that the local plastics industry supplies the machinery, parts and raw materials. From Cincinnati more than 40% of all US production facilities can be reached by truck within one day.

Flottweg in the Center of the Chemical, Pharmaceutical and Food Industry

Flottweg is one of the leading manufacturers of decanting centrifuges worldwide. Their export share is almost 90%. Flottweg's important customers – the chemical, pharmaceutical and food industries – are



Around Cincinnati, a truck reaches within one day-trip 43% of all national production sites and 44% of U.S. consumers.

well represented in the Cincinnati metropolitan area and the Midwest in general. The locally available engineering know-how was an important criterion for choosing this location.

Arku Coil Systems Relocates U.S. Headquarters to Cincinnati

OEMs as well as the so-called Tier-1 and Tier-2 suppliers to the automotive industry are among the key customers of Arku Coil Systems. The company relocated its U.S. headquarters from Detroit, Michigan to Cincinnati. As many as

70 automotive assembly plants are in close proximity in the area. Arku is absolutely satisfied with its decision to make direct investments in the U.S. Albert Reiss, Managing Director of Arku, the parent company headquartered in Germany, commented, "80% of our customers are within a 400-mile radius of Cincinnati."

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Cincinnati USA Regional Chamber
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www.CincinnatiUSA.org

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- once the container is empty, the end user requests collection by Schütz.

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In the Heart of Germany

Saxony-Anhalt Has Plenty to Offer

A World of Firsts – For over 100 years, the chemical and plastics industry has played a defining role in the economic development of the southern part of present-day Saxony-Anhalt. The world's first color film, rubber synthesis, the first synthetic plastics – all this was achieved here. Today, the sector will write history again: With the world's most modern chemical-specific infrastructures, the region is attracting even more investors.

"Continuously increasing employment and turnover figures are the best proof of the outstanding development of the future chemicals/plastics cluster," said Dr. Reiner Haseloff, the state's minister of economic affairs. "The chemistry works in Saxony-Anhalt."

The Chemical Employers' Association Nordostchemie confirms that turnover increased by 20.6% to €6.1 billion in the state in 2007. Saxony-Anhalt thus carries approximately one-third of the turnover from chemicals in eastern Germany. With approximately 14%, the sales of pharmaceutical products contributed to a significant part of the state's final results.

The number of employees in the over 100 chemicals companies in the state rose by almost 10% on the previous year to 14,058. At 105%, their productivity is clearly above the national average. "The figures show that the chemicals/plastics cluster is unaffected by the general trend toward a slowdown in growth in the German economy overall," Haseloff said.



The chemicals industry is important in terms of determining the structure of Saxony-Anhalt. As measured against the total sales volume generated by the manufacturing industry, it is the second largest sector – with particular competence in fine and specialty chemistry, polymer chemicals and plastics development, as well as composite materials and agrochemicals. The state has also been working on special early-riser qualities in the fields of nanotechnology and materials research and development.

Above all, the state's chemical parks, which have joined together in the CeChemNet network, are responsible for the extremely positive development of the future cluster. In the process, synergies result from excellent raw materials and product networks. Also, an extensive number of service providers connected to the chemicals industry strengthens the competitive edge of Saxony-Anhalt as a strong location for the chemical industry. Bayer Bitterfeld, Dow Chemical, DOMO Caproleuna, Total Raffinerie Mitteldeutschland as well as Radici Chimica and Manuli Stretch of Italy are all companies that have already settled here successfully. Other

big in the local area here include Linde, based in Leuna, supplying factories with technical gases such as nitrogen and carbon dioxide; IDT Biologika, which has specialized in the research, development, production and marketing of biological products in Dessau-Roßlau; or Sodawerk Stassfurt, which, with the production of light and heavy soda, creates the starting point for a large number of synthetically-manufactured chemical products.

Catalyst In The Region

"We are well on the way to becoming one of Europe's leading chemical regions," Haseloff said, who is also president of the European Chemical Regions Network (ECRN). Saxony-Anhalt industrial policies are pursuing the goal of developing the chemicals/plastics cluster in Central Germany as a competence center for polymer chemicals and plastics processing at European level. This process should contribute to driving forward the positive development of companies in the region, and sustainably optimizing the existing value chain. Only in this way can an even better utilization of the competitive manufacturing plants be achieved – including

an efficient infrastructure, as well as R&D capacities.

