

CHEMManager

EUROPE



Markets & Companies

Using social media as a marketing tool in life sciences

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CHEMICAL AND
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Pharma

Pharma has a lot to learn from the auto industry

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Newsflow

Dow Corning reported increased sales and a solid income in first quarter 2011, with an adjusted net income of \$175 million and quarterly sales of \$1.58 billion. The company said its Q1 profits were softened by sharply rising materials and energy costs. Dow Corning also reported continuing growth for silicones in emerging economies throughout Asia, Latin America and Eastern Europe.

Clariant announced sales of CHF 1.717 billion for the first quarter of 2011. Sales growth in local currencies amounted to 5%. Due to the appreciation of the Swiss franc against most major currencies, sales were 6% lower in Swiss francs year-on-year. Sales prices improved 5% year-on-year. While not fully compensating for higher raw material costs yet, sales prices increased 2% sequentially with dynamics picking up towards the end of the quarter. The gross margin was up to 29.8% from 28.7% last year.

Belarus has raised export duty on potash fertilizers by 50% from June 1, a presidential decree showed, a move that is likely to hurt local producers. The duty will rise to €75/ton from the current €50. BPC, a joint venture between Belarussian state firm **Belaruskali** and Russia's **Uralkalis**, is the sole exporter of potash from Belarus and controls up to 30% of the global potash market.

PPG Industries announced the signing of a share purchase agreement to acquire **Dyrup**, a European coatings company based in Copenhagen, Denmark, from its owner, **Monberg & Thorsen**, a public holding company. The total transaction value, including assumed debt, is around €135 million (\$200 million). The transaction is expected to close in the third quarter of this year.

Huntsman and **Wilmar International** have signed a memorandum of understanding between their respective subsidiaries for **Wilmar** to build a state-of-the-art natural alcohol plant at Huntsman's chemical site in **Rozenburg** (Rotterdam, The Netherlands), and to supply natural alcohols to Huntsman. The facility is scheduled to come on stream by 2013. The plant will be owned and operated by **Wilmar**, one of Asia's leading agri-commodities companies and one of the world's largest oleochemical businesses.

Rockwood Holdings said its shareholder **Kohlberg Kravis Roberts & Co** will sell almost half of the stake it owns in the specialty chemicals maker, sending its shares down 2% in extended trading. **Kohlberg Kravis** – an asset management company – owns about 21% stake, or 15.9 million shares in **Rockwood Holdings**.

Driving Change – Is sustainability everything when it comes to packaging? Not necessarily, says Shanna Moore, global director of Sustainability at DuPont Packaging & Industrial Polymers. The member of the Sustainable Packaging Commission points out that while sustainability is important, proper protection of the product should be the first priority. "We cannot sacrifice proper protection for the sake of a definition of sustainable packaging ... breakage of the product inside would have far greater environmental impact than the packaging itself," she said. However, she also points out that the packaging industry is moving towards minimizing the total environmental impact of packaging. Brandi Schuster asked Moore about what sustainability means to the industry, current trends and the road ahead.

CHEManager Europe: Sustainability is really "the" buzzword in the chemical industry; what exactly does it mean when it comes to packaging?

S. Moore: The first, most important item is that we cannot forget that packaging plays a critical role in society – that of protecting the product. We cannot sacrifice proper protection for the sake of a definition of sustainable packaging; spoilage or breakage of the product inside would have far greater environmental impact than the packaging itself. It is not sustainable if the total environmental impact of the system is increased because the product is not properly protected due to a packaging change made in the name of sustainability.

When I think about sustainability and packaging, I think of minimizing the environmental impact of the product and package. We can do that from using less packaging in the first place through use of materials that enable thinner, more light-weight structures while still protecting the product inside. It can also be accomplished via recycled or renewable materials. These usually all have a positive impact on the sustainability of the package.

What do you consider to be the main problems with non-sustainable packaging within the chemical industry?

S. Moore: I believe that one of the main issues is the escalation and volatility of raw material costs. With growing unrest in oil producing regions, we will continue to see shifts in raw material pricing. We have already seen significant spikes in oil prices. At the point where these petroleum-based materials become more expensive than their bio-sourced alternatives,



Shanna Moore, global director of Sustainability at DuPont Packaging & Industrial Polymers

it will be economically attractive to make a change to the more sustainable solution. It likely won't be very soon, but we must plan now so that we have alternatives.

Have you seen an increased – and honest – interest in sustainable packaging within the industry?

S. Moore: I have absolutely seen an interest in sustainable packaging. What is interesting is that I see companies changing to more sustainable alter-

natives, but they are not necessarily marketing it "on package." They are using it more from a corporate standpoint with investors, shareholders and in improving their brand reputation. In addition, most conversions to sustainable packaging actually provide a cost benefit because the packaging is more efficient, has reduced transportation costs, etc.

What are other drivers behind the interest?

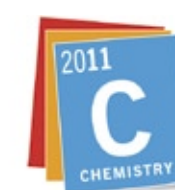
Protecting The Product

DuPont's Shanna Moore on the Role of Sustainable Packaging

S. Moore: There are a number of factors. For one, public corporate goals such as greenhouse gas reduction are driving change up the value chain. This is especially true when a retailer makes public goals and they depend on their supply chain to deliver the results. Also, many see biopolymers as the low-cost option in the future, so they are planning now to have reduced cost in the future as oil prices continue to rise.

There is also increased recognition that the packaging we are throwing in landfills has value even after it is used for product delivery. That packaging should be physically recycled if possible and if not, used for energy production. To get this going, the brand owners need to ask for more recycled content. This will drive the demand for more recycled materials.

Have you seen more chemical companies working towards developing a triple bottom line?



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S. Moore: The chemical industry started on their journey over 20 years ago with the development of Responsible Care, which focuses on what chemical companies should be doing to reduce their footprint while delivering more societal value. The standards continue to evolve as the industry learns more, but overall I think most al-

ready have this focus and others are likely working on it.

What responsibility does the chemical industry have when it comes to sustainable packaging?

S. Moore: It is up to us to develop the more sustainable monomers and polymers that will be used in sustainable packaging in addition to more sustainable approaches to packaging. We also have the responsibility to consider how we can use more sustainable packaging in the packaging of our products.

What are the latest trends in sustainable packaging?

S. Moore: The easiest solution is reducing the weight packaging structures, and that has been done for many years. We may be reaching the point where that would impact the product protection and preservation. People are starting to experiment with recycled and renewable materials when there



is an environmental footprint advantage.

Where do you see the market in five to 10 years?

S. Moore: We'll be recycling much more – especially in the U.S. and other regions where recycling rates are low. We'll also start to see broad use of renewable materials and hopefully those will primarily come from non-food sources such as cellulose or waste products.

You're a member of the executive committee of the Sustainable Packaging Coalition. Can you tell us more about your involvement and what exactly the Coalition does?

S. Moore: The Sustainable Packaging Coalition (SPC) is a great coalition of more than 200 packaging companies. I am very proud to serve on the executive committee where we help shape the agenda of the coalition. The SPC brings the industry together providing education on relevant sustainability topics and also provides a forum for working groups to advance certain topics or industry needs.

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Imprint

Reliance to Invest \$12 Billion in Chemicals, Launch Rubber Business



Mukesh Ambani
Reliance Industries
Chairman

Reliance Industries said it plans to invest up to \$12 billion in the chemicals business to tap the market for hygiene and healthcare products and will look at developing a new rubber business, Chairman Mukesh Ambani said in an interview to the Economic Times.

"We will make RIL one of the world's largest players in rubber as the whole tire industry moves to Asia," Ambani told the paper. The big trend is that if you look at next 10 years, the projections for automobile growth is all China, India and Asia focused," the billionaire said, adding that Reliance would be a supplier

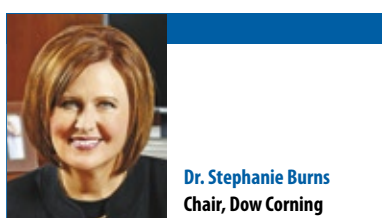
and not a tire maker. The company is also looking at strategic alliances in the energy and consumer sectors, Ambani said.

Reliance struck three shale gas joint ventures in the U.S. last year, including a \$1.7 billion deal with Atlas Energy to own 40% of its Marcellus Shale operations in the eastern U.S. Ambani said he strongly believes India would be a \$5-trillion economy well before 2025, and that it would have a \$2.5-trillion consumption market.

"I think the India growth story is unstoppable. I look at it as an opportunity in the acceleration mode," he said.

India needs a supportive governance environment at all levels and systemic reforms to reduce corruption, he said. Ambani also said the company was confident of ramping up gas output at its key block off India's east coast. ■

Robert Hansen Named CEO of Dow Corning Corporation



Dr. Stephanie Burns
Chair, Dow Corning

Dow Corning Corporation's board of directors elected Robert D. Hansen, CEO of Dow Corning, effective immediately. Dr. Stephanie A. Burns, remains chair. Hansen has been employed by Dow Corning for 29 years and was named president in November, a position he will continue to hold.

"In the six months Bob has served as president, he has brought focused attention to creating the capabilities needed to support Dow Corning's growth," said Burns. "With Bob's record of strong business leadership and results, our board of directors and I are very confident in his ability to lead Dow Corning in a new era



Robert Hansen
President and CEO,
Dow Corning

of global expansion, technological exploration, and sustainable innovation."

Hansen joined Dow Corning's Finance function in 1982, in Midland. Six years later, he relocated to Brazil as regional finance manager, returning to the U.S. in 1992 as economic evaluator and controller for the Rubber business. Hansen became the manager for the South American region in 1996. Following that, he had numerous roles including product line management, procurement director and global oversight for Dow Corning's Construction business before being named European Area president in 2002. ■

Kurt Bock New BASF CEO; Company Announces Strong Q1

Dr. Kurt Bock has taken over the reins from Dr. Jürgen Hambrecht at BASF. Hambrecht, who served as the company's head for eight years, has retired. Bock was named to BASF's board of executive directors as chief financial officer in 2003 and since 2007 he was also chairman and chief executive officer of BASF Corporation based in New Jersey. Dr. Hans-Ulrich Engel has been named the company's new CFO.

The company also announced a strong start 2011. Capacity utilization rates in the company's plants were good; in particular, demand in the chemicals business increased compared with the same quarter of the previous year. Sales grew by 25% to €19.4 billion; BASF said its December 2010 Cognis acquisition made a significant contribution to sales growth. The earthquake off the coast of Japan and its aftermath as well as the tense political situation in North Africa have not yet had a significant impact on BASF's business.

Compared with the first quarter of 2010, sales volumes rose in nearly all segments. As a result of the situation in Libya, oil production was suspended at the end of February 2011; this led to a reduction in oil production volumes in the Oil & Gas segment. In the Agricultural Solutions segment, prices declined slightly; all other segments reported price increases. Income from operations (EBIT) increased by 39% to €2.6 billion compared with the first quarter of the previous year. EBITDA rose by €738 million to €3.4 billion. The EBITDA



Dr. Kurt Bock (right) succeeds Dr. Jürgen Hambrecht as chairman of the board of executive directors of BASF.

margin rose to 17.4% (first quarter of 2010: 17%).

The financial result was €830 million, an improvement of €910 million compared with the same period of the previous year. This was due to the special item of €887 million that resulted from the sale of the company's stake in K+S Aktiengesellschaft. Overall, special items in income before taxes and minority interests amounted to €705 million.

Net income increased by €1.4 billion to €2.4 billion. Earnings per share were €2.62 in the first quarter of 2011 compared with €1.12 in the same period of 2010. Adjusted for special items and amortization of intangible assets, earnings per share amounted to €1.94 (first quarter of 2010: €1.32). ■

Nord Stream Finishes 1st Gas Pipeline

Nord Stream has finished its first 1,200 km (745 mile) pipeline and prepared it to start shipping gas from Russia to Germany on schedule in October, the company said. The €7.4 billion (\$11 billion) project is aimed at replacing dwindling North Sea gas supplies and avoiding shipment through central Europe. It is owned 51% by Russia's Gazprom and 15.5% each by Germany's E.ON Ruhrgas and BASF-Wintershall. Nord Stream is building two roughly parallel pipelines across the Baltic

Sea with an overall annual capacity of 55 m³ (bcm).

Once the pipeline's three zones have been tied-up by divers and tested, it will gradually be filled with gas over four weeks, reaching commercial viability in October, he said. Pipeline one is designed to have an annual capacity of 27 bcm. Hoekstra said Nord Stream had already begun laying pipeline two and expected to complete it by April 2012. France's GDF Suez and Dutch company Gasunie also hold minority stakes. ■

ChemChina to Buy MA Industries

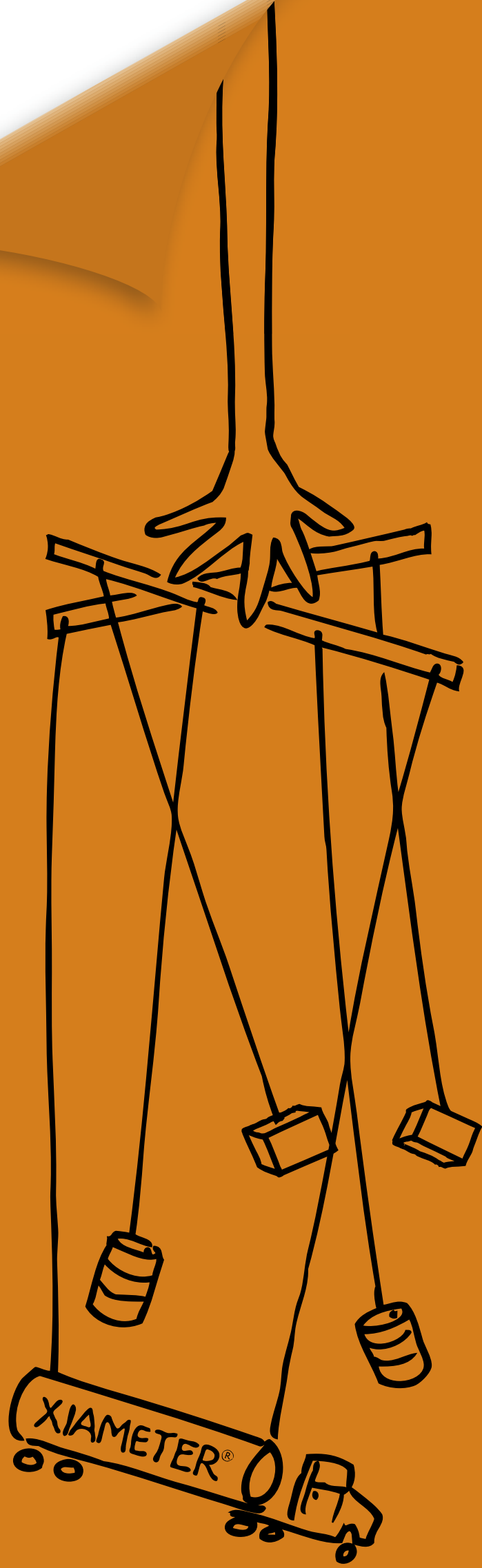
China National Chemical Corp (ChemChina) has received final approval for its bid to buy a controlling stake in Israeli generic agrochemicals maker MA Industries. MA said that ChemChina won approval from the Administration of Foreign Exchange of China. "This concludes the required approvals from the Chinese authorities for the transaction," MA said in a statement. The deal to buy control of MA, the world's largest maker of generic

crop protection products, received approval from the National Development and Reform Commission of China in March.

It has also received approval from China's Ministry of Commerce. Koor Industries, a subsidiary of IDB Holding Corp, owns 47% of MA.

The deal values MA at \$2.4 billion. ChemChina will buy the 53% of MA held by the public for \$1.27 billion and pay Koor \$168 million for another 7%. ■

DOW CORNING

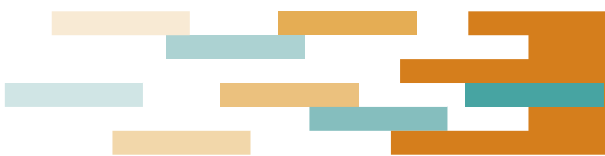


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No Risk, No Fun?

Social Media and Networking in the Life Science Industry

Tread Cautiously – Social media and social networking are at the forefront for many industries, and the life sciences industry is no different. George Ng, a partner at Gordon & Rees LLP, highlights the many uses and benefits of social media and social networking, as well as the associated risks.

Social networking websites are currently at the forefront of worldwide public awareness. Social media and networking is a recent extension, and some would say revolution, of the traditional social network, which primarily consisted of relationships and families in towns and villages. Social networking involves using websites to build and bring together online communities of people with similar interests and common activities. Social media includes information, in various forms (from written text to music to video), that is disseminated through social networking, as well as the online tools for such dissemination. Together, social media and social networking have resulted in a new way of communicating and sharing information, by allowing people to access the information of and from other people located anywhere else in the world while only requiring an Internet connection.

Social Media Marketing

One of the major developments and trends is social media marketing, i.e., to utilize social media and networking to market services or goods. Many companies are using social media tools, such as Facebook share widgets, to market their products. For example, these share widgets appear as small buttons or thumbnail images, on a Facebook page. When anyone clicks on that share widget, another box or website with shared content (oftentimes, with links to other web pages) is opened. In this manner, these share widgets may be used as mini-advertisements to attract and bring users to more robust content on another page or website.

Another prominent use of social networks is to monitor the activities, thoughts, trends and feedback of individuals, as well as targeted groups. For example, in the consumer goods industry, many companies utilize various social network sites, such as Twitter, to monitor public sentiment toward their products, as well as to address criticism and



George Ng
Partner, Gordon Rees LLP

reported problems. There have been instances in which pharmaceutical companies have partnered with physician social networking sites, such as Sermo, to gauge the opinions of physicians in certain topics through surveys and other tools.

