CHEManager EUROPE

6/2012 June

THE NEWSPAPER FOR THE CHEMICAL AND LIFE SCIENCE MARKETS

Chemicals

Specialty chemicals make soccer balls faster and pharmaceuticals more effective.

Pages 8–11

Production

New concepts and technologies for energy and resource-efficient manufacturing processes.

Pages 13–21

Newsflow

Country Focus

Germany is our featured country in this issue. The chemical powerhouse of Europe is host of the Achema 2012, the global flagship conference and exhibition for chemical engineering and biotechnology coming up June 18-22 in Frankfurt. And some of the most promising future concepts for chemical production and infrastructure (e.g. the model of chemical parks) have been developed in Germany as well.

More on **Pages 13, 15, 16, 18, 19, 20, 21** ▶

M&A News

DuPont is sorting out bidders for its car paint unit. Four private equity firms are still in the race to buy the automotive paint business and have been given access to more detailed financial information. The short-list includes a consortium of Blackstone and Bain Capital, a pairing of KKR and LP-Onex, Carlyle and Apollo. The value of the business has been estimated as high as $4 billion.

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Investments

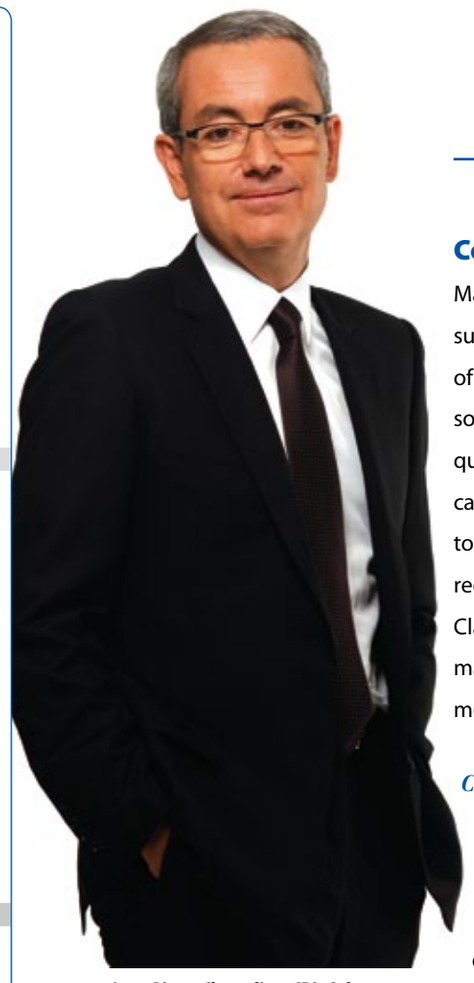
Mitsui Chemicals and Sinopec have set up a 50-50 joint venture to build a $315 million plant that will produce ethylene-propylene-diene terpolymer (EPT). The plant, to be located in China's Shanghai Chemical Industry Park, will have capacity to produce 75,000 tons of EPT a year and is set to start commercial operations in the first quarter of 2014.

SABIC invests in capacity expansion for its polycarbonate (PC) multiwall sheet business at its manufacturing facility in Vadodara, India. The company will open a state-of-the-art production line to help meet rising customer demand in the region for the high performance Lexan Thermoclear multiwall sheet products used for roofing and glazing in the building & construction sectors.

Ashland has responded to strong demand for polyvinyl pyrrolidone (PVP) by adding new low-viscosity, pharmaceutical-grade Plasdone PVP capacity at its manufacturing facility in Calvert City, Kentucky, USA. Ashland currently produces PVP also at its manufacturing site in Texas City, Texas.

A Catalyst For Change?

With the Integration of Rhodia, Solvay Strives to Become a Major Player in Chemistry



Jean-Pierre Clamadieu, CEO, Solvay

Combining Cultures – On May 11, 2012 Jean-Pierre Clamadieu succeeded Christian Jourquin as CEO of the Solvay group, since the consolidation of Rhodia in last year's third quarter one of Europe's leading chemical players. The former Rhodia CEO also took a seat on the Solvay board of directors. CHEManager Europe asked Clamadieu about shareholders' and management's vision for the newly merged Belgian-French group.

CHEManager Europe: Mr. Clamadieu, what is your vision for the new Solvay?

J.P. Clamadieu: Our vision as one of the world's top ten chemical companies is to be a strong leader in the reshaping of this industry. We also want to be a model of sustainable chemistry. It is our firm belief that chemistry has the ability to find solutions for some of the challenges that society faces. The Solvay family shareholders strongly support management on this. They clearly believe that the integration of Solvay and Rhodia should be a catalyst for change.

How solid a company is the new Solvay financially?

J.P. Clamadieu: In 2011, Solvay and Rhodia together generated pro forma sales of nearly €13 billion and EBITDA of over €2 billion. Implementation of our new strategy should put us in a position to increase EBITDA by 10% year-on-year in average to €3 billion by 2016. This is challenging, but in our view achievable. Around €600 million of the improvement should come from organic growth. Here, innovation will play an important role, certainly helped by the fact that the merged companies have very significant R&D resources. The remaining €400 million should be achieved through operational excellence.

How will you achieve these targets, especially in view of the recessionary tendencies in parts of Europe and the slowdown expected in China?

J.P. Clamadieu: There will certainly be bumps in the road. But that's the name of the game. I don't expect the going to be easy but I also don't think we will have to wait until 2016 to start experiencing growth. If you look at our Q4 2011 results you will see that some businesses are faring very well, and in fact did not see a crisis. While the targets are demanding they are by no means unachievable. After combining the two companies' assets we are already benefiting from purchasing synergies as well as cost efficiencies that will contribute to EBITDA over the next few years.

When the merger process is completed, what will the company's portfolio look like?

J.P. Clamadieu: I believe we already have quite a broad portfolio. A recently conducted analysis has enabled us to clearly assess the performance of each individual business and to identify growth engines. It shows that 90% of our sales are transacted in markets where we are among the top three global players. Our three fastest-growing segments now account for about half of our overall trading activity.

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Learning From The Cliff

As the Global Pharma Business Changes, NNE Pharmaplan Bridges the Gap Between Countries

Pharma Engineering – While the upheaval in the pharmaceutical industry has brought with it a lot of problems, one sector that is benefiting from the overhaul is pharma engineering. Companies such as NNE Pharmaplan are the ones pharma companies call on when they are looking to expand to new regions, build new facilities or revamp existing ones. Brandi Schuster spoke to Stefan Berg of NNE Pharmaplan, general manager of the Central Europe region, and Gert Mølgaard, corporate vice president of strategic development, about the opportunities ahead and the company's strategy for a worldwide footprint.

CHEManager Europe: What are the biggest challenges facing pharma engineering in 2012?

S. Berg: Challenge is probably not the right word. There are a lot of opportunities to be had in pharma engineering; our customers are strong and in the mood to invest. If there is any challenge at all, it is finding skilled workers. But even that is not an issue everywhere, but rather in specific disciplines, such as in supply engineering and project management.

How has the market changed over the last decade?

G. Mølgaard: If I had to pick one element that has led to significant changes over the last decade, then I would pick the patent cliff. This cliff has been building up over the last 10 years; we've been through megamergers that transpired so companies could have access to yet another blockbuster. Now, most companies have realized that this is not the way of the future, and this has been the catalyst for change within the pharma industry. This is truly the end of the blockbuster era, and we need to forget about it and look forward at the opportunities ahead.

How has the patent cliff specifically affected your business?

S. Berg: Pharma companies have come to the realization that they have to make some changes – going into mergers or restructuring their own businesses, for example. This in turn creates work for us. Every merger, every restructuring is good news for us. Pharma companies know that their business will be completely different in the future than it is now.

Gert Mølgaard
NNE Pharmaplan

Stefan Berg
NNE Pharmaplan

G. Mølgaard: Pharma companies are diversifying, which is something we like, because it gives us the opportunity to showcase our offerings. We provide services in biotech, sterile manufacturing, medical devices, diagnostics, automation, manufacturing IT, process analytical technology, etc. At the same time, because we focus on pharma and biotech, we have very specific know-how.

Do you think the growth we're currently seeing in biotech is sustainable long term?

G. Mølgaard: Yes, there is currently a large demand for innovative solutions within biotech, such as single-use technology, prebuilt modular facilities and the ability to revamp and upgrade existing facilities. For us, this underscores the importance of working with our customers long term in order to get to know them well.

Market globalization is another hot trend.

G. Mølgaard: It's clear that our market is shifting toward increased business in emerging markets, especially India and China. However, there is a solid growth in Central Europe as well. There are many mid-sized companies that aren't affected by patent expiries; these companies are robust and forward-looking, and they are excellent to work with.

Are requirements different in emerging countries?

G. Mølgaard: Most companies, regardless of location, are looking to upgrade their facilities. These companies have been around for many years, and they know that keeping the status quo won't be enough to remain competitive in the future. For example, China just brought in new GMPs at the beginning of 2011. Looking to Russia, they want to build their own independent pharma industry, and they expect the standards to be the same as in Western Europe. This means that Western knowledge and standards are in high demand there.

We're also seeing a lot of innovation coming out of emerging markets. There is a lot of interest in getting into biosimilars and even the creation of new drugs based on existing drugs.

What regions are becoming more interesting for your customers?

G. Mølgaard: Besides China and India, there is a lot of interest in Brazil, and that certainly won't be the end of it. We will get into more countries as we see the market needs coming; but we are also careful to not take on too many countries at once.

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CONTENT

Long-delayed Evonik Stock Launch Likely Before Summer

After years of delay, the dawning of the day for Evonik Industries as a public company could be at hand. In late May, the Essen, Germany-based speciality chemicals producer confirmed that the launch of an undisclosed number of shares at a ratio of 2:1 on the prime standard Frankfurt stock exchange would take place "before the summer break."

While some market watchers thought the move would take place before the end of June, others said the Greek elections on June 17 were factor of uncertainty. Depending on the outcome of that vote, euro-denominated stock markets could be thrust into disarray. Shareholders RAG coal mining foundation and private equity investor CVC Capital Partners own 74.9% and 25% of the company's equity, respectively.

Evonik said shares would be offered to private and institutional investors in Germany and Luxembourg through an initial public offering (IPO). In other countries, a sale to institutional investors would take place via private placement. U.S. plans call for an offering to qualified institutional investors.

Proceeds accruing to the RAG foundation would go toward financing the phase-out of coal mining in Germany up to 2018.

The latest IPO plans represent one of several attempts by Evonik and its predecessor companies to go public in the past five years. In every case, economic uncertainties, the coal mining legacy of the former RAG or internal management disputes threw hurdles into the path. As market sentiment soured again in 2008, the company sold a 25.1% stake to CVC, which promised to exit by 2013. For 2011, Evonik reported record sales of €14.5 billion and adjusted EBITDA of €2.8 billion.

Commenting on the revived launch plans, supervisory board chairman Wilhelm Bonse-Geuking said Evonik's transformation from a diversified group into a specialty chemicals player "has proven successful" and that it is "extremely well prepared" for a listing.

CEO Dr. Klaus Engel said management is approaching the IPO "with great confidence," despite "challenging" conditions on the financial markets. ■

A stock exchange listing will make Evonik even more attractive.

Dr. Klaus Engel, Chairman of the Executive Board, Evonik

GlaxoSmithKline Amends Conditions For Takeover of U.S Biotech Partner

British drug maker GlaxoSmithKline (GSK) has amended its $2.6 billion bid for long-time partner Human Genome Sciences (HGS) after the U.S biotech company adopted a Shareholder Rights Plan to deflect the hostile takeover. HGS said in April that the offer did not reflect the company's inherent value.

GSK also plans to launch a campaign to replace the entire board of Human Genome Sciences with its own nominees, sources said. The British company has started reaching out to executives in the pharmaceutical industry as well as finance and governance experts who could be nominated as independent directors on Human Genome's 12-member board, they said. GSK now intends to seek consent from Human Genome shareholders to replace the entire board and the consent solicitation process could come in the next few weeks, the sources said. GSK is also expected to extend its tender offer for Human Genome beyond June 7. The move could send yet another signal to potential bidders of the seriousness of GSK's desire to buy Human Genome. This might make it harder for the U.S. biotech company to find a white knight willing to take on the UK pharma giant. ■

India's Piramal Healthcare to Buy U.S. Firm to Boost R&D

Just weeks after acquiring Bayer's new molecules division, Indian drugmaker Piramal Healthcare of Mumbai has announced plans to buy Burlington, Massachusetts-based Decision Resources Group (DRG) for $635 million. The U.S. healthcare data provider with 300 analysts is expected to post revenues of $160 million this year.

Pirama, which has been looking to expand its R&D portfolio after selling its formulations business to Abbott Laboratories for $3.72 billion in 2010, hopes to complete the acquisition by the end of June. DRG, which provides web-enabled information using proprietary database to global healthcare companies for their R&D projects, is growing 20% a year and claims 48 of the top 50 global pharmaceutical companies as its clients.

According to Piramal, the global healthcare information industry is valued about $5.7 billion, and tough regulatory challenges in R&D are expected to boost demand for researched data on existing as well as new molecules. Analysts note that the Indian company is trying to diversify away from generics and focus on grass-root research and high-value patents. ■

DSM to Buy Dietary Supplements Manufacturer for €420 Million

To complement its vitamins and food supplements business, DSM will buy dietary supplements manufacturer Ocean Nutrition Canada for about €420 million ($534 million), including debt. The Nova Scotia-based firm is world's biggest supplier of fish-oil derived Omega-3 fatty acids to the dietary supplement and food and beverage sectors with production sites in Canada, the U.S. and Peru. For 2012 it expects sales of about C$190 million and EBITDA of C$55-60 million.

In recent years, DSM has sold much of its bulk chemicals business to invest in the life sciences sector. In February 2011 it acquired U.S. baby foods ingredients maker Martek for $1.1 billion. The Canadian acquisition marks the third major deal so far this year, following the 50-50 biofuels joint venture agreement signed with private U.S. ethanol manufacturer and the takeover of POET, one of the world's largest ethanol producers. In early May, DSM said it would buy U.S. medical device-maker Kensey Nash for $360 million. ■

Four Bidders Still in the Race for DuPont's Car Paint Unit

Four private equity bidders are still in the race to buy DuPont's automotive paint business and have been given access to more detailed financial information to allow for in-depth due diligence, a Reuters report says.

The short-list includes a consortium of Blackstone and Bain Capital, a pairing of KKR and LP-Onex, Carlyle and Apollo.

Several other potential buyers are said to have dropped out, among them a consortium of TPG and Advent and the team of Clayton Dubilier & Rice with CVC. The value of the business has been estimated as high as $4 billion.

Several of the potential buyers are said to have concerns about DuPont's earnings assumptions for the business as well as industry trends, as volume sales of coatings to auto body shops are declining in the developed world. Along with refinishers, OEMs such as Ford and General Motors are key customers. ■

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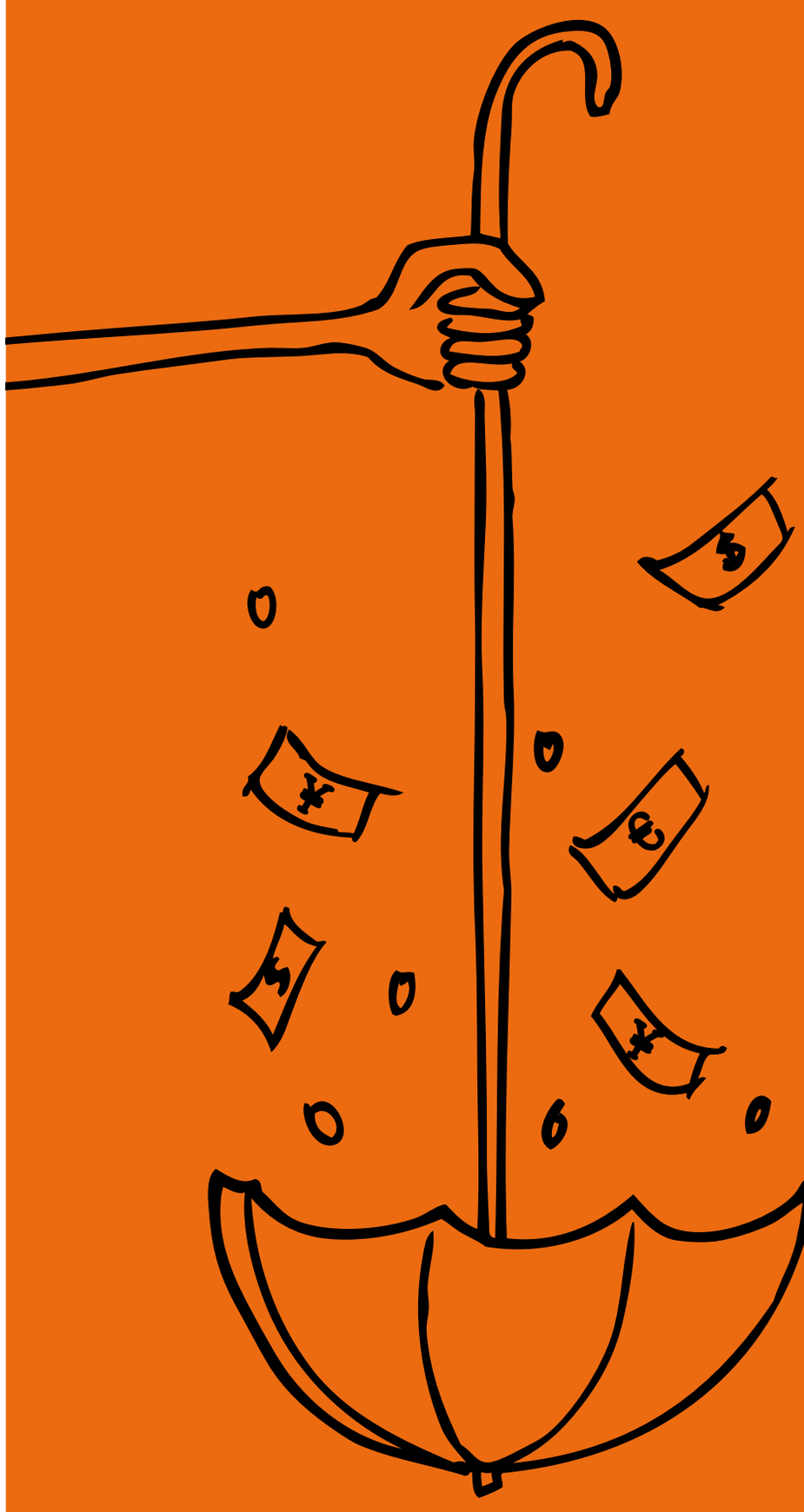

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Collaboration: A New Mantra for Growth

Chemical Customer Connectivity Index (C3X) Survey Identifies Supplier Customer Collaboration as the New Recipe for Success

Collaboration – A.T. Kearney, CHEManager Europe and Westfälische Wilhelms-Universität Münster (Institute of Business Administration at the Department of Chemistry and Pharmacy) recently completed their Chemical Customer Connectivity Index 2012, the sixth such survey conducted since 2008. One of the chief findings of this survey was: The future belongs to those who are able to exploit all benefits of supplier customer collaboration across value chains. According to the survey participants, the value creation potential is tremendous: For European chemical players alone, it can trigger additional sales of up to €25 billion in the long run.

Dr. Tobias Lewe, Partner, Chemicals and Oil Practice, A.T. Kearney

Robert Renard, Senior Consultant , Chemicals and Oil Practice, A.T. Kearney

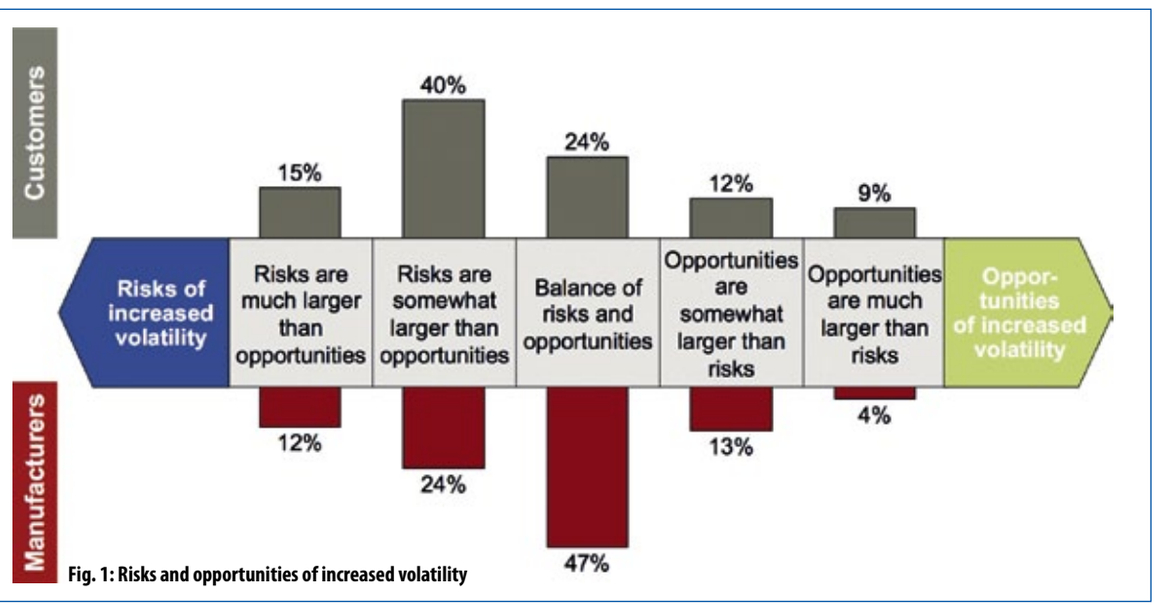

Fig. 1: Risks and opportunities of increased volatility

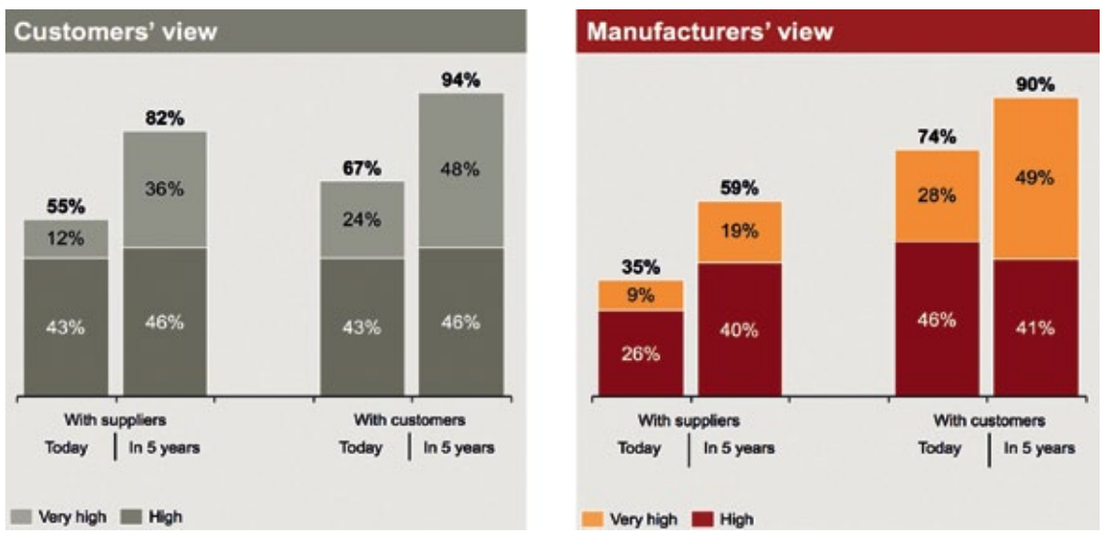

Fig. 2: What is the degree of collaboration in the value chain?