Today, the central German Chemical Triangle covers more than 5,500 hectares, with ultramodern composite materials technologies. Regions such as Leuna, Schkopau, Bitterfeld-Wolfen, Zeitz or Piesteritz offer the best conditions for newcomers. The basis for this is built on the efficient large-scale industry and the innovative small and medium-sized enterprises, as well as on the region's recognized research potential. One of the cluster's main focal points is to support this potential by utilizing European sponsorship opportunities. A central building block in this process is the construction of a regional SusChem platform, which ensures the increased participation of SMEs in EU funds to promote innovation. In the medium term, Saxony-Anhalt, the Central German Chemical Region and the ECRN are pursuing the goal of developing composite materials technologies beyond national borders – particularly toward the east – in order to ensure the sustainability of the chemical region's competitiveness.

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www.invest-in-saxony-anhalt.com

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Future Equals

Chemical Parks as 'Knowledge Sites'

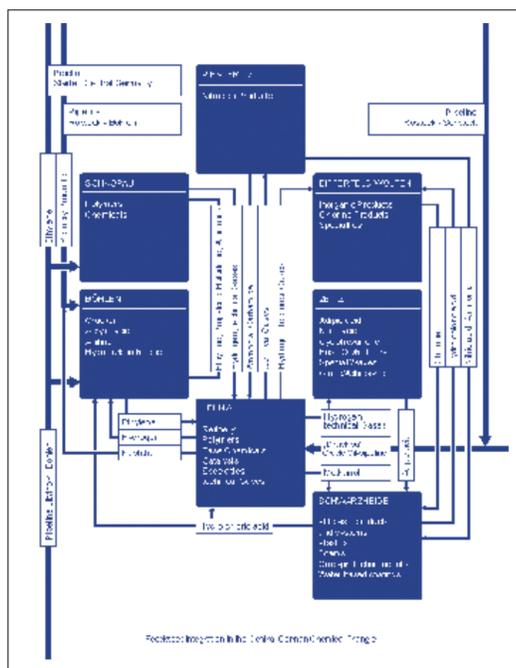
Smart Sites – CeChemNet links together many of Germany's top chemical sites.

The network of the chemical parks in Central Germany CeChemNet combines the six sites in Bitterfeld, Leuna, Schkopau, Böhlen, Zeitz and Schwarzheide with about 5,500 hectares. There are 600 companies operating with 27,000 employees. Following its start as the network of the major chemical sites in Saxony-Anhalt, the work of CeChemNet reached a new level and is now acting as a transregional network.

Central German Chemical Triangle

"The chemical sites in the Central German Chemical Triangle offer highly attractive conditions for investors with the comprehensive feedstock integration and the proximity to markets in Central and Eastern Europe," said Andreas Hiltermann, managing director InfraLeuna.

Fully developed industrial areas, modern infrastructure and tailored on-site services offered by the chemical park operators and service providers are characterizing features of the CeChemNet sites. The chemical industry is one determining branch for the economy in Central Germany, a fact that leads to a lively interaction with the federal state governments for fostering an optimal business environment. In this context, the engagement of the government of Saxony-Anhalt is rather exemplary: With the "Strategy Dialogue Chemistry" and the "Model Project Chemis-



try/Plastics," which are part of the coalition agreement, innovative approaches of a cluster policy are developed by building upon the successful cooperation of politics, industry and sciences. To meet the challenges of the knowledge society in terms of attracting innovative investors as well as qualified staff, the CeChemNet partners pursue the approach of chemical parks as knowledge sites: Every site aims to set specific priorities in terms of research and development. This process of establishing a network of innovation sites in the Central German chemical triangle leads

to a unique selling proposition in competing for investments on a global scale.

Dr. Gunthard Bratzke and Fiene Grieger, CeChemNet

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Total Aids Victims of Myanmar Cyclone

One of the World's Oldest Oil Producing Countries

Southeast Asia – Through its socio-economic team, Total E&P Myanmar is actively taking part in relief efforts coordinated with NGOs on the ground after cyclone Nargis swept Myanmar's Irrawaddy Delta region in early May. Most of the aid provided is logistics-related, and includes a donation of 20,000 liters of fuel oil to the organization Save The Children, overflights of the stricken areas using the Yadana joint venture's helicopter, and the loan of the joint venture's workboat to transport containers from Thailand for the French Red Cross and for the Isha Tanaka Association.



