CHEManager INTERNATIONAL

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THE NEWSPAPER FOR THE CHEMICAL AND LIFE SCIENCE MARKETS

Pharma

Big Pharma drives market consolidation, implements new business and manufacturing concepts

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Logistics

Interaction of business and operations crucial for optimal supply-chain organization

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Devalued and Distrusted

The Biggest Challenges Facing the Pharmaceutical Industry, and how it can Restore its Broken Image

A Pharma Veteran's View — Dr. John L. LaMattina is the former Senior Vice President of Pfizer, and President, Pfizer Global Research and Development. In this role, Dr. LaMattina oversaw the drug discovery and development efforts of over 12,000 colleagues around the world directed towards new treatments for diseases like cancer or AIDS. He retired from Pfizer in 2007 and is now a Senior Partner at PureTech Ventures and serves on the Boards of Ligand Pharmaceuticals and Trevena Pharmaceuticals. LaMattina has written the books "Drug Truths: Dispelling the Myths About Pharma R&D" and "Devalued and Distrusted: Can the Pharmaceutical Industry Restore its Broken Image?" (c.f. page 15 of this issue). Recently, he gave a webinar on the topic "Challenges Facing the Pharmaceutical Industry" on ChemistryViews.org, after which he shared his thoughts with CHEManager International. Jonathan Rose and Dr. Michael Reubold asked him about the changes and challenges he has seen in the pharma industry during his three-decade career at Pfizer and since.

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Newsflow

M&A-News:
Pfizer has increased its offer to buy its British rival AstraZeneca in a friendly take over, but the $106 billion bid was rebuffed again.

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Companies
Takeda has vowed to fight a $6 billion damages award to US plaintiffs who blamed its Actos diabetes drug for their bladder cancer. Co-defendant Eli Lilly, which co-marketed the drug in the US, was ordered to pay $3 billion in damages.

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Production
Polyamide 6.6 producer Butachemie, a 50:50 JV of Invista and Solvay, will retrofit production facilities at Chalampé, France, with the latest ADN feedstock technology.

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People:
Randy Woelfel resigned as CEO of Canada's Nova Chemicals after five years on May 1. CFO Todd Karran will serve as acting CEO until a replacement has been found.

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CHEManager International: Dr. LaMattina, in what ways have you seen the pharmaceutical industry change over your three-decade career at Pfizer and since?

J. LaMattina: The changes have been very dramatic. Mergers and consolidations have resulted in many of the companies that I applied for job at in 1976 are no longer in existence. When I began at Pfizer in 1977, the pharmaceutical industry was highly fractionated with probably close to 100 different companies looking to discover and develop new drugs. The industry has consolidated greatly since then. However, the biotech industry has developed since the 1970s and literally hundreds of these small companies exist today.

I am envious of the young scientists starting out in drug discovery today.

Dr. John L. LaMattina, Senior Partner at PureTech Ventures, former Senior Vice President of Pfizer, and President, Pfizer Global Research and Development

More important, however, have been the breakthroughs in science - e.g. the unraveling of the human genome and advances in laboratory capabilities - that would have been seen as pure science fiction when I started. I am envious of the young scientists starting out in drug discovery today. This is a much better time to do drug R&D than it was when I started decades ago at Pfizer. The immense amount of knowledge now available about biological processes and diseases have provided new insights as to what projects to attack in the lab.

What do you think are the biggest challenges facing the pharmaceutical industry today?

J. LaMattina: First, the challenges in bringing to market a new medicine are harder than ever before. Of course, you have to prove to the FDA that your drug is safe and efficacious – as well as show that it is at least as good as other drugs out there that are already being used to treat the disease your drug targets. To prove this, you need to run clinical trials involving thousands of patients for at least 3-5 years. Such studies add not just time, but also costs as these types of trials can cost $300–800 million. This is a major change. There are tremendous new hurdles in clinical development that didn't exist years ago. But just as big a hurdle is generating the data necessary to show the value of your new drug to payers. Given the great drugs that have gone off-patent in recent years, you had better be able to show major improvements over existing therapy, otherwise your expensive new drug won't be reimbursed.

Second, it's imperative for the pharmaceutical industry to improve its image and reputation.

In recent years an increasing number of drug candidates fail in clinical trials. What are the reasons for this declining success rate?

J. LaMattina: There is no doubt that a higher percentage of drugs are failing in late-stage clinical trials.

There are tremendous new hurdles in clinical development that didn't exist years ago.

A recent paper in "Nature Biotechnology" showed that from 2003 to the end of 2011, 40% of drugs that entered Phase 3 failed to reach the market. The major reasons are the hurdles described before. Many times, the only way to prove that your compound is truly superior to existing therapy is to demonstrate it in clinical trials. What we are seeing is that this is a tough hurdle and a lot of compounds don't clear it.

What is the most significant misconception the general public has about drug companies?

J. LaMattina: The biggest misconception is that drug companies are not innovative and that most innovation occurs in research institutes, universities and biotechs. This is completely false! Major new drugs have been and will continue to be discovered in-house in Big Pharma. Furthermore, the public doesn't understand that, while great science is done in academia, it is the biopharmaceutical industry that discovers and then tests the experimental drug to prove or disprove medical hypotheses. Nowhere else is this done!

My personal opinion is that people have no clue about the value that pharma companies bring to the healthcare system, how difficult drug R&D is, and how much money an effective pill can save on overall healthcare costs.

How would you describe the image the pharmaceutical industry has in the public compared to other sectors and how has this image changed over the past decades?

J. LaMattina: In the late 1980s and early 1990s, the big pharmaceutical companies were routinely listed as among the most admired companies in the world in Fortune Magazine's annual survey. In fact, Merck & Co was THE most admired company in the world for seven straight years. This same survey now shows few pharmaceutical companies in the top 50.

What do you think are the reasons for this development? Are they "home-made" or is the pharmaceutical industry treated unfair by its critics or by politicians?

J. LaMattina: I think that there are a number of reasons for this. First of all the overaggressive selling of drugs for diseases for which they have not been approved has led to the settling of lawsuits in the billions of dollars. This has certainly caught the public's attention.

Second, there have been some high-profile issues of drugs causing unanticipated side-effects resulting in public distrust. It must be noted that all drugs cause side-effects and I think that the public's expectations are way too high on this point.

Also, I don't think that TV ads have helped Big Pharma. The laundry list of side-effects announced in every such ad – which can at times take up 30 seconds of a 60 second commercial - reinforces the public's concerns about the safety of new drugs. Furthermore, people perceive that these ads are expensive and these costs help to drive the high cost of new medications.

The biggest misconception is that drug companies are not innovative.

That's an interesting angle. Is this typical for the U.S.? Do you see regional differences when you compare the image of the pharmaceutical industry in the U.S. with Europe, Asia or other parts of the world?

J. LaMattina: No. I think that the negativism exists in Europe as well. It may be less in Asia.

So, when you think of the pharmaceutical industry as a patient who has a disease or deficiency syndrome, what would your prescription look like?

J. LaMattina: First, I would recommend stopping the illegal detailing of drugs, and second, stopping the TV ads. Third, make all clinical trial data available in a timely fashion, and fourth, make all payments by pharma to healthcare professionals completely transparent. Finally, use scientists as ambassadors for their profession.

Webinar

Check out the Dr. LaMattina's webinar "Challenges Facing the Pharmaceutical Industry" on ChemistryViews.org

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CONTENT

India's Sun Pharmaceutical to Buy Compatriot Ranbaxy

Sun Pharmaceutical Industries, India's largest drugmaker by market value, has agreed to buy compatriot generics manufacturer Ranbaxy Laboratories for $3.2 billion from Daiichi Sankyo, Japan's fourth-biggest pharmaceutical company by revenue.

Including Ranbaxy debt, the overall value of the all-share transaction, the biggest pharmaceutical sector deal in Asia-Pacific this year, is $4 billion. Combined revenue is estimated at $4.2 billion,

The deal expected to close by year-end would create the world's fifth-largest maker of generic drugs and India's biggest. It marks a significant retreat for Daiichi Sankyo, which has seen the value of its investments in India halved since it bought control of Ranbaxy in 2008.

The Japanese company will end up with a stake of about 9% in Sun Pharma valued at about $2 billion, compared with the $4.2 billion it paid for a 63.9 % stake in Ranbaxy in 2008. (dw) ■

Valeant, Ackman Make $47 Billion Offer for Allergan

Canada's Valeant Pharmaceuticals International and activist investor Bill Ackman have made an unsolicited $47 billion bid to buy Botox maker Allergan in a move to create one of the world's five biggest drug companies.

The offer would bring together two mid-sized pharmaceutical companies with expertise in skin care and eye care products.

Ackman's Pershing Square Capital Management, Allergan's largest shareholder with a 9.7% stake, disclosed in a filing that it supports the bid. Allergan said it will carefully consider the proposal. The offer is 31% higher than Allergan's stock price on April 10, the day before Pershing Square's ownership reached 5%. Valeant has been on a buying spree since 2010 and last year acquired contact lens maker Bausch & Lomb.

Allergan, which also has a lucrative portfolio of ophthalmic drugs to treat conditions such as glaucoma and dry eye, is larger by revenue, reporting $6.3 billion in sales last year. Valeant reported $5.8 billion in revenue last year. (dw) ■

Bayer and Reckitt Said Finalists for Merck & Co. Consumer Arm

Bayer and Reckitt are said to have emerged as frontrunners to win the auction for the Merck & Co consumer products unit, each reportedly offering roughly $13.5 billion.

As both bidders are very keen to buy the asset, the price tag could go higher in the final days, sources told the news agency Reuters.

The sale would be the latest in a wave of recent healthcare deals. The surge has driven healthcare M&A volumes to $153.3 billion so far this year, with pharmaceuticals transactions accounting for 71%.

The Merck auction also is believed to have drawn interest from several other healthcare and consumer giants including Procter & Gamble Co, Boehringer Ingelheim, Novartis and Sanofi.

Reckitt, which owns over-the-counter (OTC) medicines, aims to be a major player in consumer healthcare and has the firepower to do sizeable deals, according to its CEO. Bayer already has a strong portfolio of consumer products but is looking at deals to expand the business further.

In 2012, Bayer lost a bidding war with Reckitt for Schiff Nutrition, which agreed to sell to the British consumer products group for $1.3 billion.

Merck wants to sell its consumer unit as it is not a leader in this market, with a share of only around 1%. The US drugmaker is following in the footsteps of other drugmakers such as Pfizer, which sold its infant-nutrition business to Nestle for $11.9 billion in 2012 and last year spun off its animal health unit as a separate publicly traded company called Zoetis. (dw) ■

NKNKh Starts Polystyrene Plant

Leading Russian petrochemical producer Nizhnekamskneftekhim (NKNKh) has started up its new 50,000 t/y polystyrene production line in Tatarstan, lifting total output to 150,000 t/y. At the end of 2012, NKNKh completed a 60,000 t/y ABS facility. During 2013, it plans to revamp its alpha-olefins plant. The company said it is continuing to study plans for a world-class olefins complex with capacity of 1 million t/y of ethylene in addition to back-integrated PE and PP plants. (dw) ■

Technip Wins Cargill EtOH Contract

France's Technip has won a contract for engineering, procurement and construction (EPD) from US agriculture giant Cargill for the new €60 million bioethanol plant scheduled to go on stream in fall 2015 at Barby, Germany.

Cargill processes wheat to starch and starch derivatives in the town located in the eastern German state of Saxony-Anhalt. The ethanol unit will include a fermentation unit and a distillation/rectification unit. (dw) ■

Indorama Acquires 51% Stake in Turkish PET Producer

Indorama Ventures (IVL), world's largest PET producer, appears to be building a strong foothold in the Turkish market through acquisition. The Dutch subsidiary of the Thailand-based company has now bought a 51% stake in Sasa Polyester Sanayi from the Sabanci Holding, with an option to acquire the remaining 49%.

This is IVL's second Turkish move this year. In March, the company received clearance from Turkish authorities to acquire Artenius TurkPET from bankrupt Spanish producer La Seda de Barcelona.

Sasa's integrated feedstock and polymer facilities at two plants in Adana, Turkey – where TurkPET has a PET polymerisation plant – have 600,000 t/y of total capacity for feedstock DMT, staple fibers, filament yarns, PET, PBT polymers and specialty chemicals. (dw) ■

Merck Receives Final Antitrust Clearance for AZ Electronic Materials

Germany's Merck KGaA has received final clearance for the takeover of AZ Electronic Materials. This follows approval of the deal by China's Ministry of Commerce (MOFCOM).

Merck said the go-ahead from China means that the last antitrust hurdle has been taken. AZ shareholders now had until May 7 (after press time of this issue) to tender their shares.

In December 2013, the Darmstadt-based chemicals and pharmaceuticals producer offered £1.6 billion in cash for the Luxembourg-based firm, which manufactures anti-reflective coatings used in hard disc drives, as well as specialty chemicals for the graphic arts sector and shrink coatings used in memory devices. The offer was extended several times. (dw) ■

Platform to Take Chemtura's Agriculture Arm

US-based Platform Specialty Chemicals has agreed to acquire the agricultural chemicals business of compatriot Chemtura for around $1 billion in cash and stocks.

The activities of Chemtura AgroSolutions, which reported sales of around $449 million and adjusted EBITDA of more than $100 million in 2013, include seed treatments and crop protection products for a variety of applications.

Following the sale, the core business of Connecticut-based Chemtura will be focused on two segments, Industrial Performance Products (IPP), which manufactures petroleum additives and urethanes, and Industrial Engineered Products (IEP), which produces flame retardants and brominated products, as well as organometallics.

These units generated $1.8 billion in sales and $200 million of adjusted EBITDA.

The sale of the agrochemicals business will enable Chemtura to become a pure player in industrial specialty chemicals, the company's CEO, Craig Rogerson, said. (dw) ■

Pfizer Chases AstraZeneca for Potential $106 Billion Deal as British Drugmaker Unveils Restructuring Plans

AstraZeneca has unveiled plans to sell or partner infection and neuroscience units with combined 2013 sales of $3.5 billion and a basis in antibiotics and antipsychotics as well as an experimental Alzheimer's drug. At the same time, Pascal Soriot, CEO of the Swedish-British drugmaker, announced faster-than-expected progress of the company's experimental cancer drugs.

The announcements follow reports AstraZeneca had spurned a $101 billion bid approach from Pfizer earlier this year. Pfizer has confirmed that it approached its British rival for the first time in January, and again at the end of April only to be rebuffed twice.

The US drugmaker increased its offer again on May 2 to $106 billion, but the proposal was rejected for the third time. If successful, the deal would be the biggest foreign acquisition of a British company and one of the largest pharmaceutical deals ever.

AstraZeneca's board said the sweetened offer undervalued the company "substantially" and was not an adequate basis on which to engage. AstraZeneca said it remained confident of its independent strategy. The stand-off triggered speculation that Pfizer could pursue a hostile takeover. Buying AstraZeneca would boost Pfizer's pipeline of cancer drugs and create significant cost and tax savings. Under British takeover rules, Pfizer has until May 26 to announce a firm intention to make an offer or back away.

Pfizer CEO Ian Read said AstraZeneca had declined to engage in talks and the US group was now considering how to proceed, but he remained convinced that combining the two companies made strategic sense and would benefit AstraZeneca investors.

Most of Pfizer's past deals have been conducted on a friendly basis, including its 2009 purchase of Wyeth for $68 billion. But it has been willing to play hardball if needed, as it did in 2000 with its $90 billion purchase of US rival Warner-Lambert.

Pfizer's declaration turns up the heat under AstraZeneca CEO Pascal Soriot, who has been in the job since Oct. 2012 and has supported an independent future for the UK group, flagging spin-offs of two non-core units as one option to create more value. (dw) ■

Novartis and GlaxoSmithKline Swap $20 Billion in Oncology and Vaccines Assets

Novartis and GlaxoSmithKline have announced an asset swap worth more than $20 billion, with an eye to bolstering their best businesses and exiting weaker ones.

The swap calls for Novartis to buy GSK's oncology portfolio while GSK acquires Novartis' vaccines business.

The Swiss group said it had agreed to pay $14.5 billion for GSK's oncology products, plus another $1.5 billion if results of a trial in melanoma are successful. The deal will strengthen Novartis's no.2 position in oncology behind Roche.

Novartis said it was also selling to GSK its vaccines, excluding flu, for $5.25 billion plus potential milestone payments of up to $1.8 billion and ongoing royalties, as well as creating a joint venture with the British company in consumer healthcare. Separately, it plans to sell its animal health arm to Eli Lilly for about $5.4 billion.

Novartis CEO Joe Jimenez said the revamp would help make his employer "fighting fit" to meet the challenges of the global healthcare industry over the next ten years.

He said the deals would lower overall sales at the Swiss group by around $4 billion, but result in higher profit as it swaps lower-margin vaccines for higher-margin oncology drugs.

GSK chief Andrew Witty said his group did not have sufficient scale to compete in cancer drugs, so it made sense to put them into "the hands of somebody who is a world leader in oncology." Conversely, he said the deals with Novartis will strengthen the group in two of its core franchises: vaccines, a business that supplied more than 2 million shots every day, and consumer health, where it will take the lead in running a business worth about $10 billion in annual revenue with the Swiss group.

Witty said the plans also constitute a further step in his strategy of focusing on areas of strength, while moving further away from the monolithic model of drugs companies that try to do everything.

After the deal, GSK will draw 70% of sales from its franchises in respiratory, HIV, vaccines and consumer health.