Social networking is also being used by companies to help position their products or services by allowing these companies to convey a desired message about those products or services or to educate physicians and/or patients, such as through patient networking websites. For example, a company may purposefully send messages or posts



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through Twitter or another social networking site to highlight a recent improvement or a new version of its product or services. Additionally, in the case of Twitter, through sending out carefully-crafted tweets, which are text-based posts of up to 140 characters, some companies have utilized Twitter as an extension of their customer service departments to publicly counter complaints or address concerns or questions.

Specific to the life sciences industry, in the past, some pharmaceutical companies have also partnered with patient networking sites, like PatientsLikeMe.com, to recruit patients for clinical trials. In one instance, a patient networking site sent out a message to its members interested in a specific therapeutic indication alerting them to a particular clinical trial in that indication.

Regulatory, Compliance and Legal Risks

Social media and networking have many uses, but not without risks. In particular, many social media tools are limited in the amount of space they can occupy, which is a part of their novelty, but this limitation (or advantage, depending upon the perspective) has posed a problem from a regulatory and compliance standpoint. Indeed, on July 29, 2010, the U.S. Food and Drug Agency (FDA) sent a warning letter to a pharmaceutical company regarding its use of a Facebook share widget to post shared content about one of its pharmaceutical drug products. The FDA asserted that through the share widget, the company made representations and suggestions about the safety and efficacy of the drug product was shared, but without directly communicating any of the risk information associated with the drug product. In the shared content

of the widget, there was a hyperlink to various drug product websites containing risk information, but the FDA concluded that use of the hyperlink was an inadequate method of conveying risk information.

Another area of risk is in monitoring. Although gaining physician and patient sentiments about drug products may be the goal of monitoring, adverse event information will likely crop up as well. This adds the extra burden on companies that monitor to develop and have in place the appropriate policies, standard operating procedures and mechanisms to compliantly track and report adverse events gleaned from monitoring.

Aside from the regulatory and compliance issues, there are other legal risks associated with the use of social media and networking within a company. For example, employee use

of social media can cause a number of problems for employers in the areas of security, disclosure of confidential information and privacy.

Conclusion

Although some life sciences companies have embraced social media and networking, many life sciences companies are wary of potential regulatory, compliance and legal risks and have taken a "wait-and-see" approach. Exacerbating these concerns is the fact that many government regulatory agencies, have yet to issue any formal guidance on the use of the Internet, social media and networking in the marketing of regulated medical products. For example, although the FDA held an open hearing to receive public and industry input on this topic back in November 2009, it has yet to issue any formal guidance on the subject. Indeed, the FDA recently announced a second delay in issuing its long-promised guidance documents on social media.

However, doing nothing is also not without its share of risks. Delay in registering for websites and social networking accounts for desired names, such as a company or drug product name, could result in losing those websites and accounts to another person or entity that registers them first (or the hassle of going through legal and administrative proceedings to recover them). Also, not putting into place a carefully-crafted social media and networking policy, or otherwise providing guidance and/or restrictions on employee use of social media and networking websites, could lead to disasters, from harassment lawsuits (from, for example, employees posting inappropriate information or pictures and sharing them with co-workers via social networking sites) to inadvertent disclosure of sensitive and confidential, company information.

All in all, social media and networking have unquestionable value, but their utilization in the highly-regulated, life sciences industry requires careful consideration and planning.

Contact:

George Ng
Gordon & Rees LLP
San Diego, Calif., U.S.
Tel.: +1 619 696 6700
Fax: +1 619 696 7124
gng@gordonrees.com
www.gordonrees.com

[chemanager-online.com/en/tags/social-media](http://www.chemanager-online.com/en/tags/social-media)



SALES & PROFITS

DuPont Reports Double-Digit Sales Gains in All Segments DuPont's first quarter 2011 earnings were \$1.52 per share, compared to \$1.24 per share in the prior year, despite a Pharmaceuticals earnings decline of \$.14 per share. Sales increased 18% to \$10 billion with 9% higher sales volume, 8% higher local price and a 1% increase from portfolio changes. Sales in developing markets grew 30%. DuPont said customer-driven innovation contributed to the company achieving five consecutive quarters of pricing gains. All segments recorded double-digit sales growth, driving a 31% increase in segment pre-tax operating income, excluding Pharmaceuticals. Volumes were especially strong in Safety & Protection, Agriculture & Nutrition, and Electronics & Communications. The company increased its full-year 2011 earnings guidance to a range of \$3.65 to \$3.85 per share from the previous range of \$3.45 to \$3.75 per share, excluding the impact of Danisco (see article on this page).

Dow Sales up 20% in Q1 Dow has reported sales of \$14.7 billion in Q1 2011, up 20% over the same period last year. Top-line growth was driven by an 8% increase in volume and a 12% increase in price. All operating segments and geographic areas reported double-digit sales increases. At a company level, EBITDA rose \$622 million, or 34%, to \$2.4 billion. Dow said this was the second highest quarterly EBITDA on record for the company. Performance Products and Chemicals and Energy each posted EBITDA increases in excess of 50%, and Coatings and Infrastructure EBITDA increased more than 30%.

Health and Agricultural Sciences EBITDA reached a new quarterly record of \$406 million and Plastics EBITDA exceeded \$800 million.

Bayer Group Sales up 13.2% Sales of the Bayer Group climbed by 13.2% in the first quarter of 2011, to €9,415 million (Q1 2010: €8,316 million). Adjusted for currency and portfolio effects, sales were up by 10.4%. Despite the positive business trend, the operating result (EBIT) improved by only 4.0% to €1,148 million. The company said its earnings were diminished by special charges of €442 million (Q1 2010: €77 million). Of this figure, the restructuring measures already announced at CropScience and HealthCare accounted for €248 million. Charges of €194 million were taken mainly for an intended settlement program in connection with litigations concerning genetically modified rice in the U.S. Earnings before EBITDA – before special items – climbed by 22.3% to €2,232 million. Net income came in at €684 million, up 8.4% year on year. Core earnings per share rose by 28.3% to €1.45.

Ashland Profit Widely Beats Expectations Chemical maker Ashland posted a better-than-expected quarterly profit as it raised prices to counter rising raw material costs. For the second quarter ended on March 31, Ashland's net income came to \$353 million, or \$4.39 per share, including a \$231 million gain from the sale of its distribution unit to private equity firm TPG Capital for \$979 million cash. Excluding that and other one-time items, Ashland posted earnings of 86 cents per share. By that measure, analysts expected 77 cents, according to Thomson Reuters I/B/E/S. Year-earlier net income was \$22 million, or 27 cents per share. Revenue rose 9% to \$1.56 billion. Analysts expected \$1.49 billion. The cost of sales rose 14% to \$1.14 billion.

Akzo Nobel's Q1 Profit Up Akzo Nobel has reported a 58% increase in profit to €128 million during the first quarter of 2011, compared to a profit of €81 million reported during the same quarter last year. The company's revenue increased 16% to €3.7 billion in the quarter compared to €3.2 billion in the same quarter last year, reflecting a 7% increase in volumes and a 4% positive price effect. The company reported a 10% increase in EBITDA during the quarter to €437 million. For the period from January to March, AkzoNobel said its specialty chemicals segment reported €1.35 billion in revenue, up by 17% year on year, while its performance coatings had an 18% increase in sales at €1.24 billion. The company also said it is planning to increase its revenue to €20 billion within five years.

Eastman Chemical Q1 Profit Surges Eastman said its quarterly profit rose sharply as sales increased in every region of the world, driving revenue above analysts' expectations. For the first quarter, the company posted net income of \$220 million, or \$3.04 per share, compared with \$101 million, or \$1.37 per share, a year before. Earnings from continuing operations were \$2.52 per share, and revenue grew 28% to \$1.76 billion. Analysts had expected earnings of \$1.93 per share on revenue of \$1.53 billion, according to Thomson Reuters I/B/E/S.

Unipetrol Q1 Net In Line With Expectations Czech downstream oil group Unipetrol reported a 50% rise in first quarter net profit, in line with market expectations. Net profit was 464 million Czech crowns (\$28.57 million), compared with an average estimate for a profit of 465 million crowns by analysts in a Reuters poll, who said the bottom line will be buoyed by a steep rise in oil prices. Revenue rose 28% year on year to 23.088 billion crowns, just above estimates for 23.03 billion. Operating profit was 571 million crowns, below 584 million in the Reuters poll.

Merck Reports Higher-Than-Expected Earnings Merck & Co reported higher-than-expected first-quarter earnings, fueled by strong sales of its drugs for diabetes, asthma and rheumatoid arthritis. The second-largest U.S. drugmaker said it earned \$1.04 billion, or 34 cents per share. That compared with \$299 million, or 9 cents per share, a year earlier, when it took a number of big charges and a tax expense related to U.S. healthcare reform. Excluding special items, Merck earned 92 cents per share. Analysts on average expected 84 cents, according to Thomson Reuters I/B/E/S. Global sales of \$11.58 billion topped the analysts' average forecast of \$11.37 billion. Merck trimmed its full-year forecast for research and development spending to between \$8 billion and \$8.4 billion. It has previously expected \$8.1 billion to \$8.5 billion. The company said it expects earnings this year of \$3.66 to \$3.76 per share, excluding special items – nudging up by 2 cents the lower end of its earlier estimate. That would reflect profit growth of 7% to 10% from 2010.

DuPont Raises Offer Price for Danisco To \$6.64 Billion



Ellen Kullman
President and CEO of
DuPont

DuPont raised its offer for Danisco by 5% to \$6.64 billion, bowing to pressure from dissident Danisco shareholders who had complained the initial offer was too low. DuPont Chief Executive Ellen Kullman had aggressively courted shareholders of the Danish food additive maker for weeks. The U.S. chemicals maker wants Danisco's technology as part of a bigger push into the foods business.

A confluence of minority shareholders who insisted on a higher bid stood firm, forcing DuPont to tweak the offer.

"This is a very strong sign of dedication on the side of DuPont," Danisco's Chief Executive Tom Knutzen told Reuters. "This can only

strengthen the (Danisco) board's recommendation to shareholders" to accept the deal. DuPont raised its offer to 700 crowns per share (\$139.28) from 665 crowns per share. By saying it now will move forward if only 80% of shares tender, DuPont is effectively admitting it will run Danisco as a majority shareholder until it is able to buy 90% of shares in the open market.

The tender offer deadline for Danisco shareholders was extended to May 13 from April 29. So far, 48% of Danisco shares have been voted in support of the deal, the companies said. Danisco's largest shareholder, Danish pension fund group ATP, signed off on the deal late Friday.

DuPont has extended the offer three times. Danisco first agreed in January to be acquired by DuPont for \$5.9 billion, but the deal met resistance from Danisco shareholders who wanted more money.

Final regulatory approvals were granted in April. ■

French specialty chemicals maker Arkema won EU regulatory to acquire parts of French oil major Total's chemicals business to boost its coatings and resins operations and increase its Asian presence. Arkema said in December the acquisition included Cray Valley and Cook Composite & Polymers coatings resins units and Sartomer's photocure resins operations, which are

present in 13 countries. The European Commission, the EU competition watchdog, said the deal would result in a vertical link between the parties, but that it would significantly reduce competition. Arkema produces glacial acrylic acid (GAA) and acrylate esters which are used in making the resins of the photocures and coating businesses of Total. ■

EU Clears Arkema to Buy Total's Resins Units

Israel's MA Industries to Buy Herbicide From DuPont

Israel's MA Industries will acquire DuPont Crop Protection's global non-mixture diuron business, the world's biggest maker of generic agrochemicals. Financial terms of the agreement were not disclosed. According to the agreement, MA will receive rights, registrations and supporting regulatory data for all of DuPont's non-mixture diuron herbicides, including its industry-

leading DuPont Direx and Karmex brands. The acquisition will expand the company's global product offering and broaden its market reach in North America, Brazil and Asia Pacific, MA said. Excluding potential synergies, the acquired products are expected to generate additional annual sales of around \$35 million to MA in the first year. ■



SALES & PROFITS

Süd-Chemie Reports 20% Revenue Increase Süd-Chemie, a group company of Clariant, has made a successful start to 2011. The company has reported consolidated revenue of €318.7 million for Q1 2011, an increase of 20.6%. Rising by 38.1% on a year-on-year basis, consolidated operating profit (EBIT) grew even faster than revenue to reach €20.3 million. Reasons for this marked rise in earnings included the business expansion, increased plant utilisation in response to higher demand, as well as non-recurring income of €2.8 million resulting from acquisition of a 50% share in Exaloid Süd-Chemie S.L., Arceniega, Spain which is active in the foundry additives sector. Adjusted for this non-recurring income, the EBIT rose by 19.0% to €17.5 million.

Wacker Off to Good Start in 2011 Wacker Chemie said significantly increased sales and earnings in Q1 2011, giving it a good start into fiscal 2011. Sales of the Munich chemical company grew by 21% to €1.29 billion from January through March 2011 (Q1 2010: €1.07 billion). This rise was primarily due to higher sales volumes. Wacker's profitability also grew significantly, compared to both the previous year and Q4 2010. Earnings before EBITDA rose to €351 million in Q1 2011, a year-over-year increase of 38%. The EBITDA margin continued to grow in the first three months of 2011 and now stands at 27.2%, up from 23.8% in Q1 2010. Group earnings before interest and taxes (EBIT) climbed to €245.9 million in the first quarter of 2011 (Q1 2010: €153.7 million). The EBIT margin rose to 19.0% (Q1 2010: 14.4%). Net income for the period reached €168 million, yielding earnings per share of €3.39. Wacker said it expects sales and earnings growth for full-year 2011. The Munich chemical company anticipates consolidated sales of over €5 billion. 2011 EBITDA is expected to surpass last year's figure of €1.19 billion.

Henkel Q1 Profit up over 2010 Henkel said its Q1 profit increased from last year, positively influenced by the general economic developments. Based on the performance, the company said it now expects full-year 2011 organic sales growth at the upper end of its outlook range. However, Henkel left its full-year adjusted earnings view unchanged as increasing raw material prices continue to impact results. In Q1, net income attributable to shareholders increased 10% to €285 million from €259 million in the previous year. Earnings per share were €0.65, up from €0.59 per share reported in the preceding year. Excluding items, adjusted net income was €314 million, up from €258 million a year ago. On an adjusted basis, earnings per preferred share were €0.73, higher than €0.60 in the prior-year quarter. Earnings before tax for the quarter improved to €393 million from €368 million in the preceding year. Quarterly sales grew 8.9% to €3.82 billion from €3.51 billion in the same quarter last year. After adjusting for foreign exchange, sales improved 6.8%.

Linde's Q1 Profit up 15% Linde has reported that its Q1 profit rose from last year as group revenue increased 15%, with the gases and engineering divisions delivering higher sales. The company attributed the improvement in profitability to the implementation of HPO (high performance organization) concept to increase efficiency, and backed its outlook for the full-year 2011. First-quarter earnings attributable to Linde shareholders were €284 million, up from last year's €198 million euros. Earnings per share rose to €1.67 from €1.17 a year ago.

LyondellBasell Sees 15% Increase in Q1 Sales LyondellBasell announced net income for Q1 of \$660 million, or \$1.15 per share. First-quarter 2011 EBITDA was \$1,402 million, an 84% increase from the fourth quarter 2010 figure which excludes a \$323 million lower of cost or market (LCM) inventory adjustment. Sales in the first quarter were \$12,252 million, an increase of 15% from the prior quarter. The company said results improved across all business segments in Q1. Most notable were improvements in global Olefins & Polyolefins and the Refining & Oxyfuels segment as increased margins were realized in spite of significant crude oil price increases during the quarter. Commenting on the near-term outlook, CEO Jim Gallogly said, "The second quarter is off to a good start. Conditions experienced in the first quarter were maintained and, in some areas, improved during April."

SABIC Sees 42% Increase in Net Income SABIC announced a net income of SR 7.69 billion for Q1 2011, compared to the net income of SR 5.43 billion for the same quarter in 2010. This represents an increase of 42%, and compared to the net income for the fourth quarter of 2010 of SR 5.75 billion representing an increase of 34%. The gross operating profit amounted to SR 15.43 billion compared to the same quarter in 2010 of SR 12.22 billion representing an increase of 26%. The income from operations amounted to SR 12.51 billion compared to SR 9.71 billion for the same quarter in 2010. This represents an increase of 29%. The earnings per share amounted to SR 2.56 compared to SR 1.81 for the same period in 2010.

DSM Reports Strong Q1 DSM has reported that its Q1 EBITDA from continuing operations is up 14% to € 325 million. The company also said that its Life Science results were driven by ongoing good performance in Nutrition. DSM said it expects 2011 to be a strong year toward achieving its 2013 targets. Commenting on the results, Feike Sijbesma, CEO/Chairman of the DSM managing board, said: "In the quarter we successfully completed our acquisition of Martek, welcoming its employees to DSM. The integration of Martek started immediately and the contribution to our profit is in line with expectations."

Syngenta Sales Up 13% Syngenta reported a 13% increase in sales to \$4 billion for Q1 2011, up over last year's Q1 sales of \$3.53 billion. The company attributed the increase to its strong growth in crop protection and seeds sales in all regions. In the quarter, crop protection sales grew 11% to \$2.79 billion from prior year's \$2.51 billion. Sales of seeds climbed 20% to \$1.24 billion from last year's \$1.04 billion. Syngenta also stated that it experienced a good start to the Northern hemisphere season during the quarter.

BASF's Kurt Bock Says Asia Takeovers Remain Difficult

Following a string of takeovers in Europe and the U.S., BASF continues having a hard time finding suitable targets in Asia, the German company's biggest growth market.

"We would like to carry out more acquisitions in Asia, but that is easier said than done," said Kurt Bock, who took over chief executive of the world's largest chemical company on May 6. "Over the next few years Asia will account for more than half of the growth in the chemical industry," he told reporters at the group's Ludwigshafen headquarters.