In addition, employee volunteers from the local subsidiary of the French oil company have been helping disadvantaged communities near their offices in Yangon, distributing food and delivering drinking water, providing construction materials and rebuilding a school.

These relief efforts, funded by the subsidiary and the Yadana joint venture's partners, amounted to \$200,000 by mid-May. This is in addition to the \$2 million Total earlier donated to the International Federation of Red Cross and Red Crescent Societies.

Total E&P Myanmar is also helping its own and contractor employees. A total of 865 people are receiving different forms of aid, such as food and drinking water, electricity, financial aid, medicine, and information on water purification measures.

The group has nearly 300 employees in the country, on a production platform in the Andaman Sea, at gas pipeline facilities in the south near the border with Thailand, and in the Total E&P Myanmar offices in Yangon.

Oil and Gas in Myanmar

Myanmar is one of the world's oldest oil producers, exporting its first barrel in 1853. Rangoon Oil Company, the first foreign oil company to drill in the country, was created in 1871. However, the country's oil output is small and gas is taking over from oil. Myanmar produces around 170,000 barrels of oil equivalent per day, of which 90% is accounted for by gas.

The oil and gas industry was nationalized after a socialist-leaning military regime seized power in 1962. As in many other countries, the state assumed ownership of the resources, either operating them itself or delegating this task to private operators, who were paid for their outlay and work in oil or gas under production sharing contracts (PSCs).

The linchpin of oil and gas policy in Myanmar is the Ministry of Energy, which has oversight for three state-owned enterprises:

Myanmar Oil and Gas Enterprise (MOGE), created in 1963, is responsible for oil and gas exploration and production, as well as domestic gas transmission through a 1,200-mile onshore pipeline grid.

Myanmar Petrochemical Enterprise (MPE) operates three small refineries, four fertilizer plants and a number of other processing plants.

Myanmar Petroleum Products Enterprise (MPPE) is responsible for retail and wholesale distribution of petroleum products.

Since nationalization, the country's oil policy has gone through two distinct periods: From 1962 to 1988, oil exploration and production were mainly performed by MOGE; foreign operators were kept out by a strict nationalistic policy and the lack of an appropriate legal framework. In 1988, Myanmar passed foreign investment legislation and began relying on outside technology and capital to revive its oil and gas industry.

In 2007, nine foreign oil companies (Myanmar Petroleum Resources Ltd, Focus Energy Ltd, Westburne, China National Offshore Oil Corporation, China National Petrochemical Corporation, Sinopec, Essar, Goldpetrol and a representative of the Kalmik republic) became involved in 16 onshore blocks to explore new areas (EP blocks), to enhance recovery from existing fields (IOR blocks), to reactivate fields where production has been suspended (RFS blocks) and to produce (PSCs).

For the offshore area, Total, Petronas Carigali Myanmar, Daewoo, PTT-EP, China National Offshore Oil Corporation, China National Petrochemical Corporation, Essar, Gail and Rimbunam (Malaysia) are exploring and/or developing 29 blocks.

Myanmar authorities have intensified the opening of blocks to foreign companies since the end of 2004.

Total In Myanmar

Total's activities in Myanmar began in 1992 with the signing of a basic agreement (Production Sharing Contract). Construction work with an investment of \$ 1 billion was implemented between October 1995 and June 1998. Production first reached commercial stage in 2000. In 2006, 19.3 million m³ of gas were produced per day. 90% of the gas production are sold to Thailand for supplying gas power plants in the Bangkok area.

The Yadana joint venture of Total, Chevron, Petroleum Authority of Thailand, and MOGE operates a gas production unit offshore, a 346-km

sub-sea pipeline, and a 63-km onshore pipeline through the Tenasserim district to the Thai border.

The onshore stretch of the Yadana pipeline runs 63 km in an east-west direction through a fairly isolated, sparsely populated region in southern Myanmar's Tenasserim district. The center of the region is sparse scrubland, crossed by a number of waterways, including two fairly large rivers, the Heinze Chaung and the Dawei. The terrain becomes more in-

hospitable further to the east toward the Thai border at an altitude of 850 m. It is rugged and densely covered with degraded forest and undisturbed tropical forest. The pipeline runs north of the tropical forest to protect it, following an existing track.

Gas from Yadana covers 15 to 20% of Thailand's demand. The country's economic growth has fueled a rapid rise in electricity demand, which is increasing by 6 to 7% a year. Around 70% of power generation in Thailand

is gas-fired, using local gas resources supplemented by gas from Myanmar's Yadana and Yetagun fields.