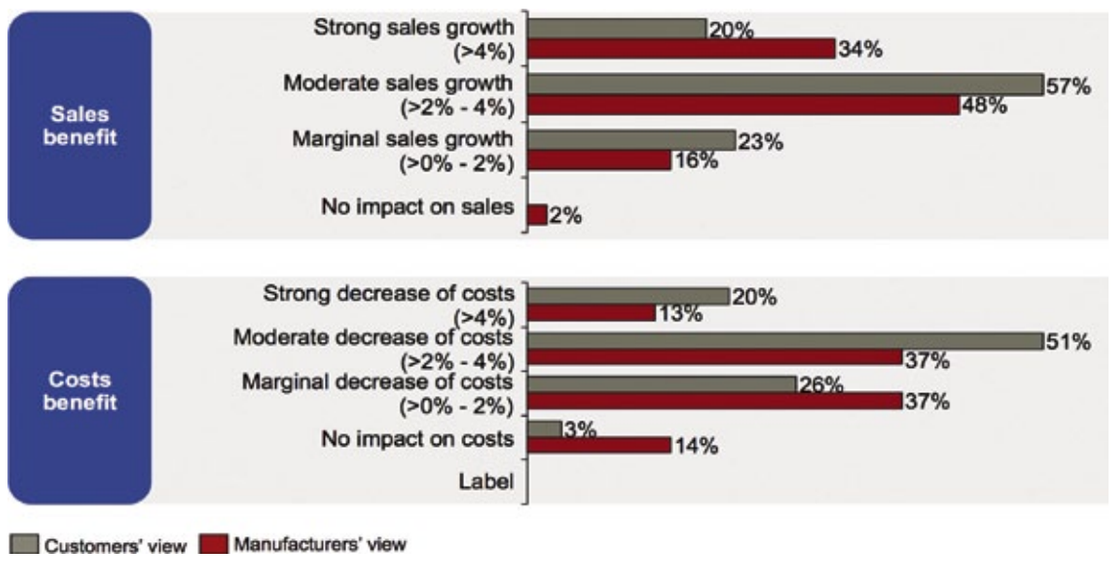

Fig. 3: What is the magnitude of sales and costs benefit from collaboration?

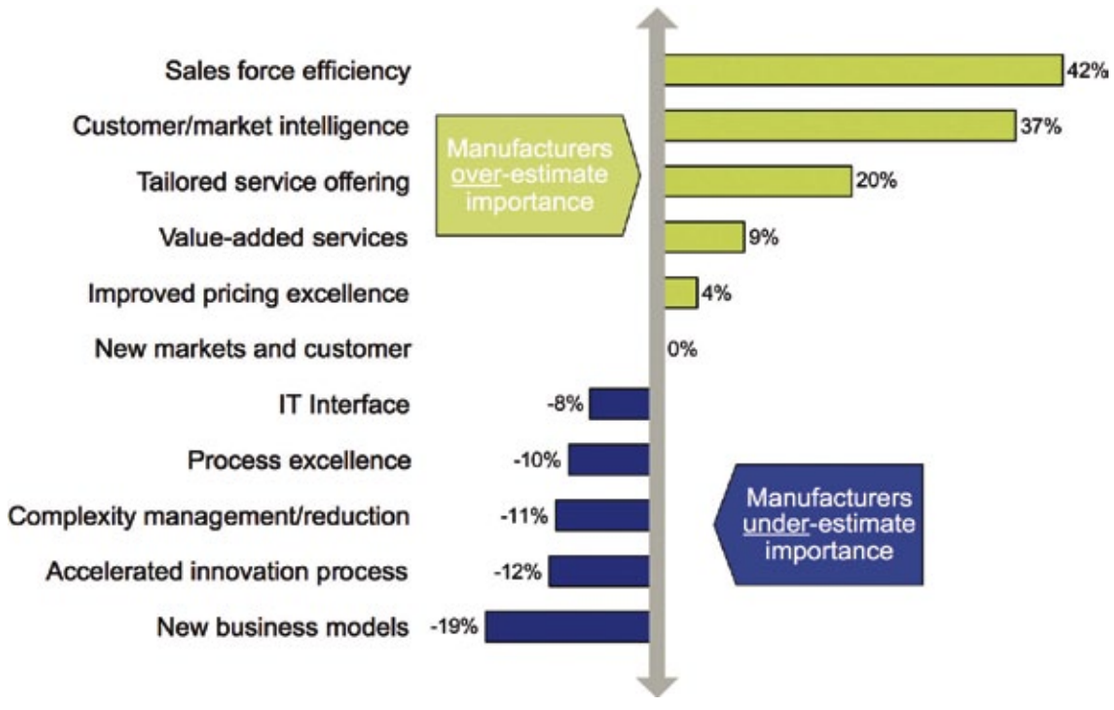

Fig. 4: What is addressed internally to improve supplier customer interaction? Delta between customers' and manufacturers' views.

When asked how their business had developed, both manufacturers and customers reported that in the last twelve months demand for their products has grown, albeit at a slower pace than during the same time period the year before. More than every other participant reported a year-on-year growth of up to 10%.

Outlook: Moderate Growth and Moderate Raw Material Price Increases

For the coming 12 months, virtually all survey participants expect their business to continue to grow. More than two thirds of them believe growth will be at the same level as the year before. Raw material prices are expected to follow suit at around the same level (up to 10%). However, compared to the 2011 survey the supply situation seems to be slightly more relaxed: Only 10% of all panel participants expect significantly higher raw material prices compared to the last 12 months. Interestingly, panel participants from the US saw (and expect) lower increases in raw material prices as well as an improved raw material supply situation in their region.

Dr. Tobias Lewe, Partner in the Chemicals and Oil Practice at A.T. Kearney explains: "Raw material prices already reflect market expectations with respect to the future impact of shale gas derivatives in North America. The US is expected to shift from being a net importer to a net exporter of chemicals and chemical raw materials."

Volatility is Here to Stay

In spite of the stable and rather positive economic climate, there is no doubt that volatility will continue to significantly impact chemical markets in the future. While manufacturers consider risks and opportunities of volatility to be relatively balanced, the majority of chemical customers (55%) feel threatened by higher volatility. Lewe explains: "Volatility has increasingly become an issue over recent years. Driven by the global financial crisis in 2008, manufacturers have started to establish appropriate processes and tools to enable them to respond quickly to volatility and to mitigate exposure arising from it."

Collaboration: The New Recipe for Success

Managing volatility across the value chain and seeking value improvements by better managing the interfaces to suppliers andexplai direct customers have together made collaboration the new mantra for growth.

"Most players have optimized the interfaces to their suppliers or customers independently of each other. It's now time for chemical players to find ways to optimize collaboration along value chains in a comprehensive way," says Robert Renard, Senior Consultant in the Chemicals and Oil Practice at A.T. Kearney.

And this is a point all panel participants are highlighting: 90% of manufacturers expect collaboration with customers to be high or very high in five years' time (today: 74%). Chemical customers support this view (82% in five years compared to 55% today).

Renard adds: "Collaborative partnerships at a strategic level require adaptations to business models, even possibly changes in corporate culture, and a long time before initial benefits can be captured."

What Drives and What Hinders Collaboration

From a manufacturer´s perspective, it is mainly the customers who trigger collaboration.

Further impetus is provided by the need for partners to jointly manage the impact of long-term developments and changes to the ecosystem, such as the development of new energy storage or energy efficiency solutions. These require a variety of different capabilities that typically cannot be provided by one company alone.

With regard to the obstacles to collaboration, manufacturers (52%) and customers (33%) agree that people represent the most important shortcoming – either through limited HR numbers or their having the wrong talent for the purpose. As Renard explains: "Adding resources or increasing qualification for selected management functions is often hard to achieve, especially for companies that are already experiencing difficulties filling vacancies."

There is another approach to address this challenge, though: Companies that successfully manage to select and focus on a few top partnerships instead of being caught in a slow and complex transformation process with multiple partners are likely to achieve large parts of the potential fast.

Collaboration Processes Defined, but not Strictly Deployed

Three quarters of manufacturers say that they have defined structured collaboration processes with their customers. Only 40% of them, however, see these processes consistently applied today. The same picture can be observed on the customer side.

To quote Renard: "Applying these strategic processes strictly will increasingly make a difference. Obviously this has not yet been the case, which means there is an urgent need to develop repeatable and scalable collaboration capabilities, with a special focus on developing game changing collaboration skills."

Most Incentivizing Collaboration Benefits: Growth and Innovation

For all participants the most promising benefit of collaboration relates to growth and innovation: two thirds of manufacturers and customers expect collaboration to provide a breakthrough or have a high impact on growth and innovation.

With regard to the impact of collaboration on cost reduction, risk management and capital optimization, the majority of manufacturers expect it to be moderate or incremental.

With regard to the customers, nearly half of them expect the impact on cost reduction to be high, while the impact on risk management and capital optimization is predominantly expected to be moderate or incremental.

Billions of Top-line Benefits Expected

When asked about top-line sales benefits expected from increased collaboration, half of the manufacturers (48%) and slightly more than half of the customers (57%) said they expect improved collaboration to lead to a growth in sales of 2 to 4%. Every third manufacturer and every fifth customer expects a boost of 4% and more.

Linking these expectations back to the European chemical industry´s annual revenues of some €600 billion, collaboration might trigger additional sales of €12 to €25 billion in the mid to long term.

On top of this, almost half of manufacturers (47%) and nearly two thirds of the customers (64%) expect collaboration to result in a cost benefit of at least 2% to 4%.

About C3X

The objective of C3X is to analyze the chemical industry from the vantage points of manufacturers and their customers. The survey captures the views of senior executives from leading European chemical companies and of decision-makers in customer industries working at the interface to their suppliers. Participants in this sixth C3X survey, which was conducted in March and April 2012, included executives from more than 15 European countries as well as from the US and China, representing chemicals firms and client companies – a total of more than 150 executives in all. The customer industries cover a variety of different sectors, ranging from automotive and food to cosmetics.

C3X Chemical Customer Connectivity Index

Room for Improvement at the Customer Interface

How do manufacturers today strengthen their customer relationships? They do so mainly by offering improved pricing excellence (73%) – which is also considered a top three priority by their customers (70%).

Beyond that, manufacturers put a lot of effort into internal topics such as improving customer and market intelligence (70%) or sales force efficiency (66%). These topics, however, rank at the bottom of their customers' list of priorities (33% and 24%, respectively).

Sustainability continues to be a debated topic: Only 34% of manufacturers consider environmental sustainability a key buying criterion for their customers; whereas roughly every other customer (52%) bases their purchasing decision on it.

With regard to renewable raw materials, manufacturers are still missing out on an important opportunity to address their customers' wishes. In fact, it is the factor where the biggest gap persists compared to manufacturers' efforts. Higher sensitivity of end consumers to environmental aspects, but also increasing crude oil prices and the scarcity of traditional raw materials (especially in Europe), might contribute to this.

Innovation: Unfulfilled Expectations

Manufacturers are focusing their innovation efforts on several key aspects, with gaining recognition as an innovation leader (78%) and offering new product features (72%) and new applications (62%) to customers in line with their requirements among the main ones. In addition, customers expect to be offered new chemical products (71%); this, however, is recognized by only 37% of manufacturers.

Compared to 2011, the share of revenues that manufacturers spend on innovation decreased: While the share of top spenders that spend more than 10% on innovation remained stable, the number of companies that spend 5 to 10% halved. Moreover, in 2011 virtually no company spent less than 2% on innovation while 15% are doing so now.

As Tobias Lewe sees it: "Innovation has not been delivering anywhere near what it promises, especially in respect of customers' increasing appetite for step-changing innovations, e.g. new, differentiating products or even breakthrough technologies. As a result, manufacturers have proportionally reduced their spendings on innovation while targeting higher innovation efficiency. Better collaboration across the value chain will help to focus innovation spend in the right areas."

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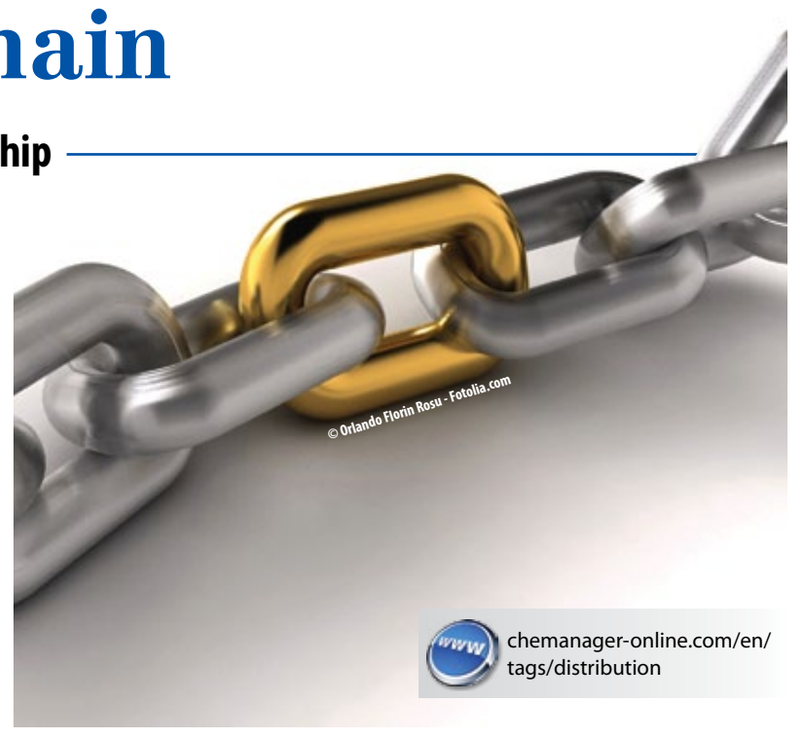
Links in the Supply Chain

Survey Illuminates the Producer-Distributor Relationship



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Defining Roles – To find out more about how chemical producers and distributors perceive and value their relationship, the Stratley Distribution Survey investigated several aspects of this link. Here is an overview of some of the key results from Stratley, a management consultancy that advises decision makers in the chemical industry worldwide.

The distribution of specialty chemical products plays an important role in the overall supply chain from the chemical industry to its customers. Producers of specialty chemicals (principals) have outsourced some or even all of their distribution activities to companies with specific business models (distributors). Whereas distributors are increasing their geographic spread and application technology knowledge, principals are concentrating more intensely on their production capabilities and selected markets/applications.

This will lead to a clearer differentiation between production and marketing/sales in the chemical industry in the medium to long term, offering various opportunities for mutually beneficial collaboration. However, the daily project work shows that little knowledge of the other side exists, and many prejudices still prevail. Since better collaboration offers value for both parties, the Stratley Distribution Survey was set up – and some of its findings are listed below. The objective was to kick-start the thinking process on both sides and to help spur discussions between principals and distributors.

Distributors' Role in the Market

Given the long history of cooperation between principals and distributors, Stratley did not expect big differences in the views on the role of a distributor in the value chain. However, principals see distributors first and foremost as the only channel to serve small to mid-sized customers. Although this view is clearly understandable, it is a little surprising that the physical distribution itself (ranked second) scores below 60%. By contrast, all the distributors questioned see their role as providing exactly this physical distribution and, to a large degree, bundling products for customers (Figure 1).

Mutual Perception

Principals and distributors have a similar understanding of what counts most: They consider market and application coverage, reputation and existing relationships to be the most important selection criteria. For distributors, a constant search for highly qualified staff with people skills should be a high priority. In addition, retaining good staff with strong principal relationships seems to be crucial to business. They also perceive the diversification of the principals' distributor portfolio as a driver for selection (Figure 2). Principals are much more concerned about market coverage and skill sets.

Distributors And Principals

Principals who see distributors as an extended sales arm miss the opportunity to benefit from their physical infrastructure and knowledge of untapped markets. On the other hand, distributors should, to a larger degree, accept their role as an extended sales arm. Even if their own product lines could prove highly successful, a much greater percentage of their business will result from sales of principals' products. Therefore, distributors should focus on winning over the right principals with appropriate offerings.

General Insights

Stratley's first set of questions covered the collaboration between principals and distributors. Regarding the share of business done via distributors, the majority of respondents put it at between 10% and 20%.

Distributors are managed by principals on a local basis. Because of a broader presence of distributors in the various markets and distributor management becoming a higher priority for business managers, Stratley expects local management to lose share in favor of a more centralized system. The large number of distributors that are used by principals also seems questionable considering that distributors are emerging with supranational capabilities across a diverse set of markets.

In distributor selection management, various ideas should be discussed. For example, the management of these relationships could be improved by setting up a company-wide approach to distributor selection in order to bundle sales and by putting a single person in charge. One could also consider regular reviews or performance-oriented tasks to increase quality as well as tracking distributors' performance – including the simple fact of how much business is done with each distributor.

Regarding the latter, the survey shows that distributors can realistically be expected to contribute up to 20% of all new business development. This should represent a good starting point for an ongoing relationship.

Outlook

What does each side see as the other party's major shortcomings? Principals primarily expect distributors to generate more new business and to provide better-qualified staff. On the other hand, distributors particularly expect principals to offer one contact person (instead of several) and to allow them to keep homegrown high-volume customers.

In general, distributors and principals want to continue or expand their business relationships. Therefore, open discussions and better communication could further improve relations – if the other party's perspective is understood and jointly beneficial offerings are developed on this basis.

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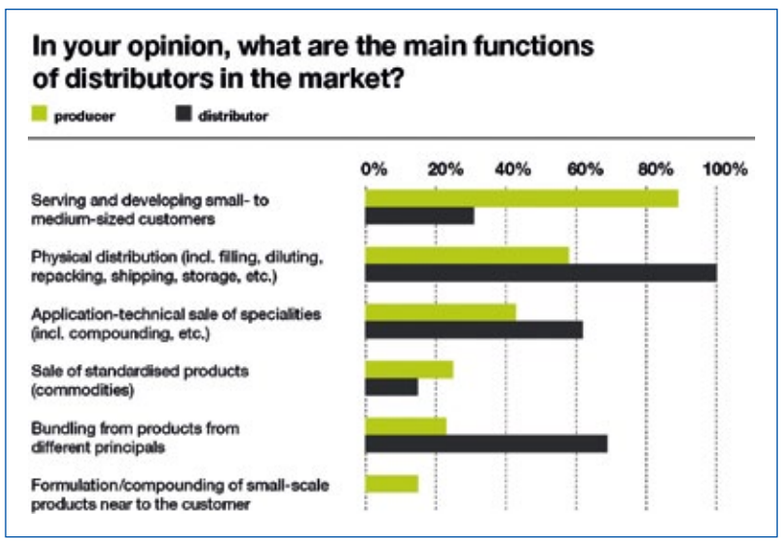
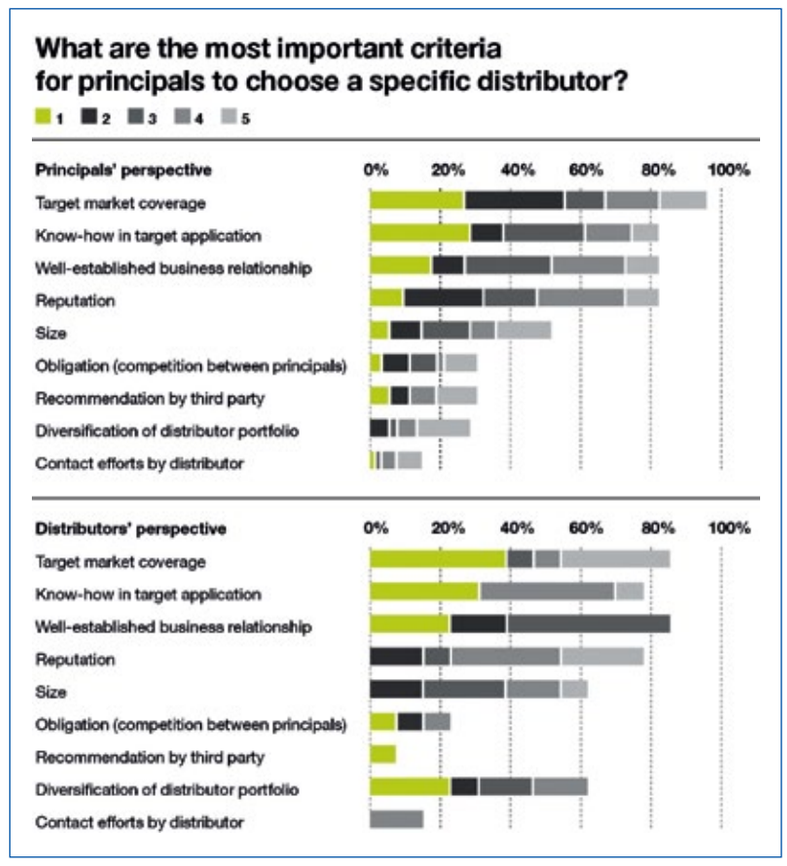
www.stratley.com





Growth Prospects of Global Solvent Market

The market research company Ceresana forecasts the global solvent market to earn revenues of about $33 billion in 2019. Especially the dynamic economic development in emerging countries like China, India, Brazil, or Russia will continue to boost the demand for solvents. The market research institute expects worldwide solvent consumption to increase at an average annual rate of 2.5% over the next years. Accordingly, the growth rate seen during past eight years will be surpassed.

The most frequently used solvents are alcohols, such as ethanol, n-butanol, isopropanol, and methanol. About 6.4 million tons of alcohol-based solvents were utilized worldwide in 2011. Demand for ethanol and ethers is projected to rise at an above-average growth rate of more than 3% per year between 2011 and 2019. Demand for halogenated solvents is especially declining in Western Europe and North America. Also aromatics and pure hydrocarbons will continue their downward trend.

Applications

Most important buyers include producers of paints and coatings followed by printing ink manufacturers. The pharmaceutical industry came in third place, followed by cosmetics and adhesives. Furthermore, solvents are used in a broad variety of other industrial applications, for example in chemical manufacturing processes, cooling circuits, chemical dry-cleaning, and as de-icing agents.

The adhesive industry is expected to record the strongest growth in solvent use. Besides private consumption, adhesives are increasingly used in industrial applications. They allow for easy, safe and flexible connections, which are usually inexpensive and light-weight.

Stimulants For Growth

With a roughly 39% share of global consumption, Asia-Pacific is the largest solvent outlet, followed by North America and Western Europe. Asian countries will further increase their shares in the global solvent market – mainly at the expense of saturated industrial countries. Many emerging and developing countries benefit from an increasing solvent demand – above all in the paint, coating, and adhesive industries.

For example, solvent demand in the paint & coating industry is predicted to increase by 2.9% per year until 2019. Mainly emerging and developing countries will boost this trend: Rising prosperity in these countries will result in an increasing per-capita consumption of paints.

Environmental Awareness

The market for solvents is considerably influenced by legal regulations and the growing environmental awareness of end consumers. Changes targeted at reducing the environmental impact of solvents will focus on both production methods and further substitutions of specific solvent types. The manufacture of solvents from renewable resources reduces the dependence on petroleum and improves the CO_2 balance.

Western Europe and North America will continue to pursue their goal of reducing emissions of volatile organic compounds (VOCs). The shifting from solvent-based paints to water-based or other solvent-free paints is negatively impacting the solvent demand in these regions. In the other regions, environmental protection is far less important. However, this is going to change in the long term.

The Study analyzes the global solvent market: Demand and revenues are given for each world region. The report also lists the largest solvent manufacturers that include Arkema, BASF, BP, Daicel, Eni., Exxon Mobil, LyondellBasell, Petrobras, Royal Dutch Shell, Sinopec, Dow, and Total.

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Surfactants in a Global Context

CESIO Congress 2013 Will Focus on Worldwide Megatrends

A Growing Market – For the coming CESIO World Surfactants Congress in 2013 in Barcelona, sales of the 52 booths have started. The novel concept and the shorter biennial rotation of the event will further revive the discussion between producers and users on all levels, which started in 2011. This is what CESIO President Dr. Thomas Greindl promises for "Surfactants Today and Tomorrow – Mapping the Megatrends" on June 10–12, 2013. Barbara Buller spoke with him for CHEManager Europe.

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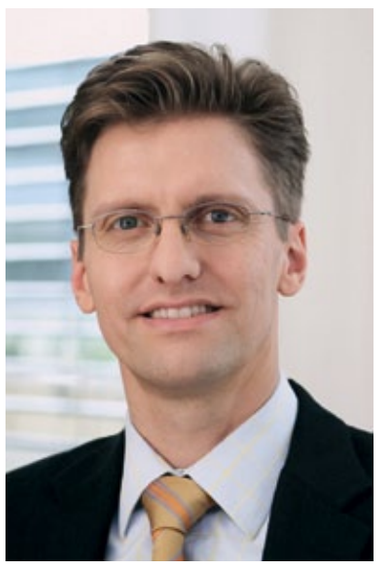
CHEManager Europe: Dr. Greindl, today, at halftime between two CESIO World Surfactants Congresses, could you make any statements on the course of the event?

T. Greindl: The 2013 event is the first time for us to put consequently into practice the biennial rotation. This rhythm makes it easier to keep up contacts and observe trends more closely. The appraisal of the recent congress in Vienna approved that we are well on the way with the new concept, which is closer to the market. In Vienna already, the interest and the presence were particularly high when market issues were addressed – regionally or supraregionally.

Our attendants come from various companies, NGOs, from R&D, and governmental institutions; in follow-up interviews, they explicitly appreciated that in addition to research-related issues, aspects were discussed which addressed our attendants from business and production and also customers.

Does this imply that there are also "megatrends" in business development?