Novartis said it would start a separate sale process for its flu business immediately, which was not part of the GSK deal. (dw) ■

Germany and EU Agree on Green Energy Surcharge

Germany and the EU have settled their differences over whether energy intensive companies can remain exempt from paying a surcharge to support the country's s drive to increase the share of renewables in the energy mix.

After initiating proceedings against Europe's most populous and powerful industrial state, EU authorities backed down and agreed that all but 400 of the nearly 2,000 companies currently exempted from the surcharge can retain this status, provided they consume large amounts of energy and face international competition. At stake was a sum of around €5 billion.

Non-industrial consumers will continue to pay 6.3 cents per kilowatt-hour on top of their regular bills. BASF and Bayer, along with all other chemical companies generating their own energy, will now be able to hang on to their full exemption. (dw) ■

Novartis and Lilly Clinch Animal Health Deal

Swiss drugmaker Novartis will sell its animal health arm to U.S. rival Eli Lilly for about $5.4 billion.

Lilly said the deal would turn its Elanco unit from the world's no. 4 animal health group by revenue to the no. 2 in a sector that supplies medicines, vaccines and feed additives for farm and domestic animals. The Lilly business posted sales of $2.15 billion in 2013, up 6% year-on-year, compared with about $1.1 billion for Novartis' animal health activities. The deal crowns a period of fast expansion for Elanco, whose operating profit margins rose to 26% last year. "Elanco has doubled its sales and tripled its profits between 2007 and today, and this acquisition really brings it into the top tier of companies," Lilly CEO John Lechtleiter said. Other top players include U.S. drugmaker Merck & Co and France's Sanofi. (dw) ■

Japan's Osaka Gas Seeks US Shale Gas Stake

Osaka Gas Co, Japan's second largest gas supplier, is looking to buy a stake in at least one US shale gas project to help supply fuel to the Freeport LNG project in Texas, according to a senior official, who said the company hopes to have nailed down a stake by the time the Freeport project starts operations sometime in 2017-2018. Japanese gas and power utilities have been looking for ways to cut fuel costs after their LNG imports and payments rose to records last year due to the second complete shutdown of the country's nuclear reactors since the 2011 Fukushima disaster.

One strategy has been to sign up for new LNG supplies from the US, which is expected to grow to be the third largest exporter of the superchilled gas by the end of 2020.

Osaka Gas and Chubu Electric have signed 20-year tolling agreements with Freeport LNG for 2.2 million t/y of LNG each from the project's first liquefaction unit. They have also invested in the plant.

In May 2013, Freeport received permission from the US Energy Department to export LNG at a rate of more than 10 million t/y from its first two trains. (dw) ■

Momentive May File for Chapter 11

Silicone and quartz producer Momentive Performance Materials (MPM) is said to be close to filing for US Chapter 11 bankruptcy protection as the company belonging to private equity group Apollo strives to reduce its debt burden of around $3 billion and start restructuring.

Put together from assets formerly owned by GE, Bayer and Toshiba, MPM has found it hard to repay what it says is "a substantial amount of institutional debt," due to continued weakness in demand and overcapacity in its industry.

Apollo acquired the holding for MPM and sister firm Momentive Specialty Chemicals, formerly trading as Hexion Specialty Chemicals, for $3.8 billion in 2006 and is said to have saddled the first company with additional debt ahead of a recession that fueled oversupply in the silicone market.

Any bankruptcy filing would exclude the specialty chemicals producer, described as having a "solid" financial position. MPM expects figures for 2013 to show a net loss of around $465 million after a $365 million net loss in 2012, driven primarily by non-cash adjustments related to concerns about its ability to continue as a going concern. (dw) ■

SI Group to Take Albemarle Antioxidant Business

In a deal set to close later this year, Schenectady, New York-based SI Group, a leading producer of phenolic resins, alkylphenolic resins and akylkated phenols, plans to acquire the antioxidant, ibuprofen and propofol activities of U.S. specialty chemicals producer Albemarle.

No purchase price has been announced. Along with manufacturing sites at Orangeburg, South Carolina, and Shanghai, China, the buy includes technical support services in Baton Rouge, Louisiana.

According to Albemarle, the businesses to be divested employ 500 people had sales of around $240 million in 2013, with low-single-digit segment margins.

The ibuprofen and propofol activities belong to Albemarle's fine chemistry service businesses with annual sales of $290 million. (dw) ■

Sanofi Said Eyeing Drug Divestments of Over $7 Billion

Sanofi is looking to sell a portfolio of mature drugs that could fetch between $7 billion and $8 billion, the news agency Reuters said, quoting unnamed sources. The French drugmaker, believed to working with Evercore Partners, is said to have contacted potential buyers.

The drugs for sale would include treatments for high blood pressure and cardio-metabolic diseases and have roughly $3.7 billion in combined annual revenue, a source told the news agency, adding that the portfolio could fetch up to two times that amount. Generic drugmakers and specialty pharmaceutical companies are seen as logical buyers for the Sanofi drug portfolio. (dw) ■

Symrise Bids for French Food Ingredient Maker Diana

Symrise, the world's fourth largest flavors and fragrances manufacturer, has made a binding offer to acquire French food ingredient maker Diana Group in a deal that would expand its activities into the pet food market. Symrise did not disclose the exact purchase price, saying only that it would "invest" around €1.3 billion to buy all the shares in Kerisper, the holding for Diana, owned by the private equity firm Ardian. In 2013, Diana had sales of around €425 million and an EBITDA margin of around 21%, Symrise said. (dw) ■

US Sanofi Executive Sentenced for Insider Trading

A former US executive of French drugmaker Sanofi, Mark Cupo, has been sentenced to 16 months in prison for insider trading, after cooperating with prosecutors. The 53-year-old was alleged to be the leader of a ring that made $1.4 million in profit off pharmaceutical and medical-technology company tips. Cupo pleaded guilty after making secret recordings of the two primary traders in the ring. Prosecutors initially had asked for a 46-57 month sentence. Assistant US attorney Shirley Emehedu said Cupo made more than $50,000 in cash through the scheme. (dw) ■

Amgen Ends Non-US Co-Marketing Pact With GSK

US biotechnology firm Amgen, the world's largest, is ending its agreement with the UK drugmaker GlaxoSmithkline (GSK) for the marketing of its osteoporosis drug in some regions outside the US.

Amgen said it would take over the marketing of the drug, sold under the brand name Prolia, in most areas, including the European Union, Switzerland, Norway, Russia and Mexico, by Dec. 31. GSK will continue to market the drug in Australia.

The world's largest biotechnology company said it would pay $275 million to GSK over the rest of this year and reimburse its partner $15 million for costs incurred during the transition period. Prolia generated worldwide sales of $744 million in 2013, a 58% increase against 2012. (dw) ■

International Drugmakers Meet Challenges

Loss of Exclusivity, Spending Cuts and Generics Impact Earnings of Global Pharma Companies

Pharma Business — In contrast to chemicals, the global pharmaceutical industry is little plagued by market cyclicality or general economic swings. But it faces equally daunting challenges, as the 2013 financial performance of Europe's and North America leading players demonstrated.

Along with the perpetual threat of missteps in clinical trials or the failure to get a New Molecular Entity (NME) approved, other dark clouds always looming on the horizon are loss of patent protection, healthcare spending cuts or generic competition.

With the race to meet the challenges and score big with new treatments for life's ills growing tougher, companies are increasingly seeking collaborations and portfolio swaps as a means of remaining profitable.

Taking the hurdles may be easier than in other industries, as the sector's leaders often are no strangers to each other or their competitors – many have worked for more than one brand. What's more, they speak the same language, despite their different native tongues.

European pharmaceutical giants Novartis and Glaxo SmithKline (GSK) agreed to swap assets worth $20 billion. Coming on the heels of reports that AstraZeneca had turned down three bid approaches from Pfizer worth more than $100 billion, the news seemed to underscore that no matter where a company is located, the challenges remain the same (c.f. the news clip on page 3).

Europe's Drugmakers Weather the Storms

One of the objects of current media attention, the UK's **Glaxo SmithKline** (GSK), met its guidance for both sales and earnings in 2013, despite "unexpected challenges," said CEO Andrew Witty. Reported sales were flat at £26.5 billion but 1% higher at constant exchange rates (CER).

Core earnings per share (EPS) were up 4%, although operating profit was down 3% to £8 billion and reported operating profit down 4% to £7 billion. For 2014, the group is targeting growth in core EPS of 4-8%.

With approvals gained for six major products, last year was the most productive period of R&D in company history, Witty said. New product launches strengthened business in the respiratory, vaccines, HIV and oncology drug markets.

The London group continued to reshape its portfolio, divesting businesses worth £2.5 billion. For 2014, the CEO said the pipeline "remains extensive," with around 40 NMEs in Phase II/III clinical development.

This year and next, GSK expects Phase III read-outs for six NMEs and the start of Phase III for about ten new products in key areas such as respiratory, oncology and immuno-inflammation. This continues the strategy of multiple product launches to promote portfolio diversification and "reduce reliance on any one drug," Witty added.

Another London-based player, **AstraZeneca**, was not as upbeat about last year's numbers. Figures show sales down 8% to $25.7 billion, or 6% in CER terms. Core operating profit came in at $8.4 billion, but reported operating profit plunged by 54% to $3.7 billion.

CEO Pascal Soriot pointed to the lingering impact of loss of exclusivity for several key brands. While "in the near term, these headwinds will remain challenging," he said management is "confident that we can return to growth faster than expected."

The French national who recently completed his first full year as head of the UK company said he is pleased with the momentum built in 2013 toward implementing strategic priorities, "in particular our objective of achieving scientific leadership."

AstraZeneca will continue to focus on areas that will drive growth, while redeploying resources to fund its promising late-stage platform, Soriot said. The acquisition of Bristol Myers Squibb's share of the joint diabetes alliance "strengthens our position in this important area," he added. At the end of 2013, the pipeline included 11 NMEs in Phase III or registration, nearly twice the 2012 figure.

As part of its drive to restore growth, AstraZeneca is also proceeding with a restructuring scheme announced in March 2013. This foresees a headcount reduction of about 5,050 over the 2013-2016 period.

In Switzerland, **Novartis** reported "a strong net sales performance" for 2013, which more than offset the impact of generic competition. Group revenue increased 2% to $57.9 billion. In CER terms, the rise was 4%.

Excluding the generics factor, underlying sales at the Swiss group grew 8% in constant currencies (CC), said CEO Joe Jimenez, an American who once served as a non-executive director at AstraZeneca. The loss of exclusivity for two major products took a $2.2 billion bite.

Group operating income fell back 3%, or 5% in CC terms, to $10.9 billion. Jimenez said negative currency movements hurt earnings more than sales. The operating margin declined by 1 percentage point to 18.8% of net sales, but improved by 0.1 percentage points in constant currencies.

Sales of Novartis' Pharmaceuticals segment were flat at $32.2 billion. The Basel group's generics arm, Sandoz, increased net sales by 5%, both in reported and CC terms, driven by double-digit retail generics and biosimilars sales in most western European markets and Japan as well as emerging markets.

At another Basel-based global player, **Roche**, CEO Severin Schwan said 2013 was "a very good year." Sales increased 6% to 46.8 billion Swiss francs and EPS by 10% to 14.27 francs. Core operating profit of 17.9 million francs was up 4% against 2012.

Driven by cancer drugs, Roche's pharmaceuticals arm lifted sales by 4% (7% CER) to 36.3 billion francs, The diagnostics arm, which contributed 10.5 billion francs, 2% more (4% CER) than in 2012, grew ahead of the in-vitro market. The environment for diabetes care – where the group is continuing the restructuring program begun in 2012 – remained "challenging."

Over the course of 2013, the Austrian-born CEO said Roche "made significant progress" in its pharmaceutical R&D pipeline, with 66 NMEs in clinical development, with 15 in late-stage development.

For 2014 the Swiss group expects growth in the "low- to mid-single digit range" at constant exchange rates, with core EPS growing ahead of sales. In Q1 2014, sales rose 5% in CER terms, but shrank by 1% in Swiss francs to €11.5 billion.

Sanofi, France's leading drugmaker, saw a return to growth in late 2013, CEO Christopher Viehbacher said. More precisely, he said, this was "growth by subtraction," as the company put the patent cliff behind it from the end of August.

Full-year sales were down 0.5% to just under €33 million, but Q4 saw a 6.5% rise to €8.5 billion. Business operating income for the full year was down 18.6% to €9.3 billion.

Sanofi took "decisive action" last year to remedy "temporary operational challenges," said the German-Canadian Viehbacher. At the year's end, growth platforms accounted for 73% of sales.. The company had nine high potential late-stage projects. Its emphasis on biologics appeared to be paying off, as 45% of sales were in this category, along with 80% of developmental pipeline projects.

The Sanofi chief said 2013 was "a solid year" for new approvals and regulatory submission. Seven products – including vaccinations and treatments for multiple sclerosis, diabetes, and cancer – were approved and two were in registration. For 2014, he expects business earnings per share to be 4-7% higher than 2013 at constant exchange rates.

Germany's **Boehringer Ingelheim,** one of the country's few major pure-play pharmaceutical producers, was pleased with its 2013 financial performance, despite "some challenges," CEO Andreas Barner said. Sales increased 1.4% to €14.1 billion, but declined 4% in currency-adjusted terms. Operating profit rose to €2.1 billion and the return on net sales improved by 2.4 percentage points to 15%.

Barner, a German who has worked in Switzerland, said the privately owned drugmaker that counts itself among the global top 20 players "successfully entered the oncology market" last year. A new lung cancer treatment was launched as Gilotrif in the U.S. and in early 2014 in Europe as Giotrif.

Over the next two years, Boehringer plans more than ten new launches in eight indications, including diabetes, COPD, asthma, lung cancer, pulmonary fibrosis and a rare form of leukemia. Due to the lack of pharmaceutical market growth, Barner predicted that 2014 sales will be comparable to 2014.

U.S. Pharma Players Show a Mixed Performance

Among US.players, healthcare giant **Johnson & Johnson** (J&J) reported "strong results" for 2013, said CEO Alex Gorsky, an American who once worked for Novartis. This was thanks to an outstanding performance by the pharmaceuticals division, the strength of key OTC brands and other consumer products, along with progress in integrating a recent acquisition.

Sales increased 6% to $71.3 billion, earnings per share by 8% to $5.52. The net result was $13.8 billion. Global sales of Pharmaceuticals rose nearly 11% to $28.1 billion. The almost equally large Medical Devices and Diagnostics segment saw revenues rise nearly 4% to $28.5 billion, and sales of Consumer Products by 1.7% to $14.7 billion.

Primary growth drivers were new group company Synthes, a medical devices producer, and joint reconstruction projects in the orthopedics business. Revenues were negatively impacted by loss of exclusivity for Aciphex/Pariet (rabeprazole), a proton pump inhibitor for gastrointestinal disorders, and Concepta (methylphenidate HCI) for treatment of attention deficit hyperactivity disorder.

After a strong first quarter, J&J lifted its earnings forecast for 2014 to $5.80-$5.90 per share, before exceptional items – up from the $5.75-5.85 predicted earlier. For Q1, it reported a sales rise of 3.5% to $18.1 billion, with operating profit up 5.3%.

Another US titan, **Merck & Co.** (trading outside North America as MSD), reported a 7% decline in 2013 sales to $44 billion, which it blamed on expiration of patents and unfavorable currency exchange rates. Revenues of Pharmaceuticals sank by 8% to $37.4 billion, while sales of Animal Health were flat at $3.4 billion. Consumer Care saw a 3% decrease to just under $1.9 billion. Net income plunged by 28.5% to $4.4 billion.

The pharmaceutical business was driven by the human papillomavirus drug Gardasil, which posted a 12% rise for the full year, as well as by combined sales of the inflammatory disease treatments Remicade (infliximab) and Simponi (golimumab), the herpes zoster vaccine Zostervax, the HIV medication Isentress (raltegravir) and the combined diabetes franchise, Januvia (sitagliptin) with Janumet

CEO Kenneth C. Frazier, the first African-American to lead a major pharmaceutical company, said Merck's performance "was tempered by ongoing business challenges, including patent expiration and global healthcare cost containment initiatives.

The loss of exclusivity for three major products, which led to a "significant and rapid decline in sales," was partially offset by higher sales of vaccines, immunology, diabetes and HIV products.

In 2013, Merck continued its cost-cutting regime, and in October announced a multi-year global initiative to sharpen its R&D focus. Geographically, it will concentrate on ten priority markets – led by the U.S., Japan and France – which account for the largest share of revenue. In the portfolio, priority will be given to diabetes, acute hospital care, vaccines and oncology.

At another American behemoth, **Pfizer**, British-born CEO Ian Read described the 2013 performance as "solid." As the drugmaker strengthened its innovative core and gave itself a new commercial structure aimed at focusing each business on "distinct market opportunities," Read said it entered 2014 with confidence.

Chief financial officer Frank D'Amelio noted that Pfizer "achieved or exceeded" all elements of its financial guidance last year, despite the 6% decline in sales to $51.6 billion and the 3% decline in adjusted income to $15.3 billion. Net income improved by 51% to $22 billion. The company also completed the separation of its animal health business.

The weaker 2013 revenue is blamed in particular on the "continued erosion" of the cholesterol compound Lipitor in the U.S. and Europe and repercussions from the loss of patent protection for another drug in 2012. This could be offset only partially by growth in other franchises.

For 2014, Pfizer is forecasting sales of $49.2-51.2 billion, down slightly against 2013. This takes into account the loss of $3 billion in revenue due to the loss of exclusivity and the expected termination of collaboration agreements with other pharmaceutical producers.