Yadana's production therefore establishes an important, long-term economic link between the two countries and contributes to the regional integration of Myanmar, which has too long been isolated from Southeast Asia's assertive growth.

► www.total.com

A Few Words from the Team

Hungry Facilities, Hungry People



Brandi Schuster

chemical reaction

Biofuels seemed like such a good idea, especially with the price of a barrel of oil shooting up to over \$130 a pop. And of course, the detrimental effects fossils fuels have been having on the environment are getting more and more difficult to ignore. If only there wasn't the problem of rising food prices around the globe, which can lead to bloody unrest, as we've recently seen in Haiti. The price of wheat has risen 130% in the past year, and staples overall have gone up 80% in the past two years. Rice rose 31% in March. The increasing popularity of biofuels is certainly not singularly responsible for the dramatic jump in food prices; the rising price of oil and a shift in the world's eating habits (particularly in China) have certainly done their part on this front.

What needs to be done to get out of this catch-22?

It's obvious that the industries worldwide can no longer rely on fossil fuel supplies as their main feedstock over the next 50-60 years. One plausible solution is the creation of ethanol from cellulose. Rather than using the edible part of the corn plant for processing, the leftover stalks and leaves are used. However, using the residue for this purpose has been considered tedious and costly.

According to the Biotechnology Industry Organization (Bio), making biofuel from cellulose cost upwards of \$5 per gallon back in 2001. However, when Genencor and Novozymes partnered with the U.S. Department of Energy to reduce the cost of enzyme-based production of ethanol from cellulose, the companies came up with a viable solution. The scientists used a common soil fungus that makes a lot of enzymes to break down the cellulose. They then looked for ways to make the enzymes work faster and thereby more cost efficiently. Thanks to the development of these enzymes, the cost of making ethanol from cellulose today is estimated to be \$1.50 to \$2.50 a gallon, making it a viable alternative to gasoline at \$3 a gallon at the pump today. In the future scientists predict that cost will be lowered to 90 cents a gallon.

The Canadian company Global Green Solutions has also taken an innovative approach to the creation of biofuels. The company has developed a new technology - Vertigro - that uses high density vertical bioreactors to mass produce rapidly growing algae, which are converted to vegetable oil and refined for biodiesel fuel. The process consists of continuous, closed loop algae bioreactors that can be built on non-arable land. This means that much less land and water are required than with traditional crops. The company says its technology can support "virtually unlimited yield capacity" for the production of biomass. According to the company, current data projects high yields of algae biomass, which will be harvested and processed into algal oil for biofuel feedstock and ingredients in food, pharmaceutical, and health and beauty products.

These are two examples of how the biofuels industry is growing and evolving in the right direction. However, further strides must be made in order to provide sustainable feedstock to all industries without compromising the availability of food around the world.

Brandi Schuster

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PEOPLE



Peter Hug

Technidata: New Head of Global Sales and Marketing Technidata assigned responsibilities for global sales and marketing to Peter Hug. In this new position Hugs primary duties will be to increase license sales, step up internationalization and optimize sales. For the past five years, Peter Hug has been executive vice president of Technidata America, where he has been in charge of developing the North American market.

During his time in the U.S., he has helped to make North America the Technidata Group's largest and fastest growing license market. Previously, he was primarily involved in expanding Technidata consulting operations.

► www.technidata.de



Fred du Plessis

New Executive Committee for ECSPP At its annual general meeting, ECSPP members elected a new executive committee to serve for the coming two-year period. Fred du Plessis of Kline Consulting Europe, UK, was elected president. Du Plessis has more than 26 years business development experience in the international chemical and life sciences industries. He held posts with Sasol in South Africa and the UK before joining the Industrial Investment Council in Berlin as vice president responsible for promoting chemical investment in Eastern Germany.

In addition to being treasurer of ECSPP since May 2005, Du Plessis has been president of the European Chemical and Strategy Association (ECMSA) since 2002.

► www.ecspp.org



Rainer Betz

Chemtura Names Rainer Betz for New Position Chemtura has appointed Rainer Betz to the newly created position of global director for brominated performance products and intermediates.

Betz has experience in international sales and marketing of specialty chemicals, including sales leadership in Germany for Chemtura and Great Lakes, which united with Crompton in 2005 to form Chemtura. He has served in sales management for Biolab Water Additives and for Polymer Additives in Europe.