T. Greindl: Fortunately, the surfactant market belongs to the stable markets. In Europe, it has revealed itself as crisis-proof, and it is steadily growing because of the broad range of use of surfactants. Moreover, Asia-Pacific and South America are developing positively: Growing affluence in these countries directly affects the consumer habits of the emerging middle classes. Let's take India as an example: Until now, soap has played an important role there. Today we know that from a certain income level the consumer behavior switches abruptly to better alternatives. At this moment we have to take care that the regional deployment meets the demands of


Dr. Thomas Greindl
CESIO president

the emerging middle class. We expect similar developments also for the other BRICS nations (Brazil, Russia, India, China, South Africa), Africa being at the very beginning of this development. I am sure that these emerging markets will attract wide interest at the next CESIO.

Which questions still have to be answered for Europe and the industry nations, respectively?

T. Greindl: The big talking point of the recent CESIO Congress, sustainability, has not been thrashed out by far. In particular the retailers are urgently waiting for answers to questions resulting from issues like "bioeconomy" or "low carbon economy" with the correspondent assessment models, such as the carbon footprint. But also in the BRICS countries, sustainability is more and more being made a subject of discussion, on the one hand because of export reasons to Europe, on the other hand because of growing regulations here. At the moment there are still different labels promising sustainability. Therefore, there is a considerable demand for harmonization and exact definitions.

Could you give us a concrete example?

T. Greindl: The standards for biosurfactants are also being discussed in the EU. The first challenge was to achieve agreement on the acceptation of "bio": Is it a question of the way of production – "biotechnologically" – or of the raw material from renewable sources? Which is the category for surfactants like APG (alkylpolyglucosides), which are produced fully synthetically but originate in renewable components?

The assessment of the sustainability of the products is even more complex. The commonly accepted approach by LCA (Life Cycle Assessment) is becoming more and more comprehensive. The certification of processes by LCA is extremely intricate. Moreover, it is always about a case study. The challenge for us will be to generate certain standard basic data – so-called scientific-based industry standards to make a statement in order of magnitude.

As before, the basic research will be one of the central issues of the Congress – are any trends emerging?

T. Greindl: As far as I know today, this section will deal with complex systems and their exploration, presumably more than with new singular compounds. For these complex systems, the question arises how it will be possible to boost the effect of a known surfactant system. Again, it is a matter of sustainability, as it has to do with saving active substance by ingenious combinations with polymers. Finally, we are looking forward to new developments for additives – enzymes that increase the range of application. To meet the consumer's demands as to performance at low temperature, we have to work on the solubility and consequently make use of synergies. This is also a trend towards "using complex systems." We are keenly looking forward to the congress section about the industrial applications, which will comprise the full range of surfactant application.

Will REACh still play a role?

T. Greindl: Now as before we have to deal with issues of REACh. At the moment, there are some questions left. There will be demands in addition to the submitted dossiers of large volume chemicals. The period for the small volume surfactants, less than 100t per year, runs until 2018. We must not underestimate this task; it concerns many small producers who possibly start to deal with the issue only now. CESIO offers them support in consortia formation and preparation of model and framework contracts.

What are your personal expectations for Barcelona 2013?

T. Greindl: Time and location of the event and also the local atmosphere are eminently suitable for offering an inspiring setting to the attendants of the Congress. Presumably, more than 1,200 visitors will come to Barcelona. The choice of the event's location in Barcelona signals our opening toward Latin America. We would interest more guests from Brazil and other emerging regions for the event, because it will be about their future, their chances for development.

chemanager-online.com/en/tags/cesio

BASF Buys Omega-3 Fatty Acids Market Leader Equateq

BASF has extended its portfolio for omega-3 products with the acquisition of fatty acid producer Equateq from the company's founder, Adam Kelliher. An acquisition price was not disclosed. The products are sold to the healthcare industry for use mainly as dietary supplements.

Equateq, which according to BASF is a global leader in its field, has production facilities on the Isle of Lewis off Scotland's western coast. The company and all 47 employees will be integrated into BASF's pharmaceutical ingredients and services unit, part of its Nutrition & Health division.

The Scottish manufacturer's proprietary chromatographic separation methods are said to allow flexible formulation of omega-fatty acids at exceptional purity levels of up to 99%, which BASF says is "unique in the market."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Syngenta and Novozymes Team up on Seed Care Technology

Syngenta and Novozymes have teamed up to jointly develop and commercialize Novozymes' seed-applied biological JumpStart technology worldwide, which is claimed to increase phosphate solubility in soil. The technology will be marketed in combination with Syngenta's seed care portfolio for grain and corn and will broaden the range for JumpStart, now sold mainly in North America.

JumpStart is based on the fungus Penicillium bilaii, which increases phosphate uptake into the plant through the root system. The companies estimate the market potential for seed-applied technologies to increase phosphate efficiency at more than $100 million.

In the first quarter of 2012, Syngenta said its enhanced corn seed portfolio enjoyed strong demand. Altogether, sales of the Basel, Switzerland-based agrochemicals giant rose 9% in Q1 to $4.3 billion. Corn seed sales rose 21% as its technology realized "global potential."

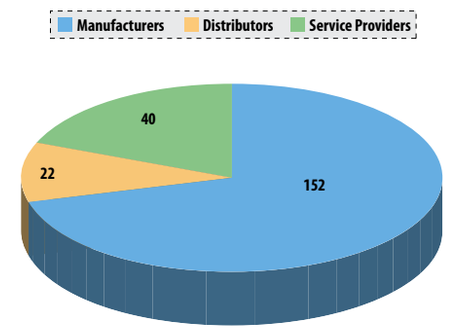
"The implementation of Syngenta's integrated strategy for crop protectants and seeds is 'proceeding rapidly' and we are already seeing benefits," said CEO Mike Mack. This, he added: "Underpins our confidence that we will continue to outperform an expanding market."

The Latest From SOCMA

SOCMA Welcomes New Members

The Society of Chemical Manufacturers and Affiliates (SOCMA) has welcomed one of its largest groups of new members in more than two years in the first quarter of 2012. Ten companies, representing chemical manufacturers, distributors/suppliers and industry service providers were approved by SOCMA's Board of Governors in April. SOCMA has now a global membership of more than 210 companies, about 70% of which are international chemical manufacturers.

SOCMA Member Company Categories



Source: SOCMA © CHEManager Europe

"This is a great time to join SOCMA because we have so many exciting things going on," said Dave Hurder, chairman of SOCMA's Board of Governors and Vice President of McGean. Jack Payne, Vice President, Ross Enterprise, said his company was drawn to SOCMA because the association "offers us valuable insight on current industry trends and challenges, which helps us enhance our products and services to meet the changing needs of chemical processors."

SOCMA's new members include:

Adesis, New Castle, DE – is a contract research organization (CRO), providing organic chemistry solutions and products. The company is adept at delivering focused libraries, advanced intermediates and active chemical ingredients (milligrams to multi-kg), and it has developed a reputation for solving difficult chemistries, delivering high-quality products and services and establishing productive and successful long-term relationships with its customers.

AllessaChemie, Frankfurt, Germany – is a partner for toll manufacturing and exclusive synthesis of intermediates and fine chemicals, drawing on 150 years of production history. All production sites are located in the greater Frankfurt area in Germany. A significant number of large vessels guarantee the capacity and flexibility for projects up to the range of many hundreds of tons.

Aveva, Houston, TX – is enabling the creation and management of complex digital assets, allowing customers to work globally with less risk, shorter lead times and greater business efficiency throughout the lifecycle of their physical assets.

ChemPak International, Houston, TX – is a supplier of manufacturing services, including flaking and pastilling, toll processing, dry bulk handling, bulk storage, drum filling and warehousing. With a fleet of more than 100 trailers and 40 tractors, ChemPak also provides bulk transportation of both liquids and powders.

Chempetitive Group, Chicago, IL – is a fully integrated, international marketing communications agency focused exclusively on science-driven markets, including the chemical industry. With offices in San Diego, Chicago and London, Chempetitive Group works with companies of all sizes to develop and implement marketing, communications and digital strategies that build brands and generate revenues.

Federal Equipment Company, Cleveland, OH – with more than 50 years' experience, is a trusted supplier of chemical processing machinery to the chemical industry. The company provides quality used equipment and related asset disposition services. With more than 15,000 pieces, Federal Equipment is one of the largest suppliers of used chemical processing equipment in the world.

ICT Industries, Cartersville, GA – specializes in the development and manufacture of partially fluorinated surfactants and polymers that are used as high-performance wetting agents and as oil, water, soil and stain repellents. ICT Industries also produces and has expertise in specialty polymers of many types, specialty surfactants and many sulfur products based on carbon disulfide.

Novacyl, Cranbury, NJ – is a wholly owned subsidiary of Novacap. Novacyl is the largest manufacturer of bulk Salicylic Acid and Aspirin in the world and also produces Salicylate Esters for pharmaceutical and flavor applications. In addition, Novacyl manufactures bulk acetaminophen.

LGM Pharma, Boca Raton, FL – promotes client research and drug development by providing them with the critical rare and novel active pharmaceutical ingredients (API) that are essential for their success.

Ross Enterprise, Atlanta, GA – offers enterprise and supply chain software specifically developed for formula-based process manufacturers worldwide. Features include social networking technologies, graphical track and trace, alert system toolkit, integrated supply chain planning, multi-mode production, product costing and compliance documentation.

For more information on the benefits of membership, please visit www.choosesocma.com.

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SOCMA is a U.S.-based trade association dedicated solely to the batch, custom and specialty chemical industry. Since 1921, SOCMA has represented a diverse membership of small, medium and large chemical companies and has now a global membership of more than 210 companies.

Trends in the Chemicals, Materials and Food Industry

A new forecast from Frost & Sullivan presents the key perspectives on growth in the Chemicals, Materials and Food Industry in 2012 and shows where the next growth opportunities are in many different sectors and in new geographies.

Mega Trends

The four mega trends of low carbon economy, health and wellness, functionality and performance, and globalization will shape these markets. Green products like bioplastics, high demand for innovative chemicals and materials, and industry consolidation will dominate the chemicals and materials industry across Europe, while weight management, heart and digestive health will be the high growth sectors in food and beverage markets.

Dr Leonidas Dokos, research director at Frost & Sullivan says: "The four mega trends define the developments in the chemicals, materials and food industry. The food, mobility and construction markets remain core developments for 2012 exhibiting growth overall driven by the emerging economies."

Global Hot Spots

According to Frost & Sullivan, China, Brazil and Russia are the top priorities for construction and utilities players, while for transportation players the focus is on China, India and Brazil. In particular, the Indian demand for chemicals will grow on the back of massive growth in end-user industries such as automotive production. China's development of green technology will draw in strong chemicals investment, even for technologies such as electric vehicles.

The Western European market remains the priority for EU based manufacturers over other regions. North America and Eastern Europe are the next priority while Russia presents significant opportunities across sectors, especially in construction, water treatment, transportation and personal protection equipment.

Latin America will be the hub for bioethanol and Brazil will continue to export it to neighboring nations. There will also be increasing focus in oil and gas exploration with restructure in the state petrochemicals companies. Brazil, in particular, is forecast to become a major center of supply for bio-based feedstocks and will be the construction hot spot until 2016 (supported by the 2014 Football World Cup and the 2016 Olympic Games).

The food and beverage suppliers are looking at China, India and Brazil as emerging markets while in Europe the focus is and will be on bakery ingredients.

Industry Consolidation

Targeted consolidation in the chemicals and materials industry continues as one of the main highlights of recent years, but the number of closed deals will be smaller due to widespread lack of cash availability. However, in 2012 we will witness a mega acquisition of a top 100 global chemicals company headquartered in Europe, says the Frost & Sullivan report. As a general forecast for all segments, the continuing debt crisis in the euro zone and the high US government debt continue to undermine the speed of the macroeconomic recovery of markets and the level of investment available.

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Takeda to Buy Multilab

Takeda is to buy Brazil's Multilab for up to 540 million Brazilian reals ($265 million) in a deal highlighting global drugmakers' appetite for emerging market sales. Frank Morich, responsible for all Takeda sales outside Japan, told Reuters he wanted to see emerging markets accounting for 20-25 % of group sales in the years ahead, roughly double what it is expecting for the current fiscal year.

Takeda, Japan's top drugmaker, which already put a big bet on emerging markets when it bought Nycomed for $13.7 billion last year, will pay 500 million reals upfront to the owners of Multilab and up to 40 million reals in additional future milestone payments.

Multilab had sales of 140 million reals in 2011 and has been growing by more than 20 % a year over 2009-11 as it taps into rising demand from the country's expanding middle classes. The acquisition of the manufacturer of branded generics and OTC medicines will make Takeda one of the top 10 pharmaceutical companies in Brazil. ■

Amylin Draws Initial Bids

Amylin Pharmaceuticals has drawn initial bids from drugmakers Merck & Co and Sanofi, Bloomberg News reported. The drugmakers made offers of at least $25 a share for the biotech company, which would value Amylin at more than $4 billion, the report said. Sources have told Reuters that Amylin, which sells the diabetes drugs Byetta and Bydureon, started reaching out to potential buyers in April. ■

Clinilabs Opens NJ Phase I Unit

Clinilabs, an early phase and specialty CRO that provides clinical drug development services to the pharmaceutical industry, announced that they have opened a second Phase I unit in Eatontown, NJ, USA. The 50-bed capacity, 15,000 square foot Specialty Pharma Phase I Unit features semi private rooms, a large PK sampling facility, a bioanalytic laboratory, pharmacy, and exam rooms. ■

Drug Data May Draw Bids for Actelion

Knock-out data for Actelion's big new drug hope could be a double-edged sword for embattled founder and CEO Jean-Paul Clozel, making it a worthy buy for pharma companies. Actelion received a shot in the arm last month from results in a late-stage clinical study on heart and lung medicine Macitentan, reassuring doubters that sales will not trickle away once its blockbuster drug Tracleer goes off patent from 2015. But that is also likely to pull the company back into the takeover spotlight, as big drugmakers hunt for biotech gems to restock pipelines depleted by the biggest wave of patent expiries in pharmaceutical history. ■

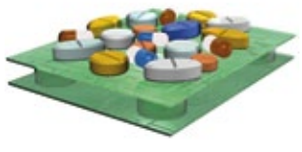
Siegfried Acquires Alliance Medical

Swiss contract manufacturer Siegfried has acquired Alliance Medical Products (AMP), based in Irvine, CA, USA for $58 million. This acquisition gives Siegfried, which is active in both the primary and secondary production of drugs, an entry into the custom market for sterile filling services.

Complementing the company's technology base with competency in sterile filling services is a strategic goal for the Siegfried Group. Founded in 2001, AMP achieved revenues of $20 million in 2011 with approximately 100 employees, is operating profitably, has an attractive client base and a substantial project pipeline.

In order to ensure a seamless integration the management of AMP will remain in place.

Siegfried CEO Dr. Rudolf Hanko explains: "Our acquisition of AMP expands this exceptional offer into the sterile filling market, a particularly attractive segment. Integrating AMP into the Siegfried Group is an asset for both companies." ■



Biopharma

Recombinant human albumin: a case study in excipient quality and functionality.

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Feedstocks

A new agricultural price regime: The link between carbohydrate crop and crude oil prices.

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Pharma

Antibiotics: will changes to Eastern regulations impact the global marketplace for APIs?

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Altana Opens Lab Building
BYK Additives & Instruments, a subsidiary of Altana, has opened a new lab building in Wesel, focused primarily on developing innovative additives for plastics applications.

Lanxess Starts NBR Plant
Lanxess has started a nitrile butadiene rubber (NBR) plant in Nantong, China, on schedule as part of its 50:50 joint venture with Taiwan's TSRC Corporation. The two companies have each invested $50 million in the new plant, with an initial capacity of 30,000 metric tons/year

Doing the Tango at the Stadium

High-Performance Materials Make New Soccer Ball Fast, Robust and Precise

Impressive Results – The development and testing phase from concept to production of a new soccer ball takes about two years. The ball for the 1986 Soccer World Championship in Mexico was the first completely synthetic ball. The games at the European Soccer Championship Euro 2012 will be played to the rhythm of the "Tango 12". The latest cutting-edge synthetic ball sports a new design and is based on proven materials from Bayer MaterialScience.

The surface texture of the official European Championship ball feels like denim, allowing for better ball control. The players are quite taken with this innovation. "I really like the new structure because it provides good grip," says Johan Elmander, a player on the Swedish national team. "The ball's weight is also optimal, making it easy to control." And Ashley Young, a winger on the English national team, adds: "The ball is great for going forward with and sticking to my feet as I dribble." Developed for the Euro 2004, one of the predecessors of the new ball called "Roteiro" has been hailed as a breakthrough in the world of soccer ball technology being the first non-handstitched ball in history. It featured a new production concept – thermal binding – which made the ball more resistant, increased touch and significantly reduced water uptake. In 2008 the "Europass" match ball sported a new panel system developed with a special texture on the surface of the ball to provide players and goalkeepers with a better grip on the ball.

Advanced Internal Structure

And high-performance materials continue to improve ball properties. The shell of "Tango 12" is made up of five layers with a total thickness of 1.1mm. These layers make the European Championship ball robust and accurate. The middle layer – an Impranil foam containing millions of gas-filled microcells – is responsible for the optimal contact of the "Tango 12" to the foot. The upper layers protect the foam from external influences and help keep the ball looking new longer.

Another specialty material is used for a patented thermal adhesive layer that makes the ball virtually impermeable to water. "Even in heavy rain, its weight increases by no more than 0.1 percent, which means that the players are able to control it better," says Thomas Michaelis, project manager for ball development at Bayer MaterialScience.

Not only did the ball deliver impressive results in comprehensive laboratory tests, it also impressed both amateurs and professionals in eight countries who played with it during a year-long test phase. "Never before has a soccer ball been subjected to such exhaustive testing," says Michaelis.

The ball's name and design are every bit as traditional as its insides are modern. The Tango debuted at the 1978 World Championship in Argentina, and its successors provided for plenty of goals at subsequent championships in the 1980s.

Classic Design

The new ball sports the classic black and white design updated with colorful accents. The host nations' national colors – red and white for Poland, yellow and blue for Ukraine – have been immortalized in the triangles. Another unique feature is that unlike its predecessors, it does not have a glossy surface – matte balls are currently in vogue.

The "Tango 12" isn't just the official game ball of the European Championship, however. It is also being used in the German Bundesliga, the Champions League, Major League Soccer in the United States and the Primera División in Argentina.

The design is modified for each, but the structure and properties remain the same. Bayer MaterialScience and Adidas want to continue their successful collaboration. The two companies are currently working on the next advancement.

▶ www.materialscience.bayer.com

chemanager-online.com/en/tags/bayer

Organic and Printed Electronics – from Vision to Mainstream

This year, the first TV sets with giant 55-inch screens based on organic LEDs will come to market. OLED TVs are the starting point into the era of organic and printed electronics. Organic and printed electronics is evolving as an attractive technology platform for comprehensive system solutions. Leading the way are extremely lightweight, flexible, and energy-efficient touch screens for smartphones and "intelligent packaging" techniques for consumer goods. These exciting developments are at the center of the 4th Large-area, Organic and Printed Electronics Convention (LOPE-C), which offers a comprehensive overview of market-ready products and the trends of industrial research and development.

LOPE-C (c.f. Events section on page 23) represents the industry's entire value chain – from academic research to industrial design to marketable product. This year, both industrial and consumer-oriented applications will be at the center of attention: organic solar cells and sensors, OLED displays and OLED lighting, ultra-flat data memories and printed batteries, all seamlessly integrated as enablers of novel products. Also on view are robust and lightweight touch screens for smart mobile devices, as well as home entertainment and in-car infotainment systems. An exciting outlook on the future of organic electronics is exemplified by networks of smart objects, which act autonomously and communicate with their hosts by radio.

Solutions for Industrial and Consumer Systems

LOPE-C 2012 presents a comprehensive product overview and the latest in research and development in the organic and printed electronics industry. Key players of the community, such as AGFA-Gevaert, Bosch Rexroth, Coatema, Fujifilm Dimatix or Poly IC, will be showcasing their products and solutions for industrial users in automotive, packaging, pharmaceutical and consumer electronics.

Scientific, Technical and Business Conferences

The conference program at LOPE-C reflects the latest market developments and focuses on concrete applications. More than 180 speakers from 27 countries will present applications, developments and advancements in organic and printed electronics. The conference is broken down into five events, i.e. the Plenary Session, the Business Conference including the Investor Forum, the Technical Conference, the Scientific Conference, and the Short Courses. Representatives of leading user companies such as Janssen Pharmaceutica/Johnson & Johnson, MeadWestVaco, Philips and StoraEnso are giving lectures.

The Plenary Session will open with internationally prominent speakers. For instance, Dr. Kai Grassie, CTO of Giesecke & Devrient, will hold a lecture on the topic of "Reliable transactions – Security through authenticity". He will present the use of printed electronics in the smartcard sector.

The Business Conference focuses on commercial aspects. For example, Eric Snoeckx from Janssen Pharmaceutica/Johnson & Johnson will hold a lecture on "The integration of printed electronics in the pharmaceuticals industry". Other items of the agenda at the Business Conference include presentations from Harris & Harris and MeadWestVaco as well as from Heraeus Precious Metals, Philips and PolyIC.

At the Technical Conference, representatives of the scientific and industrial sectors will examine the diverse range of potential applications for organic and printed electronics in their respective sectors. Prof. Henning Sirringhaus from the University of Cambridge, Cavendish Laboratory, will make a presentation on "High-performance, solution-processed organic transistor circuits."

Scientists and developers from around the world have applied to make presentations at the Scientific Conference. A committee of prominent international specialists selected the various speakers from among those applicants. Within the scope of this conference, scientists and engineers will present the state of the art in research.

▶ www.lope-c.com

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Recombinant Human Albumin

A Case Study in Excipient Quality and Functionality

Modern Excipients – Traditionally, excipients have never received the same attention as that given to the Active Pharmaceutical ingredient (API). Instead they have been seen as "inert" materials that confer a suitable form or consistency to a formulation to facilitate delivery. Increasingly, the perception of excipients is changing and these materials are now seen as functional components of a pharmaceutical formulation, where they contribute significantly to both the functionality and stability of the final product. The change in the perception of excipients and the need to implement a "quality by design" approach to drug manufacture means there has never before been a greater need to understand the critical quality attributes of an excipient product. Furthermore, it is crucial to understand how these quality attributes relate to performance in the final formulation and acceptability to the regulatory authorities.

Mark Perkins
Customer Solution Specialist, Novozymes Biopharma

Typically an excipient material will be available from multiple suppliers and a drug manufacturer will have to select the most appropriate material for their purposes based on the quality and functionality requirements. Often the initial selection of materials for evaluation will be based around examining the specifications and certificate of analyses. These may often appear comparable between suppliers and may not reveal distinct differences that could dramatically affect the acceptability of the materials to the drug manufacturer. The needs of the pharmaceutical industry are recognized and special recombinant albumin products, Novozymes Recombumin and Albucult have been designed to meet the highest quality standards. There are a number of commercial products that are intended for use in this market. In this article, some of the key quality attributes of Novozymes products in comparison to other commercially available recombinant albumins are compared. Some of the key challenges around selecting an excipient material that is fit for purpose are highlighted.

Commercial Recombinant Albumins

Plasma derived human serum albumin has a long history of use as a stabilizing agent for vaccine and protein formulations. However, concerns over the potential for transmission of viruses and transmissible spongiform encephalopathy from pooled plasma and proteins derived from it led to adoption of recombinants albumin products. The world's first and second recombinant human albumin products, derived from Saccharomyces cerevisiae are manufactured by Novozymes Biopharma. Today a further 3 recombinant albumin products are available and a summary of these is presented in Table 1. All of the products are purportedly indicated for biopharmaceutical use and have a purity of claim of >95% or greater.

GMP Certification

A first point of interest when selecting an excipient material may be the origin and compliance with good manufacturing practice (GMP) guidelines. Whist nearly all components of a final drug product are required to be manufactured to GMP guidelines; no such global regulatory requirement exits for excipients. Work in this area began in 2008 when the FDA acknowledged that GMP certification for excipient products may be beneficial to the pharmaceutical industry. This work was taken further by the International Pharmaceutical Excipient Auditing (IPEA) program that worked to define these standards in 2009. Whilst this GMP certification is not mandatory and is not a direct indication of final product functionality, it does have some advantages in reducing the burden of auditing an excipient manufacturer. A lack of compliance to GMP may be enough for some manufactures to rule out an excipient material. When considering the commercial recombinant albumins only 3 of the supplies have products reported to be in compliance with GMP guidelines (Table 1).