Dede Williams


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Essential Ingredients

Classification of Organic Chemicals and Its Effect on the Pharmaceutical Industry

Understanding The Source — Classification of today's supply chain — regarding all organic chemicals involved in the manufacturing of an API — is a useful tool for demonstrating where current good manufacturing practice (cGMP) is established and where organic chemicals are only used by their analytical purity. With this classification, sourcing in the pharmaceutical industry will be better understood.


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Chemical raw materials, which are needed in the synthesis of an active pharmaceutical ingredient (API), originate from a huge pool of organic chemicals. Classification of organic chemicals helps demonstrate how the chemicals are linked with the supply chain in the pharmaceutical industry. So risks, advantages and open questions can be addressed in due time.

A precise classification/definition of organic chemicals is not feasible. A pragmatic approach is a subdivision into three categories, namely chemical commodities, fine chemicals and specialty chemicals (Fig. 1). They account for about 40%, 5% and 55%, respectively, of the global market of organic chemicals, which was about $2.5 billion in 2012.

Chemical Commodities

Chemical commodities are low-price, large-volume products. They have a standardized specification and can be further subdivided into bulk chemicals and basic intermediates.

Bulk chemicals: Most of the organic solvents, such as methanol, toluene and acetone, are classified as commodities and are used in the manufacturing of APIs. These products are inexpensive and readily available from Western companies with consistently high quality. Thus, pharmaceutical companies can use them without further restriction.

Basic intermediates: High-volume products such as chlorinated benzene, phenols and pyridines dominate this class.

If such chemicals are used in the regulated part of the synthesis, chances are low to find a supplier that will manufacture according to cGMP. The reasons are similar to those for bulk chemicals.

Pharmaceutical companies may be able to source premium basic intermediates with up to 99.9% purity (e.g., gas chromatography [GC] or high-performance liquid chromatography [HPLC] purity), but nevertheless most of the requirements of cGMP are missing.

What to do? Close your eyes and believe that these suppliers have experience in this kind of chemistry and that premium quality will answer all questions?

Or define a basic GMP for those manufacturers? Check out Peter Pollak's book "Fine Chemicals," 2nd edition, Wiley, 2011.

Fine Chemicals

Fine chemicals are normally produced in limited quantities (less than 1,000 tons/year) and sold for more than $10/kg with established product specifications. The fine chemicals are the most interesting part for the pharma industry and can be divided into catalog products; intermediates (IM) and advanced IM, custom-made; and API, custom-made or generic.

Catalog products: Catalog products are offered on the Internet. Purchasing has to check whether the offered products are produced in lab scale, pilot-plant scale or production scale. If the product is already scaled up and the potential supplier has appropriate equipment for manufacturing in production scale, it can be attractive as a supplier to the pharmaceutical industry. Nevertheless, pharmaceutical companies must carefully check what kind of GMP is necessary. Environmental, health and safety (EHS) standards and analytical methods also have to be checked.

Pricing for the product is easy because information about the chemical process itself is known and can be used for a first quotation by the manufacturer. Furthermore, it is advantageous if the product is already at production scale, so quality is already settled and will not change during up-scaling from lab to production scale. Another advantage of catalog product is that no research and process development by the pharmaceutical company is necessary as the product is already available.

IM and advanced IM, custom-made: During phase I it would be perfect to have at least two suppliers for chemical raw materials in place. At that time some pharmaceutical companies start to cooperate with a preferred supplier or enter into a strategic partnership with potential suppliers. This kind of cooperation can be an option when both partners know and trust each other.

A partnership usually starts as follows:

After in-house process development on lab scale and pilot scale by the pharmaceutical company, a technical package will be transferred to the preferred supplier under a confidentiality disclosure agreement (CDA).

During phase I, little is known of the chemical process itself, especially the risks in increasing production and further process development. Often final product specification is unclear because the analytical methods are not well-developed at that time. Furthermore, the following problems are not discussed:

- The need for the development of the analytical method itself.
- Change in the basic raw materials source or suppliers.
- Realizing that high quality in the early steps can minimize the purification in the late steps.

Regarding cGMP and EHS requirements, the preferred supplier should be well-established. As a qualified supplier for regulated advanced IM, it must have flawless inspection records.

Since the lab work required for preparing different small samples is usually not adequately compensated, the initial phase of a new project is normally not attractive and can be justified only in the context of the overall relationship.

For preferred suppliers, the initial phase is not attractive because they often have to deliver many samples in small quantities for different tests of the API. Preferred suppliers believe that market launch will lead to big business. Unfortunately, many projects drop down in phase I or phase II, even in phase III.

On the other hand, management in the pharmaceutical industry expects to get the best total cost of ownership at the lowest risk, according to the preferred supplier concept.

API, custom-made or generic: This concept is attractive when a pharmaceutical company has decided that API manufacturing is not its core competence and it has to be outsourced.

To avoid any risks, the potential supplier has to be inspected carefully. The supplier should have a history in API manufacturing. The pharmaceutical company should have a clear procedure in place for managing the technical transfer.

Again, generic suppliers' fulfillment of cGMP must be checked. If this work isn't done carefully, it can become a huge problem.

Specialty Chemicals

Performance chemicals are the most important subcategory of specialty chemicals. Whereas fine chemicals need a clear specification when sold in the market, and can be classified as "what they are", performance chemicals are sold on the basis of "what they can do." Whether pharmaceuticals should also be classified as performance chemicals is somewhat controversial. In this article, APIs (drug substances) are classified as fine chemicals.

Looking into the subcategories, enzymes and catalysts are becoming more and more important in the pharmaceutical industry. The literature pays a lot of attention to these, e.g., catalysts for asymmetric hydrogenation. Specialized companies are offering these catalysts or are able to develop specific ones.

The chemical structure of those catalysts usually is a highly sophisticated molecule. They are complexes of precious metals with chiral ligands (organic molecules). The chemical purity as well as the optical purity is essential for the performance of the catalyst. The performance can be measured by turnover number (TON) and turnover frequency (TOF).

The catalyst usually is tailor-made and specially developed for a dedicated reaction. In the meantime, companies can be found offering this kind of service. The development of such a catalyst can be very expensive. This usually is worth the investment only for valuable and large-scale APIs.

If a catalyst is available and can be used directly for a new process, the pharmaceutical company should use the catalyst even if it does not deliver optimal results. The saving of development cost and time justifies the lower performance. Fortunately, the ligands normally should not be manufactured according to cGMP.

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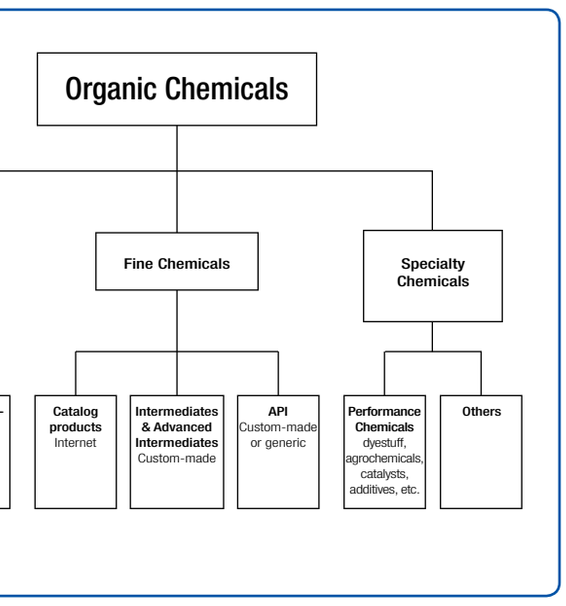

Fig. 1: Overview of the classification of organic chemicals and subcategories

Evolution of a Dynamic Market

China's Growing Local Pharma Market Entices API Manufacturers Seeking to Import Their Products

Changing Roles — China's far-reaching presence in the manufacture and supply of active pharmaceutical ingredients (APIs) around the world has long been known. However, with the implementation of the Generic Drug User Fee Act (GDUFA) and the Falsified Medicines Directive (FMD), the scope of that role in regulated markets has been better quantified. As global regulations increase, China has also been adapting its internal regulations to better match those of the highly regulated markets it supplies.

Along with providing substantial manufacturing capacity for exported products, China's large and growing local market continues to entice companies seeking to import their products; though entering the Chinese market can be difficult.

European and US Market Presence

Both GDUFA and FMD require manufacturers to identify their activities for regulated markets, albeit in different ways. Under GDUFA, foreign and domestic facilities are required to register their activities with the US Food and Drug Administration. As of mid-October, 165 sites in China had self-identified as API manufacturers for 2014. Comparatively, under the FMD, the European Commission reported that 438 sites in China were supplying the EU with API as of late 2013. This positions China as second only to India, which was listed with 496.

According to the FMD, companies obtaining APIs from China and other countries outside the EU must procure written confirmation (WC) from the manufacturer stating that the API has been manufactured under current good manufacturing practice (cGMP) standards equivalent to those of the EU. These WCs are issued by the designated local regulatory authority, with the China Food and Drug Administration (CFDA) as the issuing authority in China.

These regulatory changes demand not only more time for companies to file with respective authorities but also additional investments. Under GDUFA, companies are responsible for paying fees for facilities, as well as drug master files (DMFs) that have been referenced in abbreviated new drug applications since GDUFA was implemented on Oct. 1, 2012. As of mid-April 10% of the US DMFs available for reference were held by Chinese corporate groups (Fig. 1). The costs related to GDUFA are being handled in different ways; some companies choose to pay the fees themselves and others build in the fee payment as part of supply arrangements, thereby affecting material costs.

Domestic Market

While API sourcing from China continues to be a major trend, an increasing number of companies are looking to supply their products into China.

Gaining market access can be complicated for foreign companies. China requires domestic clinical trials to be done as part of the approval process for new drugs, sometimes adding substantially to the approval timeline for finished dose products.

For companies that achieve success, a market with 1.3 billion people and a growing middle class awaits.

In an effort to penetrate this market, companies are revamping their strategies for China. A number of Western companies have entered into joint ventures (JV) with Chinese manufacturers, either supplying API or technical expertise to capitalize on a local presence and domestic brand recognition.

Following several well-publicized JV terminations, companies are now developing different strategies. For example, recently Boehringer-Ingelheim (BI) announced plans to open a contract manufacturing plant with partner Zhangjiang Biotech & Pharmaceutical Base Development Co., giving BI further access in China. The plant will produce both Chinese- and foreign-developed biotech drugs for the local market.

Companies wishing to sell their APIs into China must have a valid import license for their products, which is good for 5 years. The majority of Chinese import registrations (CIRs) are held by corporate groups in the top five EU markets (France, Germany, Italy, Spain, United Kingdom) (Fig. 2). The largest single-country supplier is Japan, with 31 companies holding 174 import registrations for 102 products. India follows with 38 companies holding 158 registrations for 30 products. Because of the regulatory aspects and expense companies can face when selling into China, the majority of CIR holders are Big Pharma or established companies, as assessed by Thomson Reuters (Fig. 3). While these companies have experience navigating market complexities, the proportion of potential future and local companies holding CIRs has also increased, further illustrating the attraction of the Chinese market.

Looking Forward

For several years, environmental health and safety regulations have become increasingly more stringent for producers in China as manufacturing practices are scrutinized worldwide. These additional measures and increasing wages have escalated the cost of doing business in China. These increases have led to some companies relocating or scaling back manufacturing activities, sometimes ceasing production entirely.

China has long been known as a lower-cost sourcing destination for large-volume commodity products. To continue to compete globally, Chinese manufacturers will need to continue to place additional focus on developing efficient processes for specialized manufacturing as the number of products requiring cytotoxic, biologic or high-potency capabilities continues upward. To this point, the Chinese government has pledged substantial monetary support to develop domestic manufacturing of these products.

In accessing the Chinese market, companies will need to find ways to leverage their strengths through creative deal-making and innovative technologies. Additionally, price containment will continue to be emphasized in an effort to decrease healthcare expenses for China's large population. Despite rising costs, we expect China will continue to be a substantial supplier of APIs and an increasing finished-dose presence in regulated markets.

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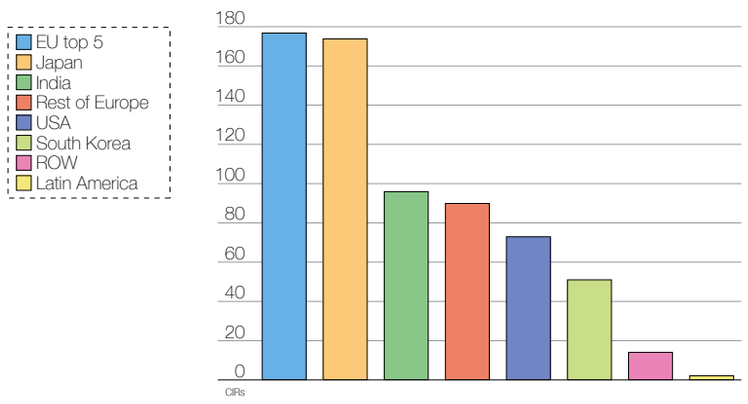
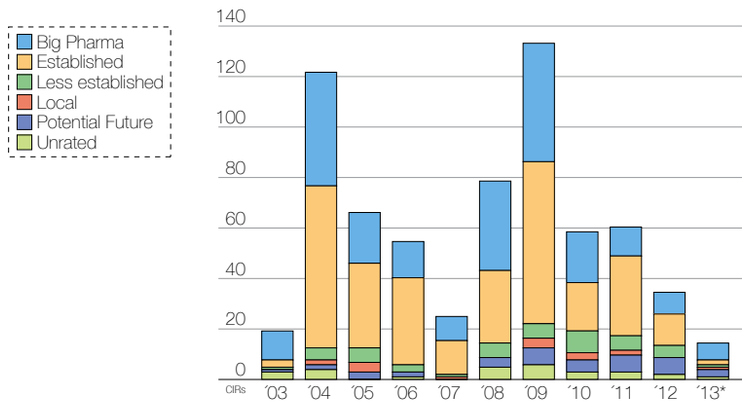
References are available from the author.

Chinese Import Registration by Corporate Group Location — Fig. 1



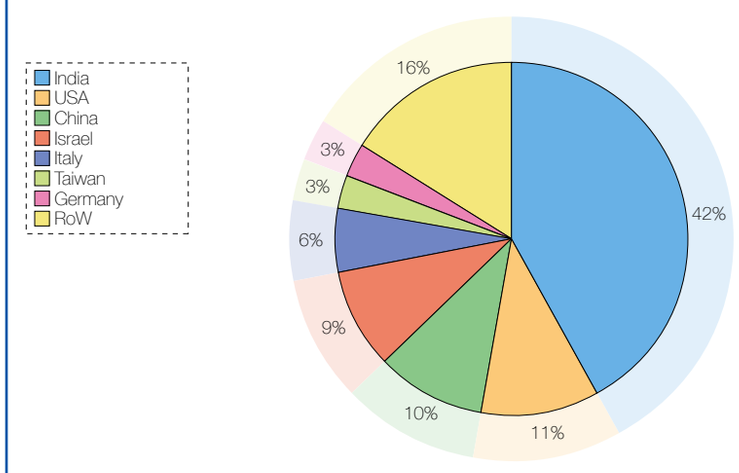
Source: © CHEManager International

Yearly CIRs by Corporate Group Rating — Fig. 2



Source: © CHEManager International

Active US DMFs for Reference by Country of Holder — Fig. 3



Source: Thomson Reuters Newport Premium © CHEManager International

BASF to Cut 260 Jobs in Nutrition & Health

BASF plans to eliminate 260 jobs in its Nutrition & Health division up to 2015 to improve the profitability of its Performance Products business segment. At the same time, the German group said it will continue to analyze "further measures" to strengthen competitiveness.

The division bundles products and solutions for human and animal nutrition, flavors and fragrances industry as well as pharmaceuticals. In the Performance Products segment as a whole, EBITDA decreased by 5% in 2013 to €1.99 billion, with sales down 1% to €15.5 billion.

In future, marketing, sales and administration in the Nutrition & Health will be "better adjusted to regional market dynamics," BASF said.

Strategic partnerships in regional markets appear to be the chosen path for the world's largest chemical producer.

In Asia, BASF is building a citral plant with Malaysian chemical giant Petronas to meet the growing demand of customers in the flavor and fragrance industry in the region. The first plants are expected on stream in 2016.

In future, the group said it will focus its production in the growing market of omega-3 fatty acids on the "attractive market segment" for highly concentrated omega-3 fatty acids. It plans to sell the Brattvåg site in Norway, where it produces low concentrated omega-3 fatty acids. (dw) ■

Takeda, Lilly Fined $9 Billion Over Diabetes Drug Safety

Japanese drug giant Takeda has vowed to fight a $6 billion damages award to US plaintiffs who blamed its Actos diabetes drug for their bladder cancer.

The company said it „respectfully disagrees" with the judgement awarded by a jury in the state of Louisiana on Apr. 7. In the same proccedings, co-defendant Eli Lilly, which co-marketed the drug in the US, was ordered to pay $3 billion in damages. Other US cases are still pending.

The Japanese company said judgments were entered in its favor in all three previous Actos trials. This was the first federal case to be tried as well as the first of a consolidated multidistrict litigation.

In May 2013, a US judge nullified a separate jury verdict for $6.5 million against Takeda after ruling that the plaintiffs failed to offer any reliable evidence that Actos had caused cancer.