► www.chemtura.com

Aesica Appoints Operations Director Aesica announced the appointment of Anthony Higham as operations director. Higham will join the company from Glaxosmithkline (GSK) where he held the position of divisional technical head within global manufacturing & supply. Anthony has more than 20 years global experience in the pharmaceutical industry in disciplines like engineering, logistics, operations management and consultancy. As divisional technical head of regional pharma supply at GSK, he was responsible for all technical operations across 29 sites.

► www.aesica-pharma.com



Ulf Wiinberg

Ulf Wiinberg Appointed CEO of Lundbeck The Supervisory Board of Lundbeck has named Ulf Wiinberg new president and CEO of Lundbeck. Ulf Wiinberg took up his new position on June 1. Ulf Wiinberg will be leaving the US pharmaceutical company Wyeth, where he has been responsible for two areas: Strategic oversight of Wyeth's biopharma activities and as president of Wyeth Europe, Middle East, Africa and Canada.

► www.lundbeck.de



Pierre Brondeau

Changes in Rohm and Haas' Board of Directors Rohm and Haas' board of directors has named Dr. Pierre R. Brondeau president and chief operating officer of the company, and approved the formation of the chairman's committee to oversee the direction of the company. Brondeau joined Rohm and Haas in May 1989 and most recently has served as executive vice president and business group executive for the company.

The newly formed chairman's committee will include Raj. L. Gupta, chairman and CEO, Brondeau, president and chief operating officer, and Jacques M. Croisietiere, executive vice president, and CFO. Croisietiere was recently named chief strategy officer of the company.

► www.rohmhaas.com

Per Westin: Regional Commercial Manager Angus Chemical Company, a wholly owned subsidiary of Dow, has appointed Per Westin regional commercial manager for Europe, East and West. This role will be in addition to Westin's current role as regional commercial manager of Dow Biocides, a business unit of Dow. In his new position, Westin is responsible for coordinating all business development efforts, as well as all current and on-going business for Angus in Eastern and Western Europe. His leadership coordination includes, but is not limited to: market plan implementation, sales deployment and technical sales and service, strategic partnerships and alliances, channel decisions and execution.

► www.dow.com/angus

► www.dow.com/biocides



Francis Osborn and Neville Prior

CBA Appoints New Chairman and Vice-Chairman The CBA's annual general meeting approved the appointment of the association's new Chairman, Francis Osborn, ISW Group, and Vice Chairman, Neville Prior, Cornelius Group.

Francis Osborn is managing director, ISW Group, and has been a member of CBA Council since 1999. He is a member of the executive committee of the association and a former member of its membership and communications committee. Osborn has served as a director of Dorset Chamber of Commerce and Industry and as chairman of the Environmental Forum for Dorset Industry.

Dr. Neville Prior is chairman and CEO of Cornelius Group and has been a member of CBA Council since 2006. He is the chair of the manufacturing advisory council for the east of England and a governor of a local secondary school.

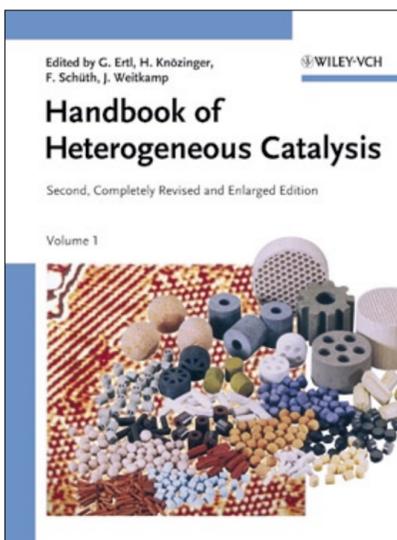
► www.chemical.org.uk

Handbook of Heterogeneous Catalysis

Heterogeneous catalysis is so pervasive in modern day chemistry that it is estimated that 90% of today's current chemical processes are based on catalytic chemical synthesis. First published in 1997, the Handbook of Heterogeneous catalysis, has become the standard reference on all aspects of the subject, from physicochemical foundations to large-scale industrial applications. Now in this updated and expanded edition, Handbook of Heterogeneous catalysis (Wiley-VCH; April 2008; Introductory price €1799.-, 4,270 pages with 2,000 figures; Hardcover; Print ISBN: 978-3-527-31241-2) provides coverage of every important topic and development related to the area of heterogeneous catalysis. This eight-volume set is an unrivalled resource in the field of heterogeneous catalysis edited by a world-renowned board of editors including Gerhard Ertl, recipient of the 2007 Nobel Prize in Chemistry.