Product Purity And Homogeneity

Purity is often a key driver in the selection of an excipient. Understanding the purity of a protein excipient such as a recombinant albumin is complex. In addition to understanding the presence of other components in the final formulation, such as host cell protein levels, attention must also be given to the homogeneity of the protein itself. The presence of modified forms of the protein, in significant quantities, such as glycosylated or partially degraded protein can have a significant effect on the functionality of the protein, as well as decreasing the acceptability of the material to regulatory authorities.

All of the commercial recombinant albumin products described in Table 1, have a protein purity specification of 95–99% based on gel electrophoresis. While this is a standard technique for the determination of this parameter, it may not fully resolve the heterogeneity of the protein. We have performed an analysis of these products using conventional gel electrophoresis and a more detailed evaluation using mass spectrometry.

The gel electrophoresis data for all the products evaluated demonstrate a single band at ~64kDa that is representative of the native intact albumin molecule. The exception is commercial albumin 1 that has distinctive bands at a lower molecular weight than the native albumin molecule.

Despite the relatively similar appearance between the products by gel electrophoresis, the mass spectrometry analysis reveals a more interesting picture. Recombumin and Albucult both demonstrated a single species at 66.4kDa that is representative of the expected native human serum albumin molecule. In comparison, all of the other commercial products contained multiple peaks that were indicative of partially degraded or glycosylated forms of the protein in the final formulation. Perhaps the most striking mass spectrum was recorded for the rice-derived product from Supplier 1. This product displayed ~40 peaks in the mass range evaluated. On the basis of this analysis it is clear that only a small proportion of the protein present is native human serum albumin. This is despite the labeled purity claim of >96% (w/w).

A further evaluation of purity can be made by visual inspection of the products. This type of inspection is often one of the first analytical tests performed to examine product color and clarity. This parameter is important since it is often considered a direct indication of product quality and purity. In instances where the material is likely to be present in relatively large quantities, such as in a final pharmaceutical formulation, a significant increase in product pigmentation due to the excipient may be undesirable.

Comparing the optical impression of the tested samples, Recombumin and Albucult were the least pigmented of the products evaluated; with both products having a clear/straw color. The alternative products showed increasing levels of pigmentation with the albumin from Supplier 1, a rice-derived product, showing the greatest pigmentation and the final product having an orange/amber color.

Functional Characterization

Many of the physicochemical properties of an excipient product can influence the performance in a formulation. In many instances, some of these characteristics may be application-specific and may require characterization that is beyond that contained on a typical C of A. Where this is required it may be necessary for the drug manufacture to work with the excipient supplier and to identify such properties and device appropriate testing procedures.

An example of this type of functional characterization in relation to recombinant albumin molecule is in the area of chemical conjugation to albumin for peptide or protein half-life extension. The albumin molecule contains a natural free-thiol group that is a natural antioxidant for stabilization but is also used as a specific target in many chemical conjugation reactions. Whilst this group is intrinsic to the native albumin molecule, it can become oxidized and deactivated due to poor storage or processing. Low levels of free-thiol in a conjugation context may lead to poor product yields that could ultimately increase manufacturing costs. In this context, it is important to work with a recombinant albumin supplier that understands the importance of this parameter and more importantly, how to control it.

The free-thiol content of the commercial rAlbumins already described in this note were evaluated and the data is presented in Table 2. It is obvious that free-thiol levels vary between products, with Recombumin and Albucult having the highest levels of all the albumins tested. Commercial albumin 3, derived from rice, is almost completely blocked and would not be suitable for conjugation applications through this chemical group.

Albumin	Source	Labeled Purity (w/w)	GMP Standard
Novozymes Recombumin	Yeast – Saccharomyces	≥99%	Yes
Novozymes Albucult	Yeast – Saccharomyces	≥99%	Yes
Commercial Albumin 1	Rice – Oryza	>96%	Yes
Commercial Albumin 2	Rice – Oryza	>95%	No
Commercial Albumin 2	Yeast- Pichia	>98%	No

Table 1: A summary of commercial recombinant albumin products

Albumin	Free thiol content (%)
Novozymes Albucult	97
Novozymes Recombumin	85
Commercial Albumin 3	69
Commercial Albumin 2	62
Commercial Albumin 1	2

Table 2: A summary of the free thiol content of recombinant albumins

Summary

As the perception of the role of excipients continues to change, the level of scrutiny given to the quality aspects of the products increases. Some of the key quality and functional features of a range of commercially available recombinant albumin products were evaluated. It is clear that there is distinct variability in the quality attributes between the suppliers of these products, despite potentially appearing quite comparable to the end user. In particular, the differences between the materials in terms of compliance of the manufacturing process (GMP), protein purity and protein homogeneity have been identified.

All of these factors may reflect in the acceptability of a material to a pharmaceutical company. The potential for this variability between suppliers of excipients highlights the need for the excipient manufacturer and drug companies to work in partnership to understand the properties of the excipient material in terms of quality, origin and performance. Whilst the focus of this article was recombinant albumins, it is likely that similar scenarios will exist for numerous other types of excipient materials.

The article and all figures can found online at www. chemanager-europe.com/tags/novozymes

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A New Agricultural Price Regime

The Link Between Carbohydrate Crop and Crude Oil Prices

Renewable Resources – In recent years, there has been a growing interest in manufacturing bio-based chemicals from the major carbohydrate crops via fermentation technologies as producers have searched for alternative sources to petroleum-based feedstocks in the hope of decoupling their raw material costs from rising and volatile crude oil prices.

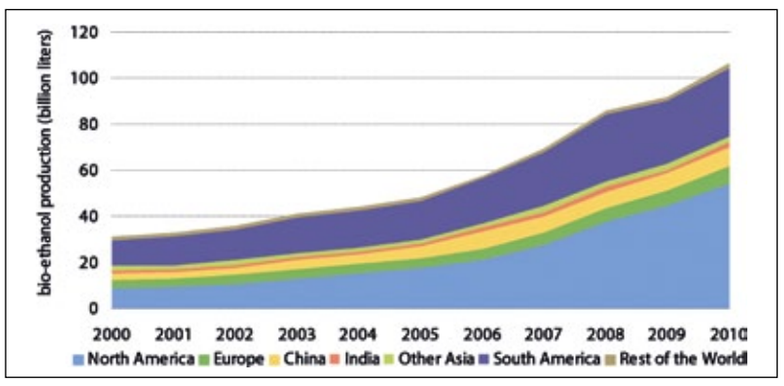

Fig. 1: Global bio-ethanol production, 2000–2010

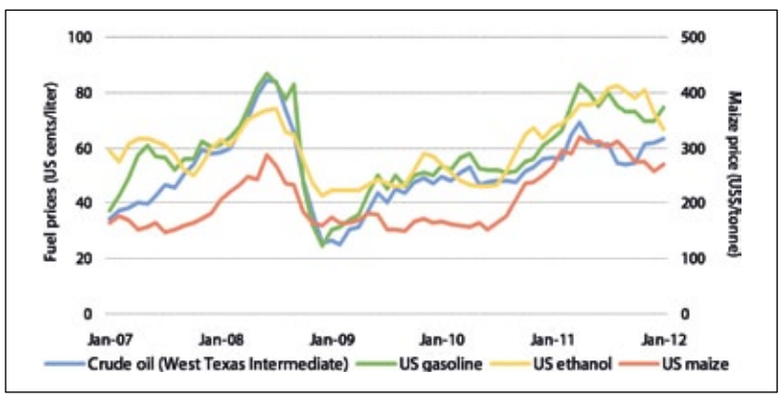

Fig. 2: US energy and crop prices

Fig. 3: Key drivers of the world sugar price

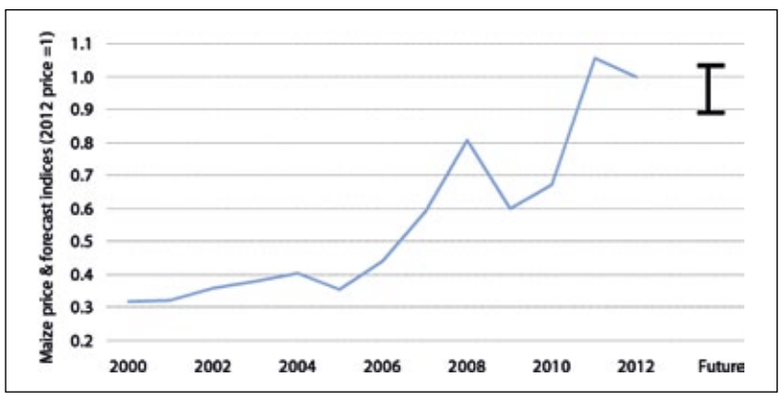

Fig. 4: Indices for US maize price and price forecasts

However, we might suggest this hope could be largely in vain. While risk exposure to fluctuations in raw material supply is improved by diversifying feedstocks, carbohydrate crops are not the solution to rising and volatile costs because, as we will illustrate in this article, their long term prices are not independent of crude oil prices.

The New Price Regime

Crop prices have traditionally been influenced by crude oil prices due to the links that arise through the cost of producing crops. In addition to the energy required in field operations, the cost of fertilizers and other chemical inputs has meant that crude oil prices have always had an impact on the prices of carbohydrate crops.

More recently, a new important link has emerged between carbohydrate crop and crude oil prices. This is due to the increasing production of bio-ethanol from carbohydrate crops which has risen tremendously since 2000 (Figure 1) and added significant demand for these crops within a relatively short period of time.

This new source of demand has established a new price regime between crude oil and carbohydrate crop prices. Movements in the crude oil price are reflected in changes in carbohydrate prices as bio-ethanol competes with gasoline in markets where discretionary blending/substitution with gasoline is possible. So, the price dynamics of the energy markets transmit to the carbohydrate crop markets. However, this link is not obvious in the short term as the institutional involvement in the fuel markets implies that carbohydrate crop prices may deviate greatly from crude oil prices.

In this article, we describe the dynamics behind the new price regimes of maize and sugar. (Note: We will refer to bio-ethanol as ethanol in the rest of this article.)

Maize

The US is the largest maize producer globally and accounts for 40% of global output. This means that the US bio-fuel policy has a huge impact on the global maize market. One of the key elements of this policy, the Renewable Fuel Standard (RFS) program regulations, was implemented in 2005. It mandated certain volumes of gasoline to be replaced by ethanol. Fiscal incentives were introduced and a market for Renewable Identification Numbers (RINs), the tradeable certificates attached to each drop of bio-fuel, was established.

These measures propelled progress in the US renewable energy sector and, although the fiscal incentives expired at the end of 2011, the RFS and RINs remain in place, continuing to steer developments in the industry.

An important effect of this policy was to establish a broad link between crude oil, gasoline and ethanol prices in the country (Figure 2). This correlation emerged because ethanol has been competitive on price with gasoline and there has been discretionary blending on top of mandated use. Discretionary blending was constrained to 10% until the end of 2011. It has been raised to 15% since then. Looking ahead, discretionary blending could play a more influential role when blends higher than 10% become more common. In all, while there is little evidence to suggest that ethanol or maize prices are directly linked to gasoline or oil prices, demand for maize to fulfill the ethanol mandate is supporting maize prices.

Sugar

Traditionally, the price of this carbohydrate raw material on the global market was mainly dictated by its production cost in Brazil. The country is the one of the world's lowest cost producer and largest exporter of the product.

However, the last few years have seen a fundamental change in global sugar price dynamics. This change was brought about by the rapid growth in Brazil's flex-fuel vehicle (FFVs) sector since the mid-2000s. FFVs can run on either gasoline or ethanol (produced from sugarcane in Brazil).

Over time, the expanding ethanol demand from the FFV fleet has led to the establishment of a relationship between ethanol and gasoline prices. This means that, in addition to Brazil's production costs, sugar prices are now influenced by crude oil prices via the ethanol sector in Brazil. If the sugar price falls below its ethanol equivalent, Brazilian millers are able to divert cane away from sugar into ethanol. This switching is possible because most of the sugarcane mills in the country are integrated, which means that ethanol is produced from sugarcane as an integrated part of the sugar production process. Depending on the relative prices of sugar and ethanol, sugarcane millers can alter their product mix (within capacity constraint).

The result of these dynamics is that the interaction between Brazil's ethanol market and world oil prices has now become an important driver of global sugar prices in the long run. This relationship is illustrated in Figure 3.

This link is weaker in the short run as domestic gasoline prices do not follow global crude oil prices. This is because of the government's influence which means that the Brazilian gasoline price has not changed since the beginning of 2006, despite the phenomenal volatility witnessed by global crude oil prices over the same period.

The reason why the support ethanol prices provide to sugar prices has increased so much in recent years is the strengthening of the Brazilian currency, which has inflated gasoline (and therefore ethanol) prices in US dollar terms. This, coupled with strong demand from the FFV fleet, means that the support provided to sugar prices by the ethanol market more than doubled since 2009!

Conclusions

The link between crude oil prices and carbohydrate crop prices is far from direct, but there is little doubt that energy prices have influenced carbohydrate crop prices in recent years. In the near future, demand growth from the food, feed, ethanol and bio-chemical sectors is expected to outstrip supply. This will support crop prices at high levels which are required to encourage growth.

While the new price regime is expected to continue into the future, the impact of crude oil prices on the various carbohydrate crops will be different because of the varying dynamics explained above.

LMC International has been forecasting crop prices for over 30 years. The establishment of the new price regime means that we now also consider crude oil prices when forecasting carbohydrate crop prices. Figure 4 illustrates this point for maize, highlighting the wide range of maize prices associated with different crude oil price scenarios.

Players in the chemical industry seeking to divorce their feedstock supply chains from crude oil price volatility will need to recognize this new price regime and determine if there truly is a cost incentive associated with switching from petroleum-based raw materials and into carbohydrate crops.

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Agriculture Industry Invests $3 Billion in Africa

As part of the New Alliance world hunger initiative, major international seed, chemical and equipment producers have committed to invest a total of $3 billion in Africa over the next several years. Participating firms based in the U.S., India, Israel, Switzerland, the UK and Norway will cooperate in the effort with African companies.

The financial injection will support the preparation and financing of bankable agricultural infrastructure products and determine 10-year targets for sustainable agricultural yield improvements. Adoption of improved technologies and seed varieties as part of a value-chain approach, as well as measures to ensure ecology sustainability and safeguard agro-biodiversity, are part of the package.

Capitalizing on food demand in Africa holds strong profit potential, the companies acknowledge. DuPont plans to spend more than $3 million over the next three year, principally in Ethiopia. It is investing in seed production and storage facilities as well as developing weed control for wheat farmers, along with creating a soil information system to boost crop yields. The US group, which aims to increase revenue from African to more than $1 billion within 10 years, is also sponsoring development of a food security index.

Monsanto, the world's largest seed company, plans to invest about $50 million in several African countries over the next 10 years. The plans include a project in Tanzania to develop corn that uses water more efficiently as well as support for development of a network of agro-dealers. Cargill is participating in two projects in Mozambique focused on increasing grain yields for small farmers and on training and education in farm communities.

Norway's Yara International plans to build a $2 billion fertilizer plant in Africa. It is also spending $20 million to build a port in Tanzania that will help expand its fertilizer delivery network throughout southern Africa. Switzerland's Syngenta has earmarked $500 million for investment in Africa to build a $1 billion business on the continent.

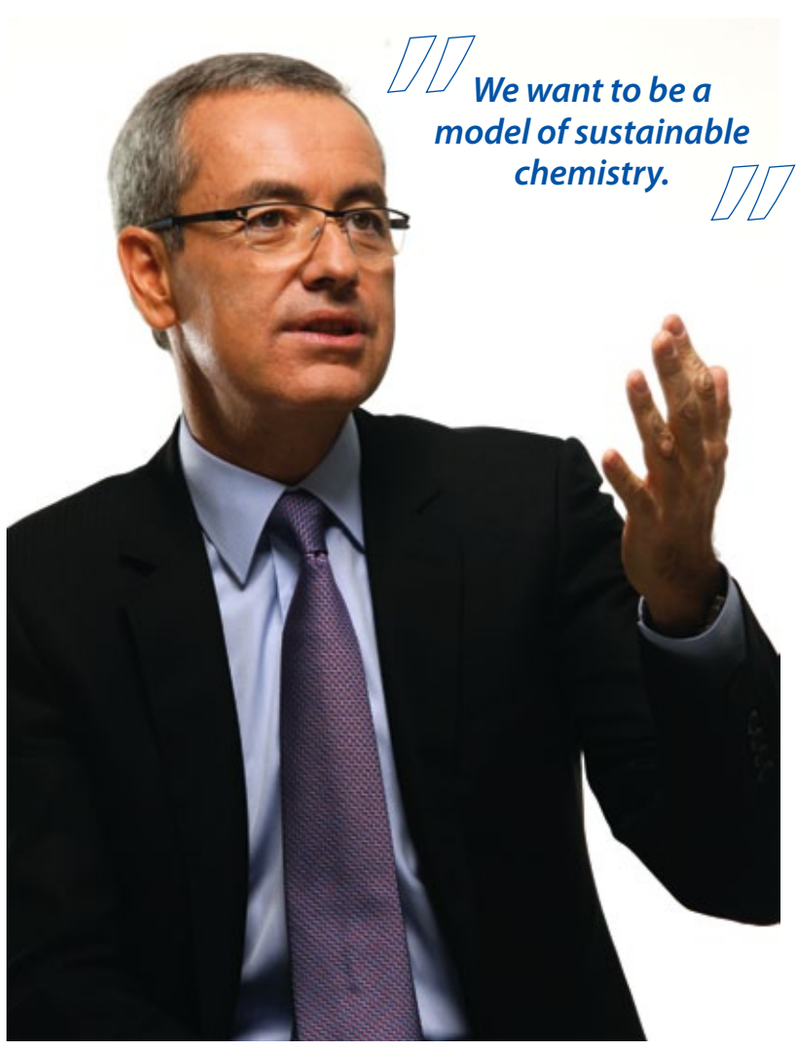
Despite the positive effect foreign investment may have on agricultural yields, the push by global corporations into Africa is seen critically in some quarters. Advocates for the region's farmers fear they will lose control over their food supply and markets as investors buy up farmland and invite international agricultural corporations. The companies, says the California-based policy think-tank Oakland Institute, would do better to provide credit, ensure open markets and ensure the rights of small farmers. ■

A Catalyst For Change?

Continued Page 1

The Specialty Polymers business supplies a range of applications from smartphone to medical equipment or oil and gas production. Rhodia's Consumer Chemical business, which manufactures shampoos and personal care products, is another growth pillar. In the third segment, Advanced Materials, which combines our rare earths and silicas, I think we are extremely well positioned. The recently agreed partnership of Rhodia and Germany's Tantalus Rare Earths to access rare earths in Madagascar is an example of our strategy to diversify resources.

Other of our other businesses, such as Acetow & Eco Services or Essential Chemicals, are essentially cash generators. We do not see huge growth opportunities, but we have a strong position. And then there are a couple of activities that are clearly cyclical, including vinyls and polyamide materials.



What place will cyclical businesses have in your portfolio? Is anything earmarked for divestment, perhaps vinyls? What does the future hold for polyamide?

J.P. Clamadieu: Although the new Solvay will not have a static portfolio, we feel under no pressure to do any streamlining short-term. In any case, before making divestment decisions, we have to be certain that we have the businesses in the right position. In PVC, we are clearly not there yet. Arkema's sale of its entire vinyls chain is not the type of deal we want to get into. To date, our polyamides business may not have returned the performance it should have, given our strong position. Improving our strategic position is certainly a goal here, too.

Will mergers and acquisitions play in shaping the new Solvay?

J.P. Clamadieu: We are looking at opportunities for bolt-on acquisitions here and there, and I think there are deals that can be done at any time. As regards more significant transformation, we are very busy integrating the two companies and we should first make sure everything is in place to deliver on our strategy. As soon as possible, however, we will be open to deals that might be bigger, more transformational, perhaps acquiring technology or specific access to some markets.

Is your new strategy focused on certain markets and regions? In which geographical areas do you see the most opportunities?

J.P. Clamadieu: Latin America – in particular Brazil – is very important. Both Solvay and Rhodia traditionally have strong positions there. Asia is well covered by both of the companies. China is obviously key because of the size of the market and the growth dynamic there. Korea and Thailand are also interesting. In India, we have a small position and are looking for opportunities to expand our presence. Russia, where Solvay has a €1 billion PVC project partnership with petrochemical giant Sibur, is also of considerable significance.

Considering the very different corporate cultures, what are the biggest challenges in integrating Solvay and Rhodia?

J.P. Clamadieu: It is true that the two companies developed differently in the recent past; however, looking at the overall picture I think our approach is in a lot of ways similar. We both have a strong industrial focus as well as a culture of responsibility and sustainability. Our integration teams have been working hard to understand any differences, but these are not as profound as some might imagine. Above all, we need to make sure that all of our 30,000 employees understand what the values of the new Solvay are and how they can contribute to our growth objectives.

How will the merger of activities affect the two workforces? Will there be any job losses?

J.P. Clamadieu: I have already said that there may be job reductions related to synergies. However, these will be limited and we expect to be able to offer a solution for a significant proportion of the affected employees to continue their career with us.

Earlier you mentioned the significant R&D resources of Solvay and Rhodia. Will any streamlining be done here?

J.P. Clamadieu: No, quite the contrary. We actually plan to spend more on R&D than the two legacy companies. In 2012 this should be about €240 million. Some 1,700 scientists work for us around the globe. We have a strong presence in Europe, with 40% of research concentrated in France because of the quality and the good conditions there. The overriding objective is to improve our ability to innovate, with an eye toward increasing EBITDA. Rather than looking for cost-saving synergies, our R&D goal will be to allocate sufficient resources to projects where we think we can make a difference. Solvay already has a strong position in organic electronics, in OLED technologies, to mention one field. We are also devoting considerable effort to biosourcing of starting materials and we are working on a major project to increase the output of oil wells.

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Antibiotics – Will Changes to Eastern Regulations Impact the West?

As companies continue to face ever-tightening budget constraints, many have turned to lower cost markets, such as China and India, as sources of active pharmaceutical ingredients (APIs). One therapeutic area that has seen much of its manufacturing transferred from the west to eastern facilities is antibiotics (see figure 1). In this respect, China and India have positioned themselves as leaders in the manufacture of materials for use in antibiotic products for many markets, including those in the US and Europe. As the number of manufacturers in China and India continues to grow, their respective regulatory bodies struggle to retain adequate oversight of their activities. With potential impacts of companies' activities ever more scrutinized, governments have made moves to curb environmental pollution to help ensure the continued efficacy of available therapies and come into line with western standards. The effects of the actions they undertake could impact the global marketplace.

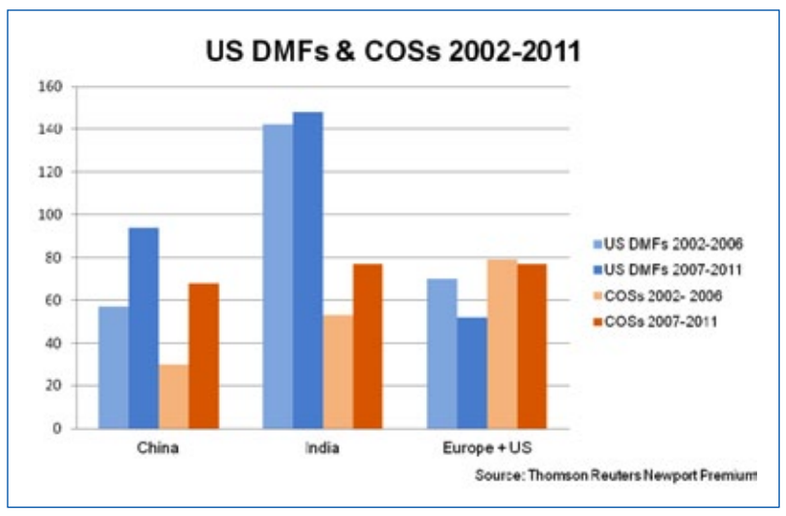

Fig. 1: Comparison of India, China, Europe and the US in DMFs and COSs for all antibiotics products over the last 10 years

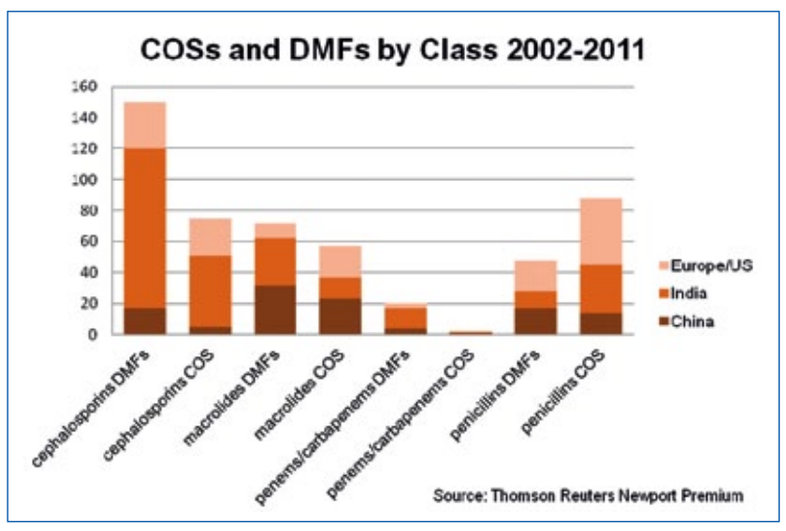

Fig. 2: Detail of US DMFs and COSs filed by companies in India, China, Europe and the US by antibiotic class

China, with its massive fermentation capacity, has become the top manufacturer of penicillin industrial salts in the world. Chinese suppliers are often able to offer these products at substantially lower costs than their competitors; this has led to decreased competition as many companies outside of China have reduced capacity or ceased production entirely. As a number of antibiotic products utilize penicillin salts as a starting material, any substantial change to the manufacturing landscape in China has the potential to impact API and finished dose (FD) prices for companies sourcing from China. The impact of this lack of reserve manufacturing resources, coupled with increasingly stringent regulations, was evidenced a few years ago, when a number of Chinese antibiotics producers were told to close their doors. The closures in China resulted in the price of penicillin G, a key intermediate for a number of antibiotics, including amoxicillin and a number of cephalosporins, tripling in a matter of months.