In the last two years BASF has bought Germany's Cognis, a maker of additives for household products, and Swiss rival Ciba, which turned BASF into the largest maker of additives for plastics and one of the biggest suppliers of paper chemicals. Larger deals have construction chemicals unit of Germany's Degussa and the U.S. maker of catalytic converters Engelhard.

BASF is looking to further expand and upgrade its main Chinese site in Nanjing and in December earmarked an additional \$1 billion in investments there. The site is part of a joint venture with China's Sinopec.



BASF's former CFO Kurt Bock took over as the company's CEO on May 6.

BASF has said it is aiming for sales in Asia to increase 7% to 8% a year to reach €20 billion by 2020. Overall, takeovers are less of a priority while BASF continues to integrate Cognis, Bock said.

"That keeps us busy for now," he said, but added that the group will keep its powder dry in case an attractive target comes to market.

"When an opportunity emerges, BASF has always been able to make a decision." Bock also indicated that the group's previous bullish outlook for the global chemical industry remained valid.

BASF said at the end of February that global chemical production excluding pharmaceuticals was set to rise 5.2% this year. Bock also said the group has no plans to hive off further businesses for now, after agreeing to transfer parts of its styrenics business into a joint venture with unlisted British group Ineos in

November. "After several measures in the last few years... the portfolio is in good shape. There is no immediate need for action," Bock said.

Timeline Of BASF Acquisitions

November 2010 – agrees to transfer parts of its styrenics business into a joint venture with British unlisted peer Ineos. The Styrolution venture, 50% owned by BASF, will have annual sales of more than €5 billion. BASF stands to receive an unspecified cash amount as part of the deal. Styrenics are standard plastics used for casings and packaging.

December 2010 – buys Cognis, a maker of additives for household products, for 3.1 billion (\$4.16 billion) including debt, to make its business less cyclical. (Announced June 2010)

April 2009 – acquires Swiss rival Ciba for €3.8 billion including debt and an equity value of €2.2 billion, making BASF the largest maker of additives for plastics and one of the biggest suppliers of paper chemicals. (Announced Sept. 2008)

February 2009 – says is mulling the sale of its leather and textile chemicals business.

December 2008 – acquires Norwegian oil and gas company Revus Energy ASA for €581 million. (Announced October 2008)

August 2008 – puts more styrenics businesses on the block, raising the annual revenue at the units that are for sale to €4 billion.

July 2008 – unveils initial plans to sell parts of its styrenics business.

July 2006 – acquires Germany's Degussa construction chemicals for €2.7 billion including debt and an equity value of €2.2 billion. (Announced March 2006)

July 2006 – acquires U.S. resins specialist Johnson Polymer for €379 million (Announced May 2006)

June 2006 – acquires Engelhard Corp., a U.S. maker of catalytic converters, for €3.8 billion (excl. debt), BASF's largest takeover at the time. (Announced Jan. 2006)

August 2005 – BASF and Shell sell their stakes in petrochemicals joint venture Basell for €4.4 billion to Access Industries and The Chatterjee Group.

April 2005 – acquires Merck KGaA's electronic chemicals business for €270 million.

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Hope In Uncertainty

A New PwC Survey Shows Optimism Among Chemicals CEOs

Looking Up –The global economy is still recovering from the worst economic crisis in 75 years, as many countries grapple with the aftermath of the recession. So PricewaterhouseCoopers (PwC) set out to uncover how CEOs are approaching growth during a time when sustainable economic growth is far from certain. PwC surveyed 1,201 business leaders in 69 countries around the globe in the last quarter of 2010, and conducted further in-depth interviews with 31 CEOs.

Chemicals CEOs see a particularly bright future for their sector: Almost 30% are somewhat confident, and 66% are very confident, of revenue growth over the next three years. All this in a sector that was one of the hardest hit during the downturn. Why such an optimistic outlook? One reason is greater efficiency. Many chemicals companies aggressively cut costs during the slump in demand: 85% of chemicals CEOs report that they have implemented a cost-reduction initiative in the past 12 months. Their companies are emerging leaner and meaner. They've changed strategies, too. A full 82% of chemicals CEOs say they've altered course in the past two years – and 29% believe the change has been "fundamental."

Uncertainty about economic growth is the predominant reason for steering in a different direction. Demand for chemicals industry products generally follows GDP levels and, though the global economy has improved, nearly three-quarters of chemicals CEOs are still worried about uncertain or volatile economic growth hurting their businesses. But many chemicals CEOs are also adopting new strategies in

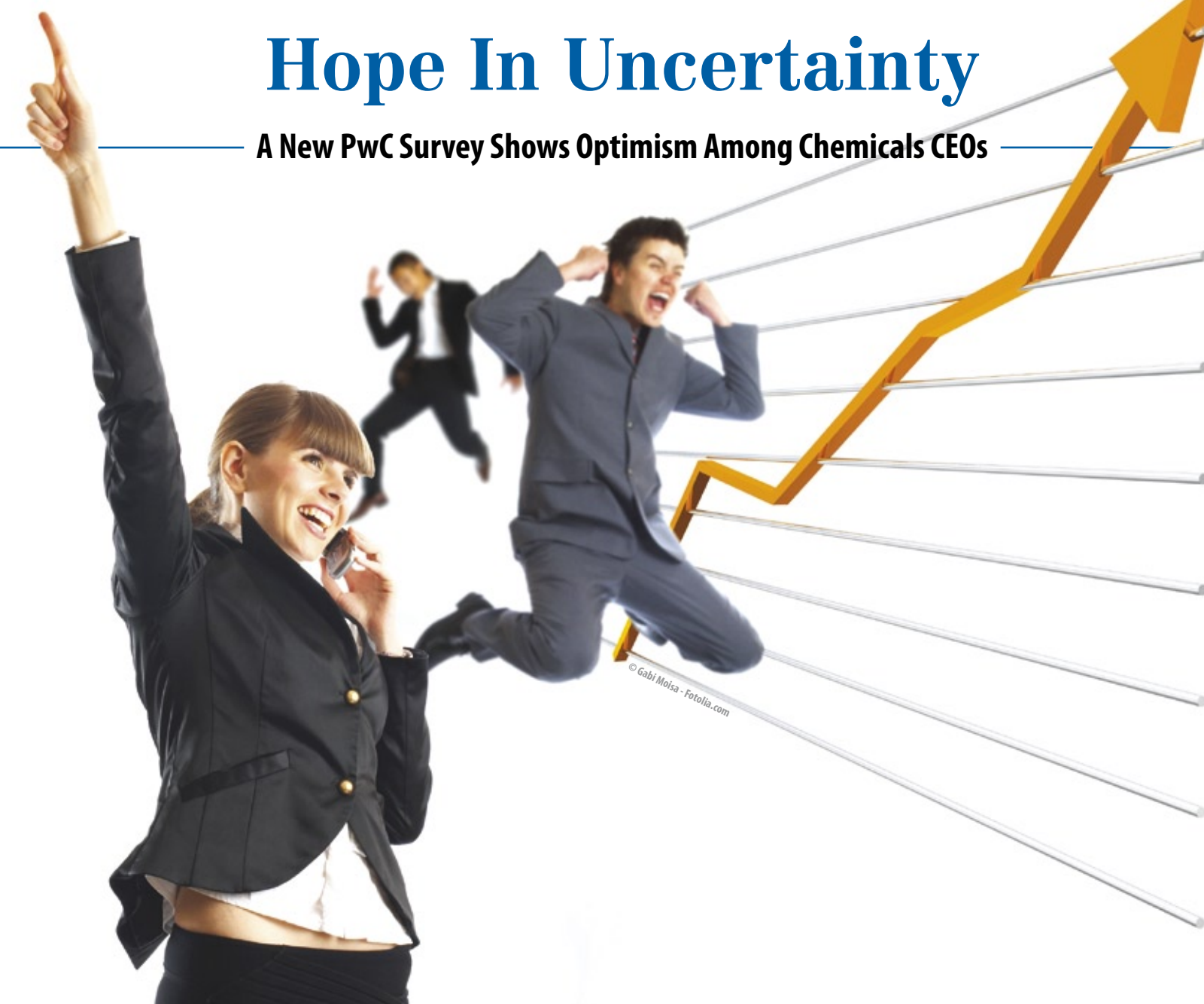
response to shifts in customer demand and industry dynamics – and all these factors are ultimately leading them towards emerging markets.

Targeting Emerging Markets

The International Monetary Fund predicts that growth rates for 2011 will still be sluggish for developed economies. But emerging markets are booming – and providing huge opportunities for chemical producers. Most chemical companies have already set up shop in key emerging markets; a higher percentage of chemicals CEOs say they already have operations in Asia and Eastern Europe than in the

survey population as a whole. And 69% of chemicals CEOs agree or strongly agree that emerging markets are more important to their company's future than developed markets, compared to 59% of CEOs in the total sample.

The majority of CEOs, regardless of the sector in which they oper-



ate, have high expectations of Latin America and Asia – particularly China. Thirty-nine percent of CEOs in the full sample named China one of the three foreign countries most important to their company's growth. But chemicals CEOs accord China even greater weight: 58% rate it among their top three countries for growth. Its significance is equally striking from a production perspective. Forty-nine percent of chemicals CEOs see China as one of the most important countries for their future sourcing needs, compared to 37% of the entire sample.

Global Strategies for Dealing with Macro Risks

It's clear that with so many chemicals CEOs – and, indeed, those in all industries – turning to emerging markets for growth, the competition is likely to be fierce. In China, for example, revenues are rising steadily – but margins are falling. So chemical CEOs will need to ensure their companies have efficient operating models and processes. They'll also need to make sure they have access to raw materials, and

the energy to process them, reliably and at a reasonable cost – and dealing with these global risks is no easy feat. A full 66% of chemicals CEOs (vs. just 34% of the total sample) told PwC they're concerned that scarcity of natural resources could put the brakes on growth. Most are already responding: Two-thirds of chemicals CEOs intend to invest more effort in securing natural resources over the next three years.

And about half now include natural resource-related factors explic-

itly in strategic planning and risk management scenarios.

Chemicals CEOs are also much more concerned than other CEOs about energy costs – which is not surprising, given the energy-intensive nature of chemicals production (fig. 1). That's why they are more likely to have plans in place to mitigate related risks than are CEOs across the sample as a whole. And many are focusing their companies' research efforts on energy reduction, too.

Putting Customers at the Centre of Innovation

The chemicals industry, which is sometimes called the world's first science-based industry, has long been at the forefront of innovation. Nonetheless, in past years, chemicals CEOs have typically concentrated on

better penetration of existing markets as the key way to drive

growth. Now they're more likely to be focusing on stimulating the innovations needed for new products and services. This trend is common to CEOs in many industries, but it's even more pronounced in the chemicals sector.

Most chemicals CEOs are confident their innovations will succeed: 85% believe new products and services will produce significant new revenue streams (fig. 2). But that will mean getting to know the customers of key markets very well.

Making Innovation Local

Companies operating globally will need to innovate to ensure they can meet the needs of local markets. But to get closer to customers, some CEOs are shifting the development process closer to customers – literally. Chemicals CEOs are particularly likely to think the majority of the innovations their companies make will originate in markets other than the

countries in which they themselves are based.

Helping Customers Operate More Sustainably

Sixty-four percent of all CEOs think that developing environmentally-friendly products or services is an "important part" of their companies' innovation strategies. The numbers are even higher in the chemicals sector (fig. 3). Many chemicals CEOs believe their companies can play a major role in fighting climate change by researching and developing products that help their customers reduce their carbon footprint.

As one example, chemical products are critical in reducing the carbon footprint of buildings, through the use of insulation and a wide range of other applications. The industry is also starting to use life cycle analysis (LCA) – a process which looks at the emissions generated during the entire life cycle of a product, from extraction to manufacture, transportation, usage and finally recycling or disposal – to document the positive impact its products can make on the carbon footprint of customers.

Opening Innovation to Supply Chain Partners and Beyond

The chemicals industry already has a history of working with supply chain partners in the search for innovation: 36% of chemicals CEOs this year expect that the majority of their innovations will be co-developed with external partners. The recent appointment of Paul-Joël Derian, group vice-president for research and development at Rhodia, as the chairman of SusChem (the European Technology Platform for Sustainable Chemistry) is another

sign of this trend. In a press release, SusChem described his appointment as a marker of its "increasing determination to accelerate the adoption of innovation along the chemical value chain by enhanced collaboration with partners." SusChem aims to lead large innovation programs with downstream industries in the European Union, and similar programs are happening in other parts of the world as well.

Innovation communities are also gaining momentum on the chemical manufacturing scene. Chemelot, an open innovation community in the Netherlands, is one of the largest chemicals industry parks in Europe. It combines factories and a research campus at one location. Seventy companies, from start-ups to service providers, take advantage of access to raw materials and peripheral services – and the community uses Twitter and Facebook to maintain connectivity.

Globalization Reimagined

CEOs' shift towards a targeted strategy signals the advance of globalization – but it may diverge from how it's looked in the past. Companies are not only affected by globalization; the actions they take will shape it. That 73% of chemicals CEOs support "good growth" is recognition that they would like to see globalization evolve in a way that links economic growth and social development. Good growth is a longterm path towards value creation that creates lasting prosperity for both shareholders and society.

Many CEOs understand that such efforts help attract and retain a strong workforce. And employees who believe their efforts are helping society as well as their company are likely to be more committed to the research efforts that drive innovation. For chemicals CEOs innovation is hands-down the best way to achieve sustainable growth.

Chemicals CEOs are optimistic about the outlook: a higher percentage than in the total sample believe that business and government partnerships will be more effective at mitigating key global risks like climate change, terrorism and financial crises in the future.

Contact:
Tracey Stover
PricewaterhouseCoopers, Global Chemicals Leader
Denver, Colo., U.S.
Tel.: +1 720 931 7466
tracey.a.stover@us.pwc.com
www.pwc.com

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Bayer Says Merger of Equals an Option



Marijn Dekkers
CEO of Bayer

Bayer would consider a tie-up with a pharmaceutical peer of the same size even though its focus remains on organic growth, the head of Germany's largest drugmaker said in an interview with Bloomberg TV.

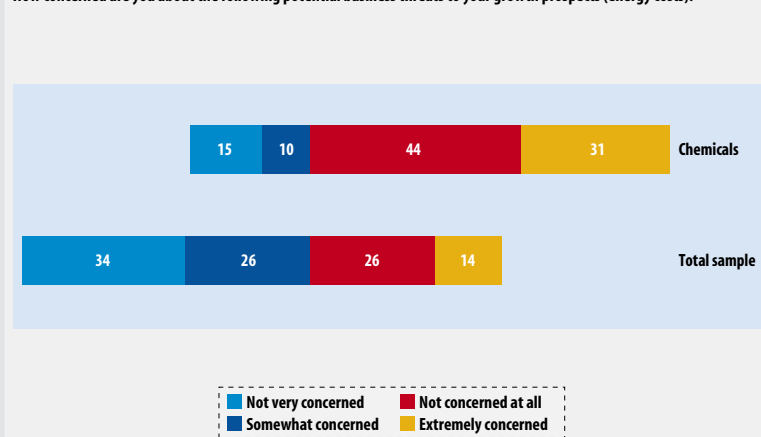
"We would possibly consider a merger of equals in healthcare but we are not desperate to do deals in any part of the company because

our major focus over the next years will be organic growth," CEO Marijn Dekkers said.

Speaking about general industry trends, the CEO said: "The real big mergers would more likely be mergers of equals than one putting a lot of money down for another."

He reiterated recent remarks that Bayer was eyeing the drugs sector and the genetically-modified seeds industry for possible takeover targets and that the sale of assets, such as its MaterialScience unit, would be a "very extreme option" after all other funding options had been exhausted.

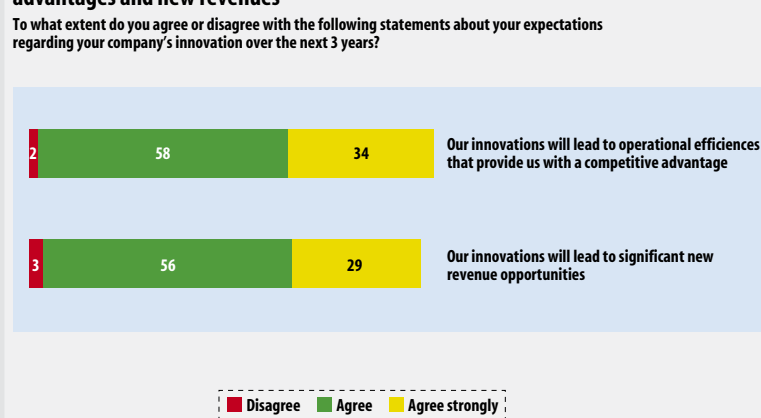
Chemicals CEOs are especially worried about energy costs Fig. 1
How concerned are you about the following potential business threats to your growth prospects (energy costs)?



Source: PwC 14th Annual Global CEO Survey

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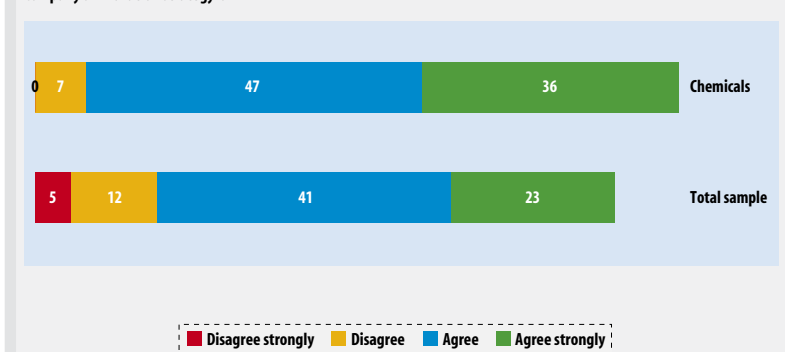
Chemicals CEOs believe innovation will bring competitive advantages and new revenues Fig. 2
To what extent do you agree or disagree with the following statements about your expectations regarding your company's innovation over the next 3 years?