Germany and France suspended use of the drug, a multibillion dollar seller, in 2011 due to worries about a possible link to cancer. (dw) ■

Bayer Sells Carbon Nanotube IP to FutureCarbon

Following its exit from the carbon nanotube sector last year, Bayer MaterialScience (BMS) plans to sell proprietary intellectual property gained in the decade-long research cooperation to one of its former external partners, FutureCarbon, based at Bayreuth, Germany.

As leading provider of carbon-based composites, the Bayer subgroup said the young company will acquire the bulk of the related patents for an undisclosed sum.

BMS said much of the knowledge has been made available to other companies and research institutions within the Innovation Alliance for Carbon Nanotubes (Inno.CNT), which counts some 90 members. (dw) ■

LyondellBasell Ends Talks to Sell Berre Refinery

LyondellBasell has ended talks to sell its Berre refinery near Marseilles, France, to privately owned oil products trading company Sotragem. It said the bid had failed to offer acceptable commercial terms and showed no guarantee of a restart. The 105,000 barrel/d refinery was mothballed in 2012. (dw) ■

Linde Acquires Two Canadian Gases Companies

Linde Canada, subsidiary of the German gases and engineering group, has acquired shares in two Canadian companies, Oxygene Sorel-Tracy (OST) and Soudure Industrielle du Richlieu Metropolitain (SIRM). Both companies are based at Sorel-Tracy in Quebec, from where they have supplied industrial gases (OST), welding equipment and services (SIRM) to local companies for several decades. Chris Ebert, vice president and general manager of Linde Canada, said the deal gives the company an extended presence in this part of Quebec as well as a competitive edge in serving industrial customers in that area.

Linde Canada specializes in industrial, medical and specialty gases as well as welding and cutting equipment and safety supplies. (dw) ■

Celanese to Expand PPS Compounding in China

Celanese has announced plans to expand compounding capacity for Fortron PPS compounds at its integrated site at Nanjing, China up to the end of 2014.

The US group said the expansion, which it did not quantify, is in reaction to "impressive growth" in the People's Republic and in Asia generally.

Fortron Polymers, a 50:50 joint venture between Celanese and Japan's Kureha, produces 15,000 t/y of the high-tech heat-resistant polymer at Wilmington, North Carolina. The company recently applied for $100,000 in state aid to "make improvements" at the site. It was not clear whether expansion was targeted. (dw) ■

Catching Up

Implications of the Closing Wage Gap between European and Chinese Chemical Industries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Variety of Factors Influence Salaries — In the last 10 years, salaries in China have been rising at an average annual rate of about 14%. Though this rate has recently been somewhat lower, it is still around 10%. At the same time, salaries in Europe have increased at well below 3% per year. As a result, the salary gap between China and Europe has decreased quite substantially. Of course, this also applies to the chemical industry.

This does not mean that salaries in China have already reached European levels, at least with regard to the positions requiring lower levels of education. Blue-collar chemical workers in China may receive monthly salaries of €300-€500 — still substantially below their European counterparts. On the other hand, for experienced sales managers in the chemical industry, the monthly Chinese salary may already reach a base salary between €4,000 and €7,000.

Factors Influencing Wage Differences

Obviously the wage gap between the Chinese and the European chemical industries depends on a number of factors. An important one is the region within China. For example, the minimum wage in Shanghai is about 60% higher than the one in Guizhou, a poor province in western China, and though the specific minimum-wage values are not particularly relevant for the chemical industry, they can be seen as an indicator of the overall wage level in a province. Thus Beijing and Shanghai have wages that are much closer to European levels than those of some of the western provinces.

Another factor is the position level. Generally, the wage gap between Europe and China is much bigger for lower-level positions — an expression of the higher level of inequality of Chinese society.

Finally, there is some difference based on the ownership type of Chinese companies. While the wage level of listed Chinese companies is similar to that of Western-owned companies, wage levels are still somewhat lower for state-owned companies and private companies. As a consequence, the salary gap to the European chemical industry is bigger for the latter.

The main reason for the large salary increases is the overall increase in gross domestic product rather than the increase of salaries relative to GDP. In fact, private consumption — which is linked to salaries — accounts for a comparatively small and stagnating share of Chinese GDP compared with Europe. Other reasons are the slightly decreasing overall working population and the government policy to frequently increase minimum wages (by up to 20% per year).

However, the biggest driver for salary increases is still the lack of relevant experience within the labor force. China's economy has grown so much in the past decade that not enough people have the technical and management experience required, particularly for the higher-level positions. Thus competition for these highly qualified employees is fierce, and companies need to pay competitive salaries to hire them.

Dr. Kai Pflug

A final aspect that should not be forgotten when discussing the salary gap in the chemical industry is an indirect effect. Most segments of the chemical industry are not particularly labor intensive. This reduces the direct effect of rising wages. However, chemical industry segments may still be strongly affected if their customer industries are labor intensive. For example, producers of textile chemicals in China may in the long run be affected as their textile-producing customers move to lower-wage countries such as Bangladesh or Vietnam.

How Chemical Companies React

There are many ways companies can react to rising salary levels. Perhaps it is most interesting to see which of these measures chemical companies so far have not used much.

Western chemical companies have not reduced staff. In fact, staff numbers at Western companies still increase at a rate of 5%-10% per year. This is despite the occasional reduction. For example, BASF had a staff of about 7,800 in greater China at the end of 2011, then reduced this number by about 500 employees one year later but increased again to more than 8,400 employees at the end of 2013. In general, for each chemical company reducing its employee number, there are still several late entrants into the Chinese market hiring additional staff.

Also, companies have not substantially moved away from China. Unlike the effect of high labor cost on labor-intensive chemical segments in the European chemical industry (e.g., fine chemicals), so far no shift toward lower-cost countries has occurred. The main reason is the necessity to produce where the market is: in China. In addition, countries with lower wages do not have the infrastructure and educational level to justify the shift for the comparatively low-labor intensive chemical industry.

Thirdly, while chemical companies have tried to reduce further salary increases, they have only had moderate success so far. Past routine annual increases of 10%-12% have been replaced by a more moderate 7%-8% in the past one or two years, but the general upward trend has not been stopped.

In contrast, chemical companies in China strongly focus on increasing the productivity of their workforce. This includes a variety of measures such as:

- Increased automation and general improvement of work processes
- Increased capacity utilization, e.g., by widening the locally produced portfolio (to achieve a dilution of salary costs on higher total sales) — this trend has been in line with the general move toward localization of production
- Widening the qualification of the workforce, and extending its tasks — for example, some chemical companies have trained the electricians in the afternoon and night shifts to also take over operator duties, thus reducing the number of staff present during these shifts
- Increasing the retention of employees in order to improve the overall experience of staff in their positions, e.g., via active employer branding

According to Chinese statistics and some third-party surveys, the productivity increases thus achieved are roughly in line with salary increases, which makes the rising wages more palpable for the chemical industry.

Outsourcing of selected functions is another tool utilized particularly by foreign companies. While most companies still feel somewhat uncomfortable outsourcing production of chemicals (unlike in Europe, where toll production is more common), the bigger use of third-party distributors, as a way of outsourcing part of the sales function, is getting more frequent. This particularly holds true for those companies that have already created strong own sales teams in China and are now re-evaluating the use of this own staff for smaller, lower-value customers.

Increased flexibility of pay is employed in order to limit pay increases to the actual improvement of company results. Private local chemical companies use this tool to a large extent, often offering quite low base salaries and a huge upside potential based on personal results, particularly for sales staff. Chinese companies also accept a much wider wage differential, paying quite low wages for employees deemed easily replaceable (e.g., accountants) while highly rewarding their star performers, e.g., in sales.

An action taken primarily by local Chinese companies has been to shift part of their production away from the expensive tier 1 cities in eastern China, and toward western and central China. This can indeed result in substantial savings in wage payments; however, it also brings additional issues such as scarcity of qualified staff in these regions and inferior infrastructure, particularly for companies involved in import and export. These issues have so far kept most foreign companies from considering a move away from the main chemical centers in coastal China.

What This Means

Generally, although management of chemical companies in China is highly aware of the substantial salary increases, the issue is still not perceived as very severe. The times when China was mostly a cheap production site for export elsewhere are long gone. Within the next few years, China will be the biggest chemicals market in the world. Thus there is no real alternative to having a strong China presence and consequently to hiring and paying qualified staff. Therefore the closing salary gap is unlikely to have a significant influence on the chemical industry in China.

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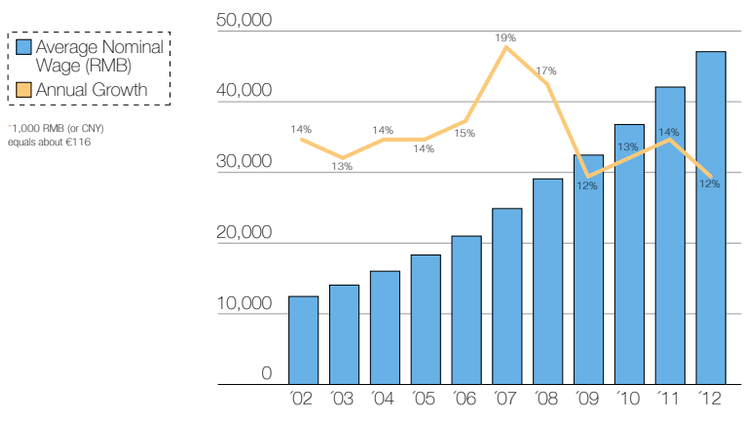
Development of Chinese average wage — Fig. 1
in Yuan Renminbi (RMB)* and %



Source: German Chamber of Commerce, China calculations based on Chinese National Bureau of Statistics © CHEManager International

Effectively Addressing Today's VUCA Challenges

LEAN Supply-Chain Planning for the Pharmaceutical Industry Featured in Third Pharma Management Radar

Power Of The Unknown — Despite a generally positive estimation of the current business climate, global pharmaceutical companies face challenges that endanger their business development.

Many of these challenges can be summarized under the term VUCA, an acronym for "volatility, uncertainty, complexity and ambiguity," that describes precisely the conditions of increasing variability and uncertainty of demand, and the complexity and ambiguity of product portfolios and supply-chain networks in which companies are forced to operate today. Nearly all of them consider themselves affected strongly or even very strongly by VUCA challenges.

At the same time, many industry players are hesitant to take appropriate action in the field of supply-chain planning — although most of them have a clear vision of what the right countermeasures against countermeasures should be.

This is the picture that emerges from the third Camelot Management Consultants Pharma Management Radar, a biannual survey among an expert panel consisting of almost 100 executives from leading globally active pharmaceutical companies based in 16 countries and spread over four continents. Survey participants represent almost two-thirds of the global Top 20 pharmaceutical companies. The focus topic of the third Pharma Management Radar is supply-chain planning in a VUCA world.

> *It is not about reducing the amount of uncertainty in the future. It is about eliminating the need for certainty.*
>
> Ronald W. Bohl, senior director supply chain, Eli Lilly

Lowered growth expectations for emerging markets

Although the pharmaceutical industry is still suffering from the Euro zone crisis in various regions, it is no longer as extremely focused on emerging markets. The tremendous growth expectations registered last September for countries and regions such as Eastern Europe (8.5%), Russia (9.5%) or Brazil (9.6%), have cooled down to an almost disillusioned level of around or below 4%. Some respondents are particularly pessimistic with regard to Russia, which has politically veered away from the West during the past months: It is the only region in the world in which even generics expect decreasing demand in the next 12 months.

In accordance with their lowered growth expectations for the emerging markets, the pharmaceutical companies are returning to the established markets with their regional investment plans for the next 12 months. Compared to the last survey, Northern Europe and North America have gained considerably with regard to investment attractiveness. This trend is particularly strong among generics respondents, who are all planning to invest in Northern Europe (including Germany) in the next 12 months.

All in all, investment plans reflect the optimism of the positive general business climate: The share of respondents who do not plan any regional investments at all has further decreased since the last survey.

VUCA Challenges Affect the Whole Industry

Asked for the greatest risks for their companies' business development during the next 12 months, many participants name complexity, rising volatility and uncertainty — factors generally subsumed under the term VUCA. The latter also plays a role in the most important industry trends. "Countermeasures against rising complexity" as well as "countermeasures against rising volatility and uncertainty" rank relatively high. When looking at the two predominant business models separately, "concentration on emerging markets" is — alongside the two VUCA countermeasures — among the top three trends for the generics sector. This is due to the growth potential the generics see in these regions.

When asked directly about the influence of VUCA challenges on the companies' business success, the respondents virtually speak with one voice: Nearly 90% consider their business to be affected "strongly" or even "very strongly" by VUCA challenges. None of them thinks that VUCA challenges have no effect at all.

> *Our survey shows that many supply-chain heads have a feeling of lacking sufficiently synchronized supply-chain planning.*
>
> Michael Jarosch, Camelot Management Consultants

VUCA awareness is particularly strong within the generics segment, with all respondents feeling affected by these challenges at least strongly. Among the innovators, only a small minority considers business to be hardly affected by VUCA challenges. According to the industry executives, supply chain and production stand out as the business functions affected most by these challenges.

With regard to the biggest threats caused to the supply chain by VUCA challenges, "high volatility in demand and supply" is indisputably considered the main problem, while opinions differ with regard to other possible threats. It is striking, for instance, that innovators attach far less importance to the threats of "increased risk of stock outs" (37% vs. 60%) and "need for high safety stocks/inventories" (32% vs. 60%).

This may be traced back to the fact that innovators are used to having comparably high inventories to avoid stock outs — which is, however, not efficient under the cost aspect. As a consequence, the answers imply that many innovators do not make much progress on their way toward modern supply-chain planning.

Countermeasures Against VUCA Challenges

When it comes to countermeasures against VUCA challenges, some highly interesting discrepancies between current action, planned action and wishes can be observed: Currently, the pharmaceutical companies mainly focus on "improved forecast accuracy" and "demand-driven supply-chain planning." Concerning the countermeasures that the pharmaceutical industry's executives personally consider most promising for the future, "leveled production and utilization" plays a considerably stronger role.

> *Conceptual, organizational and IT-related issues are perceived as the main hurdles for the implementation of VUCA countermeasures.*
>
> Dr. Josef Packowski, Camelot Management Consultants

The discrepancy between personal assessment and actual planning is further illustrated when asking which countermeasures against VUCA challenges in supply-chain planning the various companies have planned for the near future. Regarding the top answer, there is a much higher share of respondents wishing to apply demand-driven supply-chain planning than of respondents whose companies have planned to actually do so.

This discrepancy can also be found with regard to "leveled production and utilization," which one-third of respondents consider promising but only one-fourth have planned for the near future.

Taking a closer look at innovators, this phenomenon can also be observed when it comes to increased flexibility in production patterns (wish: 37%, plan: 21%). In addition, there seems to be a considerable need for action concerning leveled production (wish: 26%, plan: 16%) in this segment.

To find out why the various players in the pharmaceutical industry do not do as they wish with regard to VUCA countermeasures, it is helpful to realize what they consider the biggest hurdles for successful implementation of such measures. The participants' answers show that conceptual, organizational and IT-related issues are perceived as the main hurdles.

This in turn allows for the conclusion that the VUCA challenges must be addressed with an integrated conceptual approach in order to fight them effectively — comprising strategy, organization and processes, and IT systems. And it seems that the VUCA challenge is perceived to be too big for further single initiatives, as a truly integrated approach implies a major transformation of the global supply chain, including the necessary change-management program and board sponsorship.

Given all these hurdles it shows that the most promising countermeasure against the challenges of today's VUCA world lies in a process-oriented cross-functional and fully integrated end-to-end LEAN supply-chain planning concept. The latter can be found in Camelot Management Consultants' concept of LEAN supply-chain management, which has specifically been developed to address today's VUCA challenges most effectively.

Dr. Josef Packowski, managing partner, and Michael Jarosch, head of industry segment pharmaceuticals and life sciences, Camelot Management Consultants

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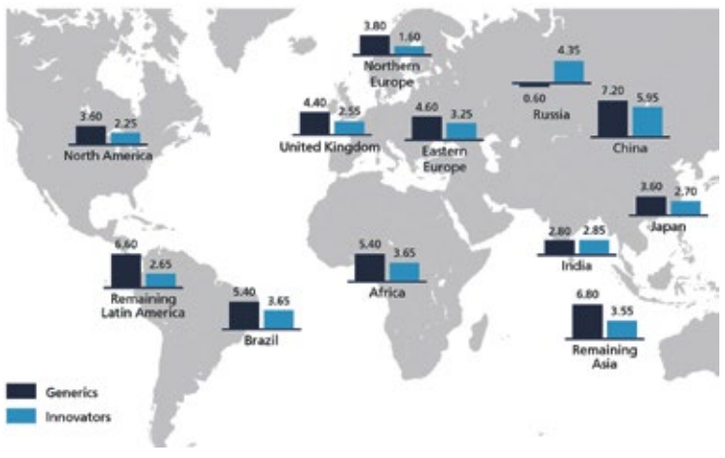
Registration

To participate in the next Pharma Management Radar survey please register here: www.pharmamanagementradar.com

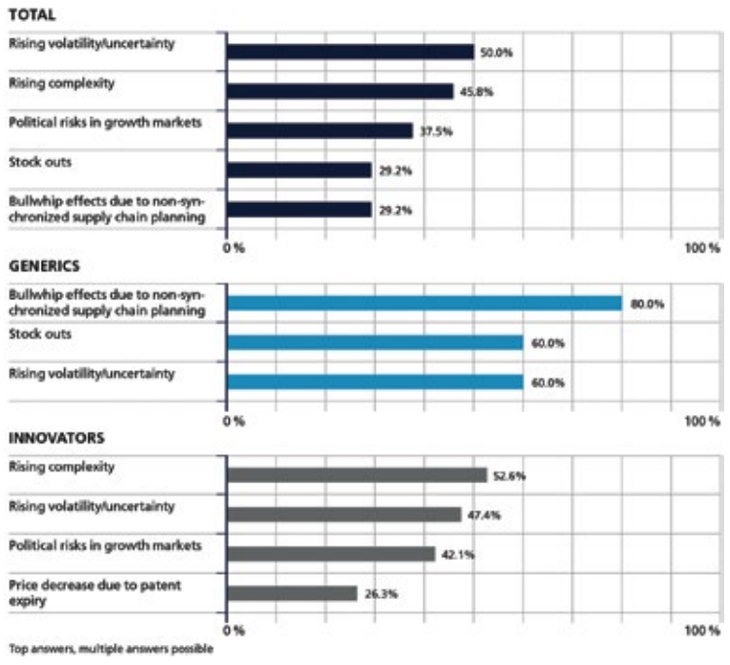
Question:
Assessment of the demand situation during the next twelve months, according to regions.