The Chinese government has reportedly imposed the strictest regulations to date, with sweeping changes being made not only to production standards, but also to antibiotic prescribing and consumption guidelines. The stricter Environmental Health & Safety (EHS) regulations implemented in China focus on several areas, including wastewater treatment. In traditional fermentation, like that of penicillin, vast amounts of wastewater are generated during production. Some of this wastewater is contaminated with antibiotic residue when it is released. The presence of these products in the environment has been linked with a growing global trend of antibiotic resistance. This poses a threat to public health as organisms exposed to this residue garner additional defenses, allowing them to defeat a growing number of treatments. Under the manufacturing regulations, plants unable to meet the specifications for things like waste water contamination are facing complete closure or costly upgrades to existing facilities. In 2011, Harbin Pharmaceutical Group, one of China's largest penicillin producers, was fined by the Chinese government for its continued pollution of the water and air in the surrounding area, resulting in a cessation of API production. The company signed an agreement to relocate the plant in 3–5 years.

The Indian government has also announced plans to require compliance with environmental regulations, though there appear to have been fewer actions to date. Late in 2011, Orchid Chemicals' cephalosporin plant was cited for improper disposal of solid waste. This citation resulted in a facility shutdown lasting for several weeks. Recently, several plants were closed by the Pollution Control Board for violations, but details had yet to be released at the time of writing. With many products being sourced from China and India at various points along the supply chain (See figure 2), API and FD prices worldwide could see significant effects as the costs impact manufacturers.

While the additional cost of compliance for manufacturers in China and India could impact prices, it might also provide incentive for western manufacturers to increase their production of these products. Historically, the excess capacity and lower labor costs in China and India have led to lower cost products. As labor and energy costs rise in both countries, and more non-compliant manufacturers are being shut-down, western manufacturers could find greater opportunities for these products. A number of manufacturers in Europe have recently made substantial investments in their European facilities for many therapeutic categories. Among them is GlaxoSmithKline who has said it will increase antibiotic production capacity at its Irvine, Scotland site to meet growing demand as part of a large scale investment plan in their UK facilities. As regulatory bodies look to implement stricter quality initiatives, this westward investment could become more prevalent.

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Page 20

Crisis Weathered – Opportunities Exploited

In Chemical Processes, Automation Systems Save Energy and Enhance Environmental Protection

Working Smarter – The Chinese word for crisis is made up of two ideograms, one meaning danger and the other opportunity. Automation equipment manufacturers were forced to deal with the financial fallout of the economic crisis. They also, however, seized the opportunity to maximize the user-friendly features, energy efficiency and integration of their new designs.

Automation technology is a major factor that drives industry forward. It was regarded in the past as a job killer, but it has turned out to be just the opposite. The automation industry generates employment inside Germany's borders. Many of the companies are SMEs, and they have succeeded in retaining their innovative edge. Suppliers have been taken on an economic roller coaster ride for the past few years, and the economic crisis has had a massive effect on the market. However, the industry is now well positioned again and ready to capture new markets. The year of crisis did not actually weaken the industry. Automation suppliers saw the crisis as an opportunity, and they are now even more responsive to the needs and preferences of users who are, of course, their customers.

To an increasing extent, IT has become a driving force in the development process. Globalization is another factor in the equation. German companies have a high export quota, making them very dependent on international political and economic developments. However, many automation suppliers are able to exploit that situation to their advantage.

Automation Systems Create Flexibility

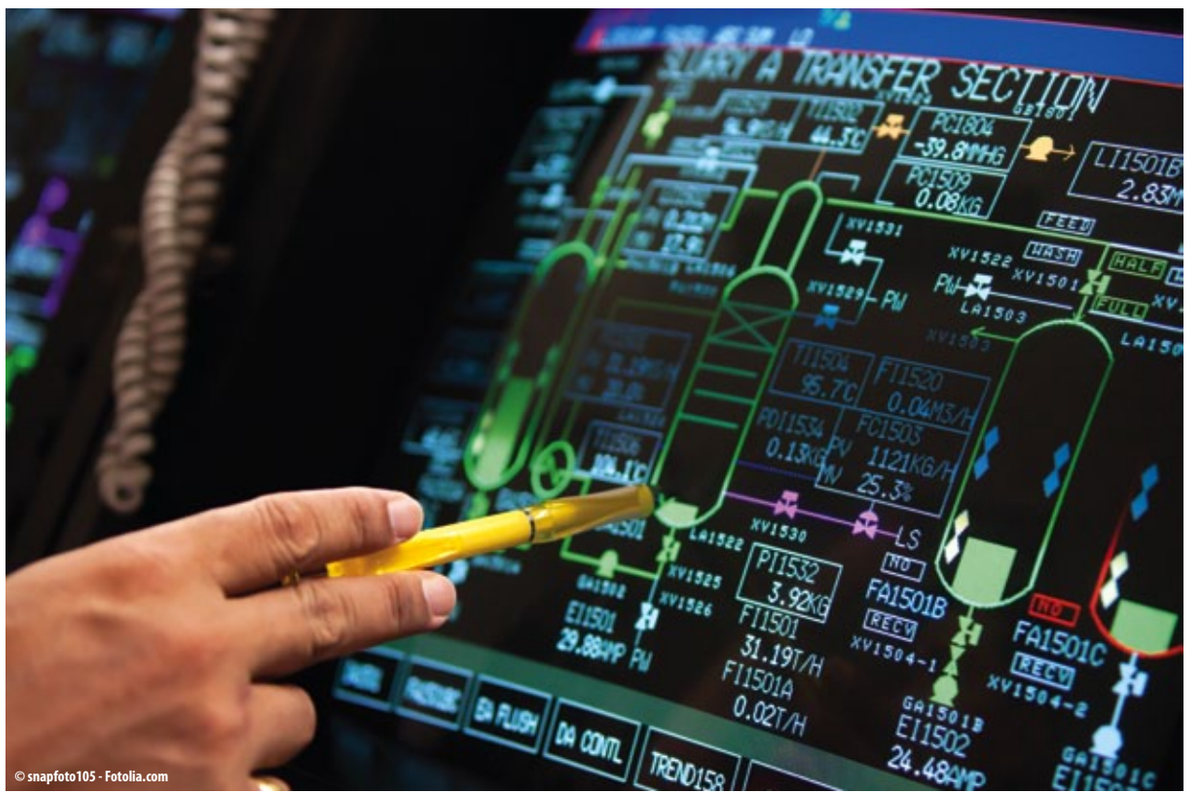
The manufacturing industry needs a great deal of flexibility to stay in step with today's market expectations. Automation engineering has taken on that challenge. Even out on the production floor, intelligent production management using tools such as lean production, production on demand, mass customization, global production management and supply chain management is no longer feasible without intelligent, adaptive automation systems. The increasing importance of automation system networking is also apparent. The traditional distinction between discrete manufacturing, process and building automation is becoming less and less relevant as the boundaries become blurred. Electromechanical, electrical and automation systems are more closely entwined. Intelligent power supply equipment is now integrated into automation networks, providing preventive maintenance information for controllers and SCADA (Supervisory Control and Data Acquisition) systems.

The role of engineering, design, planning, data management and service software as an information provider is also becoming increasingly significant. However, technology for supplying information in a data format that can be readily transferred from one automation device to another without programming effort is often still in its infancy. There is also work to be done to make the equipment more user friendly, and that is an area where there are plenty of opportunities for innovation. The earnings generated after the economic crisis now need to be invested in R&D.

Zeroing In On Usability

The goal of usability engineering is to eliminate complicated commissioning procedures, unintelligible HMIs (human machine interfaces) and guesswork when faults occur, all of which are high on the wish list of both users and suppliers. Intelligible operating instructions, online help and familiar-looking HMIs reduce the time needed to get systems up and running. Especially on time-critical applications when quick reaction to fault conditions is vital, products with a user-friendly design are particularly helpful. Intuitive operation saves a lot of time and, of course, money.

The human resource profile is also evolving. In the past, the system operators were highly knowledgeable, and many of them were trained technicians. Today, it is increasingly common for semi-skilled workers to be at the controls. The familiarization period is generally quite short. These operators need an HMI with good usability features, as they generally lack in-depth background knowledge. Manufacturers must keep programming effort to a minimum, and ideally most of the machine/system operation should take place at a graphical user interface. Here again, there is a wealth of untapped potential that needs to be analyzed and exploited.



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Process Control Systems and SCADA Drive Development

Process control systems and SCADA are another major factor in the field of automation engineering. Estimates published by IMS Research indicate that the world market for process control systems will reach $17.2 billion by 2014. IMS reports that most of the growth will be centered on the energy, oil and gas, and water and wastewater industries. IMS expects growth in this sector alone to be in the region of $1.5 billion, and it is important to note that these systems are being deployed to an increasing extent outside the manufacturing industry. The increasing popularity of smart grid applications is also creating growth opportunities in the industry.

The trend toward greater energy efficiency generates additional momentum for process control system and SCADA suppliers. State-of-the-art process automation equipment is ideally suited to produce savings and reduce the environmental effect in energy-intensive industries. According to a study carried out by ZVEI (German Electrical and Electronic Manufacturers Association), intelligent automation systems can reduce energy consumption by between 20% and 25%. Figures put together by the association indicate that intelligent data acquisition, process automation and electrical drive technology could cut the amount of energy used on German industrial production lines by 88 billion kWh, which is equivalent to an annual reduction of 43 million tons in CO_2 emissions. Broad-based deployment of energy-efficient automation technology could reduce industrial CO_2 emissions in Germany by 11%.

ACHEMA

World Forum of the Process Industry

Achema is the world forum of the process industry and the trend-setting technology summit for chemical engineering, environmental protection and biotechnology. The 30th Achema to be held June 18–22 in Frankfurt, Germany, will again be the leading international meeting point for decision-makers and experts from all related industries. Visitors at this year's Achema will have the opportunity to take a firsthand look at the wide spectrum of automation systems that are currently available.

▶ www.achema.de

Ongoing Advances in IT and Internet Technologies

A Chinese proverb says that one generation builds the street on which the next will walk. This is a good way of describing the automation engineering development path. From 1999 to 2002, introduction of IT and Internet technology had a major influence on the industry. In the meantime, Ethernet in all of its incarnations has taken its place beside fieldbus systems as a standard networking platform, and Internet technologies (e.g., on-board web servers in automation equipment) have become the norm in many applications. As a result, an increasing amount of attention is being directed at the familiar security issues that affect the IT world as well. More work is needed on IT security, and this also creates development opportunities. In the control system space, we are seeing a remarkable convergence between industrial PCs and Soft PLCs (programmable logic controllers) and embedded controllers. Functionality commonly provided in the IT world such as integrated web servers, database connectivity and file functionality is now often available on embedded PLC systems. These developments also help boost efficiency.

Conclusion

Automation systems have become indispensable in many areas of our lives, and the development trajectory continues. Energy efficiency, user-friendly design, advanced communication capabilities and system networking have attracted an increased level of interest and discussion. The automation industry is a major factor in the German economy, and it has retained its importance in the country's industrial landscape in the wake of the economic crisis.

This article is based on a trend report compiled on behalf of Dechema Gesellschaft für Chemische Technik und Biotechnologie (Society for Chemical Engineering and Biotechnology), Frankfurt am Main, Germany.

▶ www.dechema.de

chemanager-online.com/en/tags/automation

Ineos May Divest Two HDPE Plants

Following a recent strategy review, Ineos Olefins & Polymers Europe said it may divest its HDPE production facilities at Rosignano, Italy and Sarralbe, France to focus on highly integrated sites.

The facilities, each with capacity to produce 200,000 metric tons per year, are not back-integrated to a cracker. They were acquired from BP with the Innovene business in December 2005. Since that time Ineos has improved the performance such that today both sites are highly "cycle-resistant" producing a sophisticated range of differentiated polymers with reliability and cost leadership.

Both sites are described as profitable, cash generative and highly cycle-resistant, producing a sophisticated range of differentiated polymers. Ineos also produces HDPE at Lillo, Belgium, and Lavera, France.

Learning From The Cliff

◀ Continued Page 1

How much consulting work does NNE Pharmaplan do when it comes to advising companies on location?

S. Berg: This is the heart of our business. For us, this can entail evaluation of sites, evaluation of productivity, etc. We also advise on what elements should be maintained and what should be changed as well as the cost of each route. We also provide risk studies and the occasional investment feasibility forecast.

The Russian government is currently pumping a lot of money into its fledgling pharma industry and enticing many Western companies to start greenfield projects there. Do you see this kind of phenomenon elsewhere, too?

G. Mølgaard: Russia is certainly the country that is the most direct about it. They want companies to do real manufacturing there, not just packaging. And this is starting to spread: Other emerging countries are starting to also request companies to be there locally. On the other hand, some companies prefer to go into emerging countries with their own manufacturing as a way of circumventing counterfeiting.

That's not the case in India, where they are very protective of their domestic pharma industry. Do Western companies who want to get into the Indian market with a facility have more difficulties than in other places?

G. Mølgaard: In order to get into India, it's easier to enter into partnerships with Indian companies. However, the government there is currently reconsidering its legislation.

Do you also work together with local companies or enter joint ventures?

S. Berg: We're not constantly entering joint ventures, but our local partners are extremely important. We need local partners in order to provide local knowledge, information about regulations, etc. Also, sometimes we simply need to be able to provide enough resources locally in order to staff a project. There are manifold reasons to cooperate with local partners on a project basis. At the same time, it is always important for us to be independent. The customers must recognize us as an independent partner who works on their behalf.

> *We're seeing a lot of innovation coming out of emerging markets.*

Going back to China: It can be very difficult for a western company to put steel in the ground there. What does NNE Pharmaplan do to make that easier for companies to really get in there with a facility?

S. Berg: We want to be where our customers are. Over the last several years, it was clear that there would be a lot of growth in China, so we began to build up our presence there about 20 years ago. We now have four offices in China with a total of 400 employees, most of whom are locals. No matter where we are in the world, our strategy is to be local while using global knowledge.

So you predict where the industry is shifting before it actually moves?

S. Berg: Yes. It is not unusual that multinational company investments are launched in Europe or the U.S. with China being the final destination. It is of benefit when we can start with our customers in Europe – creating the basic concept, etc. – then transfer the project to China or India. Therefore, it's good to be in both places, like the customer is or wants to be, and manage this cross-country transfer of the project.

But this doesn't just apply to emerging markets. Our strategy is to be where our customers are; for instance, we recently opened a new office in Belgium, because we see that country as a pharma cluster. We also just opened our first office in Brazil at the end of last year.

What other regions are on the up and up?

S. Berg: We have a strong reputation in Korea, for instance. We are also seeing more and more projects in Indonesia. Of course, time will tell if these become booming areas or not.

> *This is truly the end of the blockbuster era.*

Some shifts, such as to China, India or Russia, are obvious. But as an engineering company, you always have to be one step ahead of the game. Do you consider this kind of strategy to be something of a gamble?

S. Berg: No, it is not a gamble, but we have to be early. The early bird catches the worm, so we obviously strive to be the early bird.

G. Mølgaard: Exactly. Nowadays, as you said, the shift to the East is obvious. But as I said before, we've been in China and Russia for almost 20 years and in India for 15 years. We are thinking ahead, but I really don't think we are gambling. We typically move into a particular region as a reaction to a customer request. Our offices in Belgium and Brazil are perfect examples of that. Local customers wanted our knowledge locally.

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Achema 2012: hall 9.1, booth E4

So if we meet up again in 2032, you'll be able to say that NNE Pharmaplan has been in country XY for 20 years, because you recognized the trend in 2012?

S. Berg: Yes, absolutely.

chemanager-online.com/en/tags/nne-pharmaplan

Quantifying the Impact of Humidity on Powder Properties

New experimental data demonstrates how dynamic, shear and bulk powder testing can be applied to quantify the impact of humidity on powder behavior, supporting the need to develop effective strategies for moisture control and process optimization.

Of the many factors that influence powder behavior, moisture, or humidity, is perhaps one of the most instantly recognized and potentially one of the most problematic. Adding even small amounts of water to a powder can transform its properties. The challenge for formulators and process engineers is to understand the extent to which a powder will take up moisture and, more importantly, how this will affect the powder and its performance.

The white paper explores the impact of humidity through the application of dynamic, shear and bulk property testing using Freeman Technology's FT4 Powder Rheometer. Together these techniques reliably quantify how powder behavior changes as a result of moisture uptake, providing the comprehensive insight needed to develop effective strategies for moisture control and process optimization.

Experts from Freeman Technology will be available to discuss the humidity work or any other aspect of powder testing and its role in process optimization at Achema 2012, hall 4.2, booth F62.

▶ www.freemantech.co.uk

RFID For Product Tracking

Optel Vision is presenting its Track Safe, an advanced track and trace system at the Achema. In order to comply with the existing and upcoming anti-counterfeiting regulations, Optel Vision has developed a new technology allowing product tracking at each packaging level, from the unit to the pallet. The Track Safe suite is a modular solution that addresses the manufacturers needs on their packaging lines, warehouse and distribution centers (DC). The resulting serialization data is the first piece of information to allow tracking and tracing of the products through the entire distribution chain. The system can be adapted to all packaging line configuration. This serialization solution allows radio frequency identification (RFID) technologies in lieu or in support of the printed serial number, also called Electronic Product Code (EPC). The RFID encoding offers a supplemental support to identify and read the EPC information through the distribution chain. RFID tags use a passive technology allowing them to be read and programmed on demand without any physical contact or without seeing it. The outer portion of the RFID is used, as an antenna while the middle portion is the programmable chip. The RFID does not have a battery. It gets its power by induction from the external antenna microwave. The Optel Vision Track Safe solution supports RFID encoding from item to pallet level including the turnkey delivery of all encoding and decoding setup as a labeler web antenna, bundle and case aggregation tunnel, bundle, case and pallet RFID label coding and manual RFID scanning station. Optel Vision recommends utilizing the RFID as a secondary carrier on the packaging line, the EPC is first printed within a 1D or 2D barcode and the RFID tag is then programmed with the same unique EPC.

▶ www.optelvision.com

New Standardized Chemical Pump

At this year's Achema in Frankfurt, the KSB Group will debut the latest generation of its standardized chemical pumps. In technological advances, the MegaCPK type series convinces with a high output per size and very low energy consumption. It is an advanced version of the internationally successful CPK, CPKN and Megachem type series.

At identical operating conditions users can select much smaller pump sizes compared to conventional types of standardized chemical pumps. With its improved hydraulic system, MegaCPK nonetheless achieves considerably higher efficiencies.

The use of high-quality mechanical seals and casing gaskets in manufacture and minimal axial thrust contribute to the pumps' long service life and low life cycle costs. A wide range of materials and mechanical seals accommodate for the most diverse customer requirements and applications.

Manufactured at production sites in Europe, Asia and South America, the new type series is integrated in a production and service network which offers a high level of availability for owners and operators.

▶ www.ksb.com

21st Century Cleanroom Technology

Cleanzone: First Standalone Trade Fair and Congress for Cleanroom Technology

Save The Date – There is a new date on the industry's calendar to remember: on 24 and 25 October 2012, the very first Cleanzone will be taking place in Frankfurt/Main. This specialist trade fair and congress for cleanroom technology offers a comprehensive overview of every step in the process, from planning and constructing a cleanroom to the operation of these controlled, contamination-free workplaces.

"Cleanroom technology is increasingly important not only in international research and development, but for countless industrial applications as well. With the establishment of Cleanzone, we have responded to the growing demand by providing this key technology with its first standalone platform," states Klaus Reinke, member of the management board of Messe Frankfurt Exhibition GmbH.

The event's objective is to offer the industry an ideal venue for establishing new collaborations, increasing expertise and presenting the latest technological developments, which is why Cleanzone will be bringing the relevant sectors and interdisciplinary operations together for two days in Frankfurt.

Exhibitors at the trade fair include the manufacturers of cleanroom facilities, technology, construction components and associated consumables, for example, as well as the universities and technical colleges whose achievements are helping to shape the future development of cleanroom technology. A congress taking place alongside the trade fair will foster the communication of independent scientific knowledge.

Cleanzone visitors are decision-makers from the fields of chemicals, medicine, and pharmaceuticals, the food sector, nanotechnology, optics, laser technology, microelectronics, and the automotive and aerospace industries. The future of cleanrooms Before Cleanzone, cleanrooms were dealt with almost exclusively as part of related industry events, yet the number of fields in which this technology is applied is increasing markedly. Cleanrooms are now being used ever more frequently in the production of high-tech goods and foods, life science applications and many other specialized industrial sectors. Standards for product quality and hygiene are rising around the globe, driving the demand for controlled production environments. Ever since innovations made it possible to create miniaturized cleanrooms and complex cleanroom technical facilities, more and more small- and medium-sized enterprises have been making profitable use of these pioneering technologies.

As a result of this positive development, Messe Frankfurt was called upon to create an independent platform for the industry, so it is no surprise that Cleanzone's debut in October 2012 enjoys the support of renowned experts in the field: Reinraum-Akademie, as a marketing and content partner for content consultation and the development of the congress programme, VDI-Gesellschaft Bauen und Gebäudetechnik (Association of German Engineers – Construction and Building Technology Division), the International Confederation of Contamination Control Societies (ICCCS) and the German Cleanroom Institute (DRRI). Media partners include the trade journals ReinRaum Technik, Contamination Control Report and Reinraum Online among others.

More information is available online: www.cleanzone.messefrankfurt.com

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chemanager-online.com/en/tags/cleanroom

Water Instead of Solvent – For the Sake of the Environment

The motivation for the research project came of the lacquer-manufacturing industry. The target of the research project was the development of a new maximum pressure technology for the cleaning of industry bins that with strongly adhering materials were dirty.

Without the application of chemical additives the residue-free cleaning of production reservoirs was not realizable. But the employment of chemicals connoted large dangers for the health of humans, animal and environment.

The target of these project was the cleaning without employment of chemicals; water by maximum pressure, picture analysis system for the cleaning control, filtration and processing of the rinse water in combination with integrated control engineering is the solution.

A closed housing in which the whole complex mechanics of the delivery, cleaning, cleaning control was therefore developed. A new water cycle with pump station was also developed. Both developments comply with law of the occupational health and safety and of the environmental safety guidelines.

▶ www.ape-porta.de

Heat Recovery Saves Energy and Minimizes Costs

Compressor operators have a distinct advantage when it comes to reducing energy consumption and costs, because the savings are already there for the taking. The key to this potential 'gold mine' lies in heat recovery – up to 96% of the compressor drive energy remains available for reuse as heat.

100% of the drive energy fed to a compressor is converted into heat. Air- and fluid-cooled rotary screw compressors are the best-suited compressor technologies for efficient heat recovery. Some 76% of the energy consumed by these compressors is transferred to the cooling fluid as heat and is in turn extracted in the fluid aftercooler. A further 15% of this energy can be recovered as heat via the compressed air aftercooler. Up to 5% of the energy however is radiated away as a result of heat loss from the electric motor. Fully-encapsulated rotary screw compressors can use targeted cooling to recover this energy. Therefore, 96% of the electrical drive energy can be reused for heating purposes. Only 2% of the energy is lost as radiant heat and 2% remains as heat in the compressed air.