Ease of access to the content is facilitated by a subject index of approximately 100 pages, making the eight-volume set simple to navigate.

In addition to the print set, this reference is also available online at



www.interscience.wiley.com/reference/hetcat. The online version offers added functionality including fully expandable colored figures, as well as links to the primary literature and key scientific websites. A powerful search engine provides easy access to the full text, tables, figures, and chapters that can be viewed, downloaded, and printed in PDF format.

► www.interscience.wiley.com/reference/hetcat



EVENTS

Pharma Chemoutsourcing Conference & Exhibition The annual Chemoutsourcing conference and exhibition will take place on Sept. 8-9 in Long Branch, N.J., U.S. The show is attended by large, mid-sized and small pharmaceutical/biotech company executives and scientists plus a large assembly of suppliers from around the world who source chemicals. Chemoutsourcing sessions cover the chemical gamut from discovery through drug product and everything in between.

► www.chemoutsourcing.com

Pharmaceutical Anti-Counterfeiting Forum The Annual Pharmaceutical Anti-Counterfeiting Strategies Conference, taking place July 1-2 in BSG House, London, UK, industry will hear the latest techniques and strategies of pharmaceutical counterfeiting. More than 50% of the drug supply in some developing countries is said to be counterfeit and worldwide sales of counterfeit drugs could double to €60 billion by 2010. The industry made the decision to meet and discuss how to fight the problem. The latest strategies such as transparent laser markings, new finger print technologies and surface authentication systems, will be explained and discussed.

► www.bsg.co.uk

ECTA Conference 2008 The ECTA (European Chemical Transport Association) annual conference on June 10 will be followed by the annual general meeting of the ECTA member companies at the Brussels Autoworld. Owners, CEOs and top managers of the chemical transport industry will come together and network to share practical knowledge and practices on safety, HR, security and efficiency in chemical transport. The annual conference generates understanding and provides an open discussion on changes and improvements in the chemical transport sector.

► www.ecta.be
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 IT-Manager
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 1,001 - 5,000
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- Yes
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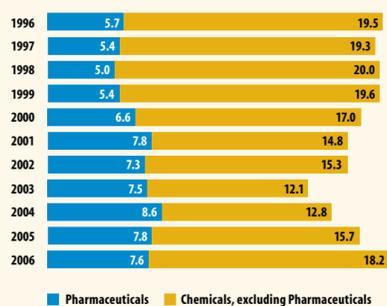
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EUROPE

Investment in the Chemical Industry

Capital Investment

Capital expenditures (billion \$)



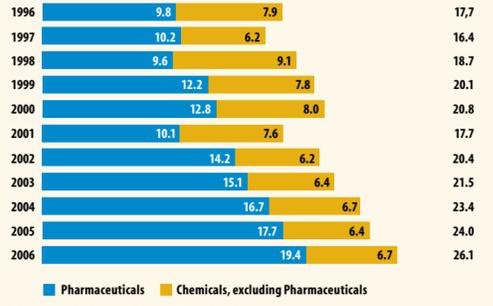
■ Pharmaceuticals ■ Chemicals, excluding Pharmaceuticals

Source: U.S. Bureau of the Census, American Chemistry Council © GIT VERLAG

The business of chemistry is to convert natural materials into their barest elements in order to recombine them into useful products. These processes require industrial-scale versions of some of the equipment familiar to high school chemistry labs. As a result, the chemical industry is very capital-intensive. That is, huge investments in plant and equipment are required to generate these complex chemical reactions.

Investment in Knowledge

Funds for research and development (billion \$)



■ Pharmaceuticals ■ Chemicals, excluding Pharmaceuticals

Source: National Science Foundation, American Chemistry Council

Innovation and technology have driven the world economy for centuries. The business of chemistry is among the most innovative industries in the world with the business of chemistry accounting for about one in nine U.S. patents. This high level of research is benefiting the industry and society as a whole. The payoff is a rapid rate of technological innovation, evidenced by a constant stream of new products and production processes.

Technology to Combat Greenhouse Gases



A team of scientists at Newcastle University, led by Michael North, has developed a highly energy-efficient method of converting waste carbon dioxide (CO₂) into cyclic carbonates. The team estimates that the technology could potential use up to 48 million tonnes of waste CO₂ per year, resulting in a 4% reduction in UK emissions.