How will the demand for your products evolve during the next twelve months in the following markets (in each case -15% to +15% or 'no comment')?



Question:
Assessment of business risks in the pharmaceutical industry

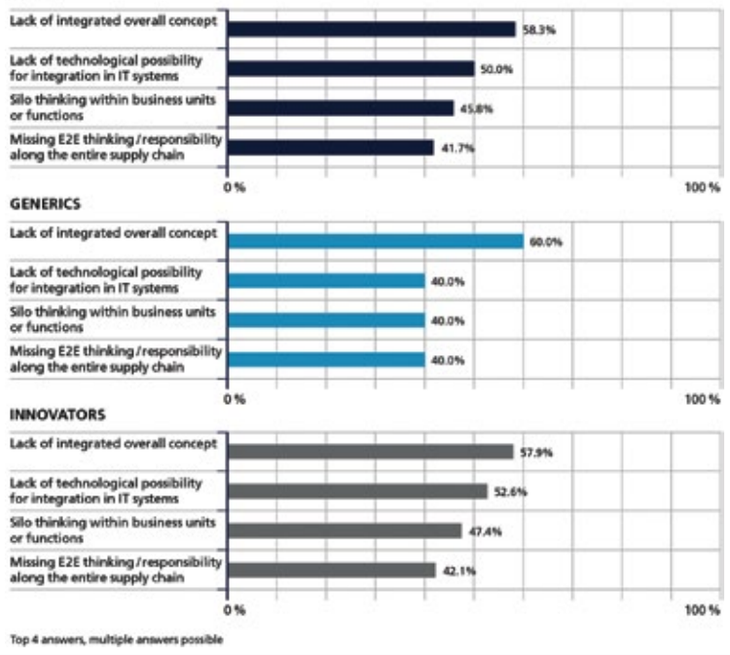
The greatest risks for your company's business development during the next twelve months is:



Top answers, multiple answers possible

Question:
Hurdles limiting the implementation of VUCA countermeasures

What are the biggest hurdles for successfully implementing VUCA countermeasures?



Top 4 answers, multiple answers possible

Seven Steps to the Optimal Supply-Chain Organization

Discussions Should Focus Less on Processes and More on How Business and Operations Interact

Look at the Big Picture — Supply-chain management is a widely discussed topic, and the chemicals industry is no exception. At some companies, this is because supply-chain costs — especially the expense of transport and storage — make up a significant share of total costs. At other companies, it's because differentiated market access and efficient delivery performance are key competitive factors. In both cases, however, process-related questions tend to be in the foreground: How can process flows be improved? How can costs be saved? How can service be made better?

Dr. Jan Friese
Boston Consulting Group

Dr. Stefan Gstettner
Boston Consulting Group

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This concentration on process-related topics means that, usually, too little thought is given to the organization of all activities associated with supply-chain management. At many companies, these activities are spread over various units with no coordinated management. Many companies in the chemicals industry, too, are far from having an integrated value chain.

Seven steps are needed for companies to optimally organize their supply chains. This is the only way the desired process improvements can be realized. Not infrequently, efforts in this regard fail because they have not been sufficiently anchored in the organization.

Step 1: Define the Scope of Supply-Chain Activities

In the first step, the activities to be included in the future supply-chain organization must be defined, whereby the handling of the purchasing and production functions is particularly important.

Chemicals companies often do not view these functions as parts of their end-to-end supply-chain activities, believing that the relevant special mechanisms and tasks, such as commodities trading in procurement or safety instructions in production, are better off situated in their own departments. But there are also many activities that should be included in an independent supply-chain organization — see Figure 1 below for an overview.

Step 2: Clarify the Role of the Supply-Chain Organization

In the next step, the fundamental role of the supply-chain organization must be clarified. For instance, the role of a centralized supply-chain organization can be limited to the formulation of guidelines and monitoring of adherence to standards for defined supply-chain activities. Execution is then up to the business units.

In a contrasting model, guideline authority and execution are bundled in one org unit. This model — in which all operative activities are combined under one person, usually the COO — is called "one operations."

Step 3: Determine the Degree of Centralization

The degree of supply-chain centralization proceeds largely, if not completely, from the two steps described above. If a centralized supply-chain organization is only to specify guidelines, certain activities will be difficult to centralize. The question of which individual supply-chain activities should be centrally performed, and which should not, must be answered based on three key criteria: synergies, efficiencies, and know-how.

For example, synergies in global product transport by ship can be achieved only when managed globally, while transport by truck is better suited to regional or national management. Centralization brings efficiency when an activity has the potential for considerable scale effects, making it worthwhile to situate employees in one region for higher productivity. The criterion of know-how can work either for or against centralization. On the one hand, bundling crucial know-how facilitates the transfer of knowledge. But on the other, know-how can also include regional or national particularities, in which case strong centralization is not advisable.

Step 4: Define the Organizational Model

After the tasks, mission and scope of the supply-chain organization have been decided, the basic organizational model can be defined. The question here is whether the organization should be oriented on regions, functions, or products/customers/technology segments. This should be decided based on careful analyses, the aim being a solid understanding of the market requirements that the supply-chain organization must fulfill.

A rule of thumb is that each decision-maker in the business needs to have a counterpart in the new supply-chain organization. These pairings form the backbone of the future working relationship between the supply-chain organization and the business.

Step 5: Detail the Makeup and Personnel of the Organizational Units

As soon as the basic organizational model is set, its various units can be detailed, such as in regard to concrete regional boundaries. Just as important as the discussion of these units is the timely appointment or recruiting of the people who will comprise them. These people will have the critical job of bringing to life the structures created on the drawing table.

Step 6: Set Up Reporting Structures

The question of who will report to whom can inflame passions like few others. If only for this reason, it should not be given too much weight. Many of the decisions associated with reporting structures are predetermined by the steps described above.

In considering all the details of reporting, the underlying success factor, namely a common understanding shared by the supply-chain organization and the business, must not be forgotten. If the supply-chain organization starts to become an end in itself within the company, including due to its reporting structure, the achievement of real competitive advantage in the supply chain is out of the question.

Step 7: Shape Physical Interfaces

Last but not least is another question that tends to inspire heated debate: Who will sit where — not only in the office, but also globally speaking. A supply-chain organization needs good interfaces for collaboration. The better an organization communicates — and communication is still best in physical proximity — the more effective its work will be.

Summary

An optimally structured supply-chain organization is a crucial component of a competitive value chain. It can decide whether customers perceive a company as a service-oriented partner or not. It is therefore surprising that the managers responsible for this topic devote considerably less attention to the supply chain than to process-related questions. The seven steps outlined here — from the basic definition of supply-chain activities; to the clarifications of supply-chain organization's role; to the questions of personnel recruiting, reporting and physical interfaces — form the basis for successful supply-chain management that enables business and operations to work toward their shared goals — pulling together, not just side by side, or in the worst case, in different directions.

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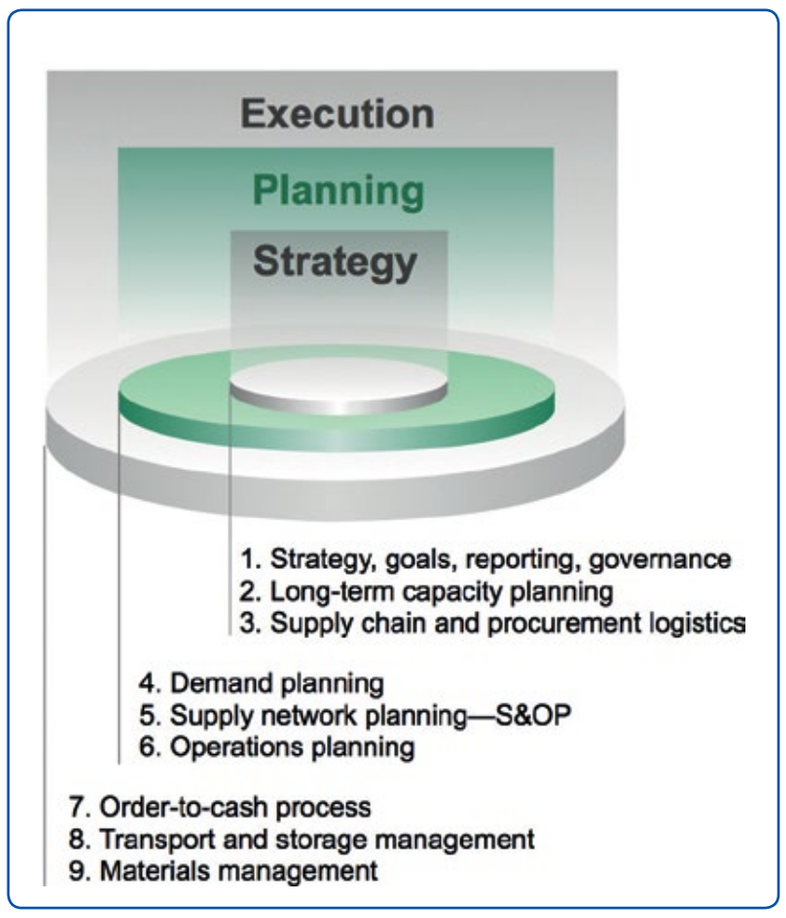


Fig. 1: Potential scope of supply-chain activities

How Safe is Your Business?

Why Top Class IT Security is Essential to Healthcare Logistics

Staying in Control — IT security requires some effort. Not investing in security measures can turn out to be much more expensive than actually doing it, according to Marcel Reifenberger, IT Security Officer at Movianto Group, a European healthcare logistics partner for the pharmaceutical, biotech and medical device industry. CHEManager International asked him about the importance of top class IT security for the healthcare industry and its logistics processes.

Marcel Reifenberger, IT Security Officer, Movianto Group

CHEManager International: How do you define the term IT security?

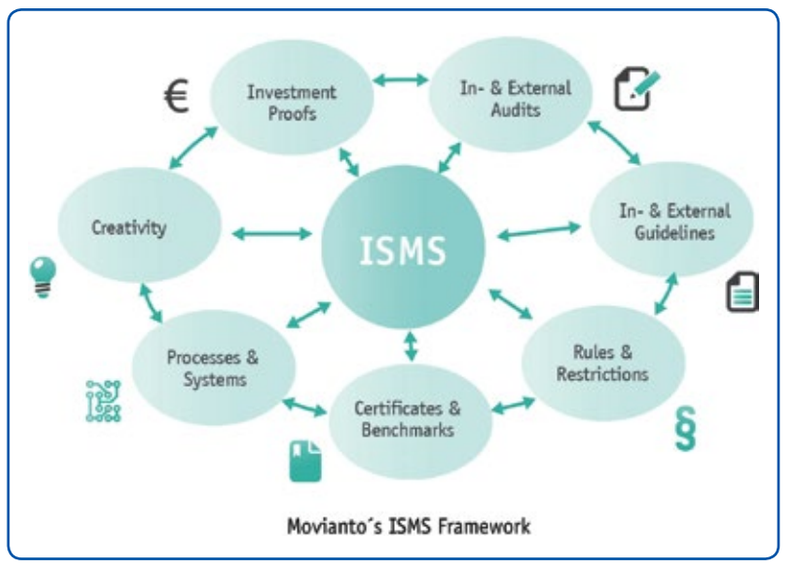
M. Reifenberger: Security refers to the state of being free from danger or threats, which nowadays is almost impossible to achieve. All the criminal energy creates risks faster than they can be contained. As a consequence, IT security systems should be able to recognize current trends, develop new ideas and fix security flaws before anything can happen. The key to success in IT security is to have your finger at the pulse of time.

Recently, a study conducted by Steria among European companies showed that 90% of the interviewed companies believed themselves capable of dealing with a major security crisis. However, only a quarter stated they had a 24/7 IT security solution. Therefore, the IT security officer's scope of tasks has fundamentally changed. While formerly our work was mainly technical, today questions of 24/7 availability, compliance or marketing play a major role, too, when it comes to defining an IT security framework for the company.

What priority do IT systems have in healthcare logistics?

M. Reifenberger: Electronic thieves could take advantage of opportunities to hack the companies' corporate networks or IT systems and even steal confidential company, client or employee information. Phished information can either be sold or used to counterfeit drugs, commit identity theft or fraud. However, IT systems in general are definitely known and accredited as one of the pillars of a company. Especially in the healthcare industry a major security crisis can seriously threaten your business.

Every IT system – above all in the healthcare sector – should be flexible and safe. A simple example from our line of business depicts clearly, why this is such an important topic. When Movianto is assigned with the delivery of certain drugs directly into the operating room of a hospital, the patient's life is also in our hands. Even the slightest mistake or delay can endanger the successful outcome of the surgery. Therefore, we follow strict protocols and make sure everything goes as planned.



Movianto´s ISMS Framework

ISMS = information security management system which is a set of policies and procedures for systematically managing an organization's sensitive data with the goal to minimize security risk

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What are the main risks during data exchange in healthcare logistics?

M. Reifenberger: In a globalized world, security threats can occur along the entire supply chain at any time. In this respect, both healthcare companies as well as their logistics providers have a huge responsibility, since they administrate sensitive data of thousands of employees and clinical trial participants.

In addition, targeting healthcare companies seems to have become the new strategy of organized crime. If they manage to hack a corporate IT system, the inside information obtained is usually used to expand their black market operations.

Therefore, every step of the supply chain involves certain risks that need to be contained. Movianto, as the leading European healthcare logistics provider, does not only offer dedicated warehousing and other services but also facilitates the real-time tracking of each delivery, allowing customers full transparency at all times.

What are your methods to maintain IT security?

M. Reifenberger: First, it is my responsibility to consider a great deal of the so-called inefficiency factors and ask myself the question 'How can I run the IT system safely and at the same time grant access to partners and employees – both in an efficient way?'.

Secondly, the introduction of an Information Security Management System – ISMS - is mandatory. This ISMS framework is compiled of an array of different measures - e.g. policies, processes and systems - that guarantee to react in an optimal way in case of any security breaches. In case of a sudden event, risks can be managed better when using intelligent monitoring systems, backups and other tools.

According to a study conducted by Steria Mummert Consulting in 2014, nine out of ten companies in Germany believe themselves to be able to deal with a big IT security crises. However, only a third stated they had a 24/7 IT security solution. This overconfidence causes a significant security risk and shows that obviously only a few companies apply an appropriate solution for the type of risks. We are very much aware of these challenges and the importance of each component for the overall IT performance. For this reason, we use a double failsafe IT environment, which ensures 99.5% availability, i.e. after a complete crash our system is designed to be back online and running after only 3.6 hours.

"In addition to the high validation standards of our central systems, I am glad that our IT security features the same high standards."

Robert Selinka, IT Director, Movianto Group

What else does Movianto do differently?

M. Reifenberger: Let me give you three examples of the security we provide to the European healthcare industry:

In recent years, the frequency and severity of cyber-attacks on businesses and organizations across the pharmaceutical market have increased sharply as well as the direct and indirect costs they inflict. Movianto developed a complete new user validation system, which has already been successfully implemented. Thanks to this system, Movianto owns a personalized authentication module, which basically ensures that neither can personal data be stolen, nor can a password change be exploited in any way.

Movianto enjoys the results of regular external audits on the basis of globally certified standards, streamlined guidelines and our European Quality Management System. Due to our high level risk protection we stay in control. Moreover, we do not restrict ourselves to just one certification – we have several, all of which are reinforced by regular internal audits in all of our European subsidiaries.

In business, operational security is driven by multiple factors, e.g. operational, compliance and audit demands. Of course, all of it needs to be cost efficient and transparent. While standards and methods used to quantify security and operational control are already established, common open standards for the assessment of financial risks and to measure the value of activities were not available. Therefore, I created a solution named OpenDEEM - Open Dynamic Efficiency Evaluation Methodology. This method, which is developed as an open standard, strives to close this missing link. It has recently become an official part of the Fedora Security Lab, an upstream collection of security tools and methods for the official Fedora Security Spin of the Fedora Project, which is one of the largest Open Source Projects with more than 30 million users worldwide. Thanks to this methodology, we now have the ability to compare the costs of an investment to its real value for the company. Let us assume an investment of €5,000 was only worth €2,500 – through the OpenDEEM methodology that would become clear before spending the money. Therefore, it is justified to say that we have the same top level IT security as the "big players" in the logistics industry.

So, what would be your essential piece of advice?

M. Reifenberger: IT security requires some effort, not investing in security measures can turn out to be much more expensive than actually doing it. The worst-case scenario would be an immense damage to corporate reputation. Safety awareness will open new doors. Use this opportunity!