Source: PwC 14th Annual Global CEO Survey

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Chemicals CEOs are focusing innovation efforts on developing environmentally-friendly products Fig. 3
To what extent do you agree or disagree with the following statements about your expectations regarding your company's innovation over the next 3 years: "Developing environmentally-friendly products or services is an important part of my company's innovation strategy?"



Source: PwC 14th Annual Global CEO Survey

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Flexibility In Bioprocessing

Merck Millipore on its Single-Use Production Solutions

It was a most unusual road trip – Drivers on the highways of Europe were probably surprised to see the scaled-down equivalent of a bioprocessing production line rolling next to them last year. In 2010, Merck Millipore launched its Biosafety Tour, a travelling exhibition and technical seminar tour designed to provide customers with answers to their unmet biosafety challenges, directly at their facilities. The truck visited 23 cities throughout the Netherlands, Belgium, UK, Germany, France, Austria and Switzerland and gave visitors a hands-on look at Merck Millipore's single-use technology. Brandi Schuster spoke with Michael Weber, regional sales manager Germany/Denmark for biopharm process solutions at Merck Millipore, about the lessons learned from the tour and new trends in bioprocessing.



Michael Weber
Merck Millipore

CHEManager Europe: Mr. Weber, the European Biosafety Tour sounds like it was an epic undertaking. What was the reason for it?

M. Weber: By meeting biotech and pharmaceutical manufacturers face-to-face, we wanted to help solve their greatest biosafety challenges. Since most in the industry are pressed for time, a truck that physically showed our capabilities and innovations – from the bioreactor to sterile filtration all the way down to final fill steps – was highly appreciated by our customers. We were able to show them how we can help with challenges on new projects – from process development to clinical production using single-use technologies.

What kinds of trends are you seeing in bioprocessing?

M. Weber: Our customers have been achieving higher titers, particularly for monoclonal antibodies – mAbs – for some time now. These higher titers allow them to consider using smaller bioreactors. This, over the last several years has resulted in a push to the use of single-use technologies in bioprocessing – not just the bioreactor, but the purification process as well, on order to enhance production flexibility. The Merck Millipore truck showed a completely disposable way of producing monoclonal antibodies. That means for every single step involved, everything was disposable.

How does the use of disposables make production more flexible?

M. Weber: First and foremost, there is no cleaning necessary between batches, which makes production time much shorter. It can also save money – the investment in disposables can be lower than in stainless steel.

One other important reason for the increased interest in single-use technologies is the ability to delay investment decisions. It takes significantly less time to go from plan to qualification with a single-use facility when compared to a fixed/stainless steel facility. This enables some of our customers that are waiting for clinical trial results to defer large investment decisions. While stainless steel still has its place in production, it's much more cumbersome to use if a manufacturer often changes production from one product to another. In the case of stainless steel, all of the equipment must be properly cleaned and validated and sometimes a company even needs dedicated equipment for a particular product.

With the Merck Millipore Mobius FlexReady solution, users can install equipment, configure applications and validate their processes quickly

and easily, significantly shortening development, validation and manufacturing time. It can simply be taken off the shelf and it's ready to go – the pump is there, as well as pressure sensors, valves, etc. If the user wants to then start production on a different product, they only need to dispose the used flowpath or Flexware assembly put the previous one away, put a new Flexware assembly in place and then they can get going. That means there's no sterilization involved and no need for cleaning.

In terms of flexibility, are companies are trying to do different kinds of processes at the same time? Are they doing smaller batch runs?

M. Weber: This is very often the case for the contract manufacturers and researchers used by the big industry players. They simply must be able to work flexibly and quickly. They need to be able to go through an entire process in a short period of time, and they need to be able to change from one product to another.

While the time-saving advantages are obvious, it sounds like the use of disposable equipment can get relatively expensive over time, whereas stainless steel is more or less a one-time investment.

M. Weber: As mentioned before, the disposable solution doesn't fit everywhere. The investment and the running costs of a process have to be calculated for both solutions and customer needs to make a decision. This isn't an easy task as you also have to consider the costs of working time, water, cleaning chemicals, waste, etc. Merck-Millipore has experienced specialists who can do a full-cost calculation with our customers in order to assess what would be their best solution – disposable or stainless steel.

Is there a demand for more and more components to become disposable?

M. Weber: Yes. We are currently developing disposable sensors that measure things such as pH or conductivity. Of course, when the assembly is disposable, only a certain price is acceptable. This is certainly a challenge we are currently working on.

What about the recyclability of these disposable components?

M. Weber: Sustainability is for us a big topic, and we are doing a lot of things in this direction. For example, we started in an early phase with contracts with some of our customers to recycle our cartridges after production. But as the Flexware assemblies are often used for monoclonal antibodies, they are not allowed to be recycled. Therefore the used single-use components are generally incinerated.

We were asked a lot on the tour about the sustainability of using disposable equipment. However, when we consider that stainless steel has to be cleaned and sterilized after each use, which consumes an incredible amount of energy, water and cleaning solutions, it is not very easy to handle in terms of sustainability.



The truck visited 23 cities throughout the Netherlands, Belgium, UK, Germany, France, Austria and Switzerland and gave visitors a hands-on look at Merck Millipore's single-use technology.

So does it come out being around about the same or is there really a sustainability advantage to having disposable?

M. Weber: It depends, which is why we first work to figure out what's best

for the customer's particular production line. For example, if a company has a production line producing the same product every day over years, then it makes absolutely no sense to use disposables. However, if they are frequently switching be-

tween products, then it makes perfect sense. While there is a general perception that there is more waste with single-use equipment, detailed analysis has shown that the overall carbon footprint with single-use is comparable or smaller than the carbon footprint in an equivalent stainless steel production facility. The perception exists because the use of single-use technologies generate more visible waste while the predominant waste in a fixed/stainless steel facility is water (lots of it) and cleaning chemicals.

What kind of scale up can be done with disposables?

M. Weber: The largest bag we've sold was 3,500L, but that was really an exception. Normal would be up to 1000-2000L. This is a range that can be handled well with disposables. We have mixers that start at 10L and go all the way up to 500L; and also a 1,000L disposable mixer will be launched this year.

It should be mentioned that almost one year has passed since Merck bought Millipore in July 2010. How did that affect the company in terms of innovation?

M. Weber: In terms of all the new products like the Mobius FlexReady solution, I am sure the innovation we did as Millipore was really outstanding, and now it is even easier with Merck. Now we've been able to combine the capabilities from both companies in order to find the best solution for our customers.

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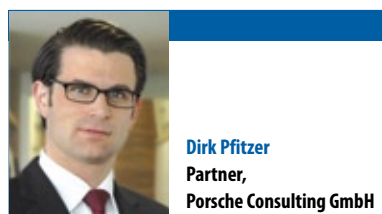
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Pharma Tuning

What Pharmaceutical Companies Can Learn from the Auto Industry

Going Lean – The pharmaceutical industry is subject to very special requirements: strict approval procedures, rising cost pressures in the healthcare industry and lost sales due to competition from generic manufacturers. Yet some of their difficulties are self-inflicted, and pharmaceutical companies can make their processes significantly more efficient – as a comparison with operational excellence initiatives in the automobile industry demonstrates. Even product development can be restructured on “lean” principles.



Dirk Pfitzer
Partner,
Porsche Consulting GmbH



Klaus-Dieter Pannes
Principal Healthcare
Division,
Porsche Consulting GmbH

At first glance, the pharmaceutical and automobile industries have little in common – drugs are not cars, after all. The type of customers and legal requirements of the two industries are likewise highly distinct. Drugmakers are faced with a range of special problems: Approval procedures for new drugs are becoming more and more stringent while cost pressures continue to rise as politicians and health insurance companies seek to stem rising costs in national healthcare systems. The companies also face the prospect of falling revenues as patents expire and generic manufacturers launch competing products.

A Homemade Problem

Yet some of the challenges facing the pharmaceutical industry can be traced back to the companies themselves: The development of new drugs has become markedly more cost-intensive in recent years. Compared to other industries, pharmaceutical companies rely heavily on in-house value creation. Organization of the value-creation chain in the industry is often sub-par; in production in particular, there is often a

great deal of waste. Many different lot sizes and packaging variations mean that machines have to be retooled frequently. On average, wait times and other activities that do not directly result in revenues account for 60% of production time. Pharmaceutical companies can therefore significantly increase their efficiency if they successfully restructure their production and logistics processes.

Lean Management and Operational Excellence

The automobile industry, which has faced similar cost pressures for decades, has already gone through just such a slimming-down process. Manufacturers have reduced their share of the value creation chain to their core competencies and restructured their production and logistics processes so that parts are only delivered to the assembly line when needed. This has allowed manufacturers to shrink their inventories substantially. And overall equipment effectiveness (OEE) exceeds 90% in the automobile industry. Porsche provides an impressive example of the methods used by carmakers to achieve such significant efficiency gains.

Over the past 20 years, the carmaker has implemented the principles of “lean management,” reducing its work processes to the essential. Porsche is constantly looking for ways to improve its organization. The objective is for all employees to continuously question the company’s processes and optimize them step-by-step. The experts at the group’s consulting company Porsche Consulting, whose 250-plus employees have been supporting companies in the industrial and service sectors around the world for years, talk about “operational excellence.”

And Porsche has it in spades. Manufacturing costs for a Porsche 911 today are significantly lower than in 1991. The reason: Porsche has continuously improved its production processes and made them more efficient. Moreover, today Porsche engineers keep the production process in mind when designing new products. But above all, competitive, efficient processes are made possible by Porsche’s decision to keep only the production steps in-house that comprise its core competency.

Room For Improvement

Pharmaceutical companies can learn from the automobile industry, as successful consulting projects by Porsche Consulting in the indus-

try have shown. The transformation begins with the development of new drugs. Over recent years, the average product development time in the automobile industry has decreased by 28%; in the pharmaceutical industry, by contrast, it has risen by 31%. Just as in the automobile industry, pharmaceutical companies can involve all departments, such as production, labor, marketing and sales, in the



While drugs are not cars, the automotive sector’s experience in operational excellence sets a good example for the pharmaceutical industry.

product development process from the beginning. A precise procedure defines individual steps – from the identification of a gap in the market to clinical tests and even the design of the package. The time-to-market for new products can be reduced by up to 25%. It is also easier to identify unpromising products at an earlier stage. A company can save millions.

There is great potential for efficiency gains in production as well. Porsche Consulting projects in the pharmaceutical industry have shown that production and filling equipment can be retooled from one drug to the next up to 40% faster. For instance, machine operators must perform as many work steps as possible before the machine stops operating (external changeover). Moreover, one person can operate multiple machines at once provided that they follow a defined tact. In this way, staff requirements can be reduced by up to 30%.

Another area ripe for optimization is the enormous stocks held by drugmakers. In order to be able to deliver upon demand, stocks of some drugs are so large that they would cover a year’s worth of demand. The result is that companies are often forced to destroy stocks when drugs have passed their sell-by dates, the packaging has been changed or demand has dropped. But the same supply capability can be achieved

through short lead times in production and quality control – and with substantially smaller stocks and thus a significant impact on working capital.

An Example From Porsche

Here again Porsche can lead the way: In its Leipzig logistics system, Porsche has reduced the stock days’ supply for required parts to under

two minutes. The reduction of stock was made possible by applying lean production principles to logistics: Employees and material follow a clear tact and parts are reloaded as infrequently as possible. Above all, however, the carmaker came to regard the supply chain as a whole – and the supply chain for cars is even more complex than those in the pharmaceutical industry. A Porsche consists of over 15,000 parts and several thousand supplier reference numbers. The steering wheel alone – one of 150 assemblies – emerges from a multi-step supply chain in which the trim, buttons and leather come from different suppliers with production steps in a dozen countries. And although there are millions of possible variants, Porsche can name a delivery date for customers within two minutes.

Unlike with cars, customers in the pharmaceutical industry generally do not accept delivery lead times. Nevertheless, the experts from Porsche Consulting have been able to help their clients in the industry to reduce stocks by up to 30%. They rely on the “pull principle,” in which current usage determines what is produced and therefore also which preliminary products need to be delivered. The finished goods stock must only last until more of the product can be produced. In the next step, a pro-

duction rhythm is defined: different products are put through the machines in the order in which setup times can be kept to a minimum. This optimal sequence of products always stays the same; only the respective quantities are re-determined each time – in accordance with demand.

One thing is clear: The pharmaceutical industry is subject to very special requirements. Nevertheless, many successful optimization principles from the automobile industry can be applied to the pharmaceutical industry as well. Pharmaceutical companies that are able to significantly improve their operational performance and responsiveness will be the market leaders of tomorrow.

Contact:

Dirk Pfitzer
Porsche Consulting GmbH
Bietigheim-Bissingen, Germany
Tel.: +49 711 911 12238
Fax: +49 711 911 12204

Klaus-Dieter Pannes
Tel.: +49 711 911 12870
Fax: +49 711 911 12204

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one day on average. Clearly defined processes and stocks deliver an additional advantage: comprehensive transparency. Fluctuations in the supply chain become visible very early and thus countermeasures

Teva to Buy Cephalon for \$6.8 Billion

Teva Pharmaceutical Industries struck a deal to acquire U.S. specialty drugmaker Cephalon for nearly \$7 billion, topping an unsolicited bid by Canada’s Valeant Pharmaceuticals International. The deal would boost the brand-name business of Israel-based Teva, best known as the world’s largest maker of generic drugs. Cephalon’s pain, sleep and cancer drugs will help Teva reduce its reliance on the big-selling Copaxone multiple sclerosis medicine, which faces increasing competitive threats.

Teva’s \$81.50-a-share deal represented a nearly 12% premium over Valeant’s \$73-a-share offer, which Valeant made public on March 29.

Valeant said after the joint Teva-Cephalon announcement that it was withdrawing its offer. The combined company would have about \$7 billion in branded drug sales, representing 36% of Teva’s sales last year. The deal is worth \$6.8 billion, including the conversion of Cephalon’s convertible debentures and stock options.

J&J to Buy Synthes for \$21.3 Billion

U.S. healthcare conglomerate Johnson & Johnson has announced a \$21.3 billion deal to buy Swiss medical device maker Synthes, the Wall Street Journal said, citing people familiar with the matter. The deal is expected to value Synthes at 159 Swiss francs (\$180.51) a share, the Journal said, citing one person familiar with the matter. Synthes recently confirmed it was in merger talks with J&J about a deal that would be J&J’s largest-ever acquisition and reshape the medical devices industry. The Journal said J&J is expected to pay one-third cash and the remainder in stock as part of the deal.



If the deal for the Swiss medical device maker Synthes goes through, it will be J&J’s largest-ever takeover.

Asahi Awarded up to \$547 Million in Actelion Case

Swiss biotech group Actelion may appeal against a jury’s decision in a Californian court to award Asahi Kasei Pharma Corporation up to \$547 million in a dispute with Actelion unit CoTherix. Actelion said in a

statement that the Superior Court of the State of California jury would continue deliberations regarding punitive awards. Asahi filed a complaint at the State Court of California at the end of 2008 against Actelion

and its subsidiaries Actelion Pharmaceuticals U.S. Inc., Actelion Pharmaceuticals Ltd, Actelion U.S. Holding Company, CoTherix and three individual officers. The dispute concerns a licensing and development

agreement between Asahi and CoTherix for the drug compound fasudil that was terminated when Actelion bought CoTherix in 2007.

U.S. Top Court Questions State Drug Data Limits

U.S. Supreme Court justices sharply questioned whether a state may prohibit the use of prescription drug records for marketing, expressing concerns that it violated free-speech rights. Chief Justice John Roberts said Vermont in adopting the law wanted to lower healthcare costs not by direct regulation, but by restricting the flow of information and “censoring” what doctors can hear from pharmaceutical companies so they prescribe generic drugs. A number of other justices voiced similar concerns in hearing arguments about the law that restricts commercial use of prescription records. Pharmaceutical manufacturers use data about a doctor’s prescribing habits to better inform their drug salespeople when they visit physician offices to market certain products.

The court seemed sympathetic to the arguments by attorney Tom Goldstein in challenging the law on behalf of three data mining com-

panies – IMS Health, Verispan and Source Healthcare Analytics, a unit of Dutch publisher Wolters Kluwer – that collect and sell such information.

Goldstein said the law discriminated against drug companies and made it harder for them to get their message to doctors while unfairly favoring views espoused by the state and insurance companies that favor generic drugs.

Vermont, Maine and New Hampshire have been the only states to adopt such laws, though similar measures have been proposed in the last three years in about 25 states across the country.

A ruling is expected by the end of June.



Packaging

An in-depth look at the ongoing trend of bio-based packaging

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Bioplastics

Which country is shaping up to be Asia's bioplastics hub?

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Chemicals

Converting PLA waste into virgin material

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UNDER CONSTRUCTION

Lanxess Expands Capacities for Baypren Specialty chemicals company Lanxess is investing €17 million in the expansion of its production capacities for polychloroprene solid rubber. The expansion at the Dormagen site is scheduled for completion by the end of 2012 and will increase production by 10 percent to 63,000 metric tons per year. Lanxess produces and markets polychloroprene solid rubber under the brand name Baypren. Uses for this product range include the production of cable sheathing, hoses, belts, seals and air springs. The expansion work will also see the implementation of a new production technology that the company says will enable it to operate more energy and resource efficiently and thus more ecologically.