The most efficient and also the simplest method of heat recovery is to directly use the cooling air that has been heated by the compressor. Air ducts feed the warmed cooling air into store rooms or workshops. If there is no heat demand then the surplus heat is simply released to atmosphere via a damper or louvres. Thermostatically controlled, motorized dampers control the flow of warm air to maintain consistent room temperatures. In addition to providing heating or heating support, the recyclable energy can also be used – for example – to aid drying processes, to create hot air curtains, or to preheat burner combustion air for heating systems. The associated investment costs are often amortized within a year.

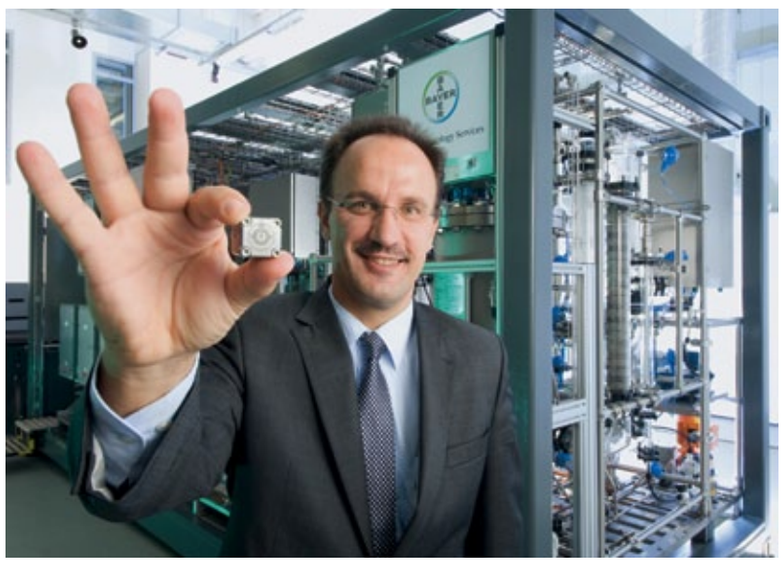
Even if only one rotary screw compressor is being operated, the implementation of a heat recovery system can considerably reduce energy consumption and costs. By replacing the original energy source with reusable heat from the compressor, a 15kW machine (operating for 1,000 hours) can save around €790 in fuel oil or around €740 in natural gas each year.

▶ www.kaeser.com

Future Manufacturing Concepts

German Consortium Offers Solutions for Innovative and Resource-Friendly Production Processes

Technological Transfer – The UN-Year 2012 is themed "International Year of Sustainable Energy for all" and focuses on the reduction of global energy consumption by about 40% until 2030. In order to reach this ambitious goal, resource and energy efficiency in production technologies can make a significant contribution, Dr. Thomas Bieringer is convinced. The physicist is the managing director of Invite, a research organization which was established as a German private public partnership between TU Dortmund and Bayer Technology Services. Invite is one of five members of the cluster FuMaChem (Future Manufacturing Concepts in the Chemical and Pharmaceutical Industry). The consortium offers complete solutions for innovative and resource-friendly production processes. FuMaChem's goal is to introduce these abilities and technologies to an interested audience in Asia, an approach which the German Federal Ministry of Education and Research (BMBF) supports within the campaign "Leading Ideas for Green Production – Green Production Technologies". Dr. Thomas Bieringer talks about the concept behind FuMaChem.



Dr. Thomas Bieringer, Managing Director, Invite

CHEManager Europe: Dr. Bieringer, which contribution could innovative production processes make to fulfill global sustainability goals?

T. Bieringer: About 20% of the global greenhouse gas worldwide emission is caused by industrial production. In particular, the German industry is strongly committed to a reduction of greenhouse gas emission. Since 1990, the chemistry sector has increased productivity by 42%. But at the same time total energy consumption was reduced by about 33% and absolute greenhouse gas emissions was almost cut by half. Here, growth and energy consumption are decoupled. This can only be achieved using new technologies!

From your point of view, how can the development of innovations be stimulated? What levers do we have at our disposal?

T. Bieringer: Germany is a leading nation in developing cutting-edge technologies in the field of resource efficiency. These technologies can help solve global problems. But in order to achieve this, they must be able to develop and be made more widely known, and that's why it's so important to boost the transfer of knowledge.

Could you describe how FuMaChem pursues this approach?

T. Bieringer: FuMaChem is a roadshow which we use to demonstrate German solutions in the field of resource-friendly production processes in high-growth countries like China, India and Singapore as well as to articulate our future visions. We don't want to do research in quiet seclusion, but to open up our laboratories and to get every stakeholder involved. Thus, we want to emphasize where we are able to make contributions to a more sustainable economy.

What do you think is the relevance of the topic "energy and resource efficiency" in China, which is the most important target country for the cluster FuMaChem?

T. Bieringer: It is essential that all countries collaborate on this global issue. The first thing which caught my eye when I arrived in Shanghai was a poster with the slogan: For a green future. So, acting in an energy and resource efficient way is very important for China, too, and the five-year Plan of the Chinese Government is clarifying this as well.

Invite works on new sustainable production concepts for a "Factory of the Future". In this context, the production of pharmaceutical substances, among others, is to be optimized. Are there any significant differences between the "Factory of the future" and the "Factory of the Present"?

T. Bieringer: The established processes will continue to be massively improved. But beyond that, completely new technologies will be adopted in some fields. Take, for example, our production containers for small- and medium-scaled production. Our containers consist of individually manufactured modules and in these modules chemical reactions are carried out. What we offer is a modularized and standardized concept similar to a LEGO-kit. The container is the platform and the bricks are the modules which you can put into the container, quite flexibly creating different products.

On the one hand this approach has technical benefits because now, by using our special so called process-intensified production, we are able to carry out chemical reactions that are difficult or even impossible to realize using conventional processes. On the other hand there are ecological advantages, e.g. because with this technology you need less solvent and generate fewer by-products. In addition, this technology offers economic advantages, because it requires less capital to build and to operate those standardized plants. We also think that with this new technical approach we can reduce the product development time significantly. Last, but not least, container-format production facilities open up completely new possibilities for flexible reaction with regard to individual requirements or capacities.

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chemanager-online.com/en/tags/resource-efficiency

Agilent to Pay $2.2 Billion for Dako

In a move to expand its life sciences business, California-based electronics testing equipment manufacturer Agilent Technologies, a 1999 spin-off from Hewlett-Packard, will pay $2.2 billion in cash to acquire Danish cancer diagnostics company Dako from Sweden-based private equity group EQT.

The deal is due to close in two months. Agilent produces tools that measure voltage variation, analyze chemical compounds and vacuum pumps. It also has a sizeable life sciences business that contributed about a third of its 2011 revenue of $5.58 billion. Dako, a provider of reagents and instruments for cancer diagnosis to pathology laboratories, is active in more than 100 countries and had 2010 annual revenue of about $340 million. ■

Bacteria Synthesized Nanocellulose

Nanocellulose (BNC) is a very high-quality biopolymer that can be obtained from sugar in a single step. It has a lot of advantages compared to organic cellulose or synthetic polymers. Because of its excellent properties, nanocellulose offers a vast range of applications, in (bio) medicine as well as in other technical fields. The applications range from wound dressings, via products for cosmetics and food industry to technical applications as membranes or filter systems.

EPC Engineering Consulting and its partners, the Friedrich-Schiller University Jena and Polymet Jena e.V. developed a new process and a new system for continuous production of bacteria synthesized nanocellulose (BNC). With this system, a world-wide technological breakthrough has been reached by producing the biopolymer nanocellulose in planar form for the first time in continuous process. In 2010 this breakthrough won the 13th Thuringian Innovation Award in the category "Industry and Material".

Nanocellulose can be used as a natural carrier for a variety of products in cosmetics. In medicine, the BNC fabric can be processed to normal wound dressings as well as "active anti-microbial wound dressings." Compared to conventional wound dressings, wound dressings with nanocellulose offer a lot of advantages regarding the healing time of burn wounds and the regeneration of the own body tissue.

The outstanding properties and advantages of nanocellulose:

- high purity (it is free of lignin, hemicellulose and pectin)
- high mechanical stability and chemical resistance
- high tensile and tearing strength (mechanical properties of single fibers comparable with Kevlar or steel)
- temperature-resistant up to 300 °C
- very large internal surface and uniformity thanks to the nanofibre network
- nano-fiber network is also accessible for liquids, ions and small molecules
- high water absorption and retention ability
- outstanding adsorption and desorption behavior
- usable in moist and/or dry condition
- edible, bio-compatible, biologically degradable
- wound dressing -> prevention of wound infections, healing of infected wounds and burns (active -> antimicrobial, biological)
- variable properties (in situ or post modification)
- increase of flexural strength and elasticity of synthetic polymers
- versatile modification possibilities

▶ www.epc.com

"BIOTechnikum. Investigate life – design the future"

'BIOTechnikum. Investigate life – design the future' – with this initiative the Federal Ministry of Education and Research is bringing biotechnology closer to the people, in the truest sense of the word. This campaign, as part of the Federal Government's High-Tech strategy, is travelling Germany since autumn 2008 to supply information on the latest biotechnological research conducted and results achieved in Germany as well as to highlight career opportunities and encourage budding scientists. The central information and dialogue platform for this venture is the mobile experience world BIOTechnikum, a double-decker vehicle containing a complete laboratory infrastructure accompanied by a multi-media exhibition.

21st Century Technology

Biotechnology is not just one of the most dynamic fields of science and one of the most innovative sectors of business, it also affects every one of us in our everyday lives, whether in health and nutrition, in agriculture or in production and conservation. Three worlds form the core themes of the initiative 'BIOTechnikum. Investigate life – design the future'. It demonstrates the connection between research, on the one hand, and the development of new products and procedures, on the other, along biotechnological value chains. It aims particularly at school pupils, budding scientists, the general public as well as companies with an affinity for biotechnology.

To enable the initiative to reach this target audience directly, the mobile experience world BIOTechnikum is touring Germany. This double-decker exhibition vehicle will be calling at such venues as schools, universities, research institutes, science nights, trade fairs and other major events.

▶ www.biotechnikum.eu

Single-Use Mixer for Biopharmaceutical Processes

Mixing is a critical operation within biopharmaceutical processes for many applications ranging from buffer and media preparation to final formulation. The Allegro single-use mixer is part of Pall's expanding range of products and services providing integrated process solutions throughout the drug production process. The mixer combines critical requirements for single-use technologies, such as extreme ease-ouse, with established criteria for robust engineering principles for mixer design to deliver the ultimate in mixing performance.

The mixer bag film is the same as standard Allegro 2D and 3D biocontainer products – Pall provides consistent materials of construction for systems used anywhere from small scale preclinical to full scale production batches, reducing the burden of validation and requalification.

▶ www.pall.com

A Call for More Collaboration in Industrial Biotech

An Increasing Exchange of Knowledge and R&D Results Would Benefit the Entire Industry

Industrial Biotech – The growing shortage and rising price of fossil energy has increased interest in finding economically attractive replacements that draw on biotechnology. Rising awareness of the environmental impact of fossil fuels and other chemical pollutants has also boosted demand for less problematic, biological solutions.

Dr. Gottfried Freier
Partner, Kaye Scholer

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Accordingly, many small companies – often academic start-ups or subsidiaries of big chemical companies – are actively researching and developing alternative energy solutions, such as pioneering algae-based technologies that absorb carbon emissions and creating biofuel from sugar cane. This situation resembles the R&D surge in the pharmaceutical industry about 20 years ago related to the then-emerging "red" biotechnology. For the most part, these small companies do not expect to establish or operate fully integrated enterprises with all of the attendant functions, such as R&D, production, marketing and sales. Rather, they strive to develop new technologies to sell or license to one of the big players, often traditional chemical and petrochemical companies.

Collborative agreements have long been the mainstay of the biotech industry when it comes to technology transactions. Because these agreements typically require the buyer to make considerable payments for the acquired or licensed technology, most provide for a three-tier payment structure and for back-loading a large part of the consideration the buyer has to pay. At the first tier, the buyer is often expected to pay a large upfront fee, or the mere granting of access to an innovative technology. Such fee is usually not refundable, or refundable only in exceptional cases. Second, buyers must also provide "milestone payments," due upon achievement of a specified event in the ongoing development of a project. Such events may include successful tests, reaching certain sales figures or launching the product in new markets. The final pillar of the consideration structure used in such technology transactions is often a sales-based royalty. Despite the complex payment structure used in this type of agreement, the pharma and biotech communities have, over the years, accumulated comprehensive expertise in the use of such sophisticated long-term collaborations.

Creativity in Deal Structuring

Beyond the "traditional" bilateral collaborative agreement described above, a collaboration among three or more parties presents even more challenges, requiring greater creativity in deal structuring. This "creativity" is particularly important in arrangements involving five or more participants, where each contributes to the project in their respective area of expertise. Sometimes, academia, nonprofit organizations, public or governmental institutions, and project coordinators are part of multi-partite collaborative agreements.

The requirement for broad, diverse and complex cooperation models pushes business developers and lawyers to be creative in devising the corresponding contractual structures.

However, in the industrial biotech and alternative energy arenas collaborations and resulting deal flow still seems pretty limited. Big industry players are in large part refraining from any collaborations, restricting themselves to fee-for-service arrangements or simply acquiring the biotech "partner". Why?

Certainly the industrial biotech industry is dominated by big chemical multinationals with gigantic R&D in-house resources. These huge corporations tend to view small industrial shops as insignificant. In addition, the "not-invented-here" syndrome, as well as trade secrets concerns, may play a greater role in the chemical industry where unregistered, always jeopardized know-how (rather than patents) plays a bigger role than in pharma.

Another possible reason for the lack of collaboration between big chemical and small biotech may be that the small companies feel unable to bargain with the much bigger partner, and "big chemical" does not do anything to disprove that perception.

Improving the Level of Valuable Cooperation

The problem with each of these scenarios is that, in agreeing to a fee-for-service or low-level supply agreement, the biotech companies may actually be ensuring that their deals come in well below value. Were small biotech companies to capitalize on their strengths to achieve better deals, the level of valuable cooperation between big chemical and small biotech companies might similarly improve, with deal flow ultimately increased as well. As an increasing exchange of knowledge and R&D results would also benefit the entire industry, big chemical should also be interested in letting biotechs enjoy their fair share. In any event, the tool box containing all approved and tested instruments for suitable deals is ready to be used.

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▶ chemanager-online.com/en/tags/biotechnology

2012 Facility of the Year Awards

The Facility of the Year Awards (FOYA) program, sponsored by the International Society for Pharmaceutical Engineering (ISPE) is the pharmaceutical industry's premier awards program dedicated to celebrating innovation and accomplishments in facility design, construction, and operation. The program recognizes state-of-the-art pharmaceutical manufacturing projects that utilize new and innovative technologies to enhance the delivery of a quality project, as well as reduce the cost of producing high-quality medicines. Five Category Award Winners and one project for Special Recognition in the 2012 FOYA program were announced earlier this year and presented at the Interphex 2012 trade show and conference, held 1–3 May in New York City. The winning projects are located in Germany, India, Ireland, Italy, and the USA. The winning companies and respective award categories are:

- Chiesi Farmaceutici, winner of the Facility of the Year Award for Sustainability for its Chiesi Farmaceutici Research and Development Centre facility in Parma, Italy
- Eisai Pharmatechnology & Manufacturing, winner of the Facility of the Year Award for Project Execution for its Eisai Knowledge Centre facility in Visakhapatnam, Andhra Pradesh India
- Merck & Co., winner of the Facility of the Year Award for Facility Integration for its Merck Vaccine Bulk Manufacturing Facility (VBF) Program of Projects in Durham, North Carolina USA
- Rentschler Biotechnologie, winner of the Facility of the Year Award for Equipment Innovation for its REX III manufacturing facility in Laupheim, Germany (picture)
- Roche Diagnostics, winner of the Facility of the Year Award for Operational Excellence for its TP Expand project in Penzberg, Germany
- National Institute for Bioprocessing Research and Training (NIBRT), winner of the Facility of the Year Award Special Recognition for Novel Collaboration for its New Greenfield facility in Dublin, Ireland

© I+0

"Our 2012 Category Winners reflect the true spirit of the Facility of the Year Awards program," said Judging Panel Chairperson Chaz Calitri. "The winning projects exemplify innovation in pharmaceutical manufacturing for the benefit of patients all over the world, who depend upon us for medications that are high quality, available and affordable. Our winners come from 5 different countries and include novel, low cost biologics facilities, creative and visionary industry-academia-government collaborations, and hyper-fast track investments made to ensure vaccine's get to patients in need. We are also proud this year to recognize facilities that seek to speed up drug development as well as facilities that greatly reduce the environmental 'footprint' of manufacturing in the communities in which they reside."

The Facility of the Year Awards program is truly global, as submissions over the past eight years have been received from more than 25 different countries and territories. Each of the submissions was reviewed by an independent, blue-ribbon judging panel consisting of global senior-level executives from all aspects of the industry. The judging panel met personally in December 2011 to select the Category Awards Winners and select the 2012 overall winner, which will be announced at ISPE's Annual Meeting in November.

At the Interphex 2012, attendees were able to meet the Category Award Winners. Team members from winning companies were on-hand to discuss the success stories associated with these pharmaceutical manufacturing facilities. Category Winners will also give presentations about their winning projects during ISPE's 2012 Annual Meeting, 11–14 November in San Francisco.

▶ www.ispe.org
www.facilityoftheyear.org

Protection for Products and

Sophisticated Anti-Counterfeit Identification and Packaging Solutions Are Needed,


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The Real Thing – Copies, fakes and imitations pose a problem for nearly every segment of industry. Counterfeiting is booming. Imitations are not just a problem for consumers. Wholesalers and retailers as well are often victimized by sophisticated organized crime networks that produce and distribute counterfeit products.

A few industries have already set up organizations to combat product counterfeiting. The pharmaceutical industry is one of them. Few counterfeit products can have such serious consequences for consumers as imitation pharmaceuticals. Quite apart from the financial losses incurred by the companies involved, counterfeit drugs represent a danger to consumer health. The list of risks includes inefficacy, harmful substances and over or under dosage of the active ingredients.

The World Health Organization (WHO) has created the International Medical Products Anti-Counterfeiting Taskforce (IMPACT) which is attempting to bring nations together in an effort to stop the production, trade and sales of imitation pharmaceuticals. One task force working group is looking specifically at international standardization of product marking. Until uniform worldwide standards are in place, marking technology suppliers are being asked to come up with anti-counterfeiting strategies.

Existing Identification Techniques

As is the case with any other commercial item, identification features on pharmaceuticals are used for product authentication and to deter counterfeiters. Identification methods that are difficult to reproduce create enormous difficulties for imitators, and the costs involved in making copies are considerable.

There is a wide variety of identification techniques, from very simple to high-tech. Identification features can be added in different places including various parts of the packaging or on the product itself. Anti-counterfeit identification technology is divided into three main categories:

- Overt (open/visible) technologies
- Covert (hidden) technologies
- Forensic techniques

Overt marking provides basic product identification information for consumers, knowledgeable professionals and customs agents. It is generally highly visible on the product. In the case of pharmaceuticals, the marking is applied to the vial or folding carton, and imitating it is difficult and costly. Examples include holograms, which may contain customer-specific designs. Optional hidden features that are admissible as evidence in court provide added counterfeit protection.

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Color shift ink as well as security ink and foil that change color depending on the viewing angle belong in this category. The ink and pigments are available only from certain manufacturers, which is an additional security aspect.

Marking on the product itself, for example a tablet, is an overt technique. It provides a certain level of security, because imitating tablet dies is costly and time consuming. In addition, color shift ink can be applied directly to products such as coated tablets to produce changing colors. This provides protection against product substitution later on. Slanted corners or similar features can be added to the packaging to differentiate it from standard versions.

Security graphics created by printing fine lines, micro text or images similar to what you see on banknotes combine overt and covert design features such as guilloches, grids and line embossing. Printed using standard offset lithography, they may be used as a background or placed in a less conspicuous location. Overt features provide protection, however, only if dealers or consumers are aware of their significance.

Partially hidden markings straddle the boundary between overt and covert technologies. Examples include thermo-reactive printing that changes color as a function of temperature. Pressing a finger on the color field is sufficient for immediate authentication.

Hidden Product Validation Identification

Hidden markers are used among other things to enable brand owners to identify counterfeit products and remove them from circulation. Only the manufacturer should know the exact details of the markings. Consumers either do not notice them or are unable to verify their authenticity.

This marking category includes such things as printing with invisible ink, which can be applied to virtually any product or packaging. The printing is visible under UV or infrared light and may fluoresce at different wavelengths and in different colors. Invisible images, which appear only when a special filter is used, can also be produced. Other options include the use of special fluorescent fibers, watermarks, metal threads, scents or chemical reagents in the product packaging. The printing can also be designed in such a way that it cannot be copied.

Application of digital watermarks is one of the more complex methods. To verify authenticity, readers and special software are used to recover data that is digitally encoded in the watermarks. Laser coding is also complex and cost intensive, but that is precisely what makes it a very secure type of anti-counterfeit identification.

High-Tech Methods Provide Almost Total Security

Strictly speaking, forensic identification belongs to the covert category. Special equipment is needed to detect the markers, which are not visible to the naked eye and cannot be found using simple analysis techniques.

This category includes various types of taggants. Chemical taggants and marking with isotopes in defined ratios, which can only be detected with highly specialized reaction and analysis techniques, are one example. Biological and DNA taggants are another possibility. Minute amounts added to the product formulation or packaging are sufficient for identification. Highly sophisticated analysis equipment is needed to detect these substances. Forensic markers such as micro taggants made of microscopic particles or threads that contain encoded information require an equal amount of effort to detect.

These markers are very effective, but they are also very expensive; and consumers are not aware of them. They are primarily intended for extremely expensive pharmaceuticals and high-end products that counterfeiters often target. When imitators are at work, an effective method is needed to remove imitations from circulation.

Rather than relying on just one type of identification, a combination of different overt and covert technologies is often used. To make life as difficult as possible for counterfeiters, manufacturers do not reveal which methods they are using.

Traceability at Any Point in the Supply Chain

Track and trace techniques have been used for years to mark or serialize products to ensure authenticity and provide traceability of batches and packages as they pass through the distribution channel.

Despite, or perhaps because of, the fact that these methods have been in use for so long, there is as yet no standardized worldwide approach to documentation. One simple solution is autonomous recording of product movements at each point in the supply chain. Electronic pedigree systems are another option. Serial numbers are passed along the supply chain, creating a distributed database containing electronic proof of origin. When complete end-to-end verification is implemented, each segment of the supply chain has an obligation to forward the product codes to a central server. The location of every product can then be determined no matter where it is, and the movement of goods can be traced after the fact using information available at a central location.

Identification Techniques

Whatever the method, every product must have a unique identifier, e.g. product name, batch number and possibly the expiration date. Additional product details, for example the distribution channel, can be included when the encoding is more complex. Making the coding or serialization more specific (e.g., pallets, cartons or individual packages) enhances the security of product authentication.


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A number of identification techniques provides varying degrees of

Customers

Particularly for Pharmaceuticals

anti-counterfeiting protection: barcodes, 2D codes, RFID tags.

Linear barcodes have a proven track record, and they have been in use worldwide for many years. However, they can store only a limited amount of information, and they are hardly suitable for product individualization. As a general rule, they should have a certain minimum height. A number of different printing techniques are available for applying them to the product or packaging. Manufacturers are free to define their own barcodes, but ISO/IEC 15420 defines commercial barcodes such as European Article Number (EAN) and Universal Product Code (UPC), which ensure unique product identification worldwide. There are other forms of barcoding besides commercial barcodes such as Code 39, which is commonly used in industry, and 2/5 Interleaved, which packs a large number of digits into a small space to increase information density.

The information density of 2D codes is even higher. Information is encoded in stacked barcodes, a rectangular matrix made up of individual pixels (e.g., QR codes), or circular barcodes (e.g., ShotCodes). Matrix codes in particular are used worldwide, and they can be scanned with CCD cameras. Nevertheless, matrix codes are not standardized either. Quick-response (QR) codes are very popular in Japan, whereas data matrix codes as defined in ISO/IEC 16022 are more widely used in Europe and the U.S. Other manufacturer-specific versions such as the UPS MaxiCode are also not uncommon. However, there are fewer matrix code versions compared with barcodes. For that reason and also because of the higher information density, matrix codes are more suitable for international product identification that is standardized, unique and traceable. As an added security feature, any type of barcode or 2D code can be printed in invisible ink on the product or packaging.