STATEMENTS

Complexity, Cooperation and Standardization in Logistics

The complexity of supply chains is rising continuously. Therefore, complexity management is an ongoing topic in the industry. Cooperation of logistics providers all along the supply chain could partially solve the problem of complexity. Also, the standardization of logistics processes is an imperative in certain sectors.
For the 2014 edition of "CHEManager Distribution & Logistics" — our special supplement that is inserted into this edition of CHEManager International — our expert Dr. Sonja Andres, editor Logistics, asked industry specialists and company spokespersons about their opinion. These are the questions we put up for discussion:

- What kind of actions should be done on both sides — industry as well as logistics partners — to manage the problem of complexity and keep a safe and reliable supply chain?
- Do you think cooperation of logistics providers all along the supply chain would partially solve the problem of complexity?
- To get a better overall performance: What do you think about the importance of standardization of logistics processes in the chemical industry?

Here you can read excerpts of the answers we received. You will find the complete statements online on www.chemanager.com/en/tags/cdl-opinions and many more in the supplement "CHEManager Distribution & Logistics".

Creativity and Flexibility Will Be Key

The perspective on complexity is twofold: First, we see the opportunity to address more customer requirements by extending the product and service portfolio. Supply-chain management has to manage this value-adding complexity with all needed consequences as differentiation of services. Second, there is homemade complexity in our supply chains. Here, we analyze carefully benefits and costs and consequently minimize this kind of bad complexity, which might lead to unnecessary working capital.

For both cases, logistics partners need to support us by providing lean or differentiated services with an integrated information flow. The required end-to-end view demands closer collaboration between supply-chain partners in the future.

Coming from more standardized processes, the chemical industry is getting more differentiated in products and services — as many other industries are. Nevertheless, the pressure on efficiency and costs for supply chain and logistics is increasing. For commodities, lean and standardized logistics processes are imperative and will gain even more importance. For the more downstream-oriented businesses, specific solutions are a service differentiator. Here the creativity and flexibility of our service providers will be a key for future success.

Dr. Andreas Backhaus, senior vice president, Global Supply Chain Strategy & Performance, BASF

Additional Link Relieves Pressure on the Supply Chain

With dynamic development, increasing complexity and growing demands of the European markets, the supply chain continues to come under pressure. This is a result of information bottlenecks, reduced availability of raw materials at the right place and time, financial requirements for warehouses, short-term changes in production and consequently in inventory planning, besides already existing difficulties such as environmental disasters, political unrest, increasing legal constraints, as well as lacking or undeveloped infrastructures.

Biesterfeld Spezialchemie provides options as interfaces between manufacturers, the processing industry and 3PL service providers. As an additionally operating link in the chain, Biesterfeld stores materials from globally operating suppliers for customers and as a result relieves the pressure in the supply chain. Outstanding, flexible distribution processes and direct control of suitable logistics companies through connection to the ERP (enterprise resource planning) system ensure a needs-based provision in the European market.

Andre Neddermann, head of logistics, Biesterfeld Spezialchemie

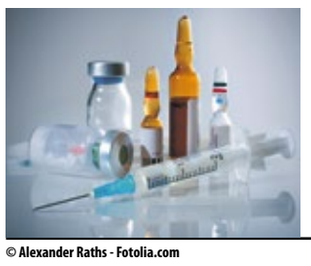
A Global Company Needs Globally Harmonized Systems

Merck is a global pharmaceutical and chemical company that operates in a highly regulated market. The complexity of the supply chain is continuously growing. More and more countries are issuing their own dangerous-good handling requirements, which are not globally harmonized. Country-specific formats and handling requirements are the result, and this is increasing both complexity and cost enormously.

At the same time, customers want specific packaging designs, delivery conditions, labels and documentation. Customers that operate globally require from their suppliers globally harmonized standards, for instance standardized quality, delivery documents and barcodes. Increasing complexity leads to increasing cost pressure.

How can a company like Merck deal with increasing demands such as these? The answer is: through more standardization of processes and master data supported by a globally harmonized IT system. At the same time, logistics processes of a global company need to be managed globally as well.

Manfred Fischer, vice president distribution chemicals, Merck



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Packaging

New pharmaceutical markets need new best practices and manufacturing concepts

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Asset Management

Proactive management of idle and surplus equipment can deliver additional value

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Industrial Locations

A benchmarking study compares nine chemical-related industrial parks in Germany

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US, China Beckon to German Chemical Contractors

Shale Gas and Coal Processing Offer Attractive Opportunities

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Regaining A Foothold — "Made in Germany" is often regarded as a symbol for quality. But quality has its price, and this a cross that the large plant contractors committee (AGAB) in the German Engineering Federation VDMA has always had to bear. Especially as engineering contractors in developing countries have continuously found ways to copy their success and deliver at lower cost.

While low-priced competitors based in China and Korea have long since replaced Japan as the Germans' nemesis as regards cost competition, the country's engineering flagship firms still have to get by without the desired amount of support from their federal government in the form of export credit guarantees, and for cost reasons must often outsource engineering and procurement competence.

Despite all the hurdles that have to be taken, however, German contractors have continually risen to the challenge, mustering their intellectual and technical resources to not only survive but thrive.

The past year was no exception. Despite the backdrop of weak global economies, overcapacities in basic manufacturing sectors and political unrest, contractors belonging to AGAB increased their worldwide order intake by 3% to a value of €21.2 billion.

With orders from abroad flat at the 2012 level, business at home leapt forward by 15%, committee spokesman Helmut Knauthe, who is chief technology officer for Thyssen-Krupp Industrial Solutions, explained in presenting the group's annual report for 2013/2014. The figure is relative. Put into context, foreign orders were worth €16.7 billion, the value of business at home only €4.5 billion.

In the domestic market, builders of chemical process plants did not profit substantially from the 2013 order upswing. This largely benefited contractors for wind energy plants. For companies with expertise in building traditional fossil fuel-fed plants, business in Germany and Europe continued to stagnate or dwindle.

But if German contractors on the whole were affected negatively by the stagnation in business abroad, builders of chemical plants had reason to celebrate. Their order intake from in foreign climes in 2013 surged ahead by an impressive 43% against 2012 and provided a welcome contrast to steadily falling orders from major German chemical producers who are increasingly shifting capital investment to Asia or North America.

Chemicals outperform other engineering sectors

All in all, German chemical contractors were able to improve their order intake at home and abroad by 15% last year to a value of €3.4 billion – five times the sector's general dynamics and the highest level seen since the beginning of the global economic crisis in 2008.

An encouraging development, AGAB said, was that conditions for financing new projects improved. This made it possible companies without ready cash reserves to build new petrochemical production facilities.

Not all engineering firm executives were able to uncork the champagne, however. Uncertainties in some of the weaker Eurozone markets continued to dog business to some extent. Suppliers of air separation plants were especially affected by lower investment rates in some industries such as steel.

Despite the only gradual recovery of the US economy and still sluggish development of the BRIC economies, suppliers of chemical process plant and equipment engineered in Germany have now begun to profit from a burgeoning upswing in worldwide plant construction that began in mid-2012 and as yet shows no signs of turning around.

Starting from a low level, the US petrochemical market was the driver of Germany's success last year, with engineering firms receiving orders for projects worth €1 billion – compared with only €230 million a year earlier. After years in the doldrums, German plant manufacturers believe they have good chances to regain a foothold in the American market, Knauthe said.

Only a year ago, engineering firms headquartered between Hamburg and Munich saw their markets as clearly moving eastward, to Southeast Asia, India and the Middle East, but also to Russia. In surprising contrast, AGAB's annual report shows that in 2013 the US moved back to the top of the list of customer countries – for the first time since 2008.

The reasons for the shift in the economic wind's direction seem obvious. Leading the list is undoubtedly the decline of the Middle East as a major market – the reverse side of the shale gas boom in the US, which has pushed gas prices to record lows. In the building activity taking place in the Gulf region, Asian contractors have a stranglehold, the German grouping notes.

In light of recent political developments in and around Ukraine, the outlook for Western contractors' future business in Russia is, at best, murky, even if "Putin's Kingdom" as some wags are dubbing the country, was worth a project volume of €900 million.

Will last year's glimmer in the US light a spark?

For projects in the US, German plant and equipment suppliers hope that last year's glimmer was only the spark that will lead to an explosion of new projects. As AGAB points out, in the American market, shale is driving all projects that process gas for end applications or rely on gas feedstock. New facilities are on the drawing boards or already taking shape for ethane crackers and ammonia plants, for example.

Leveraging an analysis frequently seen, the contractors' committee underscored that the US market has become the el dorado of international chemical plant building. But as Germany's major players face fierce competition for new projects from US firms as well as other European contractors, voices from the off are already warning companies not to focus their strategic hopes on one country, however tantalizing the prospects may be.

Even if the dynamics of doing business in another mammoth market, China, have slowed, German contractors are well aware that the People's Republic still represents the largest economy for chemical construction, and India is still looming large on the horizon.

In China, Knauthe noted that AGAB's member firms are in a good position to leverage their know-how in coal processing — which once formed the nucleus of the chemical industry at home. However, he said there are caveats: although the government's economic planning gives undisputed preference to coal feedstocks, it appears that Western competitors' welcome has worn thin.

Dede Williams, freelance journalist, Frankfurt, Germany

BASF Plans New Specialty Amines Plant in Ludwigshafen

BASF is expanding its global production network of amines with a new 12,000 t/y plant for specialty amines at its Ludwigshafen, Germany headquarters. Start-up is scheduled for 2015.

The plant will complement existing units for amines at Ludwigshafen and Schwarzheide, Germany as well as at Antwerp, Belgium, Geismar, Louisiana, USA, and Nanjing, China. The range of the new multi-product plant extends to 15 amines for varying applications in the construction, automotive, crop protection and pharmaceutical industries.

With the new facility, which is said to allow flexible reaction to changes in demand for individual products, BASF said it is responding to customer demand for specialty amines, particularly in Europe.

In March of this year, BASF announced plans for another new multi-product specialty amines unit, at Nanjing, China. The main products of this plant, which is due to start operation in 2015, will be dimethylaminopropylamine (DMAPA) and polyetheramine (PEA). (dw) ■

Chevron Phillips Breaks Ground for new Cracker

Chevron Phillips Chemical (CP Chem) has held groundbreaking ceremonies for the new 1.5 million t/y ethane cracker to be built at its Cedar Bayou site near Baytown, Texas. The cracker will form the nucleus of the petrochemicals producer's $6 billion US Gulf Coast (USGC) Petrochemicals Project scheduled to go on stream in 2017.

As part of the project, the company also will build two 500,000 t/y polyethylene plants - including a bimodal HDPE unit and a metallocene LLDPE unit - at its Sweeny site at Old Ocean, Texas. To feed the PE plants but also for retail purpose, ethylene output is being upgraded by 90,000 t/y. At Cedar Bayou, CP-Chem is also building a plant for 1-hexene, which it claims will be the world's largest. Details are expected to be presented soon for an expansion of normal alpha olefins capacity at the same site.

A joint venture of Jacobs Engineering Group and Fluor has the EPC contract for the two PE facilities at Old Ocean. (dw) ■

Emerson Expands European Capabilities

Emerson Process Management is expanding the company's existing manufacturing and engineering services campus in Cluj-Napoca, Romania. The $60 million investment will help meet growing demand for the company's flow measurement products and services in Europe and other regions.

Additionally, in the summer of 2014, Emerson Process Management moves into a separate, newly constructed $16 million facility on the Cluj campus that will be home to the Regional Project Engineering Centre and the European System Integration Centre for its PlantWeb Solutions Group. This facility will house up to 600 employees. ■

Lanxess Restarts Rubber Plant as Belgian Strike Ends

Lanxess is restarting its 150,000 t/y butyl rubber plant at Zwijndrecht, Belgium, after a nine-week strike that idled the facility and required the company to supply customers from sites at Canada and Singapore.

Lanxess said production workers had agreed to a new two-year contract on wages and working conditions. The German company said it has invested roughly €250 million in Zwijndrecht — where it currently employs 435 people — over the past several years. Belgium's chemical industry association Essenscia recently warned that jobs at the site as well as at contractors and logistics companies could be jeopardized if the strike continued. (dw) ■

Preparing for Tomorrow's Pharmaceutical Challenges

Part 1: New Markets Need New Best Practices and Manufacturing Concepts

High Purity — New legislation, expiring patents and increasing healthcare costs call for decisive changes in the global pharmaceutical industry. New markets for specialty medicines, biopharmaceuticals and biosimilars are opening up, entailing opportunities for further growth. The coming years will see markets across the globe implement new best practices and manufacturing concepts. What they all have in common is the need for safe, high-quality and consistent operations.

Dr. Johannes Rauschnabel
Chief Pharma Expert, Bosch Packaging Technology

According to a report by the IMS Institute of Healthcare Informatics, published in November 2013, total annual spending on medicines is set to reach the 1 trillion US dollar threshold in 2014 and continue to rise to 1.2 trillion US dollars in 2017. After a period of turmoil due to patent expiries and austerity measures following the economic crisis, the developed markets are now starting to rebound. The U.S. is forecasted to resume increased spending following implementation of the Affordable Care Act. In Japan, the threat of rapidly increasing medical demands from the aging population urged the government to an unprecedented decision – by 2018, 60 percent of all off-patent prescription drugs are to be dispensed as generics. Overall, lower-cost generic alternatives will continue to have the largest impact on growth. Generic producers and contract manufacturers require very robust and flexible machinery with high output, while complex medicines for targeted treatment demand flexible platforms and smaller batch sizes.

The pharmerging markets will still be extending their progress by 10 to 13 percent, as population increases and rising incomes contribute to dramatically higher use of medicines. Improved access to drugs is supported by economic expansion, significant demographic and epidemiologic changes, and a broad range of government and private healthcare policies. China, the primary growth driver in Asia and beyond to date, now also faces a period of modest decline compared to recent years. This will not only affect local manufacturers but also pharmaceutical producers from the developed countries, who have built a large manufacturing and distribution network in China and have been rewarded with unparalleled revenues. India's healthcare sector, on the other hand, does not seem to stop growing. Pharmaceutical exports from India are forecasted to increase more than twofold over the next four years, if India succeeds in meeting regulatory challenges.

Flexible and Safe Pharmaceutical Operations

Robust and powerful machines remain the first choice for manufacturing companies in the emerging markets. Especially generic producers want to achieve the highest possible productivity at lowest possible costs. Many drug manufacturers have shifted their focus to the development of new drug formulations and have outsourced their end production such as filling and closing operations and secondary packaging to contract manufacturers. Their main concerns are flexibility and productivity – primary and secondary packaging machines must be adaptable to different products, packaging formats and speeds at consistently high output rates.

Although large-scale production of blockbuster products and generics is still the most prominent manufacturing assignment of the emerging markets, some countries like India also observe a shift to more complex formulations, which has led to a higher demand for sophisticated technologies. The trend towards small amounts of targeted drugs, particularly for the treatment of cancer, calls for flexible platforms that can handle small batches while ensuring the highest safety for both operators and products. Biopharmaceuticals, vaccines and anti-virals must be manufactured and packaged with the utmost caution and attention-to-detail.

The Looming Biopharma Patent Cliff

Having left the largest part of the generic patent cliff behind, the pharmaceutical industry now faces a new challenge. The patents of several large, biotech molecules are about to expire, opening the doors for biosimilar production. In 2002, biologics represented 11 percent of total drug sales; now IMS estimates biologic agents will continue to outpace overall pharma spending and will represent close to 20 percent of the total market value by 2017. Monoclonal antibodies and human insulin will further spur this growth. Biosimilars account for less than 0.5 percent of biologic spending in mature markets; in emerging markets, non-original biologics represent more than 10 percent of all biologics spending, and counting.

Biopharmaceuticals and their successors all require intensive research and development, as well as sophisticated equipment and contamination-free raw materials, such as purified and highly purified water and water for injection, generated by sophisticated high purity media systems. To deliver the best possible product to patients, drug manufacturers count on safe processing and packaging solutions, while patients rely on their preferred drug delivery devices for safe administration. As far as these devices are concerned, the pharmaceutical industry has successfully focused its development activities on even safer and easier administration. Although oral dosage forms are more convenient, parenteral administration has taken its place as the most effective and safe treatment. For many biological products there is yet no alternative to parenteral administration. The development of new drug delivery devices increasingly focuses on patients' individual needs. Insulin pens, for example, have been optimized with respect to convenience and ease of use, while the devices generally tend to be smaller and safer to handle.

Isolating the Product from the Operator

The use of high-potency pharmaceuticals has grown extensively, causing manufacturers to pay more heed to protecting all elements of the supply chain from their potentially harmful effects. Protecting products from contact with operators and vice versa has steadily moved up the agenda. Recent equipment solutions favor the use of automation and robotics technology to reduce human contact with the product. Due to ever-stricter guidelines for aseptic filling operations, manufacturers increasingly rely on the use of isolators. Compared to conventional cleanroom production, isolators offer higher product quality, lower operating costs and significant energy savings, as well as a safe accomplishment of longer production cycles.

The U.S. Food and Drug Administration's (FDA) 2004 aseptic guidance states that an isolator "offers tangible advantages over traditional aseptic processing, including fewer opportunities for microbial contamination during processing". The worldwide increase in filling line isolators will continue over the coming years. Vials remain the predominant containers handled in isolators, while the use of pre-filled syringes is rapidly growing especially in Europe. The development of ready-to-fill sterile primary packaging systems in cooperation with leading equipment manufacturers has improved aseptic filling operations and paved the way for the development of new, highly flexible filling and closing machines designed to handle pre-sterilized nested syringes, vials and cartridges.