Linde Builds Large Hydrogen and Synthesis Gas Plant in China The Linde Group has announced it will build and operate a large hydrogen and synthesis gas plant in the Chongqing Chemical Park in Western China in a joint enterprise with Chongqing Chemical & Pharmaceutical Holding Company (CCPHC). The project has a total investment value of around €200 million. Linde holds 60% of the shares in the joint enterprise with CCPHC. In future, the new on-site plant will provide the production facilities of BASF and CCPHC based in Chongqing with carbon monoxide, hydrogen and synthesis gas. The new plant, which will be supplied by Linde's Engineering Division, is expected to come on stream in the third quarter of 2014.

SABIC in Chemicals JV with Japan's Asahi, Mitsubishi SABIC will launch a joint venture firm with Japan's Asahi Kasei Chemicals and Mitsubishi. The new company, Saudi Japanese Acrylonitrile (Shrouq), will build a plant to produce acrylonitrile and sodium cyanide at one of the SABIC affiliates' sites in Jubail. The site was not identified. The facility will have capacity of 200,000 tons annually of the former and 40,000 metric tons annually of the latter, SABIC said. It has announced plans to build an acrylonitrile butadiene styrene (ABS) plant at its fully-owned affiliate Petrokemya. The three companies will start conducting basic engineering design and will take a final investment decision in 2012.

CJ CheilJedang and Arkema to Build Bio-Methionine Plant CJ CheilJedang (CJ Group) and Arkema have signed a memorandum of understanding to build a bio-methionine and thiochemicals platform in South East Asia (Malaysia or Thailand). This project entails the construction of the world's first world-scale methyl mercaptan integrated bio-methionine plant, which will enable CJ to respond to strong demand for methionine, a sulfur amino acid widely used for animal feed in Asia, and Arkema to better serve its Asian customers from a new industrial platform. The project represents overall investments of \$400 million split equally between both partners. The 80,000 ton bio-methionine production plant, which would be unique in the world, and the thiochemicals platform would come on stream at the end of 2013.

Evonik to Build Organic Specialty Surfactants Plant in China Evonik said it is building an integrated production plant for organic specialty surfactants at its site in Shanghai, China. With an investment volume in the upper double-digit million range, the production network is scheduled to begin operation in mid 2013. The various specialty surfactants based on renewable raw materials will be used primarily for cosmetics and laundry care products, as well as for industrial applications. The new integrated production plant will produce ingredients for cosmetics and laundry care products, as well as specialty surfactants for industrial applications. The Chinese cosmetics industry accounts for the lion's share of production.

LDK Solar Makes \$40 Million Entry into LED Business Solar wafer producer LDK Solar will invest about \$40 million to enter into the business of sapphire substrates used to make LEDs, which are likely to see higher demand as power generation costs and greenhouse gas emission concerns rise. Solar companies, including LDK and GT Solar, are diversifying into other businesses to offset potential setbacks in their traditional business because of subsidy cuts in major markets of Europe. LDK plans to build a new plant, with the capacity to supply two million two-inch equivalent pieces of sapphire wafers every year, in the Nanchang city of Jiangxi province in China. Last month, a joint venture led by Samsung Electronics tied up with Sumitomo Chemical for a \$72 million venture to produce the substrates.

Israel Chem to Invest €160 Million in Spanish Unit Fertilizer and specialty chemicals maker Israel Chemicals (ICL) said it would invest €160 million in the first phase of an efficiency plan for its Spanish unit, Iberpotash. The plan calls for an expansion of Iberpotash's mine and processing facility at Cabanas and Suria, near Barcelona, and the phasing out of operations at another Iberpotash mine and processing facility, ICL said. The goal of the efficiency plan is to lower the cost of Iberpotash's mining operations, increase its production of potash and salt products and improve its environmental footprint, ICL said. The first stage is planned to be completed in early 2014.

Automation on a Small Scale

Increasing Efficiency in Continuous and Batch Manufacturing

New Solutions – As a manufacturer of particle board resins, Dynea Benelux participates in a competitive commodity market and thus establishing a cost-leadership position is crucial. In 2004, although its cost structure was competitive, the business was experiencing more demanding requirements on customer service and flexibility, product quality and business planning and controlling and reporting. In order to meet these requirements, management elected to implement state-of-the-art automation solutions.

Goals And Objectives

At the start of the effort, production processes were semi-automated, with the operator controlling the batch from the DCS but still required to complete some activities manually. Administrative systems were stand-alone. The objective of the program was to simplify and increase the level of automation of all business processes, including manufacturing, administration and business planning, control and reporting. By doing so, safety and product quality consistency would be improved, raw material consumption reduced and data capturing, handling and reporting would be faster and more accurate.

It was determined initially to select open, standard software packages from leading suppliers that were designed to meet the specific demands of a small and not too complex process industry site employing both batch and continuous processes. Systems would be configured with a strong focus on process and cost efficiency according to the ISA S88 industry standard. Furthermore, standard tools and set-ups from other Dynea sites and suppliers would be adopted where possible and interfaces between systems would be included in order to eliminate double input and work.

Project Initiation

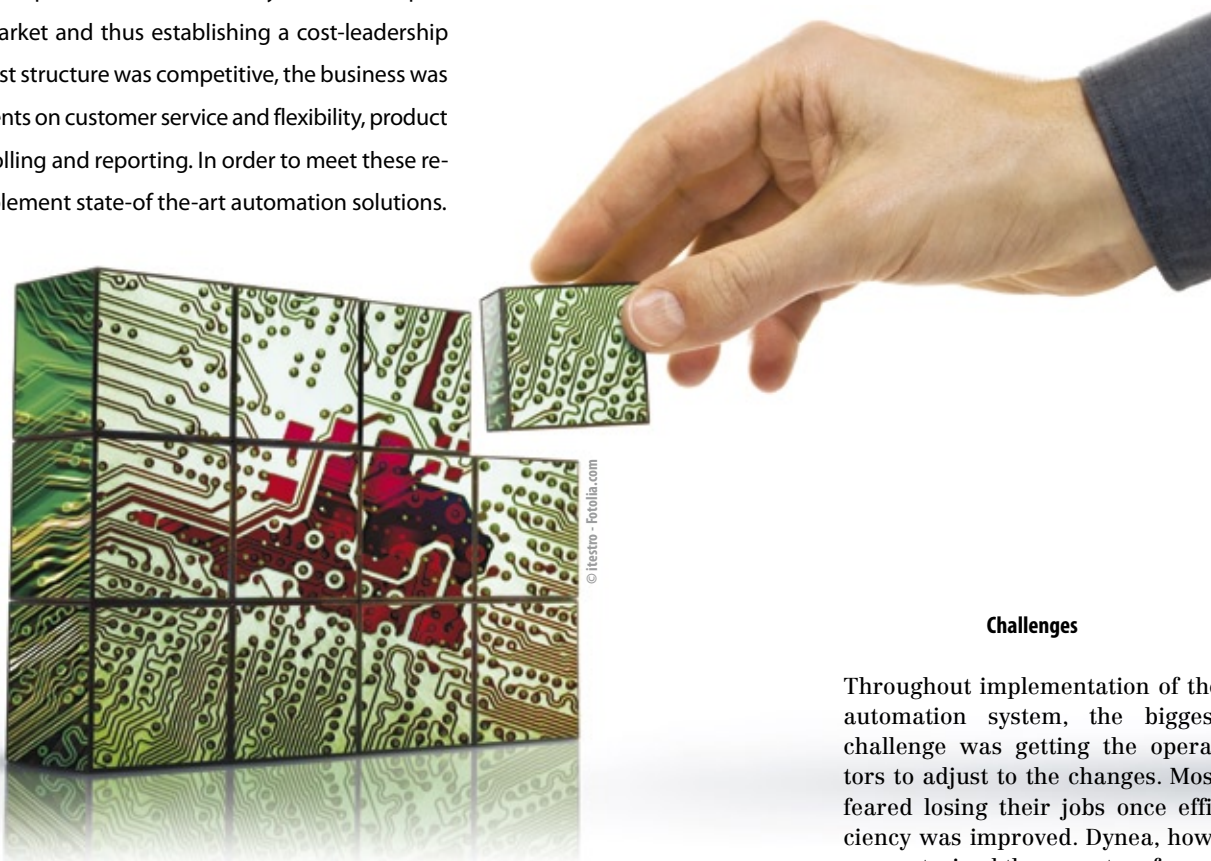
The project was initiated from the bottom to the top, keeping later phases and the totality of the systems in mind from the start. Increasing process efficiency and automation was followed by increasing the level of automation and integration of manufacturing support systems and ultimately business systems.

To get the most value out of the project, the processes themselves were evaluated to identify opportunities for improvement of efficiency and productivity to make the operations leaner as well as automated.

The Emerson DeltaV system was chosen because it offers an integrated solution that follows the ISA-88 Batch standard. It is a DCS with multi-unit recipe control and integrated batch automation. In addition, all of its components are designed to use a single configuration database, and the DeltaV Batch History module is included. Furthermore, using the standard modules and tools available from the Emerson Project Builder Library, design and implementation time were significantly reduced.

Implementation

At the time of project implementation, the existing system was not designed for recipe handling and batch automation, was not easy to config-



Challenges

Throughout implementation of the automation system, the biggest challenge was getting the operators to adjust to the changes. Most feared losing their jobs once efficiency was improved. Dynea, however, retrained the operators for expanded responsibilities so that they now do multiple tasks in addition to performing their operator duties. Commitment by management helped overcome this problem.

The openness of the DeltaV software, while a great benefit, also presented a challenge as well. People experienced in programming the DCS system are required to maximize its use. Therefore it was necessary to find production people looking for the opportunity to learn this skill and expand further their responsibilities. Fortunately, some people volunteered and have been trained.

Conclusions

The results at Dynea Benelux demonstrate that it is not necessary to be big to benefit from being lean and automated. When making such significant operational changes, however, it is very important to proceed at the right speed and consider employee concerns. People still have to operate the automated systems and must accept the changes, or the investment will not bring the proper return.

Finally, the introduction of automated systems has been successful and we are thus considering other opportunities including more automated production scheduling, integration of the DeltaV and Oracle ERP systems for plant maintenance operations and more integration on the Dynea Europe level for activities such as supply chain planning.

ure and it was getting difficult to obtain good support and spare parts. Paper documentation for batch and production data, material consumption, formulations, quality control, production scheduling and other activities was required, and only basic process controls were automated using a PLC-based system.

The first step, therefore, was to increase automation of processes

which historically came from different companies (Neste Chemicals, Dyno), utilized different systems. With adoption of the company-wide ERP system, data from the DeltaV DCS at Dynea Benelux (raw material consumption, production figures, analytical data and shipment numbers) are exported to the ERP system, and the Benelux business has rapid access to necessary ad-



Dynea Benelux's automating of its operations has led to improved product quality and reliability.

including better automated equipment (e.g. valves) and monitoring systems (flow, weight, etc.). Most importantly, controls were installed for automated batch sequence.

The DeltaV software also includes the ability to control specific actions at various levels, build recipes and manage campaigns, and provides one operator interface, making it easy to monitor the system. Batch-based analysis tools have helped dramatically with early identification and resolution of operational problems. Web-based access enables easy interaction with the program and provides flexibility in scheduling batches. Dynea's intranet is protected with a firewall and a gateway to the Internet.

Integration at the top level did not take place until Dynea adopted a corporate-wide ERP system in 2008. Until this time, different sites,

ministrative and other corporate level information.

Results

Automating operations has led to improved product quality and reliability. Operations are more efficient due to improved production planning. Business activities (logistics, financial) are also more efficient due to ready access to production, sales, shipping and order information. Reduced resource consumption (raw materials, paper, energy) and waste generation help with cost reduction and environmental compliance. The DeltaV system also provides good plant benchmarking possibilities. The performance of each plant and how individual plants are performing in relation to each other can be evaluated, resulting in improved operational insight.

Contact:
Erik Bastiaensen
Dynea NV
Gent, Belgium
Tel.: +32 9 342 34 30
Fax: +32 9 342 34 50
erik.bastiaensen@dynea.com
www.dynea.com

Full Automation at Low Costs

Reused Coriolis Flow Sensors and State of the Art Solution? Sure!

Benefits at a Lower Cost – The downturn of global economy has not reduced the need for investing in process automation. It has, however, prompted creative thinking. The value and quality of devices that would have been scrapped just a few years ago is now thoroughly evaluated. In some cases it turns out that all the benefits of a fully automated system can be obtained at lower efforts and lower costs, simply by upgrading of process instrumentation devices already in use. BASF in Ballerup in Denmark has tested the concept and reduced their need for manpower.

Close Monitoring Required

At the BASF plant in Ballerup, Denmark, two production lines have recently been automated. The plant microencapsulates vitamins for use in the food and beverage industry. During the manufacturing process, nature identical vitamin oil is mixed with antioxidants in an oil vessel. When the ingredients have been mixed, the oil is dosed into two spray vessels and is microencapsulated in a sugar-gelatin solution through an emulsion process. The oil flow between the oil vessel and the two spray vessels is measured by use of two Coriolis mass flow meters from Siemens. Then the microencapsulated solution is dried in a traditional spray drying plant in a spray vessel.

Before the automation of the lines was implemented, an operator had



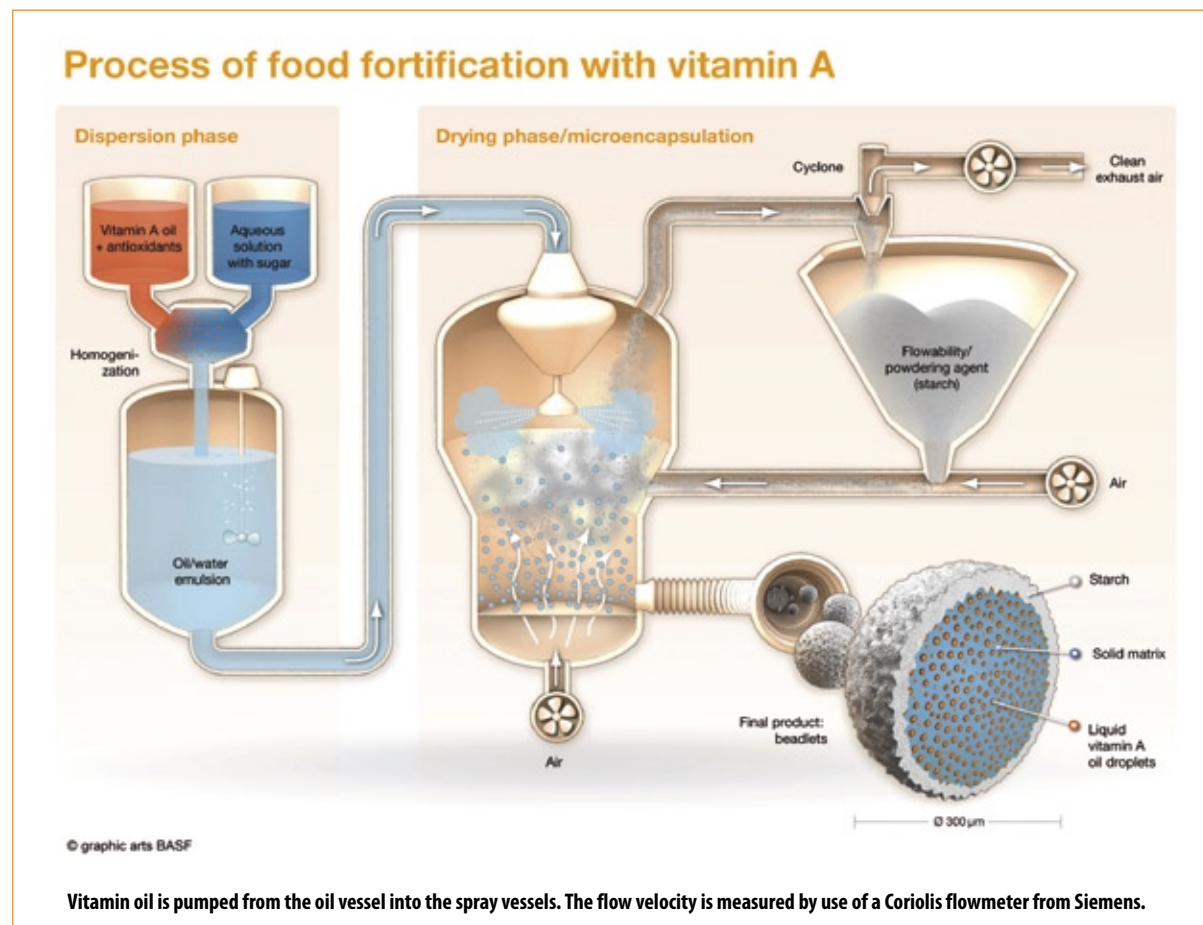
Mogens Joergensen
Siemens

to continuously monitor and control the oil flow from the oil vessel to the spray vessels. This was the only way to ensure that the flow velocity was not too high for the spray vessel and that the dosing was correct. Because the BASF requirements for precision and traceability are very high, it is required that the amount of oil pumped into each vessel is exactly the same. Previously, this was a manual operation, and the process therefore required close monitoring and control to ensure that the two spray vessels reached the same filling quantities at exactly the same time.

Reduced Need For Manpower

Out of the box thinking and a continuous dialogue with the operators about possible improved solutions for the process, made Bo Kilund, project manager for the automation of the two lines, come to a new and unconventional conclusion. The right – and most cost-effective – solution would keep the existing flow sensors but upgrade them with new transmitters and thereby achieving all the benefits of an automated process.

Today, the two Coriolis mass flow meters from Siemens still measure the flow of oil from the oil vessel to the spray vessels, while the need for manpower has been significantly reduced, since manual process control is no longer required.



“When we start an oil dosing process, the operator selects the required pump velocity and the maximum flow rate,” Kilund explained. “If the flow exceeds the maximum flow rate, the pump velocity is automatically reduced by 1% every five seconds until the maximum flow rate is no longer exceeded. The operator does not have to monitor the process any longer.”