The technique relies on the use of a catalyst to force

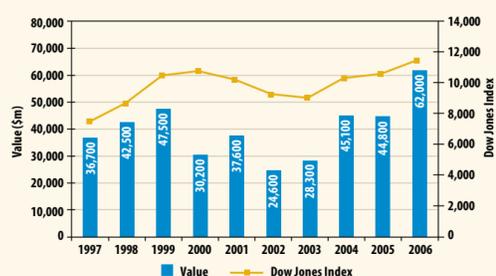
a chemical reaction between CO₂ and an epoxide, converting waste CO₂ into this cyclic carbonate, a chemical for which there is significant commercial demand. The conversion of CO₂ via its reaction with epoxides is not new, but previous techniques require a lot of energy, needing high temperatures and high pressures and also require the use of ultra-pure CO₂, which is costly to produce. The New-

castle team has succeeded in developing a very active catalyst, derived from aluminium, which can drive the necessary reaction to turn CO₂ into cyclic carbonates at room temperature and atmospheric pressure. The team's technology vastly reduces the energy input required to convert CO₂ making it more cost efficient.

► www.nd.ac.uk/

M&A in the Chemical Industry

Overall value of M&A transactions and Dow Jones Index



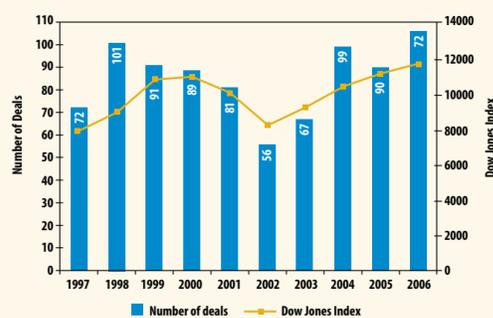
Notes:
1) M&A transactions in the chemical industry > US\$ 50 million
2) Dow Jones Index: annual average

Source: David Ingles Consulting; Bloomberg; KPMG International analysis, July 2007

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M&A activity in the chemical industry appears to be linked to the performance of the financial market, as can be seen by the comparison the Dow Jones index with the overall value of deals in the chemical industry. In order to overcome current issues facing the industry, ongoing change and restructuring are the norm. M&A is one tool available to reconfigure the industry so as to keep the European chemicals industry truly competitive.

Number of M&A transactions and Dow Jones Index



Source: David Ingles Consulting; Bloomberg; KPMG International analysis, July 2007

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It should be noted that in some years, one major deal can account for a significant share of the total deal value. For example, the sale of Basell by BASF and Shell in 2005 at a total value of \$5.3 billion represents more than 15% of the total deal value in that year. In May 2007, GE Plastics was sold for \$11.6 billion to Sabic. These two examples are typical for portfolio adjustments being carried out by most larger companies.

Coming up in CHEManager Europe 7/2008:

- Interview with Elemica CEO Mike McGuigan
- The future of chemical and petrochemical industry in the CEE region
- Solutions and innovations in specialty chemicals
- More on Reach
- A special section on catalysts

Out on July 26

This issue contains a supplement on Reach.

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European Football Championship 2008

Most Successful European Championship Teams



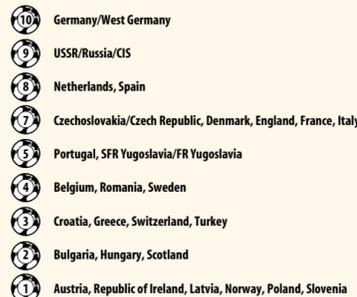
Source: UEFA.com

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This year's UEFA European Football Championship will take place June 7–29 in Austria and Switzerland. In order to qualify a team must be winners or runners-up in one of the seven qualifying groups. After this a team proceeds to the finals round in the host country, although hosts qualify for the tournament automatically. The qualifying phase begins in the autumn after the preceding FIFA World Cup, almost two years before the finals. Germany has proven to be the most successful team in

Final Tournament: Appearances

European Football Championship 2008



Source: UEFA.com

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the competition over the years; the country won the championship three times. It also made it to the final round 10 times.

Poland and Ukraine were selected to host the 2010 competition. They beat out both Italy and Croatia/Hungary. The hosts for 2016 will be decided in 2010; currently, Sweden and Norway have submitted a joint bid, and it has also been reported that Wales and Scotland will bid together.

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