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Part 2 of the article, "Quality by Design and Process Analytical Technology", will be published in CHEManager International 6/2014.

Due to ever-stricter guidelines for aseptic filling operations, manufacturers increasingly rely on the use of isolators. Currently, there are more than 50 lines with Bosch isolators installed globally.

The Bosch GKF HiProTect capsule filling machine completely isolates researchers and manufacturers from active substances during operation, maintenance and cleaning.

Peter Greven Increases Stearate Capacity

Peter Greven, a leading producer of oleochemical additives with sites in Germany, The Netherlands and Malaysia, has started up a new, state-of-the-art production facility for metallic soaps at its site in Venlo (NL) in April 2014.

Due to the increasing demand for top-quality vegetable stearates that fulfil the high-quality demands and all other requirements of the pharmaceutical, food, feed and cosmetic industry, Peter Greven started the construction of a new production complex in September 2013.

This production facility is based on state-of-the-art technology; the focus of the development was primarily based on the highest cost and energy efficiency. With this new production facility, the capacity of the Venlo site will be considerably increased.

For many years, Peter Greven has developed the Venlo site based on the requirements of the above mentioned industries: all products are produced under GMP conditions and according to HACCP standards, are Kosher and Halal certified, fulfil all major pharmacopeias (e.g. Ph.Eur, USP/NF, BP, JP, CP, DAB), the requirements of FDA for the direct food contact (GRAS) and conform with the latest Food Chemical Codex (FCC). In addition, a management system for food safety was introduced and certified with FSSC 22000 (ISO 22000) certification. Furthermore Peter Greven successfully completed the GMP+ B2 (2010) certification for the feed industry in 2013.

Sustainability and responsible use of natural resources have always been a fundamental aspect of Peter Greven's company philosophy – therefore all products are based on natural, renewable raw materials. Moreover, Peter Greven supports the sustainable production of palm oil and is the first producer of metallic soaps to receive the RSPO SCCS certificate that officially approves the production and sales of vegetable based stearates and dispersions with RSPO certified fatty acid.

With this new production facility, Peter Greven is enlarging its product portfolio: the existing product lines Ligamed with Premium Excipients for the pharmaceutical industry and Ligafood with high-quality additives for the food industry are completed by the new product line Ligafeed with special additives for the feed industry.

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Simulation Solutions for the Process Industry

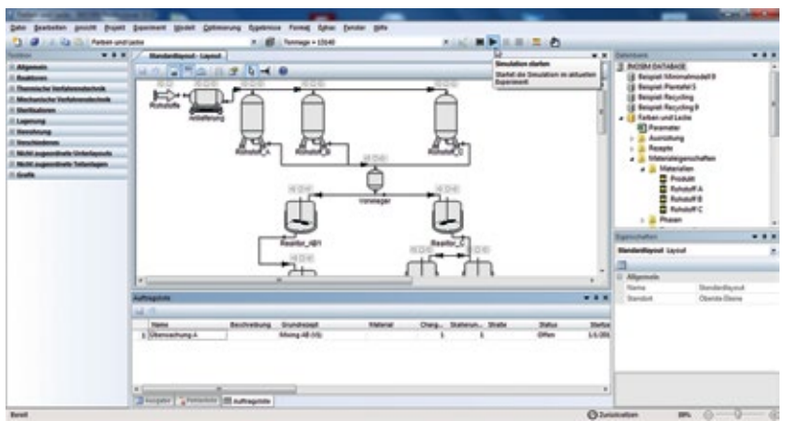
Europe´s process industry is in change. Production costs are rising as a result of increasing energy prices; at the same time, the fuels applied today are causing greenhouse gas emissions which threaten the world climate. A challenging economic environment caused by competitors from ambitious threshold countries increases, in addition, the competitive pressure. Productivity improvements, more efficient energy application, and sustainable production methods have become more urgent than ever.

Inosim, a medium-sized German enterprise develops sophisticated software for process simulation. Very early, Directing Manager Peter Balling had recognized a high potential for the application of simulation tools in European process industries: Compared to other industrial branches, there had been a technological deficit here for a long time.

In between, this gap has been closed. With Inosim's event-oriented simulation solutions, continuous and Batch processes as well as their combinations can be emulated on the base of adaptable simulation models. Application examples are plant design, optimization of existing plants, or preventive maintenance management. The development of the advanced simulation tools goes hand in hand with process-technical research projects and cooperation with industry and science, in particular with the chair for systems engineering and process technology at TU Dortmund University.

A current example of the application of Inosim software in process industries is BASF. The chemical company has been applying material flow simulations for many years in order to emulate and control production processes. In the future, BASF will apply Inosim simulation solutions worldwide. The Ludwigshafen engineers are mostly convinced of the tool´s great flexibility and its high adaptability for specific operational purposes. Dr Christian Klewer, responsible project manager at BASF, says: „We are convinced of the tool´s high flexibility and of the good cooperation concerning the specific adaptation of the software for our interests."

▶ www.inosim.de



Maximum Return

Sophisticated Tools Emerge in Specialist Asset Management

Surplus and idle assets — Throughout industry, pressure to squeeze maximum return from each and every asset is intense. This principle drives process simplification and the focus on maximizing efficiency in production. Such strategies have become vital for day-to-day operations in many industrial sectors and return considerable value.

Ben Potenza
vice president marketing, Equipnet

However, business leaders in pharmaceutical, fine and specialty chemical companies who aspire to the very highest levels of excellence are now extending this rigor to other aspects of their companies. For example, they are recognizing the additional value that proactive management of idle and surplus analytical laboratory instrumentation, and plant and packaging equipment can deliver.

Significant Asset Base Idle and Underutilized

Today's companies hold enormous value in the form of equipment and plants. Keeping an accurate asset register provides a solid basis on which to make management decisions, but research suggests that on average, 5% of a manufacturing company's global asset base is idle, with most not having good visibility of these underutilized assets.

Businesses have always traded surplus assets, and equipment dealers and auctioneers have been there to help. But increasingly, more sophisticated tools — tools that can develop a comprehensive inventory of assets and support their utilization across multiple sites as needs change — are being systematically implemented. In parallel, there has been significant growth in the market for the sale and purchase of surplus equipment.

Progressive businesses strive constantly for an efficiency edge, but in recent years, the tough economic climate has driven consolidation, relocation, mergers and acquisitions, outsourcing, and plant closures in almost every sector and company. The result? More executive teams see that a focus on managing assets can deliver directly to the bottom line.

Once a decision has been taken to proactively manage the asset base, a company must consider a series of choices. For many, the variables are clear — redeployment vs. external sale, or realizable value vs. available time, for example.

But every situation is different — reusing equipment within an organization may be seen to deliver the highest value and, with time available to do this, some companies will have this as the sole focus. External sale is a secondary consideration that only comes into play if redeployment is not needed. For other organizations, perhaps where a site or line is being closed, time may be short and releasing as much value as possible within the available window is the overriding factor.

Whatever the goal, the process is logical and straightforward, but like much in business it needs to be carefully planned, and rigorously executed in order to maximize returns. For most executive teams, asset management is not a core activity, so contracting with an external specialist that can bring industry expertise and experience to bear, whatever the size and shape of the project, is an attractive option.

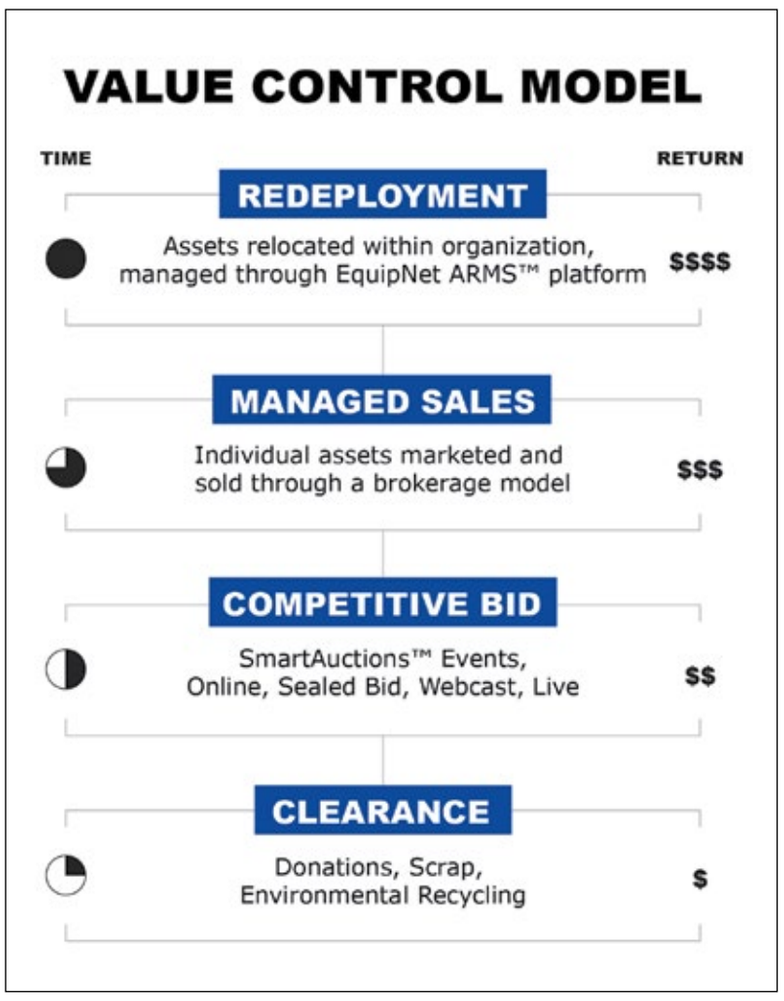


Figure 1. Assets are liquidated using a range of strategies

Right Tools for the Job

As noted above, auctioneers and equipment dealers offer their services in many industrial sectors. However, there is a view evolving of what best practice in asset management looks like, and specialist companies have become established leaders.

A holistic approach that balances the needs of a company can be developed. Equipnet describes this with its Value Control Model. Figure 1 shows how redeployment, negotiated sales with managed pricing through an online marketplace, competitive auction events and clearance programs fit together to deliver a consolidated service, whatever the individual needs of a company.

We can pull this apart to consider the key components. Importantly, what ties the redeployment part of the model together is the availability of an asset tracking platform that can be installed across multiple sites. Users should be able to post, track, identify and internally redeploy equipment that is not being used in its present location, ahead of moving to external sale.

An established example is the ARMS (Management System) platform. This simple yet robust program can sit behind the company firewall, and features workflow management, multiple access levels for plant managers and executives across the business, in-depth search functionality, and comprehensive listing specifications, providing information that lets the company know what they have and where it's located.

The rise of the Internet has seen the development of online marketplace products. Innovative features to look for here include:

- "Top-down" offers rather than the more usual "bottom-up" bidding model
- Expert evaluation of goods offered for sale and accurate setting of sale prices
- Concentrated promotion of the marketplace platform and, within it, advertising of specific equipment
- Payment by results

Auctions are another dependable channel, but the competitive nature of auction events can produce wildly differing results. Designing and managing a successful auction event depends on many factors. A specialist partner should advise on the right approach in each case; your options might include online auctions, live/webcast auction events, sealed bid and private treaty sales. Innovation should be at work here, too; look out for active marketing by the auction provider, expert knowledge of the equipment being offered for sale, and a flexible approach to managing bids close to but under any reserve set. For instance, Equipnet's Smart Auctions Technology picks up and processes bids that most auctions would ignore.

There are those assets that hold very little value and are best dealt with through clearance, by donations, scrap and environmental recycling. Working with your chosen expert, you should expect to be advised of the scrap value of your idle equipment and presented with a comparison of that amount against the market value to sell it, together with a recommended strategy that will generate the highest rate of return for your company.

Summary

Pursuing a proactive asset-management strategy is not without its challenges. It requires formalized processes, specialist knowledge of the industry and its equipment, dedicated resources, and a concerted effort to change management. Many companies lack the time or resources that are necessary to establish a successful program themselves. For this reason, the majority of companies that are succeeding in this area are relying on a partnership with a specialist service provider. They are enjoying the clear benefits of cash release, reduced costs and increased efficiency.

As to what makes us different, clients tell us that our industry expertise really adds value. We have become the world's largest specialist asset-management company by not only offering a range of tools to allow businesses to take control of their assets, but also by building a team of specialists — people who know the equipment, know the market, and understand project management. Taking a holistic view that balances the needs of a client to realize maximum value for key assets, dispose of routine items in as timely a way as possible, and deal with scrap and low-value residual materials, too, has been the platform for our success.

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$39 Million Recovered

In 2012, a multinational company approached Flexible management of bids close to any reserve can deliver higher ROI with several disposition projects. The program has now completed 49 jobs in over eight countries including Canada, India and Ireland. Using Equipnet 's portfolio of services, the company not only redeployed and sold its surplus equipment but also assessed the value of current inventory. To date, the program has recovered a total of $39 million.

A Place to Thrive

Industrial Parks Benchmarking of Infrastructures and Services Part 1: Building infrastructures, Fire Brigades and Security Services

Performance And Potential — Based on a benchmarking study with 9 chemical parks and chemical related industrial parks in Germany this article describes key performance indicators and cost saving potentials of building infrastructures, for fire brigades and security services. Part 2 will show the benchmark results of energy, utility and traffic infrastructures.

Performance improvement

In Europe, the shifting of new investments to locations outside of Europe led to a dissatisfying degree of utilization of industrial sites and the emergence of industrial parks. Especially in the chemical and chemical related industries, the last 15 years have seen an increasing trend towards industrial parks with dedicated infrastructure companies as site operators. This is one reason for the excellent competitiveness of the chemical industry in Germany. A key aspect is the cost advantage of an efficient network structure, for example with regard to energy and utility supply. The goal is to achieve as many scaling and networking effects on the production site as possible, in order to strengthen the whole network structure. Size is an important factor for success: the larger the industrial park, the easier it is to strengthen the network structure.

Permanent performance improvement is also important for competitiveness. It is necessary for each industrial park to understand the individual performance level and adapt best practice in all areas. It is the performance level which makes a clear difference between high performance industrial sites and sites which have to be more consequent in their restructuring and cost saving efforts. Therefore, a comprehensive benchmarking study with 9 chemical parks and chemical related industrial parks in Germany was conducted. The main focus of this study was on maintenance costs of selected infrastructures and operational costs of selected services. More than 50 key performance indicators were defined and analysed. An important aspect was to take into account the different histories and structures of the infrastructures by using appropriate correction factors for all key performance indicators. The aim was a more standardized comparison of the different infrastructures to increase the acceptance of the results by the participants.

Buildings infrastructures

Important was a differentiated view according to the type of building (administration buildings, industrial buildings, warehouses) and the consideration of specific aspects, like average age of the buildings or technical equipment of the buildings. The standardization of maintenance costs for buildings on the basis of normalized building costs, and not only based on replacement value, made the customer specific allocation of maintenance costs possible. Key performance indicators for administration buildings are maintenance rates based on the gross floor area as well as in relation to the normalized building costs and the replacement value. The maintenance rates based on the gross floor area are up to 45 € per m², based on normalized building costs up to 4.5% and based on replacement value up to 3.7%. For industrial buildings, the gross building volume is used instead of the gross floor area. The maintenance rates based on the gross building volume are up to 2 € per m³, based on normalized building costs up to 1.9% and based on replacement value up to 3%. For warehouse buildings also the gross building volume is used. The maintenance rates based on the gross building volume are up to 2 € per m³, based on normalized building costs up to 1.7% and based on replacement value up to 1.9%.

The number of buildings was chosen as correction factor, i.e. as measure for the complexity of maintenance. Figure 1 (P1 to P9 stands for the different participants of the benchmarking study) shows the maintenance rates for all types of buildings based on normalized building costs with the number of buildings as correction factor on the vertical axis. The linear regression line increases slightly with the correction factor, which is expected, as increasing maintenance rates should correlate with increasing complexity. Despite P1 and P6 having the same maintenance rate, the complexity correction shows that the values for P1 are unusually high compared to the other participants. P6, P3 and P4 represent best practice, as the data points are near the regression line. For example, the cost saving potentials based on normalized building costs for P1 are nearly 500,000 € per year. Besides maintenance, the building management costs, i.e. costs for the technical facility management, are the second largest cost factor within the category buildings. The specific building management costs are the building management costs in correlation to the replacement value to consider the value of the buildings. For example for P1, they are up to 0.3% and the cost saving potential is 30.000 € per year.

	P1	P2	P3	P4	P5	P6
Maintenance rates (normalised building costs)						
Number of buildings	12	9	26	80	4	143
Influenceable cost [%]	1,53	0,43	0,78	0,86	0,29	1,45
Total costs [%]	1,82	1,46	1,05	1,74	0,29	1,84

Figure 1: Maintenance rates for all types of buildings based on normalized building costs with number of buildings as correction factor

Fire brigades and security services

Most of the activities of fire brigades are call-outs and legally necessary activities, i.e. activities which are required by law or authorities. The fact that both activities count only for 60 to 90% of the available time gives an indication that there is a cost reduction potential in some chemical/industrial parks. This statement is supported by analysing the key performance indicators. Total costs per employee of the fire brigade and per ha of the site area are presented in Figure 2. The performance differences between the participants of this benchmarking study are large, ranging from 46,000 to 75,000 € per employee of the fire brigade and 6,700 to 24,900 € per ha of the site area.