As a consequence, the need for manpower has been significantly reduced, while the requirements to

quality, precision and traceability are continuously met.

Insignificant Difference

“When we are dosing oil to the two spray vessels simultaneously, the programming of the system is somewhat complex, but the only additional matter the operators have to do is to enter the maximum allowed amount of oil into each spray vessel,” Kilund said. When the process is started, the new transmitters

continuously transfer the actual flow rate and the total amount of oil being dosed to each of the two spray vessels to the PLC.

The program sequence has a fast and a slow mode, which ensures that the amount of oil dosed to the two spray vessels is exactly the same. In the fast mode, the oil is dosed with maximum flow rate and an allowed total difference between the two vessels of up to 4 kg. If this difference is exceeded, the system automatically stops dosing to the spray vessel with the highest totalized amount of oil, and will not restart until the filling quantities are the same. When the amount of oil in the oil vessel reaches 50 kg, the slow mode is started. In this mode the difference between the two spray vessels must not exceed 1 kg.

“We always end up with an insignificant difference between the two spray vessels – and that is quite an achievement as the initial amount of oil in the oil vessel lies between 1,200 and 1,400 kg. What is more important is that we have released resources to other tasks. If any of the dosing parameters are exceeded, the system will send out an alarm message.”

State-Of-The-Art System Integration

The operators do not stand next to the line monitoring flow velocity and dosing anymore, as the process has

been fully automated. Additionally, it even turned out that the replacement of the old transmitters was a piece of cake.

“Terminals and sensors were the same, and even the wiring was the same as before, so we simply replaced one transmitter by another one,” Kilund said. The reason behind the easy replacement is the memory unit technology, storing all sensor specific data in a Sensorprom. When the transmitters were replaced, the Sensorprom memory units were simply moved from the old transmitter to the new one and all sensor specific data thus transferred to the new transmitter. As a result, sensor recalibration was avoided without any loss of accuracy. With all sensor specific data quickly and easily transferred to the new transmitter, programming was made easier.

The new transmitters are of the type Siflow FC070 and fully integrated in the Simatic S7 automation system via an ET200M Profibus node. At a size of no more than 40 mm, Siflow FC070 perfectly matches the well renowned Simatic design features. An even more important improvement is the fact that the users of Siflow FC070 are experiencing the same interface consistency available in the full scale and depth of Siemens instrumentation and control systems. With the fully integrated diagnosing system and the detailed traceability of the dosing process, the operators' possibilities of tracking and resolving any problems that might occur have been enhanced. In this way, BASF has moved from an analog to a digital state-of-the-art solution and reduced the need for manpower, without having to replace the Coriolis flow sensors. On top of this, Kilund estimates that BASF only uses about 10% of the potential benefits of Siflow FC070.



Siflow FC070 in the Simatic rack, fully integrated in the automation system over an ET200M Profibus node.



Project manager Bo Kilund

Contact:
Mogens Joergensen
Siemens A/S Flow Instruments
Nordborg, Denmark
mogens.joergensen@siemens.com

chemanager-online.com/en/
tags/automation

IBIC Fuels Business Development

IBIC, an international provider of engineering services for plant construction, has announced that it has started several large projects in the first quarter of 2011. IBIC provides comprehensive consulting and engineering services targeted to the manufacturers and operators of power plants, refineries and chemical/pharmaceutical plants.

IBIC has deployed seven staff members to support a data conversion project for a customer in the chemical industry. This project includes the migration of 650 Piping and Instrumentation Diagrams to SmartPlant P&ID from its existing PDS and AutoCAD systems.

For a power plant manufacturer, IBIC will use the PDS software to create 3D piping models and isometric drawings. This will help the customer reduce the environmental impact of existing, conventional power plants. Four IBIC engineers will work on site with the client for over a year to complete this project.

In another engineering project, IBIC will create the necessary documentation in the areas of instru-

mentation and electrical engineering for a new chemicals production plant. Six employees will work on this project from IBIC's own offices over a period of 15 months. The SmartPlant Instrumentation and SmartPlant Electrical applications will directly access the customer's server via a CITRIX data connection.

A project manager of an IBIC client is satisfied with his choice: “In various engineering projects, IBIC has impressed us with its professionalism, technical competence, project management skills and international teamwork at a fair price.”

“We know how important it is to listen closely to our customers and document their exact needs,” said Hans-Peter Beier, founder and managing director at IBIC. “Based on that, we build a specialized project team which then delivers the desired service in a precise, timely manner. Our clients know that they can rely on us – and they value our dependability.”

TEPCO Aims for Cold Shutdown

Tokyo Electric Power said it hoped to achieve a “cold shutdown” of its Fukushima Daiichi nuclear plant in six to nine months. Within three months Tokyo Electric said it planned to cool reactors and spent fuel at the nuclear plant to a stable level and get radiation leaks on a downward trend. In another three to six months, the company aims to se-

cure a “cold shutdown” at the plant, a state in which the water cooling fuel rods is below 100°C and the reactors are considered stable. TEPCO, has been struggling to stabilize the Fukushima complex 240 km north of Tokyo, which was seriously damaged by the March 11 earthquake and tsunami and has been leaking radiation.



TEPCO's Fukushima Daiichi nuclear plant.

ABB Wins \$58 Million Oil and Gas Order

ABB has won a \$58 million order from QGC Pty Limited, a BG Group business, to provide integrated automation, safety and telecommunications systems and related equipment for a new upstream coal seam gas project in Queensland, Australia. ABB was appointed the main automation contractor for the project. QGC's Queensland Curtis LNG Project is one of Australia's largest capital infrastructure projects. ABB's delivery will optimize the efficiency of the upstream gas gathering and compression facilities, and provide

communications and remote operation for the 540-km buried pipeline network that will transport gas to a liquefied natural gas processing facility at Gladstone, Queensland. The plant will initially produce 8.5 million metric tons of LNG a year. The project will be commissioned in several phases, with first deliveries scheduled in 2011 through to project completion in 2014.

KEPCO-Uhde JV in Coal Gasification

KEPCO, the largest utility in South Korea, and Germany-based Uhde have signed a joint venture agreement in the field of coal gasification. KEPCO will have a 66% share of the newly established joint venture, with Uhde holding 34%. KEPCO-Uhde will use Uhde's Prenflo PSG steam gasification process to carry out global projects in integrated gasifica-

tion combined cycle) and synthetic natural gas) engineering, licensing and technology development. KEPCO-Uhde will be established in July in Korea. The JV plans to win its first contract within the fourth quarter of this year.

Wired No More

AkzoNobel on Its Wireless Network at a Belgium Plant

Wireless Controls – Nicolas Delfosse, Process Engineer Surface Chemistry at AkzoNobel's surfactants processing plant in Belgium, explains why the lack of available I/O and high cable infrastructure costs have led the plant to adopt a wireless network based on the IEC 62591 (WirelessHART) standard.

Evolving government legislation, tight corporate environmental guidelines and a very competitive marketplace mean that AkzoNobel is continually looking to improve production processes. One way of achieving this is to gain a better understanding of each individual process by increasing the number of measurement points as well as automating existing measurements. This desire for new and more detailed information has to be balanced against the cost of adding the new measurement devices themselves and, just as

Wiring Complications

Initially the company considered fieldbus for this application, but that approach would have incurred significant cabling infrastructure costs, requiring trenches and cabling between the tanks and the control room over distances of 200 m. Another major issue was the lack of available I/O in our control room. Only a small amount was available, and with future modifications and additional measurement points planned, the company did not want to use it all for this project.

One option was to modify the existing DCS system and control room, but this would be expensive and also created the risk of the control system being brought offline for a period of time. In addition, there was not enough room for the additional cabinets required. The combined cost of the cable infrastructure and the required DCS changes made the project unfeasible if the company were to adopt any form of wired solution.

62591 technology. This means that once the network is commissioned the company can install devices from any vendor as required. The company was also particularly impressed by the number and range of existing implementations of Smart Wireless around the world. Emerson's experience was far in front of other vendors, and this experience gave AkzoNobel great confidence with its own application.

Smart Wireless Solutions

Four of Emerson's Rosemount WirelessHART temperature transmitters have been installed so far to control the temperature of a number of the storage tanks. From these devices, measurement data is transmitted every minute to a wireless gateway and is then integrated into the existing DCS. The DCS then automatically controls a simple On/Off steam valve that heats the tanks.

The temperature of the tanks can now be maintained using this wire-

Previously, the company used manual gauges that required an operator to make regular trips into the field to take "snap-shot" readings. This was time-consuming and failed to provide the continuous and immediate information the company required.

A total of ten Rosemount WirelessHART pressure transmitters have been installed to replace the gauges. Again, by automating the measurements, the company has improved the efficiency of its operators by enabling them to focus on higher value tasks. The continuous pressure data the company are now receiving has enabled us to identify blockages immediately, and the company solve this quickly by flushing the vents.

A third application presented itself almost immediately. It had become apparent that additional thermal measurements were required from within the venting conduits. This information would be used to prevent potential fires arising from the high temperatures. In this application, an important issue was the short time-frame available to install the new devices to obtain these additional measurements. The company was keen to do so before the next government inspection, which would have been very difficult to achieve if we had proceeded with a wired solution.

The established WirelessHART network enabled them to install three Rosemount WirelessHART temperature transmitters quickly and easily. These devices provide us with the required temperature information and will raise an alert in the control room should levels rise above preset limits.

Adding devices is so simple that one could describe the Emerson Smart Wireless solution as "plug and play." Once the devices are in place, they quickly connect with the network and operators can view data almost immediately.

Results And Future Applications

AkzoNobel estimates overall savings from adopting a wireless solution instead of installing cabling and making changes to the DCS to be approximately €180,000. Because of the success of the initial applications, the company intends to upgrade the temperature gauges on all 40 storage tanks.

The company is now also considering a number of other applications at the Mons site. New legislation requires redundant automated level monitoring technologies to be applied to ensure against overfilling. They plan to make use of the wireless network again when implementing Emerson's Rosemount wireless vibrating forks that will identify levels in tanks to help provide overspill protection.

Another application being considered is a drain switch system on the gas venting line. Here wireless vibrating forks will be used to monitor condensate levels in the venting system. When these reach a certain level the vents will be drained automatically.

The company is even considering the possibility of using wireless to help us monitor the position of existing process valves. To ensure against tank filling errors, the company would like to bring currently unavailable position information from a number of manual valves into our DCS. Here, Emerson's wireless position monitor will forward the stranded position information.

► Contact:
Nicolas Delfosse
AkzoNobel Surface Chemistry Europe
Ghlin (Mons), Belgium
www.akzonobel.com

www.chemanager-online.com/en/tags/automation



importantly, the infrastructure that integrates this data into the existing distributed control system (DCS).

AkzoNobel's surface chemistry plant in Ghlin (Mons), Belgium, produces fatty nitriles and amines, which are stored in 40 tanks in the tank farm area of the plant before they are shipped to customers.

When loading final product into road tankers, it is imperative that the fatty nitriles and amines are maintained within specific temperature parameters. Too cold and the products are difficult to handle; too hot and the quality of the products can be affected. Steam is used to heat the tanks, usually starting a few days before a load is due to be collected.

Previously, this task required one of the company's operators to manually open a steam valve to begin the heating process. No existing temperature measurement devices were in place on the tanks; the company merely used operator experience to determine when to start heating. The company then took manual temperature readings at the main outlet valve, if the product was too hot the steam valve would be closed; if the product then cooled too much the valve would be opened and heating restarted.

This manual control was unsatisfactory, and a number of customers complained that the delivered product was too hot. AkzoNobel was therefore very keen to automate this process by introducing a simple closed-loop heating control. However, the company faced a number of challenges to doing so, including a lack of cable infrastructure, a lack of available I/O, and tight budget constraints.

Wireless Options

AkzoNobel identified wireless as the perfect alternative solution. Adopting a wireless solution would eradicate the need for digging trenches and installing cable trays to house the new power and data cables. Equally important, the data from the wireless transmitters could be fed via a gateway directly into the existing DCS without consuming any I/O.

The company also recognized that wireless offered benefits beyond this first project, especially the ability to expand the network by adding new devices quickly and at little cost compared to wired devices. With a continuous programme of process improvement at the plant, the company anticipated that more devices would be added at some point in the near future. Implementing a wireless network now would create an opportunity for installation savings every time a device was added in the future.

A number of wireless options were considered, but the company was keen to adopt an open standard technology that would not tie them to a single vendor. This would enable multi-vendor installations, selecting the best instruments for each measurement task. The approval of IEC 62591 (WirelessHART) by the International Electrotechnical Commission (IEC) gave the company the confidence to adopt this international wireless standard.

AkzoNobel selected Emerson Process Management's Smart Wireless solution for these applications for a number of reasons. Emerson's Smart Wireless is based on IEC

less closed-loop control, enabling us to ensure that the final product is delivered within the appropriate temperature parameters. By automating this process, the company removed the requirement for the operator to go into the field and manually operate the steam valve to get the desired result. This has allowed the operator to focus on higher value tasks.

AkzoNobel also gained much tighter control over the amount of steam used. Although they have yet to calculate the impact of this improvement over a long period, they know that there is a significant reduction in steam consumption, which will create a saving on their operating costs.

Expanding The Wireless Network

A second application for automating pressure monitoring on the company's venting system would also have required new cable infrastructure to be installed. This application was necessary to meet their corporate guidelines and new local environmental legislation requiring chemical processing companies to monitor and control all gas emissions.

Ammonia gasses and organic vapors are produced from the fatty nitriles and amines stored within the tanks. These gasses are collected via a venting network and then incinerated. In addition, gasses are collected via the same vent network from large basins that hold storm water and process water. To identify any blockages in these vents, pressure is monitored, with any drops below the level of atmospheric pressure indicating a potential problem.

Dr. Roger Wenige
Global Industry Manager
Chemistry

Endress+Hauser
Instruments International AG
Kaegenstrasse 2
4153 Reinach/BL1
Switzerland
Phone +41 61 715 81 00
Fax +41 61 715 25 00
info@i.endress.com
www.endress.com

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Biobased Packaging – A Long-Term Trend

Bioplastic Materials, Applications and Products Multiply

Forging New Ground – European supermarkets – Sainsbury's in the UK or Albert Heijn in the Netherlands – may be cited as pioneers, being the first to recognize the opportunities for bioplastics packaging. At the beginning of their market introduction, the focus was on materials and products made from biodegradable polymers. The range of bioplastic materials used in the European packaging market today is much broader now. The polymers used for diverse applications can be biobased, biodegradable or both. The type of bioplastic material utilized depends on the application.



Hasso von Pogrell
managing director,
European Bioplastics

About 250 million tons of plastics are produced annually. Bioplastics today still account for a share well below 1%. However, the current market is characterized by high growth and strong diversification. There are numerous industry internal and external factors that further encourage the growth of the bioplastics industry.

Industry internal factors are among others:

- Advanced technical properties and functionality
- Potential for cost reduction through economy of scale
- Cost-efficient new recycling option in case of biodegradable products

Among the industry external market factors, European Bioplastics counts:

- High consumer acceptance
- Societal concerns about climate change
- Price increase of fossil resources
- Dependence on fossil resources

With a growing number of materials, applications and products, the number of manufacturers, converters and end-users increases steadily. Significant financial investments have been made in production and marketing to guide and accompany this development.

Bioplastics – a Family of Materials

There are a multitude of applications – ranging from beverage bottles in the packaging segment to keyboards in the consumer electronics segment – depending on the application different types of bioplastics are processed in these products. Bioplastics are not a single kind of polymer but rather a family of materials that can vary considerably from one another. There are three groups in the bioplastics family, each with its own individual characteristics.

These include fully or partly biobased commodity plastics such as PE, PET or PVC, and soon PP (drop-in solutions); new polymers that are biobased and biodegradable, including PLA and PHA; and new polymers that are based on fossil resources and are biodegradable, such as PBAT or PBS.

Biobased or partly biobased commodity polymers (drop-in solutions) today feature identical properties as their conventional versions. Biodegradability of polymers is directly linked to the chemical structure, not to the origin of the raw materials. Under specific conditions (e.g. controlled temperature, humidity, aeration) biodegradable plastic products can be composted in industrial composting plants. In order to be processed this way, these polymers need to be certified and labeled as compostable.

Bioplastic packaging demand is forecast to grow at a high rate over the next five to ten years. Especially

Interpack 2011
Visit European Bioplastics at the Interpack 2011 in Düsseldorf, Germany, May 12–18. Several speakers of the industry's leading companies will share their expertise and showcase latest developments and products at the European Bioplastics stand 9E02.



Biobased polyethylene made by the Brazilian plastics company Braskem.

biobased or partly biobased commodity plastics will contribute decisively to the growing segment of bioplastic materials within packaging.

Bioplastic Materials and the Environment

The reasons for the growing demand of biobased plastics is obvious: The use of renewable resources by the industry can reduce the amount of greenhouse gas CO₂ emissions. In biobased commodity plastic products, biological carbon can be sequestered over the span of a product's useful life. This not only results in carbon being extracted and saved from the atmosphere, but also in high-value, exportable products being manufactured. Moreover, taking into account the EU's limited crude oil and natural gas resources, the increased industrial use of biomass will be indispensable in the mid-term.

However, the use of biodegradable polymers in short-life consumer goods and disposables can also be advantageous: Biodegradable mate-

rials offer additional disposal options such as composting for e.g. food packaging or catering products.

Packaging Market – A Pioneer Sector for Bioplastics

The bioplastics industry is continuously growing – about 20% annually. Its dynamic development is es-

“Biobased or partly biobased commodity plastics will contribute decisively to the growing segment of bioplastic materials within packaging.”