RFID (radio-frequency identification) works with transponders. Special readers extract the information and may write data back depending on the version. Printing techniques that are now available for producing the transponders make them much less expensive than they were just a few years ago. Nevertheless, they are still relatively expensive compared with barcodes and 2D codes. The equipment needed to read out the information is also generally more expensive than barcode scanners, etc.

The tags consist of a microchip, an antenna and a substrate or enclosure. They may also require a power source depending on the design. State-of-the-art RFID tags can send encrypted data to the reader as an added security feature. In contrast to barcodes and 2D codes, visual contact is not necessary to read the data. The tags can be located inside sealed packaging for added product protection. However, RFID tags are not standardized worldwide, and operating frequencies may vary.

In addition to the traceability aspect, track and trace also helps to identify weaknesses in the logistics chain. Cost can be eliminated by increasing the efficiency of the distribution channel.

No Agreed Method for Identifying Pharmaceuticals

The FDA already recommends the use of RFID tags, at least for identification of pharmaceuticals. The experts at IMPACT also see considerable potential in RFID technology. However, until the technology has reached a sufficient stage of maturity, they currently favor 2D codes, which have a proven track record.

The European Union is working on standardized identification for pharmaceuticals. Directive 2011/62/EU of the European Parliament and the Council defines the information that must appear on the outer packaging of pharmaceuticals, which in the future will have to have certain security features that allow verification of the product's authenticity and prevent manipulation of the packaging. 2D codes are regarded as the most likely method of identification. Information such as a unique, randomized serial number, batch identifier, expiration date and Pharmacy Product Number (PPN) could be stored in the code.

After the test phase for technical implementation of product serialization, which has been under way since December 2010, mandatory security features will be introduced in 2015. Matrix codes and a central database will provide the foundation for end-to-end verification. The extent to which consumers will be involved in the verification process is not yet clear. In any case, state-of-the-art communication devices such as smart phones give consumers new ways of detecting counterfeit products.

Packaging as an Additional Security Factor

Apart from specific identification techniques, there are other ways of making secure packaging. Besides the methods discussed above, the list of options includes sealing labels and adhesive strips that prevent tampering or provide evidence that the packaging has been opened. These items can also be used as warranty seals, security labels or asset labels.

Labels can also help prevent counterfeiting. The adhesive, for example, can contain micro particles and fragrances that are detectable after the label is opened. This, however, requires special equipment, and as a result these techniques are not very widespread.

Void labels are much more common. They are made so that lettering such as the word "Void" appears on the label and also on the product when the safety label is removed, and the label will no longer adhere. The text can be customized to include the batch number or expiration date. It is readily apparent when packaging has already been opened. Polyester security film is based on the same principle. A pattern appears when the film is removed, and the film will no longer adhere. Any tampering becomes obvious when the film is removed.

"Destructible" foil can also be used to provide evidence that the packaging has been opened. The foil cannot be totally removed. Security perforation is based on a similar principle. The label tears along the perforation when any attempt is made to remove it.

Numbered labels provide enhanced trace and track functionality. Each label has an individual number that can be used for detailed traceability and also to verify authenticity. The overt, covert and forensic identification techniques discussed above can of course also be used for labels.

Summary

Intelligent brand protection systems can deter counterfeiters if imitation of the identification/marking is made impossible or very costly. These technologies can also help clarify what is happening in the distribution and logistics chain and contribute to supply chain optimization.

This article is based on a trend report compiled on behalf of Dechema Gesellschaft für Chemische Technik und Biotechnologie (Society for Chemical Engineering and Biotechnology), Frankfurt am Main, Germany.

▶ www.dechema.de

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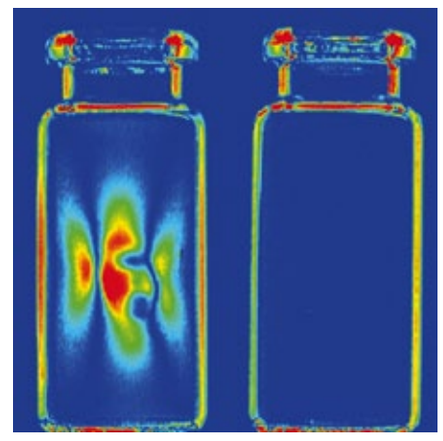
Real-time Measurement of Mechanical Stress in Packaging Materials



Detection of cracks and leaks in pharmaceutical containers to ensure the integrity and sterility of the contents is a top issue. However, only defects which already exist at the time of the inspection can be detected by such methods.

Seidenader Maschinenbau and ilis present a method by which specific prestages of crack formation in glass may be identified.

Mechanical stress can reduce the fracture strength and processability of glass containers. Even small residual stress can increase the likelihood of breakage or cracking significantly. In a relaxed state, glasses are optically isotropic, i.e. the refractive index is equal in all spatial dimensions. The propagation speed of light depends, among other things on the density of matter. Mechanical stress causes deformations in the material structure, i.e. different particle densities in the various spatial dimensions. This ultimately results in different speeds of light in the medium – the refractive index is dependent on the direction, the medium is birefringent. This birefringence can be analyzed with a polarimeter, which determines the angle of rotation of the polarization direction of linearly polarized light as it passes through a sample.

Until now, correct measurements of the rotation angles with manual polarimeters were time-consuming and experienced laboratory personnel was required. Improvements could be achieved with the development of automated imaging polarimeters, which allow inspection of not just one point, but of the whole object, and also exclude operator-induced measurement errors by automation.

Despite short measuring times of a few seconds, previously available systems are not able to inspect pharmaceutical products at clock rates of 600/min. Only now with the consistent further development of the automated imaging polarimeter is it now possible to measure and evaluate mechanical stress in glass containers in real time.

With the integration of such a system into a fully automatic inspection machine, objective and reproducible measurements at production speeds of up to 600 products/min. can be recorded so that production induced stress is detected early. Containers with residual stress can be automatically removed from the production and discharged into the defect channel. Therefore formation of stress-related cracks in the downstream production process or after product delivery is excluded to the largest possible extent.

▶ www.seidenader.com

Networked Chemical Parks

The Future Lies in Industrial Areas Designed to Promote Collaboration, Harness Synergies and Increase Efficiency

Get Connected – Good ideas and innovative approaches have never been so important for established companies and industrialized countries as they are today. Yet what's almost even more crucial is transforming them into a successful, profitable product – a process that often starts with efficient development and production focused on conserving resources. Chemical parks such as Chempark in the Rhineland can be the key to success, offering an optimal infrastructure and added value in the form of useful, extensive networks reaching out to researchers, customers, product developers and the industry as a whole.

With its three German site sites in Leverkusen, Dormagen and Krefeld-Uerdingen, Chempark is one of the largest chemical parks, offering a wide range of products.

Pipeline connections are the arteries in the materials network of chemical production sites.

German inventiveness coupled with scientific and technological understanding and the ability to design and perfect processes effectively have led to many products "made in Germany" that make life easier throughout the world. To find solutions to meet the megatrends of energy, mobility and food supplies, the chemical industry, Germany's fourth largest, has long been on the hunt for new materials for batteries, for example, and innovative applications for plastics such as polycarbonates, polyurethanes and butyl rubbers. And the three Chempark sites at Leverkusen, Dormagen and Krefeld-Uerdingen are no exception.

Dirk Wintersehl
Head of Chempark Marketing, Currenta

Basis for Efficient Product Development

The structure in a chemical park, designed to promote collaboration and efficiency and undergoing continuous development, forms an excellent basis for this. In a chemical park, it is crucial that production companies complement each other like the cogs of a clock, interlinking and fitting together perfectly like a jigsaw to form a harmonious overall concept. Each chemical site is based on a unique materials network that continuously develops and branches out from the initial production facility as the site grows over time. Efficient harnessing of synergies, for example when a company uses a by-product from a different Chempark partner, is a key benefit of the sites and the strength of the chemical park model. For instance, in the future the Finnish group Kemira at the Chempark Dormagen site will be using the hydrochloric acid generated as a by-product at the site to produce water chemicals.

Home for Future Products and Industries

Through customized services and a jointly used supply and disposal infrastructure, Chempark offers potential investors and companies in the chemical and chemical-related industries in particular the benefits of focusing on their own core competencies and conducting their production operations more cost-effectively in a network than at a site they ran themselves, while they can still maintain their absolute independence.

However, to attract suitable partners to the materials network and to Chempark that enhance the infrastructure of the latter for the benefit of all companies and do so on a lasting basis, the site's development team also actively targets specific product manufacturers and industries in Germany and abroad. These include representatives of specialties, fine chemicals, green chemistry, structural and composite materials and ionic liquids. Future-oriented sectors such as recycling, water technologies, alternative energies, membrane technology and white biotechnology could also benefit from the well-developed research and sound development opportunities at Chempark and in the North Rhine-Westphalia region.

The network philosophy at Chempark is not limited to the materials level. In particular, Chempark's compact nature offers the approximately 45,000 employees of the 70 partner companies the opportunity to network intensively both at work and play. This "network of minds" enables new ideas to be developed faster and customer needs to be met even more effectively and flexibly by suppliers. The more than 1,000 wide-ranging services offered by chemical park operator Currenta also offer access to expertise relating to areas such as permit issues, pollution control and environmental protection "just on demand", without companies having to maintain their own specialist departments and personnel. Currenta Analytics offers numerous analysis methods and services that can be used by anyone to develop pharmaceutical products and optimize/analyze plastics and it provides consulting on the complex European chemicals regulation REACh. It isn't absolutely necessary to set up a base at Chempark to benefit from these services but a large proportion of synergies are only generated as a result of the short distances and the networks that Chempark establishes at the site or maintains with universities and industry.

Committed To Networking

Developing new processes and technologies and providing support for these up to the market launch stage are only possible through intensive collaboration and networks, such as those that are constantly evolving in and around the three Chempark sites at Leverkusen, Dormagen and Krefeld-Uerdingen.

As development and processing of innovative materials are a common feature at all three sites, it was important for Chempark to underpin these USPs by setting up the Network of Innovative Materials together with partners from economic development, research and industry in the region. The idea of joining forces to develop commercially successful products was so well received in the Rhineland that, just one year since it started, the network already has more than 50 active members, who cooperate very closely in areas such as the automotive, medical technology and biomass sectors. The association's members cover the entire chain from development and production of materials, such as at Bayer MaterialScience and Momentive Performance Materials at Chempark, to usage as an actual product at 3M or Johnson Controls, for instance.

To develop even better logistics solutions with all players along the supply chain, chemical park operator Currenta has been a member of LOG-IT Club, the operational arm of LogistikCluster.NRW, since the start of the year. The industry forum took place at the Chempark Leverkusen site on February 29, the first public event by industry group ChemieLogistik.NRW, was attended by 130 logistics experts, who worked together intensively to develop logistics standards and recommendations for the public and political spheres.

Germany's role as the largest European market is a key factor in the development and sale of chemical goods produced at Chempark. To ensure this continues and to harness opportunities around the world, chemical park operators in North Rhine-Westphalia work together in a network that involves far more than just pipelines and the combined use of material flows. This is why Chempark has sought partnerships with other site operators in the region (ChemCologne), throughout Germany (specialist group on chemical parks of the VCI, Germany's Chemical Industry Association), at European level with the ECSPP (European Chemical Site Promotion Platform) and various international organizations to maximize synergies in raw material supplies and jointly formulate interest via-a-vis politicians and the public. A good example is the European chemical park conference organized last November by the North-Rhine Westphalia state energy ministry. Presentations by Chempark representatives, the InfraServ Knapsack and Chemelot (Netherlands) chemical parks and Chinese Chempark partner Nanjing focused on current challenges. Industry representatives joined politicians in underlining the long-term future and the protection required for the efficient and high-caliber chemical park model.

Outlook

For example, figures recorded by the VCI show that direct investments in the German chemical industry from other countries quadrupled over 15 years to more than €39 billion in 2008. The Frankfurt-based association recorded more than 410 foreign chemical companies with branches in Germany with over €72 billion in sales and around 147,000 employees in the period up to July 2011 alone. This success shows that high environmental standards and sustainability targets can be secured most effectively by working together to benefit all sites in Germany and Europe too.

German chemical park operators will be joining forces to showcase Germany as a location for the chemical industry with the theme "Invest in Germany's chemical parks – Make it in Germany" at the international Achema trade fair in Frankfurt.

Achema 2012: Hall 9.1, Stand D54

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PetroChina Eyeing Valero Refinery in Aruba

PetroChina is believed to be in talks to buy Valero Energy's shuttered 235,000 barrel-per-day refinery on the island of Aruba, near Venezuela. Asia's largest oil and gas producer has made a number of overseas refinery acquisitions in recent years to strengthen its global refinery foothold and boost its trading and marketing capabilities. Valero has confirmed a bid worth $350 million plus working capital without naming the bidder.

A final agreement could take place as early as June, reports say. PetroChina has said it wants to double its global trading and marketing of crude oil and refined fuel to 8 million barrels a day by 2015. Last year, in a deal worth $1 billion, the Chinese company formed a 50:50 refining and trading joint venture with Ineos, based around the Ineos refineries at Grangemouth, Scotland and Lavera, France. This was PetroChina's third overseas refinery deal after acquisitions in Singapore and Japan for more than $2 billion combined. ■

Russia's Acron in $441 Million Takeover Bid for Tarnow

Russia's Acron, one of Europe's 10 largest mineral fertilizer producers with activities in Canada, China and Estonia, as well as Russia, is seeking to acquire up to 66% of Polish chemical producer Azoty Tarnow for $441 million. Acron's three plants together can produce 1.7 million metric tons of ammonia per year along with nitrogen, complex mineral fertilizers and other products. The company reported a 2011 net profit of 20.3 billion rubles ($663 million) on sales of 65.4 billion rubles. Tarnow shareholders, which include the Polish state with 32% and pension fund Aviva PTE with 9%, however, are resisting the Russians' bear hug. Tarnow CEO Jerzy Marciniak said the offer was "rather low," and Aviva described it as "exceptionally unsatisfying." Acron deputy chief Vladimir Kantor said a higher bid would be unjustified as Tarnow's earnings forecasts for 2012 and beyond are "not that optimistic." ■

UK, Korean Firms Picked for Saudi Petchem Project

Petro Rabigh, a joint venture of Saudi Aramco and Sumitomo, is said to have issued letters of intent to at least two contractors vying for Rabigh 2, the second phase of the Saudi Arabian petrochemical complex. In 2010, Aramco CEO Khalid al-Falih estimated the total cost of the expansion at $6–$8 billion, but the price could be much lower due to intense competition. On the shortlist are said to be Jersey-based Petrofac and South Korea's GS, with Petrofac ahead for the two packages involving a tank farm and common utilities and GS front-runner for the CP3 and CP4 packages. CP3 involves production of ethylene-vinyl acetate and low-density polyethylene and ethylene propylene. CP4 encompasses methyl tertbutyl ether and methyl methacrylate. South Korea's Daelim Industrial is believed to have submitted the lowest bids for the CP1 package, including cumene, phenol and cyclohexanone, with Italy's Saipem lowest bidder for the RP2 aromatics complex. ■

German Chemical Parks Join Forces

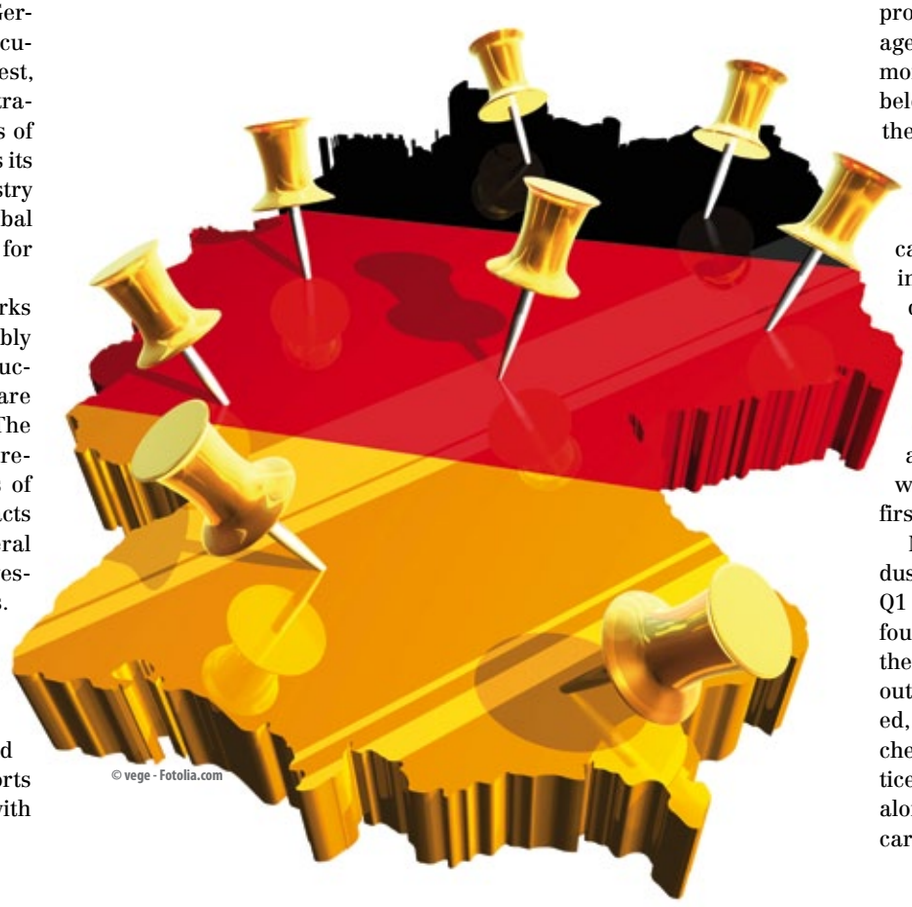
At Achema 2012 in Frankfurt, leading German chemical parks are joining forces for the third time to attract foreign investors. With the motto "Invest in Germany's chemical parks – Make it in Germany" the German chemical industry will present itself from 18 to 22 June 2012 in hall 9.1. (stand D54).

The joint stand is formed by the sector group Chemical Parks and Sites of the German Chemical Industry Association (VCI) and by Germany Trade and Invest (GTAI). Further participants are the regional initiatives CeChemNet (Central Germany), ChemCologne (Rhineland), ChemDelta Bavaria (Southeast Bavaria) and ChemSite (Ruhr Region) and – under the umbrella of the VCI's sector group – the companies BASF, Bayer Industriepark Brunsbüttel, Currenta, Industriepark Wolfgang, Infracor Marl, Infraserv Höchst, Infraserv Knapsack, InfraServ Wiesbaden, NUON Industriepark Oberbruch and Pharmaserv Marburg.

Dr. Klaus-Dieter Juszak, chairman of the sector group Chemical Parks and Sites, explains: "At this year's Achema, we will showcase the strengths of chemical parks in Germany. This worldwide unique concept provides investors with manifold possibilities to become active at the chemical industry location Germany." Michael Pfeiffer, chief executive of Germany Trade and Invest, states: "The chemical industry is traditionally one of the main pillars of the German economy and reflects its strong points: the chemical industry is extremely successful in the global market and highly interesting for foreign investors."

The sector group Chemical Parks and Sites works for sustainably competitive and attractive production sites in Germany, which are engaged in global competition. The sector group focuses and represents the interests of operators of chemical parks and sites in contacts with politicians and the general public and seeks to attract investors on behalf of its members. Germany Trade & Invest is the economic development agency of the Federal Republic of Germany. The organization promotes Germany as a business and technology location and supports companies based in Germany with global market information.

▶ www.vci.de
www.gtai.de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German Chemical Industry with Strong Start to 2012

The strong start to business in the first quarter of 2012 appears to confirm the German chemical industry's earlier prediction that the end of 2011 may have been the bottom of the trough. From January to March, production rose by 1.5% on average against last year's final three months, even though remaining 4% below the first quarter of last year, the industry association Verband der Chemischen Industrie (VCI) says in its quarterly report.

Sales of Germany's chemical producers increased by 3.5% in Q1 2012 to €43.1 billion, with domestic sales gaining 5% and foreign sales 2.5% against the 2011 period. Raw material purchases cost the industry's companies 0.6% more on average compared with Q4 2011 and were 3% higher than in last year's first quarter.

Nearly all segments of the industry saw higher production in Q1 2012 compared with Q4 2011 fourth quarter, but remained below the year's first three months. While output of pharmaceuticals stagnated, production of inorganics, petrochemicals and polymers was "noticeably higher," and fine chemicals, along with detergent and personal care products saw a slight upturn.

VCI said business in Asia was especially positive, while warning the dynamic could lessen as the year progresses. Demand from the US market improved in the early months of 2012 as the economic horizon lightened, but business there has not yet returned to pre-crisis levels. In Europe, the sovereign debt crisis continued to cloud the horizon.

All in all, at the end of the first quarter, order books of VCI member companies were full, and "the economic indicators give us confidence," said association president Dr. Klaus Engel. At the same time, he cautioned that the euro crisis is still poisoning the outlook for the EU and potentially threatens German chemical producers' export trade.

For 2012 as a whole, Engel said the industry expects output to stagnate at the 2011 level. With producer selling prices forecast to rise by 1%, VCI sees industry-wide sales as increasing to €186 billion.

▶ www.vci.de

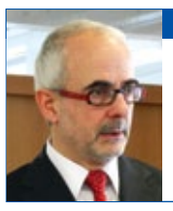
Growing Demand for EtherNet/IP Devices in Process Automation

ODVA in Ann Arbor, Michigan, USA, announced that Endress+Hauser (E+H), one of the world's leading suppliers of measurement, automation equipment and solutions for the process industries, will become a principal member, joining leading suppliers Bosch Rexroth, Cisco Systems, Rockwell Automation, Omron and Schneider Electric. E+H's increased participation in ODVA builds on its long-term support of open industrial networking technologies, including the company's portfolio of mass flowmeters designed for the EtherNet/IP network.

"ODVA is one of the world's largest consortiums advancing open, industrial networking standards through commercially-off-the-shelf (COTS) technology and a media-independent network protocol," said Katherine Voss, executive director, ODVA. "We welcome Endress+Hauser in this consortium as we have a shared vision for leveraging EtherNet/IP to simplify an end user's network architecture."

With leading industrial automation suppliers as principal members, ODVA is one of the first associations which strive to support Industrial Ethernet down to the field level in process automation. This will help provide manufacturers a complete, plant-wide network infrastructure for process, motion, safety and discrete applications and from plant-floor to IT systems.

Traditionally, devices measuring and controlling process variables rely on a field network to transfer information, while other devices within the plant use completely different networks for data communication. By improving this complex multi-tier networking strategy with one standard network architecture, namely EtherNet/IP, users have a simplified network structure as well as better access to plant-floor information. This enhances the ability to monitor overall performance, troubleshoot out-of-margin conditions and minimize downtime.


Raimund Sommer
Endress+Hauser
Process Solutions

"Our customers demand open, interoperable solutions such as EtherNet/IP, as it enables higher-level software such as ERP systems, process historians, control loop tuning programs, and asset management systems to access data from process instrumentation," said Raimund Sommer, managing director of Endress+Hauser Process Solutions. "We look forward to continue working through ODVA to help users achieve seamless integration of our instruments into system architectures."

▶ www.odva.org

Guided Wave Radar Sensors

The next-generation of Vegaflex guided wave radar sensors are on their way to Achema. New hardware and software is combined with a simple, intelligent adjustment concept to form a solid foundation for reliable measurement of liquids and solids. The application spectrum of these advanced plics sensors for level and interface measurement is now wider and more versatile than ever.

Versatile And Totally Reliable

The application range of Vegaflex series 80 is now more versatile. The user simply has to select the sensor version and the optional components best suited to their application. Cable, rod and tube versions, standard process fittings and application-optimised housings – combined with the electronic versions 4...20mA/Hart, Profibus PA, Foundation Fieldbus and Modbus – leave nothing to be desired.

The sensor's intelligent signal processing automatically detects changes in the process conditions and dynamically adjusts itself to them. This enables reliable overfill detection as well as measurement under extremely difficult process conditions. Integrated memory for measured values, events and echo curves provide information on all important sensor and process statuses. Additional diagnostic algorithms and asset management functions according to NE 107 reduce maintenance work and repairs to a minimum. And of course the sensors have all necessary approvals, from ATEX, FM and WHG (Water Resources Law) to SIL2/3.

▶ www.vega.com

An Economy Built on Ideas

MaRS: Fostering Collaboration Between Science, Business and Capital

From Lab to Fab – When Dr. John Gerald FitzGerald developed a diphtheria antitoxin, he did it in Ontario. That was in 1914 and, since then, Ontario has achieved a number of medical research "firsts." The discovery of insulin by Frederick Grant Banting and Charles Best in the 1920s; the discovery of stem cells by James Till and Ernest McCulloch in the 1960s; the first successful lung transplant by Joel Cooper in the 1980s; the first successful childhood meningitis vaccine; and the world's first pacemaker – these are just a few of the leading examples of how Ontario has changed the landscape of the life sciences industry worldwide.