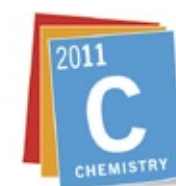
pecially obvious in the packaging sector, where bioplastics trends often are applied for the first time. Bioplastics were introduced to the packaging market about two decades ago. The variety of bioplastic materials used has since increased decisively. Simultaneously, the properties of these bioplastic materials have been optimized, for example printability, transparency, barrier, and gloss.

Bioplastics today are a sound alternative to conventional plastic packaging solutions. From yogurt cups and bottles to cosmetic packaging and shopping bags, the market penetration of bioplastic products in the packaging market is well ahead of other sectors.

Recently, big brand owners have introduced established products

with new bioplastic packaging. Danone for example is to date the only big brand owner in Europe with several bioplastic packaging options in the market. They are even using different materials:

- They are relying on a biobased PE-bottle in the French market for their product Actimel.
- They recently introduced bioplastic cups made from PLA for the yogurt brand Activia in Germany.



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Other known brand owners such as Coca-Cola, Heinz, Procter and Gamble, PepsiCo and Tetra Pak either already have bioplastic-products in the market, or have announced corresponding plans.

Challenges for Bioplastics in Packaging

Even if bioplastics' growth rates in the packaging market are clearly above average, there are still a few challenges to be met before a full market penetration is in place. Costs for research and development still make up for an important share of investments within the field of bioplastics and, therefore, have an impact on product prices. The price difference between conventional plastic products and applications made of bioplastics is one challenge to be met. Further development regarding technical properties is also needed, as some materials do not meet all technical property demands for certain applications, yet. A third barrier to overcome is the availability of materials on a large scale.

Hasso von Pogrell, managing director, European Bioplastics

Contact:

European Bioplastics e.V.
Berlin, Germany
Tel.: +49 30 28 48 23 50
Fax: +49 30 28 48 23 59
info@european-bioplastics.org
www.european-bioplastics.org



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AkzoNobel to Restructure and Split ICI Pakistan

AkzoNobel has announced its intention to seek agreement from the board and shareholders of ICI Pakistan Limited to separate the organization's paints and chemicals businesses. Under the terms of the proposal, AkzoNobel would retain direct majority control of the paints business by separating it into a new legal entity (AkzoNobel Paki-

stan Limited) through a de-merger process approved by the Pakistani courts. Subsequently, AkzoNobel would dispose of its entire shareholding in the remainder of ICI Pakistan. The entire ICI Pakistan business has been a subsidiary of AkzoNobel since 2008, when the company acquired Imperial Chemical Industries PLC. It is listed on the Karachi, Lahore and

Islamabad Stock Exchanges, with AkzoNobel currently holding 75.8 percent of the total shares. Focusing primarily on the Pakistan market, ICI Pakistan's main businesses are polyester fiber, soda ash, life sciences, chemicals and decorative paints. In 2010, ICI Pakistan's revenue amounted to €305 million.

Styron to Change Name to Trinseo

Styron, a global materials company spun out from Dow Chemicals in June 2010, has announced plans to change its company name to Trinseo. The name change will be fully effective in all countries later in 2011; the company will continue to do business as Styron until that time.

“We believe that the new name of Trinseo will position the company better for future growth and greater potential as a global materials company,” said Chris Pappas, president and CEO of Styron. “The name Sty-

ron is strongly tied to the styrenics chain – particularly polystyrene and styrene monomer, which are an important part of our company – but we are much more than that. Our new name of Trinseo will communicate that we are leaders in a broader range of businesses, products and technologies, and it underscores our commitment to growth.”

According to the company, word Trinseo comes from “intrinsic,” which means belonging to a thing by its very nature, or belonging to

or lying within a given part. The root of “trins” is combined with “eo,” the Latin verb root meaning “to go.” The company said that the name Trinseo also captures the vital role that Styron people play in collaborating with our customers to enable their next generation of products. The company will maintain the arrow icon in its current logo, along with its current color palette and company tagline of “Powering Ideas.” The Styron brand will continue to be used as a trade name for polystyrene products.

Brenntag Expands Cooperation with Lanxess Rubber Chemicals

Brenntag has been appointed as distributor for Lanxess rubber chemicals on the Iberian Peninsula. This expansion of the cooperation between the specialty chemicals manufacturer Lanxess and Brenntag adds France, Spain and Portugal to the group of countries including It-

aly, Benelux and Scandinavia where Brenntag is active for Lanxess. In addition to polymers, the product portfolio of the national subsidiaries now also features innovative high-tech specialty chemicals for rubber and latex, including well-known brands such as Vulkanox, Vulkacit,

Vulkalent, Vulkasil, Cohedur, Perkalink 900 and Vulcuren. These chemicals are used for example in the production of tires, shoes, household appliances and in the automotive industry.

India's Aditya Birla Buys Chemicals Unit for \$187 Million

India's diversified Aditya Birla Group said it has acquired a unit of local chemicals maker Kanoria Chemicals & Industries for 8.30 billion rupees (\$187 million) in an all-cash deal. Aditya Birla Chemicals (India), a unit of Aditya Birla Group, will buy the chloro chemi-

cals division of Kanoria Chemicals to boost its production capacity, the company said in a statement. Revenue for Kanoria's chloro chemicals division, which makes chlor-alkalis, chlorine derivatives and water treatment chemicals, was at 3.03 billion rupees for the year that ended on

March 31, the statement said. The deal will make Aditya Birla Group the country's largest producer of chlor-alkali, a critical input in the aluminium sector, the group's Chairman Kumar Mangalam Birla said in a statement.

Momentive Sells North American Composites and Coatings Business

Momentive Specialty Chemicals and PCCR USA have signed a definitive agreement for Momentive to sell its North American composites and coating resins business to PCCR USA, a subsidiary of Investindustrial, a European investment group with

operations in specialty chemicals, resins and intermediates. Terms of the agreement were not disclosed. The transaction is subject to customary conditions including governmental reviews. The Momentive business to be purchased by PCCR

includes manufacturing locations in Carpentersville, Ennis, Texas; Forest Park, Ga.; and Lynwood, Calif. The business had 2010 sales of approximately \$230 million and employs 225 people, who it is anticipated will join PCCR at closing.

Rhone to Buy Carbon Black for €900 Million

Financial investor Rhone Group has bought Carbon Black unit of unlisted German chemical maker Evonik for €900 million. Carbon Black was originally derived from soot, and more than 60% of world's production is

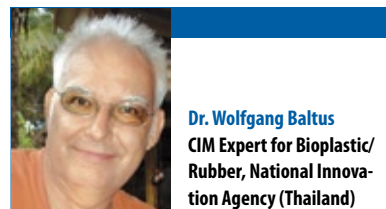
used to make tires more durable. It is also used for laser printers and photocopier toners. Market researcher Freedonia expects the global Carbon Black market to rise 4.3% per year until 2013, driven mainly by tire de-

mand in Asia. Evonik, which said last year that it has hired an investment bank to manage the sale of the unit, has said it plans to use the proceeds to expand its core specialty chemicals business.

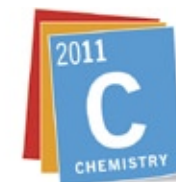
Asia's Future Bioplastics Hub

Thailand Has All the Trappings to Become a Global Player

Boom Region – In 2011, the markets for bio-based materials are continuing to develop dynamically (with annual growth rates of 15–30%). It is estimated that a global production capacity for bio-based products of 700,000–800,000 tons per year was established by end of 2010. Within these scenarios Asia is going to develop as a key region for bioplastics – Asia is predicted to serve 25% of the world demand for bio-based materials in 2020.



Dr. Wolfgang Baltus
CIM Expert for Bioplastic/
Rubber, National Innovation
Agency (Thailand)



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bioplastics has significantly grown at industry, retailer and consumer level. Thailand is therefore expected to develop as the future alternative hub for global bioethanol/bio-based resin production, complementary to Brazil.

However, raw materials costs represent 40–60% (and more) of the production costs for certain bioplastics like PLA or PBS. A concern for bioplastic producing companies is to be able to produce these bioplastics in an economically feasible way.

Other Factors

The price for fossil crude oil has reached high levels of more than \$110/barrel at the beginning of 2011 and is predicted to further increase to \$150/barrel by the middle of the year. Unfortunately, the sugar and starch fermentation industry has been strongly hit by decreases and climate effects (droughts) in 2010 as well, which has caused high prices for these commodities and has equalized the market push effect of the high oil price at present. However, if Thailand is able to achieve all of the planned measures, the country's future vision to be the bioplastic hub of Southeast-Asia is within reach.

General Situation for Bio-Based Materials in Asia

Many countries in Asia are currently intensifying their efforts to push bio-based products into their economies in search of biomass-resource oriented, sustainable solutions.

For Asian countries, a suitable waste management solution is mandatory to avoid future environmental burdens for the societies: Asia is home to 60% of the world population, creating demands for food and materials, including end-of-life options for a high level of lifestyle.

The initial driving factor for introducing bio-based plastics into the domestic Asian markets is still the biodegradability aspect. In many Asian countries like India, China, Malaysia or Bhutan, conventional plastic bag bans or fees have been set in place in 2010/2011.

Thailand doesn't charge for plastic bags in supermarkets: 350 million plastic bags are disposed in Thailand every day, requesting proper waste management for such materials including the handling of (wet) organic wastes (because shopping bags are often used as waste bags). Food waste contributes up to 60% to the total local municipal waste in Asian countries.

In 2010 many new investments with a focus on Asia were initiated, which are expected to be going to be realized in the upcoming years:

- Purac is currently building a 75,000 tons per year lactide plant in Thailand, which is expected to be operational in Q4 of 2011.
- Singapore-based Indorama Ventures and Purac are in discussions to set up a polylactic acid (PLA) manufacturing facility in Thailand.
- Braskem's bio-based polyethylene (PE) plant, producing PE from sugar cane bioethanol with a 200,000 tons nominal production capacity, went operative in Brazil in October 2010. Toyota is intending to act as resin distributor for Braskem and announced further collaboration with local producers to utilize bioethanol from Brazil, targeting to produce bio-PET.

The announced activities would add further 400,000–500,000 tons of bio-based resins to the projected bioplastic production capacity in the Asian region. The main application for bioplastics in Asia is still seen in the packaging sector, with 40–50% market share.

Thailand – a Potential Bioplastic Hub in Southeast Asia?

Thailand's main advantages to become the future bioplastic hub in Southeast Asia are evident: The country boasts abundant sugar- and starch-based feedstock at competitive prices. A versatile fermentation industry for organic acids e.g. for lactic acid (Purac), glutamic acid (Akinomoto), citric acid (Worldbest) or for bioethanol is already in place. A well-developed chemical industry is also able to support the production of bio-based materials like PLA, PBS or bio-based PET (Indorama). The plastic industry in Thailand is

well-established with more than 3,000 companies.

Thailand's location in Asia, in particular its proximity to China, is also of strategic importance. China is seen as having the largest future customer potential. Also, Japan as one of the most developed bio-based countries in Asia, has long-term relationships with Thailand.

Thailand is one of few countries in the world that has introduced policy measures for bioplastics to support sustainable bio-based innovations for future of the country. These policy measures are created along a National Roadmap for bioplastics, which was endorsed by the Thai government in 2008. The implementation of this roadmap was assigned to the National Innovation Agency (NIA) at the same time.

The main targets of these measures include:

- to realize sufficient supply of biomass for raw materials for the production of bio-based plastics;
- to stimulate and promote technology development for bio-based plastics and national and/or international;
- to build up new innovative industries and businesses; and
- to establish a supportive infrastructure along the value chain for bio-based plastics, including government policies and end-of-life strategies.

The enhancement of the roadmap from 2011 to 2015 is extending the activities by financial supporting the implementation and operation of a bio resin pilot plant with a capacity between 1,000–10,000 tons/year as well. The main resins in focus for pilot or commercial plants are lactic acid/PLA and succinic acid/PBS.

Benefits of Thailand as an Industrial Location

Incentives provided by the Thai Board of Investments (BOI) include a cooperate tax holiday of eight years (following a 50% reduction of tax for the next five years), reduction on import tax on raw materials and machinery and the access to domestic feedstock at export (parity) price level.

The domestic market for bioplastics in Thailand, based on volume, is currently low (estimated around 1,000 tons/year). Development of the domestic market is one of the main reasons for the pilot plant strategy of the Thai government.

The market volume for bio resins in Thailand could be optimistically estimated between 15,000–40,000 tons in the next 10 years. The NIA has supported and funded many innovation projects during the first years of operation including policy building and waste management projects trials. As important result of the activities, the awareness for

Contact:

Dr. Wolfgang Baltus
National Innovation Agency
Bangkok, Thailand
Tel.: +66 26446000
wolfgang@nia.or.th
www.nia.or.th

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Editor-in-Chief
Brandt Schuster
Tel.: +49 6151 8090 151
brandt.schuster@wiley.com

Media Consultant
Corinna Matz-Grund
Tel.: +49 6151 8090 217
corinna.matz-grund@wiley.com

Editor
Dr. Birgit Megges
Tel.: +49 9617 448250
birgit.megges@wiley.com

Publishing Manager
Dr. Michael Reubold
Tel.: +49 6151 8090 236
michael.reubold@wiley.com

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The First Step to Sustainable Composites

Unsaturated Polyester from Renewable Resources

Going Green – The global rise in environmental awareness has encouraged the use of more renewable materials. Composite materials represent one area that presents challenges – but also opportunities – for using sustainable materials. Market drivers such as sustainability programs, environmental health and safety requirements and “green” building programs are creating an incentive to develop bio-based composite products that also produce fewer emissions during different life-cycle phases.

One of the earliest notable efforts launched in 2003, when John Deere Corporation began producing side body panels for their equipment using Ashland’s Envirez polyester resins. These resins are formulated using renewable and/or recyclable raw materials and support the manufacture of more sustainable composite products. Envirez polyester resins deliver reduced environmental impact, with lower carbon dioxide emissions and a diminished dependence on crude oil. These resins meet the same performance and processing requirements as petroleum-based UPR products and are commercially available in a wide variety of processes and applica-

tions within the building, marine and transportation markets.

Shift From Traditional Materials

More have come to believe that relying solely on petroleum-based materials is not a tenable practice. One area that is experiencing a shift from traditional materials is commercial and residential construction. Green building programs strive to provide an energy efficient environment, improve environmental quality for inhabitants and reduce impact on surroundings. Buildings receiving a “green” designation are third-party certified through an established rating system. The rating systems most used are LEED (Leadership in Energy and Environmental Design) in the U.S.; BREEAM (BRE Environmental Assessment Method) in the U.K.; DGNB (German Sustainable Building Council) in Germany; and several other national systems. More information can be found through www.worldgbc.com pages, including links to national systems.

As an example, LEED was created in 1998 by the U.S. Green Building Council. Today, federal agencies, states and cities require public buildings to be LEED certified. Among the benefits from this program are responsible image, tax benefits,



Web Tip

At the Ashland-developed website, www.CompositeBuild.com, building professionals can find information and suppliers of composite products used in commercial and residential buildings.

better occupancy rates and higher lease rates, employee wellness and productivity, and lower operating costs. Also investors get better value for the buildings. Composites can become connected to LEED certification as products or materials made with rapidly renewable and/or recycled materials. These products, when used in building construction, fit in the Materials & Resources category for the program.

How to Make Polyester From Renewable Resources

In the late 1990s, Ashland, in cooperation with the United Soybean Board and John Deere, began work to develop the first commercially viable bio-based resins. Ashland researchers created a polyester resin based, in part, on soybean oil and corn ethanol. This became the Envirez 1807 resin, which was first used

to create sheet molding compounds (SMC). This enabled John Deere to realize its desire to have composite parts for tractors made from agriculture products. The resin also delivered the same performance as a 100% petroleum-based product. When Envirez 1807 resin was first introduced, it contained 18% renewably sourced materials.

Ashland continues to develop the Envirez resin range and has grown the product range to include several different applications in the building, marine and transportation industries. Research continues to develop polyester resins having ever-increasing renewable content. Several new raw-material opportunities are also being explored. In Europe, Ashland has developed its Envirez resin product range to include eight different products for applications that include hand lay-up, spraying, pultrusion, solid surface, cast marble, infusion and continuous lamination. Bio content in these resins can vary from 13–22%.

Environmental Benefits of Using Resins from Renewable Resources

In collaboration with the United Soybean Board, Ashland also supported a third-party life cycle assessment of the original Envirez 1807 resin and a comparable petrochemical-based resin. The 2009 report, by Omni Tech International, showed Envirez 1807 resin consumes 4.0 MJ/kg

(1720 BTUs/lb) less energy during manufacture than a comparable 100% petrochemical resin. The calculation takes into account the energy consumed in manufacturing as well as by farming and processing soy and corn into oil and ethanol, respectively. Thus, compared to the petrochemical resin, Envirez 1807 resin requires approximately 22 fewer barrels of crude oil to be extracted from the ground per standard (40,000 pound) batch. In addition, the study demonstrated the global warming potential impact for Envirez 1807 resin. When compared to the petrochemical resin, a standard batch of Envirez resin eliminates approximately 18,000 kilograms of CO₂ from being released.

As the interest in moving to a more sustainable approach in manufacturing, building or any aspect of life increase, savvy manufacturers are adapting and delivering technologies to meet this demand. Composites represent just one aspect of this environment-focused movement.

Contact:

Tuula Mannermaa
Ashland Finland Oy
Porvoo, Finland
Tel.: +358 9 228 42 322
tmannermaa@ashland.com
www.ashland.com



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Like A Virgin

How PLA Waste Can Be Converted into New Raw Material

Bright Future – Still marginally present in the global plastic production, bioplastics are nevertheless experiencing a rapid growth. Among them, polylactide (PLA) is predicted to have a bright future as new production units are being built worldwide. This increased availability will however bring the focus on end-of-life options. Chemical recycling is adding to the current possibilities: it is a thermal depolymerization of PLA waste from which a highly purified lactic fraction is recovered and reused in a cradle-to-cradle cycle.

Technical Background

Chemical recycling is a closed loop where the used PLA is recovered and recycled back into its original form, lactic acid. Lactic acid is a chiral molecule and has two optical isomers. One is known as L(+) lactic acid and the other, its mirror image, is D(–) Lactic. L(+) Lactic acid is the biologically important isomer. During the polymerization and the production of the original product, the treatment generates a racemization of the lactic acid. If PLA is mainly made of L(+) lactic acid, only a small quantity of D(–) lactic will remain in the final product. Generally speaking, the isomeric fraction of the incoming PLA waste will be found in similar proportions in the resulting lactic acid.

Galactic has developed a process in order to reach a high L polymer grade of lactic acid, suitable for the manufacturing of virgin PLA grades. It is therefore impossible to make a distinction between an end product made from virgin lactic acid and another one obtained from recycled source, hence the “cradle-to-cradle” claim (no downcycling). Further-

more, the recycled lactic acid may also be used in a wide range of other industrial applications such as solvents and detergents.

Practical Aspects

Concretely, PLA waste comes in all kinds of shapes and sizes: Size reduction is usually the first mechanical conversion needed to guarantee that input streams are rather homogeneous. The recycling process is designed to be as flexible as possible,

allowing the broadest range of PLA waste to be recycled. In almost all cases, physical impurities, additives, colors and other possible contaminants are effectively chemically separated from the useful material to be converted. Currently, the industry generates the largest stream of PLA waste. Because of the sources (out-of-specification material, trial runs, start-up procedures, trimmings, etc.) the material flow is generally very clean and does not need specific sorting. Possible contaminants can also be easily identified.

Wastes from domestic streams are by far the most complex scenario. Increasing numbers of PLA-made products will understandably impact mixed waste streams. But technical solutions are already available today: Near-infrared equipment (NIR) can effectively remove a PLA

fraction from domestic streams.

A study published in June 2008 by the WRAP (Waste & Resources Action Program) in England indicated that such NIR equipment could achieve a purity of 97% at a throughput of 3mT/h. Incidentally, this purity

dropped to 94% for the PET fraction.

The question is thus not a technical one but a financial one, as low volumes of PLA waste can be presently retrieved from domestic streams. However, these volumes are on the rise in light of the ongoing research that broadens the scope of possible PLA applications.

As an intermediary step between industrial and consumer waste streams, partnerships are concluded with cities or event organizers to collect PLA waste that is locally generated during a specific event (e.g. cups during a music festival or sport competition, carpets in exhibition centers, etc.). In this case, some limited contamination can be expected – usually food and drinks. This is also an opportunity to educate end consumers on bioplastics and their related end-of-life options.

Current Situation

Galactic’s PLA recycling unit is located in Escanaffles, Belgium, where 2,000 tons of waste material can be treated annually. The process is

robust and able to handle a large scope of contaminants. However, PLA formulations are becoming increasingly more complex requiring occasional adaptations of the recycling procedures.

Environmental Impact

From a LCA’s perspective, recovering the material (instead of burning or composting it) has a tremendous impact, since further land use is avoided. The percentage of PLA content in the waste mass is however a predominant factor. If the waste does contain a high percentage of organic waste with a relatively low PLA content, other options like composting should be considered. A PLA content of more than 75–80% is required for chemical recycling.

Compared to the (avoided) production of crops, sugar extraction and conversion into lactic acid, chemical recycling not only requires a fraction of the electricity and steam previously needed but also considerably reduces the use of water. This guarantees the economical viability of such recycling model, as the recycled lactic acid costs may not exceed the manufacturing of a virgin grade.

Steve DeJonghe, project manager, and Jonathan Willocq, process development manager, Galactic

Contact:

Galactic
Escanaffles, Belgium
Tel.: +32 69 45 29 63
Fax: +32 69 45 22 97
www.loopla.org



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EVENTS

FECC Annual Congress 2011 – June 6–8, Vienna The FECC Annual Congress is one of the most important dates in the European chemical industry's calendar. Hundreds of delegates, from business leaders to stakeholders, attend every year. The FECC Annual Congress is the first choice for leaders from the chemical distribution industry for networking to generate new business and reinforce existing relationships, while also learning new methods to improve their performance.

► www.fecc-congress.com

CESIO 2011 – 8th World Surfactant Congress and Business Convention, June 6–8, Vienna The CESIO 2011 will be the opportunity to meet and exchange with colleagues, customers and business partners from all over the world. Sessions, posters and exhibitions will cover the scientific, economic, technical as well as safety and regulatory aspects of surfactants and their industrial and consumer applications.

► www.cesio-congress.eu

Chemspec Europe – June 15–16, Geneva Some of the world's largest suppliers of fine and specialty chemicals and associated products and services can be found at Chemspec Europe. With many attendees representing manufacturing and consumer companies servicing multiple industries, Chemspec Europe provides the perfect opportunity to connect with visitors from not just Europe but around the world.

► www.chemspevents.com/europe

LOPE-C – Large-area Organic and Printed Electronics Convention, June 28–30, Frankfurt LOPE-C is the official annual conference and exhibition of the OE-A (Organic and Printed Electronics Organization). LOPE-C 2011 will cover the latest commercial and technological achievements in organic, inorganic and printed devices, systems and materials. LOPE-C represents the entire industrial value chain – from academic research to R&D to production to commercialization to end-user cultivation. In addition to the high-level business and technical conference with noted speakers from academia and industry, plus keynote sessions and pre-conference seminars, LOPE-C 2011 will feature an industry exhibition providing a comprehensive overview to showcase the rapidly emerging products, services and global manufacturing capacities in organic and printed electronics.

► www.lope-c.com

DuPont Tops List of 'Best Places to Work'

The Scientist has named DuPont as the No. 1 "Best Place to Work" among large companies in the magazine's ninth annual survey. Editors at The Scientist noted, "By forging new relationships and finding novel uses for existing technologies, the companies topping this year's survey are employing creative ways to advance science and expand their markets."

DuPont ranked No. 1 among top large companies and 10th over-

all. The company secured 689 new patents and successfully commercialized more than 1,700 new products in 2010. DuPont Pioneer was awarded second place among large companies and 12th overall. Editors noted their ability to "establish relationships with international companies to exchange ideas and products to make their operations more efficient and promote advancement in science."

Call for Nominees for 2011 HART Plant of the Year Award

HART Communication Foundation is seeking qualified nominees for the 10th annual HART Plant of the Year Award. End users and manufacturers from all world areas are encouraged to enter their plant or customer's plant for recognition. The HART Plant of the Year is the only international award presented to end user companies in the process automation industry to recognize the exceptional application of HART Communication technology. Nominations will be accepted through June 30. Previous recipi-

ents include MOL Danube (Hungary), Mitsubishi Chemical (Japan), PDVSA Petropiar (Venezuela), StatoilHydro (Norway), Sasol Solvents (South Africa), Clariant (Germany), and DuPont (U.S.).

The HART Communication Foundation is an independent, not-for-profit membership organization that provides global support for the application of HART technology.

KSB Wins British Pump Industry Award

KSB Limited (UK) was given the award for "Environmental Contribution of the Year." At this year's "Pump Industry Awards" in Coventry, KSB Limited received the award from the British Pump Manufacturers' Association (BPMA) for and on behalf of the KSB Group. Through the award, the BPMA intends to promote and honor outstanding achievements in pump technology. In addition to picking up the award

for "Environmental Contribution of the Year," PumpMeter was also a finalist in the category for "Technical Innovation of the Year." The monitoring unit continuously analyses the pump's operating data and establishes its energy saving potential. The PumpDrive variable speed system matches pump output to actual demand and allows energy savings of up to 60%.



PEOPLE



Albert Von Hebel Appointed Member BYK-Chemie Management Team Albert von Hebel has succeeded Gerd Büscher as managing director of BYK-Chemie as of April. In his new role, he is responsible for the areas of finance, controlling, purchasing, IT, integrated management systems, and general administration. Von Hebel was employed in a variety of roles in commercial departments of the companies within the Altana Group. In 1996, he moved to BYK-Chemie. For the last four years, von Hebel has been head of finance & controlling at Altana. Büscher is retiring in May.



Dr. Günter Bachlechner designated Head of Research at Bayer Technology Services Dr. Günter Bachlechner is to be appointed the new head of Research at Bayer Technology Services (BTS). Bachlechner, currently head of Research Technologies at Bayer CropScience, Research, is transferring to BTS on June 1. He will take over the Process Technology division as the successor to Dr. Helmut Mothes, who retires July 1.

DSM Announces New President of DSM Netherlands Jos Schneiders will retire as president of DSM Netherlands in July and will be replaced by Atzo Nicolaï, currently member of the Dutch House of Representatives, on June 1. Schneiders has worked at DSM for almost 35 years in various roles. Schneiders will remain available for the company on a part-time basis until July 2012. Nicolaï was a member of the Dutch House of Representatives from 1998 to 2002. From 2002 to 2006, he was minister for European Affairs, and from 2006 to 2007 he was minister for Government Reform and Kingdom Relations. In 2007 he returned to the Dutch House of Representatives. He holds a degree in Law and Political Science from the VU University of Amsterdam.



Louis Neltner Appointed Rhodia Vice President, Research & Development Rhodia has appointed Louis Neltner as vice president, Research & Development. He will be a member of the group's management committee. He started his career in the public sector in 1999, at the French Telecommunications Regulatory Authority (ART), then moved to the general Inspectorate of Finance. Manager at McKinsey since 2004, he directed complex strategy-related projects and transformation programs for large companies in industry and high-tech sectors.

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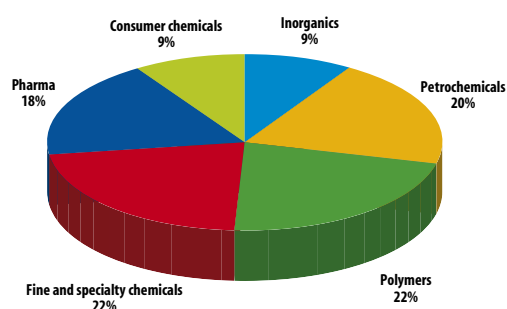
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International Chemical Industry Branch Structure

Brazil's chemical industry structure

Brazil

With a turnover of almost €70 billion in 2009, Brazil is one of the world's largest chemical producers (no. 7). However, production growth there has been slow during the last 10 years, growing on average of only 2%. The shares of sales from petrochemicals, polymers, fine and specialty chemicals as well as pharma are around 20% each. Petrochemicals and polymers make up the largest percentage of the chemical exports. However, with the World Soccer Cup in 2014 and the 2016 Summer Olympics looming on the horizon, exports of petrochemical products may drop considerably as local chemical major Braskem will have to focus on supplies for the domestic market.

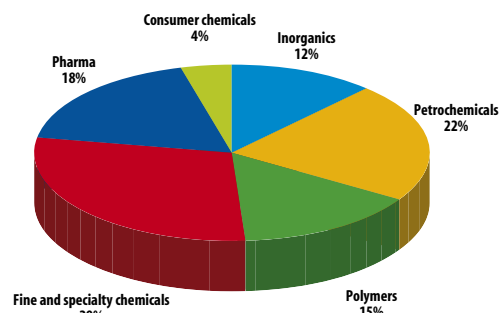


Source: Feri, VCI © GIT VERLAG

China's chemical industry structure

China

China's chemical industry just isn't specialized in basic materials anymore. Fine and specialty chemicals have become more and more important over the last several years, and pharmaceuticals are also gaining in significance. With a turnover of €510 billion, China's chemical industry is no. 2 only to the U.S. It should be noted that 12 of the top 30 major countries are Asian, generating chemicals sales of €753 billion.

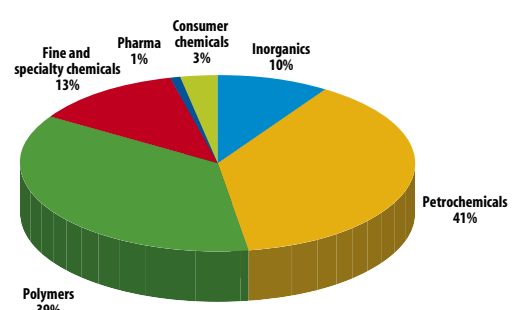


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Saudi Arabia's chemical industry structure

Saudi Arabia

The chemical industry in Saudi Arabia enjoyed strong growth before the economic crisis. However, in 1999, the branch suffered a collapse in sales and fell from no. 29 to no. 34 of the world's largest chemical producers. In 1999, the branch gained over €10 billion in sales, with petrochemicals and polymers making up 80% of the total. Recently, the country unexpectedly called on oilfield service firms to expand the kingdom's oil rig count by nearly 30%, according to Simmons & Co, to ensure spare production capacity remains ample as supply uncertainty grows. Saudi state-run oil giant Saudi Aramco met with leading oil service companies including Halliburton, unveiling plans to boost the country's rig count this year and next to 118, from around 92 now.

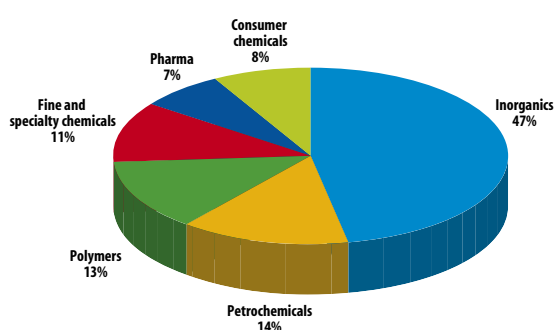


Source: Chemdata, VCI © GIT VERLAG

Russia's chemical industry structure

Russia

The Russian chemical industry has experienced tremendous growth within the last 10 years. With about €22 billion in turnover, the country is the world's 20th largest producer. However, the economic crisis hit the country hard, and the average production growth rate for the last 10 years fell from over 6% to under 3%. Russia mainly produces inorganics. Recently, the Association of International Pharmaceutical Manufacturers (AIPM) said more global drugmakers will soon announce plans to establish a local presence in Russia in response to government measures to boost its domestic sector and cut dependence on imports.



Source: Feri, VCI © GIT VERLAG



BASF: New Additive for Aviation Fuel BASF has recently acquired an exclusive license from Palox in Cyprus for the fuel additive Kerojet. After having jointly obtained approval for this product to be used in aircraft, BASF will have the exclusive manufacturing and marketing rights. Kerojet Aquarius binds the water contained in kerosene and by that facilitates the maintenance work in aircraft. Aviation fuel has to meet strict quality criteria. Stringent specifications and procedures apply for its production, transport and the into-plane fueling management. However, small quantities of water in the ambient air find their way into the fuel tanks as the result of condensation when the aircraft is in the air and on the ground. This water poses a problem in aviation fuels, because it does not mix with the kerosene. The result is that the water falls to the bottom of the tank and causes corrosion and microbial attack, and the work that is required to remove the water from the fuel tank is complicated and expensive. Kerojet Aquarius can bind the tiniest quantities of water and dispersing it homogeneously in the kerosene. This prevents the water from forming a separate phase in the fuel tank, and the water that is bound by the additive is removed from the aircraft during the normal combustion process. The German airline Lufthansa is working closely with BASF to test the effectiveness of the fuel additive under practical conditions in selected types of aircraft on selected routes.

A Look Ahead

June is a big month with lots of interesting events, like the FECC Congress, the Cesio Surfactant Congress and the Chemspec Europe. Don't miss our June issue, which will feature the following:

- Short interviews with the heads of chemical distributors Ter Hell; Brenntag; Caldic; C. H. Erbslöh; Barenz; and many more.
- Benchmarking European Fine Chemicals Companies by industry expert Jan Ramakers
- In-depth interview with FECC Director General Uta Jensen-Korte on her first months in office and her visions for the future.
- And much more!
- An overview of the European chemical distribution landscape by Distri-Consult's Günther Eberhard
- Risk and potential of R&D partnerships between multinational organizations and Chinese companies by Kai Pflug of Management Consultants

CHEManager Europe 06/2011 will be out on June 1!

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Geschäftsführer
Christopher J. Dieks,
Bijan Ghawami

Managing Director
Dr. Michael Schön

Product Management
Dr. Michael Reubold
Tel.: +49 6151 8090 236
michael.reubold@wiley.com

Editor-in-Chief
Brandi Schuster
Tel.: +49 6151 8090 151
brandi.schuster@wiley.com

Editorial
Dr. Roy Fox
Tel.: +49 6151 8090 128
roy.fox@wiley.com

Wolfgang Siess
Tel.: +49 6151 8090 240
wolfgang.sieess@wiley.com

Dr. Birgit Megges
birgit.megges@wiley.com

Media Consultants
Corinna Matz-Grund
Tel.: +49 6151 8090 217
corinna.matz-grund@wiley.com

Thorsten Kritzer
Tel.: +49 6151 8090 246
thorsten.kritzer@wiley.com

Ronny Schumann
Tel.: +49 6151 8090 164
ronny.schumann@wiley.com

Roland Thomé
Tel.: +49 6151 8090 238
roland.thome@wiley.com

Team Assistants
Lisa Rausch
Tel.: +49 6151 8090 263
lisa.rausch@wiley.com

Beate Zimmermann
Tel.: +49 6151 8090 201
beate.zimmermann@wiley.com

Freelancers
Dr. Sonja Andres

Production Managers
Christiane Poththast
Claudia Vogel (Advertising)
Andreas Kettenbach (Layout)
Elke Palzer, Ramona Rehbein (Litho)

Reprints
Dr. Katja Habermüller
Tel.: +49 6151 8090 208
katja-carola.habermueller@wiley.com

Subscription/Reader Service:
Silvia Amend
Fax: +49 6151 8090 168
silvia.amend@wiley.com

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