Dr. Sonia Sanhueza
MaRS Discovery District

Ontario's life sciences industry employs more than 40,000 people at 850 companies. Revenues top $15 billion a year, with $5 billion generated by exports. Ontario's 25 research hospitals employ 10,000 researchers, who conduct $850 million worth of research annually. Multinational pharmaceutical companies invest another $720 million annually, making Ontario the third-largest biotechnology cluster in North America.

Today, Ontario's life sciences industry is being challenged by increased global competition from established and emerging life sciences jurisdictions, and by difficult economic conditions that include tight credit and market volatility. To compete successfully in the global marketplace, Ontario must continue to attract and nurture great scientific minds, increase collaboration among academia, industry and government to accelerate the commercialization of research breakthroughs, and improve financing for innovative companies, particularly at the early stage. Since the journey from the research lab to the marketplace can be a long and arduous process, MaRS Discovery District is using a new approach to accelerate the commercialization of promising research in Ontario.

Actively Nurturing Innovation

MaRS was born from many ideas, including that Ontario needs to better capture the commercial potential of its research. Primary among the many ways MaRS seeks to build Canada's knowledge-economy, is acting as a commercialization centre to directly connect the worlds of science, business and capital to stimulate a culture of innovation.

Located in the heart of Toronto, MaRS' 750,000-square-foot centre is an inspiring blend of heritage and modern lab and office space, backed by an impressive technical and conference infrastructure. The building itself is home to a mix of 80 tenants employing more than 2,000 people. From research groups to tech and biotech companies, with mature private-sector tenants and venture capitalists working alongside policy-makers, professional service providers and networking organizations, MaRS's goal is to accelerate the commercialization of breakthrough discoveries.

The MaRS footprint is growing with the launch of the MaRS Centre Phase 2 (photo), which will more than double the available square footage of the MaRS complex, creating Canada's largest science, technology and research hub. This 20-storey state-of-the-art convergence centre – a substantial expansion of the existing facility – will enable MaRS to accelerate its role as a catalyst of innovation in the launching and growth of new science and technology businesses.

Ontario Network Of Excellence

In 2011, MaRS became a part of the Ontario Network of Excellence (ONE), a network of 14 regional innovation centres across the province that helps local entrepreneurs bring innovative ideas to market. Funded by the Government of Ontario, ONE is a coherent and effective network that will coordinate all of Ontario's programs and services available to support entrepreneurs. As a member of ONE, MaRS will give entrepreneurs access to a broad range of experts, including researchers, academics, business people, government representatives and investors, who can help sell an idea and grow a business worldwide.

Pathology Innovation Centre of Excellence

In 2011, GE Healthcare opened its first global Pathology Innovation Centre of Excellence (PICOE) in the MaRS Centre. PICOE brings digital solutions to pathology, giving practitioners and clinical partners resources that accelerate their research, development and testing. PICOE is where GE collaborates with its digital pathology joint venture, Omnyx, along with funding partner The Health Technology Exchange and numerous clinical partners, to create best practices and technologies to address current pathology challenges.

The new 2,150-square-foot centre includes a digital lab where GE will conduct training, research and development on the Omnyx Integrated Digital Pathology (IDP) platform with clinical collaborators. The lab is home to Omnyx's Pathologist and Histology Workstations, and showcases Omnyx's VL series of high-resolution scanners that will digitize glass slides.

The Heart Of Innovation

Here are some highlights of the work happening right now at MaRS:

Infonaut's Hospital Watch Live system is designed to keep better track of everything that leads to the spread of disease, from patients, doctors and nurses to equipment. Infonaut created a system that uses a combination of tracking software and inexpensive radio frequency tags to record the location of anything that could possibly transport infections. Wireless receivers throughout the building transmit the position of each tag to a central computer every one to two seconds. So when a patient infected with hospital-borne bacteria is identified, the hospital can then identify which rooms he has been in, and what equipment and which people he has been in contact with. It then identifies other potential disease carriers and hot zones that could be potentially dangerous so that infection control strategies can be focused on those areas immediately.

But having an effective, globally relevant solution does not guarantee a company's success. That's where commercialization groups like MaRS step in. MaRS has helped Infonaut by providing strategic and business planning advisory support, market intelligence, access to capital and angel investment opportunities, as well networking opportunities with key partners.

Drilling and filling cavities could soon be a thing of the past, thanks to a revolutionary new technology developed by Toronto dentist Stephen Abrams and University of Toronto engineer Andreas Mandelis of Quantum Dental Technologies.

Called "The Canary System," the technology finds cavities even before they show up on X-rays. The system is safe, non-invasive and painless – and lets dentists halt decay by using pastes or gels to remineralize teeth. With The Canary System, a dentist uses a handheld laser that emits a low-power light to examine tooth surfaces. The system measures the amount of light and heat emitted from each tooth. Since healthy tooth enamel produces a specific wavelength signature, any deviations can be analyzed and problems can be pinpointed. Custom reports are generated and displayed for immediate chair-side review and can also be downloaded to a smartphone.

MaRS has supported Quantum Dental Technologies by providing market intelligence, networking opportunities, access to capital and angel investment opportunities, and strategic support, as well as advisory services on positioning and branding.

Innovation Is Inevitable

While great science is fundamental to success in life sciences, taking that science and turning it into technologies and products that save lives is the ultimate goal. Ontario aims to be the best place in the world to take innovative biomedical discoveries and turn them into new products and services that resolve unmet patient needs by capitalizing on world-class talent, research capacity and collaborative spirit.

The old linear approach to commercialization, where a scientist invents a new molecule or devises an algorithm, then raises seed capital from early stage investors and only then is able to turn a new product into a new business with the help of entrepreneurs, is not the MaRS approach. At MaRS commercialization is seen as much more likely when researchers, business people and investors collaborate, converge and interact in an ongoing, synergistic fashion.

Five Reasons to Invest in Ontario

Top ranked research and development tax incentives. Ontario's R&D tax incentives are among the most generous in the world. When tax credits are factored in, a $100 R&D expenditure can be reduced to an after-tax cost of about $56, or $38 for a small business.

Lower business costs. Canada offers a lower business-cost environment for life sciences companies than the United States, Germany, Italy or Japan, according to KPMG's Competitive Alternatives 2010. Ontario's marginal effective tax rate (provincial and federal combined) on new capital investment plummeted to 18.6 per cent in 2010 from 32.8 per cent in 2009, and will drop to 16.2 per cent by 2018.

A research powerhouse. With 25 research and academic hospitals employing 10,000 scientists, clinical investigators and other researchers, Ontario is one of the largest biomedical research centres in North America. Ontario's universities and teaching hospitals perform 30 per cent of all the health research conducted in Canada, spending almost $2 billion annually.

Exceptional global connections and partnerships. Ontario is home to a growing number of internationally recognized centres of excellence in research, innovation and collaboration. Examples include the International Cancer Genome Consortium, the new Ontario Brain Institute and the Population Health Research Institute at McMaster University.

Critical mass of companies and talent. Ontario has a broad and innovative life sciences sector. Some 900 companies employ over 41,500 people in the pharmaceutical, biotech, advanced medical technologies and contract services sectors. Ontario's 44 universities and colleges produce more than 35,000 graduates a year in mathematics, engineering and sciences. Ontario has six medical schools, including the University of Toronto's Faculty of Medicine, one of the largest in North America.

▶ www.investinontario.com

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New DSM Research Units Focus on Biotechnology and New Materials

DSM has announced plans to invest €100 million in three new R&D facilities at Delft and Sittard-Geleen, both in The Netherlands. The Dutch group said the investment confirms its commitment to its home market. Laboratories at the two sites are due to open in 2014, with some 700 employees working to find solutions to global challenges such as energy & climate, food & health.

In Sittard-Geleen, a new materials research building will take shape in the group's Chemelot chemical park. This, the group said, offers opportunities for innovation in particular due to the proximity of start-up companies and research and educational institutes. It will also be a major R&D base for group company DSM Engineering Plastics.

The new biotechnology lab at Delft will provide a home for the R&D processes of the DSM Biotechnology Center. Supported in part by the province of South Holland, an open campus on the Delft site will give biotech start-ups space for expansion in the region. Some facilities will operate within the framework of the recently formed consortium for the Bioprocess Pilot Facility. ■

Sasol Expands High Purity Alumina Output in Germany

The Hamburg-based olefins & surfactants division of South Africa's Sasol has begun construction on the first expansion stage of its ultra-high purity alumina (UHPA) production at Brunsbüttel, Germany. Due to be completed in Q3 2013, the upgrade will increase output of the plant by at least 3,000 metric tons per year and will feed Sasol North America's alumina production facility at Tucson, Arizona.

A particular focus for aluminas is the increasing demand for raw materials to produce crystal sapphire used in the growing LED application. Sasol said its new UHPA platform will include an expanded portfolio of calcined ultra-high purity aluminas with tailored particle sizes, densities and chemistries.

New ultra-high purity calcined alumina for structural ceramics, lighting and new battery applications will also be produced from the expanded feedstock. With its proprietary aluminum alkoxide process, Sasol claims to be world's largest producer of specialty aluminas. The successful completion of this investment sets the stage for future expansions, said Klaus Diblitz, general manager of the Hamburg division. ■

Sabic Upgrades Safety, Environment and Energy Facilities at Geleen

Sabic is spending €135 million to improve the safety, energy conservation and environmental protection infrastructure surrounding the 1970-built olefins cracker at its Sittard site in The Netherlands. The upgrade scheduled to be completed in late 2013 will include more than 20 additional projects and will make the cracker one of the best and most cost-efficient in Europe, the Saudi-based petrochemicals group said.

Energy consumption is to be cut by 8%, and this, Sabic said, will result in significantly lower CO_2 emissions as well as a 2% increase in output. To complete the upgrade, the cracker will be shut for a "substantial" maintenance turnaround in September 2013. Altogether, the capital spending scheme will include more than 20 improvement projects.

Revamping olefins output reflects Sabic's growth ambitions, the group said. "The large-scale undertaking will not affect deliveries to customers," Jacques Slabbers said, director area manufacturing services Europe. ■

EVENTS

Organic and Printed Electronics Convention LOPE-C 2012, June 19 to 21, Munich, Germany

Exciting developments in the area of organic and printed electronics are at the center of the 4th Large-area, Organic and Printed Electronics Convention (LOPE-C). The event, jointly organized by Messe München International and OE-A (Organic and Printed Electronics Association), offers a comprehensive overview of market-ready products and the trends of industrial research and development. With more than 100 exhibitors from 17 countries signed up, LOPE-C 2012 represents the industry's entire value chain – from academic research to industrial design to marketable product. This year, both industrial and consumer-oriented applications will be at the center of attention: organic solar cells and sensors, OLED displays and OLED lighting, ultra-flat data memories and printed batteries, all seamlessly integrated as enablers of novel products.

► www.lope-c.com

Global Chemical Industry Sustainability Summit, September 10 and 11, Brussels, Belgium

The Global Chemical Industry Sustainability Summit (GCIS) will bring together chemical industry executives with attendees from the financial sector, representatives from major end-use industries, and the regulators and retailers who influence the whole chemical value chain. GCIS is must-attend for anyone with "sustainability" or "environment, health and safety" management responsibility within the chemical industry. It will also benefit executives from all the departments within chemical company whose jobs are influenced by corporate sustainability and CSR policies, from feedstock sourcing, planning, financial, R&D, compliance and marketing. Topics to be covered will include strategies and priorities in chemical industry sustainability/CSR for the next 10 years, attitudes and priorities in sustainability for the emerging chemical industries, potential for paradigm shifts in chemical production technology. The agenda includes speakers from BASF, Braskem, Clariant, ExxonMobil, SABIC, Solvay and Procter & Gamble.

► www.chemroundtables.com

8th World Adhesive & Sealant Conference, September 18–21, Paris, France

This global Adhesive & Sealant Conference takes place every four years alternating between Europe, USA and Asia. It is one of the most important events for all stakeholders involved in the adhesive and sealant sector. The World Adhesive Conference (WAC) 2012, organized by the Association of the European Adhesive and Sealant Industry (FEICA), discusses the latest trends in technology, business and management issues, regional market updates, and end-use market perspectives. The large adhesive and sealant industry exposition will feature raw material and equipment suppliers, industry consultants and other exhibitors. WAC's official slogan in 2012 is: "Creating the Future". The objective is to address the key industry challenges, to provide multi-perspective solutions and to promote the dialogue between all the stakeholders and to strive for both development and progress of the global adhesive & sealant industry.

► www.wac2012.org

Meeting Future Global Resource Challenges


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The European chemical industry is determined to play a key role in ensuring that by 2050 over 9 billion people live within the resources of the planet, according to Cefic's first-ever sustainability report.

The report was unveiled at the European Parliament in Brussels hosted by European members of parliament Karl-Heinz Florenz and Vittorio Prodi. It presents a vision for how the chemicals industry will help meet future challenges and It also provides 17 key performance indicators that serve as a benchmark of industry sustainability efforts to date that the sector plans to measure itself against in future.

Cefic President Giorgio Squinzi, outlining the report's vision, said: "All of the industry's activities will be directed towards enabling a future where people have access to the necessities of a healthy life, to economic prosperity and to societal progress."

Pillars Of Sustainability

The 70-page document details all three "pillars" of sustainability – planet, people and profit. The European chemicals trade body included in the report case studies drawn from chemicals companies, national associations and Cefic sector groups that illustrate contributions to sustainability, such as energy-efficient water purification, lightweight materials for cars or better building insulation.

Carl Van Camp, Cefic Sustainability Strategy Group chairman, said: "We have a good track record when it comes to sustainability, and remain committed to programs like Responsible Care. We are a partner in ensuring that the REACh chemicals legislation works and stand ready to have a lead role in EU-led public-private projects such as key enabling technologies."

A Starting Point

The report serves as a starting point in developing a sustainability framework for the European chemicals industry, a project the Cefic board tasked its Sustainability Strategy Group to put forward this year. It will also help the trade group identify flagship initiatives to increase and improve the sector's contribution to the sustainability policy agenda, which includes environmental, health and safety, and chemicals management practices.

Squinzi concluded: "Sustainability is about a mindset change in the way we work and high-tech products the chemicals industry makes. The flagship initiatives are one way in which stakeholders expect us to continue to drive the technological breakthroughs that society will need.

We can help ensure a sustainable future by working with stakeholders, having a well-trained workforce in place, and through strong business performance that attracts further investments."

See also last page of this issue for more information on the European chemical industry.

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PEOPLE


Blair Illingworth

Blair Illingworth has been appointed President and Director European Operations at Azelis. effective May 21. With a wealth of experience, Blair has held a number of roles as CEO in both manufacturing and distribution businesses mostly in the building materials sector, the last of which was as CEO of a subsidiary of AngloAmerican (Tarmac Building Products). In his new position leading Azelis' European operations, Blair will report to Azelis CEO Joris Coppye and will focus on accelerating strategic and business improvement plans via effective, functional execution and operational excellence.


Fabrice C. Bertinchamps

Dr. Fabrice C. Bertinchamps, General Manager Business Strategy, Polymers SBU at SABIC has been awarded the Handelsblatt Stratley Award 2012 for 'Best Young Executive in Chemical Industry'. He received the award during the 13th Handelsblatt conference on chemistry in Frankfurt, Germany on May 10, 2012. Bertinchamps joined SABIC (Saudi Basic Industries Corporation) in 2009. Before, he worked for Total Petrochemicals. The Belgian studied Chemical Engineering at the Université Catholique de Louvain.

Andrea Tam has joined Cerbios-Pharma as Director of Commercial Business Development. In this role, Mr. Tam, who holds a degree in industrial chemistry from the Università degli Studi di Milano, will be responsible for managing all aspects of the company's business development for the Chemical and Biological Divisions. Tam joined the Italian subsidiary of Mitsubishi Chemical as R&D scientist in 2000 achieving the position of R&D Manager. Between 2007 and 2012 he worked as Business Development Manager with Recordati and Farmabios.

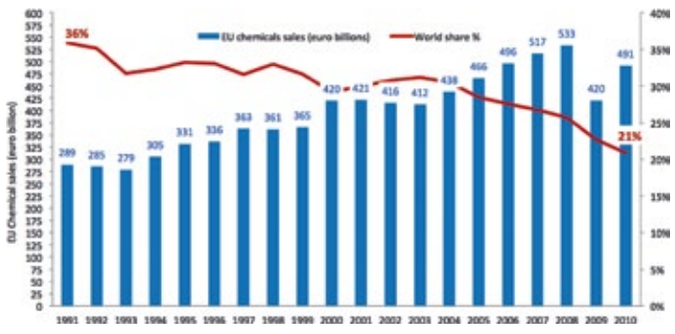

Peter Denifl

Dr. Peter Denifl has been awarded the prestigious Giulio Natta Award for 2012. The accolade recognizes the significant contribution of Dr. Denifl's scientific activity in catalyst development, in the field of polypropylene products. The award was introduced in 2003 to celebrate the scientific achievements of Prof. Giulio Natta, recipient of the Nobel Prize in Chemistry (1963) for the discovery of polypropylene. Peter Denifl is the mastermind behind Borealis' polyolefin catalyst technology, Sirius.


Marianne Lyngsaae

Marianne Lyngsaae, member of the REACh Core Team for Brenntag Europe, will receive the 2012 FECC Award for her outstanding work for FECC in developing solutions around Exposure Scenarios. The award will be presented to her during the Membership Meeting of the European Association of Chemical Distributors (FECC) in Brussels November 21, 2012. Marianne Lyngsaae from Brenntag Nordic is representing FECC in numerous industry platforms and also with the European Chemicals Agency (ECHA) where she contributed to the development of the "PROC Hierarchy" and the Chemical Safety Assessment tool "Chesar".

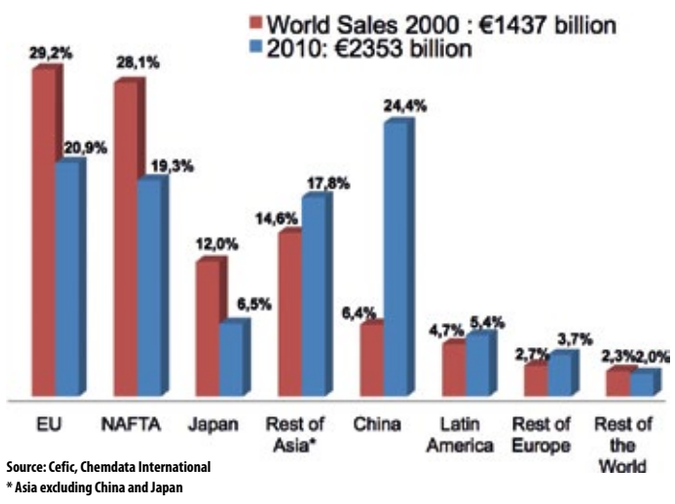
Chances and Challenges for the European Chemical Industry



Source: Cefic, Chemdata International

Decreasing Market Share

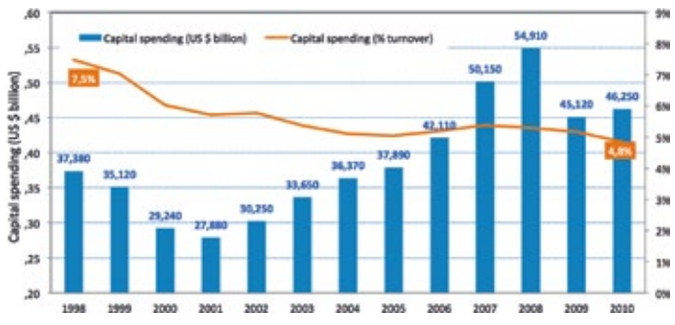
In a demonstration of its inherent resilience, the European chemicals sector registered a solid recovery in 2010 after the 2009 economic crisis. Chemicals sales of the EU-27 countries in 2010 reached €491 billion after €420 billion in 2009, according to Cefic, the European Chemical Industry Council (Fig. 1). The rest of Europe (Switzerland, Norway and other Central & Eastern Europe countries) added another €87 billion in 2010. For 2011, no official sales numbers are available yet, but given the confirmed production growth of 1.1% and price increases for most chemicals, it is likely that EU chemicals sales have jumped over the €500 billion mark again.



Source: Cefic, Chemdata International
* Asia excluding China and Japan

Emerging Competitors

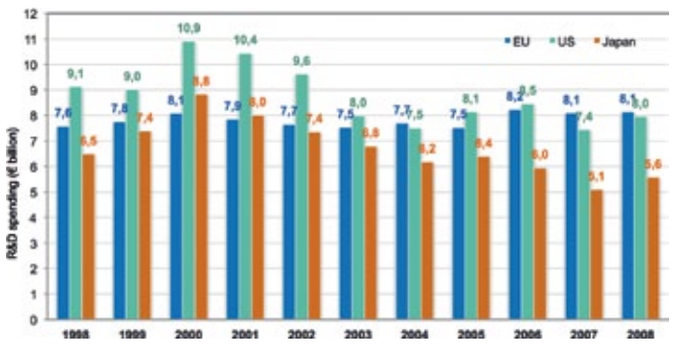
However, this position is under increasing pressure from fast growing economies, mainly in Asia and the Middle East. In global terms, the percentage of chemicals manufactured in Europe has decreased from 36% in 1991 to 21% in 2010, although output still rose by 17% in value terms (Fig. 1). With continued uncertainty characterizing both the global and European economic outlook, there is little doubt that industry will continue to find itself under pressure. Asia and the Middle East will become the epicenter for the global chemicals industry – by 2010 Asian chemical production had equaled that of Europe and the Americas, and China's share of world chemical sales had increased from 6.4% in 2000 to 24.4% a decade later (Fig. 2).



Source: American Chemistry Council (ACC) and Cefic Analysis
*including pharma

Declining Capital Spending

Investing in the chemical sector is investing in the future as industry efforts are increasingly directed towards developing specialty products and services that help customers to reach sustainability goals. The ratio of capital spending to sales of Western Europe's chemicals industry, including pharmaceuticals, has been declining for over a decade and stood at 4.8% in 2010, down from 7.5% in 1998 (Fig. 3). Industry statistics show that the Asia-Pacific region accounted for nearly 73% of global capital spending on chemicals in 2010, against 38.6% in 2000. That high level is set to continue fuelled by the region's ongoing development coupled with rising domestic demand.



Source: Cefic, Chemdata International
* EU 27, excluding pharma

Bridging The R&D Gap

The European chemical industry must build on its strengths in innovation, quality and sustainability to ensure a healthy market demand for its products is maintained. Horizon 2020, the European Commission's €80 billion package for research and innovation funding that will run from 2014 to 2020 is welcomed by industry. As a research-intensive business, the chemical industry has an essential role to play in enabling achievement of the Commission's EU 2020 target of investing 3% of public and private GDP in R&D. It's a challenging task: In Europe as well as in Japan and the U.S. R&D intensity levels are declining (Fig. 4) as other parts of the world – most notably India and China – continue to strengthen their capabilities.

ACC Concerned About Europe

The American Chemistry Council (ACC) reported a US chemical production slip in April, following a decline in March. ACC said that chemical production fell across all regions in April. Data on downstream activity indicate that customers were drawing down thermoplastic resin inventories during the month. The soda ash report was positive while the railcar loadings data in the first half of May point to moderating activity.

ACC also reported that global chemical production continued to rise in April, marking the fifth consecutive monthly gain. There was regional weakness in Europe but production has held up fairly well in Asia and to a lesser extent in the Americas. According to ACC, capacity utilization in the global business of chemistry slipped (by 0.2 percentage points) to 86.8% in April, which is below the long-term average of 91.2%. One year ago, global capacity utilization was 88.2%. Oil prices slipped below $90 per barrel between 21 and 25 May, an indication that the global economy is slowing. ACC said that the situation in Europe appears to be deteriorating and the news is getting worse. In addition, China is clearly slowing, leaving the United States the remaining engine of growth. American consumers' spending may provide some resilience for the global economy. ■

Eco Marathon The Shell Eco-marathon challenges student teams from around the world to design and build energy efficient vehicles. The winners are the teams that go the furthest distance using the least amount of energy. Huntsman Advanced Materials has been instrumental in a student project that showcases the possibilities of building a lightweight, fuel efficient hybrid concept car using high-performance composite materials made of flax and carbon fiber. The 'eXtreme Automotive Mobility' (XAM) has been designed and manufactured by a student team from the Polytechnic of Turin, Italy. The 'XAM' recorded an official fuel consumption of 100.2km/l and producing just 26g/km of CO_2 during the marathon.

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