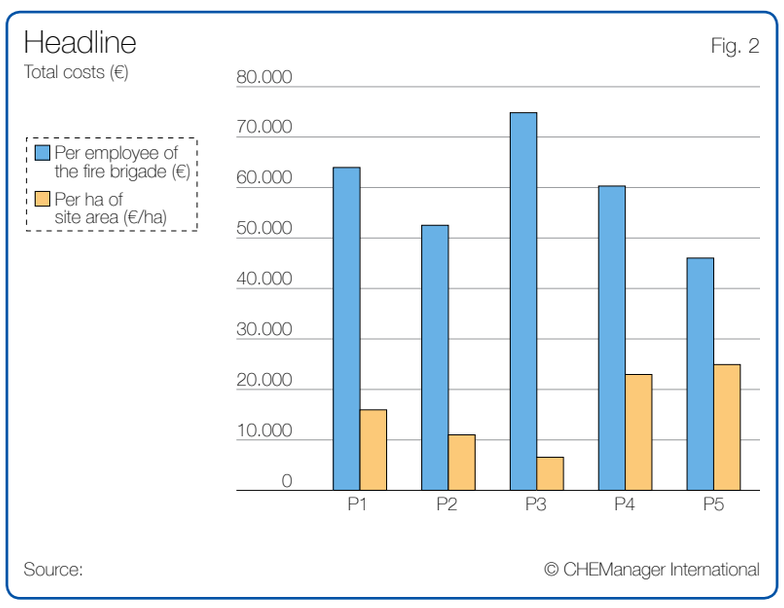

Figure 2: Key performance indicators for the fire brigade

The key performance indicators for security services are shown in Figure 3. The performance differences between the participants are even more significant ranging from 7,900 to 37,500 € per employee and 2,000 to 10,700 € per ha of the site. This is especially surprising as the salary level and the activity portfolio between the chemical/industrial parks is quite similar which was also shown by an activity analysis. The more detailed analysis and discussion of these differences gave the picture that the workload is the decisive factor for performance improvements and cost saving potentials can be realized by reducing idle time. This can be achieved by additional activities for the security service employees like postal and other internal logistics services.

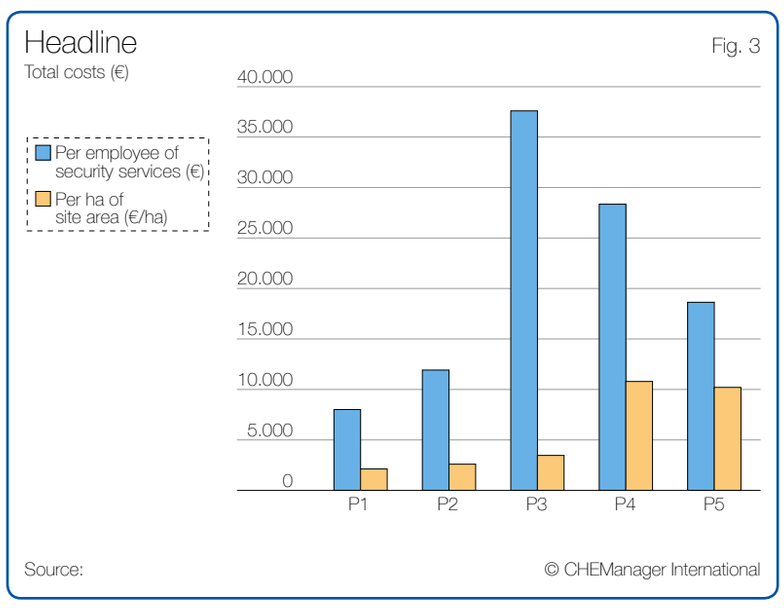

Figure 3: Key performance indicators for security services

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Part 2 of this article series will present the benchmark results of energy, utility and traffic Infrastructures. The details of the benchmarking study can be found in scientific publications, for instance: G. Festel, M. Würmseher, Challenges and strategies for chemical/industrial parks in Europe, Journal of Business Chemistry, Vol. 10, No. 2, June 2013, p. 59-66.

BASF to Build Methane-to-Propylene Plant in US

BASF has announced plans to build a world-scale methane-to-propylene complex on the US Gulf Coast to take advantage of low-cost, shale gas-derived ethane feedstock. The German group did not reveal the projected cost of the facility or a planned start-up date, but some reports said the cost could exceed €1 billion.

Speaking to the annual shareholders meeting, CEO Kurt Bock said it will be BASF's largest single-plant investment to date, is expected to "considerably improve the group's cost position and backward integration in the US. The unquantified output would be earmarked for captive use in North America.

BASF Total Petrochemicals, the 60:40 venture with France's Total, recently started up of a 10th furnace at its steam cracker in Port Arthur, Texas, which last year was revamped to use ethane feedstock.

While the group said this would improve feedstock flexibility, enhance plant reliability and increase the JV's annual ethylene output to more than 1 million t/y, it will at the same time reduce output of propylene, a BASF executive explained to a UK news agency. This will necessitate on-purpose output of C3 to balance BASF's supply-demand balance in North America.

Also at the meeting, Bock also announced that BASF will explore for shale gas in Argentina. (dw) ■

BASF Starts Inorganics-Focused California R&D Center, Expands Coatings Capacity in Brazil

BASF Corporation, US arm of the global chemical producer, has established a multidisciplinary research institute, the California Research Alliance by BASF (CARA), with a focus on new inorganic materials and their applications, along with biosciences, and related technologies.

The institute will link BASF experts with researchers from a wide variety of science and engineering disciplines at the University of California at Berkeley, Stanford University and the University of California at Los Angeles (UCLA). Ten new postdoctoral positions will be created. Research for inorganic materials is especially interesting for the electronic industry.

In Brazil, BASF has spent €2.5 million on expanding capacity for waterborne automotive coatings at its Demarchi site in Sao Paolo state.

The German group, which did not provide capacity details, said the expansion is in response to demand from new car manufacturers setting up production facilities in Brazil and the ongoing trend to replace solvent-borne with waterborne technology. (dw) ■

Celanese to Expand PPS Compounding in China

Celanese has announced plans to expand compounding capacity for Fortron PPS compounds at its integrated site at Nanjing, China up to the end of 2014.

The US group said the expansion, which it did not quantify, is in reaction to "impressive growth" in the People's Republic and in Asia generally.

Fortron Polymers, a 50:50 joint venture between Celanese and Japan's Kureha, produces 15,000 t/y of the high-tech heat-resistant polymer at Wilmington, North Carolina. The company recently applied for $100,000 in state aid to "make improvements" at the site. It was not clear whether expansion was targeted. (dw) ■

Celanese to Build Second Methanol Plant in Texas

US chemical producer Celanese has announced plans to build a second 1.3 million t/y methanol plant at its Bishop, Texas site, using low-cost natural gas from the US Gulf Coast region as a feedstock.

No planned start-up date was given.

The company said it will consider operating the plant as a joint venture similar to the arrangement it has with Japan's Mitsui for the same-sized methanol unit due to go on stream in the third quarter of 2015. Ground breaking ceremonies were held in January.

Celanese said the Bishop plant will profit from back integration, good infrastructure and economies of scale. The site manufactures specialty chemicals, engineered materials and pharmaceutical products. (dw) ■

People

Robert Yates, who currently heads Merck Millipore, is leaving the company and will be replaced by **Udit Batra**, presently head of the consumer health division of the German life sciences and specialty chemicals company. Succeeding Batra will be **Uta Kemmerich-Klein**, who currently heads the subsidiary Allergopharma. Taking Kemmerich-Keil's job at Allergopharma will be **Marco Linari**. **Annalisa Jenkins**, head of research, is also leaving Merck, but no successor has yet been named. In the interim, her responsibilities will be assumed by Belén Garijo, who recently was named to head Merck Serono. Merck also is looking for a new CFO, to replace Matthias Zachert, who returned to his former employer Lanxess as CEO on April 1.

Patrick Lindner was named as president of DuPont's Performance Polymers business effective March 1, succeeding **Diane Gulyas** retired in April after 36 years of service to the company. Gulyas advanced into progressive business and functional leadership roles, including assignments in Europe, after joining the company in 1978. Lindner has served in a diverse range of business and technology leadership positions after starting with DuPont as a chemist in 1996. He provided leadership to DuPont's acquisition of Danisco before assuming his current role in 2011 as global business director for growth of the Electronics & Communications segment.

Antonio Galindez has retired as president and CEO of Dow AgroSciences on May 1. He held the position since 2009. **Tim Hassinger**, global commercial leader for Dow AgroSciences and global leader of the Crop Protection Global Business Unit, has been named as Galindez' successor. Hassinger joined Dow in 1984, working in various sales, marketing and supply chain roles before being named global business leader in the Insecticides Global Business Unit in 2001. After serving as the regional commercial unit leader for Greater China, Hassinger became global leader for Europe, Latin America and Pacific. He assumed his previous responsibilities in the Crop Protection unit in 2009 and added global commercial leadership responsibilities last year.

Marcel Ijland has been appointed global sales and marketing director of Custom Manufacturing and Tolling (CM&T) for WeylChem, effective May 1, 2014. In his new role he is responsible for WeylChem's marketing and sales activities in the CM&T business. He is based in Frankfurt, Germany, and has more than 20 years of experience in the Industry. Prior to joining WeylChem, Ijland was Global Sales Director at Chemtura for their flame retardant-, bromine derivatives and organometallics businesses.

Jorge Nogueira, previously head of the Lanxess business unit Functional Chemicals, has taken over responsibility for the business unit Performance Butadiene Rubbers from Joachim Grub as of May 1. Grub will take a one-year sabbatical. Anno Borkowsky, in addition to being head of the business unit Rhein Chemie, will temporarily be responsible for Functional Chemicals. There has also been a change in leadership at the group function Innovation & Technology. On May 1, Par Singh, formerly country representative of Lanxess in Singapore, has taken over responsibility from Paul Wagner, who entered retirement.

Miguel De Bellis has been named President Emulsion Products and Americas at Archroma with effect from April 1. He is based in São Paulo, Brazil. De Bellis will lead and have full responsibility for Archroma's Emulsion Products business globally. At the same time, he will support the Americas region for all businesses. De Bellis is a Brazilian national. He holds a Degree in Business Administration from FMU Faculdades Metropolitanas Unidas. In addition, he studied at the London Business School and the Cranfield School of Management. Prior to joining Archroma, De Bellis was a partner at Endura Partners and worked for Croda in Brazil.

Dr. Haijun (Lou) Dong has been named as managing director for DIA China, an independent, non-profit organization in the area of life sciences product development. Dong has succeeded Dr. Jane Cai upon her retirement. He previously held executive positions as CEO for Lilly China R&D Co. and was president and CEO of Impact Therapeutics. Prior to that Dr. Dong worked at Roche in China and the United States and other Chinese and international companies, serving in R&D, sales and marketing, business development and executive leadership capacities. He holds an MBA from the China Europe International Business School and a doctorate in chemistry from the University of Washington.

Henning Neubauer has joined the Business Management team at Recipharm, a contract development and manufacturing organization, taking on the position of Business Director for Northern Germany and the Netherlands. **Antonio Lopez** also joins Recipharm in the role of Business Director for Spain and Southern France. Recently, **Åsa Wilander** was appointed to the new role of Key Account Director for the Nordic region. Neubauer previously was COO at a German generics start-up company and prior to that worked as Head of Customer Service and Sales at Haupt Pharma.

Robert Beland has been appointed to the newly created role of Vice President & General Manger of Softgel Technologies in Europe at Catalent Pharma Solutions. He will be based at Cham, Switzerland. An executive leader, with more than 25 years' experience in the services industry, both in the pharma and the vitamins, minerals, and supplements space, Beland's professional career includes two-years at Catalent's St. Petersburg, Florida facility. Prior to that, Beland was Executive Vice President and Chief Operating Officer for Ricerca Biosciences. He holds a bachelor's degree in Chemistry from Université de Montréal, Montréal, and a degree in health sciences from Collège Jean-de Brébeuf, Outremont, Canada.

Trish Kerin of the Institution of Chemical Engineers (IchemE) has been appointed as director of the new IChemE Safety Center (ISC) that will initially operate out of Melbourne, Australia. After graduating from the Royal Melbourne Institute of Technology as a graduate in mechanical engineering, Kerin worked for Mobil Oil before moving on to Australian Vinyls. Just prior to joining IChemE, she was the national health and safety manager for Wesfarmers Kleenheat Gas. Outside of these roles, Kerin's passion for process safety saw her to take on roles as a representative of the Plastics and Chemicals Industries Association (PACIA) on the WorkSafe Victoria Major Hazards Advisory Committee.

REACH Compliance - the Great Challenge for Globally Acting Enterprises

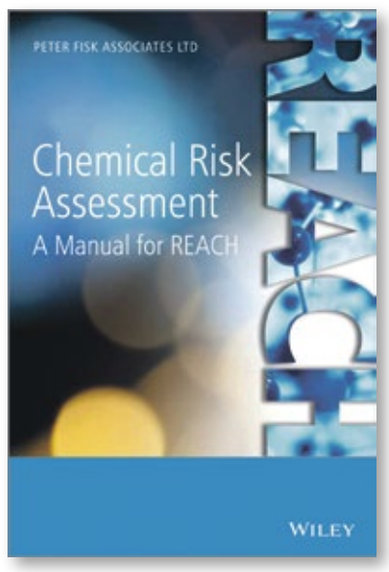
REACH Compliance: The Great Challenge for Globally Acting Enterprises is the only book to not only discuss the technicalities of the European REACH chemicals registration process, but also to directly address the resulting business risks and business solutions.

In this text for practitioners, the author pulls together the key knowledge needed to successfully run a business under REACH, distilling thousands of pages of official documentation, and incorporating experiences from different-sized enterprises in a global context.

Starting with the basics of the REACH framework, the author explains the entire process on how to register with the European ECHA office with a particular emphasis on small and medium-sized businesses. Along the way, she describes key milestones and presents sample documents from real case studies. The final part of the book addresses strategies to ensure a reach-compliant operation, including recommendations for in-house processes as well as communicating with suppliers and downstream users.

- REACH Compliance
  Susanne Kamptmann
  Wiley-VCH
  Price: € 89,00
  ISBN 13: 978-3-527-33316-5

Chemical Risk Assessment - a Manual for REACH



This book is an essential guide and support to understanding of the science and policy, procedure and practice that underpins the REACH risk assessments required for the use and placing on the market of chemicals in the European Union. A clear understanding of information provision and how this affects the assessment of chemical safety is fundamentally important to the success of policy on chemicals and ultimately to the sustainability of the chemicals industry.

Within the book, the scientific processes that underpin the policy are explained in a practical way. Importantly, it includes coverage of techniques to help solve the problems of using potentially risky and hazardous chemicals through the use of less hazardous alternatives and 'green chemistry', and also the analysis of the risks of the use of the most hazardous substances against the social and economic benefits of use.

Chemical Risk Assessment covers the following main themes: i) Assessment of chemical risk; ii) Risk management; iii) Hazard reduction, substitution and green chemistry; iv) Risk versus benefit - socio-economic analysis.

It acts as a practical guide and overview to chemicals risk assessment and risk management (in the EU context), as well as a support text for planning for the challenges of the future, which will see ever-increasing pressure to withdraw hazardous substances from the EU (and global) market, balanced against opportunities for innovation in the development of less hazardous chemicals.

- Chemical Risk Assessment
  Peter Fisk Associates Ltd.
  John Wiley & Sons
  Price: $ 99,95
  ISBN: 978-1-119-95368-5

Events

FECC Annual Congress 2014, 26 — 28 May 2014, Rome, Italy
Over the years, the annual congress of the European Association of Chemical Distributors (FECC) has become recognized as the key event for the chemical distribution industry to get together and discuss the most current issues within the industry. The congress is also a key date in the European chemical industry's calendar as hundreds of delegates, from business leaders to stakeholders, attend every year. The 2014 sessions will focus on the distribution market, sales & marketing, software solutions & legislation for the distribution industry, understanding the advocacy process, and future trends. The sessions will be moderated by Günther Eberhard of Districonsult and Wolfgang Falter of Alix Partners. Rafael Cayuela, author of the Wiley book „The Future of the Chemical Industry by 2050", will discuss what challenges and opportunities lie ahead of the chemical distribution industry.

- www.fecc-congress.com

The Future of the Automobile Industry, 28 — 29 May 2014, Detroit, USA
Light vehicles represent an important $44 billion market for chemistry in North America. The industry is especially important for plastics and composites with usage having grown significantly during the last five decades. The average light vehicle now contains 377 lbs of plastics and composites, 9.2% of the total weight. Virtually every component of a light vehicle, from the front bumper to the rear taillights features some chemistry. The 3rd Annual Industry Conference of the National Association for Business Economics (NABE), "The Future of the Automobile Industry" will take a broad look at the future of the automotive sector, its contributions to the US economy, the evolving regulatory environment, demographic trends of consumers, and the impact of technological and energy sector breakthroughs on production and planning.

- http://nabe.com/IC2014

Display Week 2014, 1 — 6 June 2014, San Diego, USA
Display Week is the premier international symposium, seminar and exhibition showcasing advances in electronic display technology. Electronic displays by themselves make up a $100 billion industry. The Display Week Exhibition on 3 - 5 June provides a venue where display technology and product providers can meet with the scientists, engineers, designers, and business development decision makers driving the integration of new display technology into products. Technologies like liquid crystal display (LCD), organic light emitting diode (OLED), HD and 4K TV, and advanced touch interfaces have been presented for the first time at Display Week. This year, the focus lies on emerging industry trends such as flexible displays, electronic paper, displays for wearables, solid state lighting, digital signage, and printed electronics

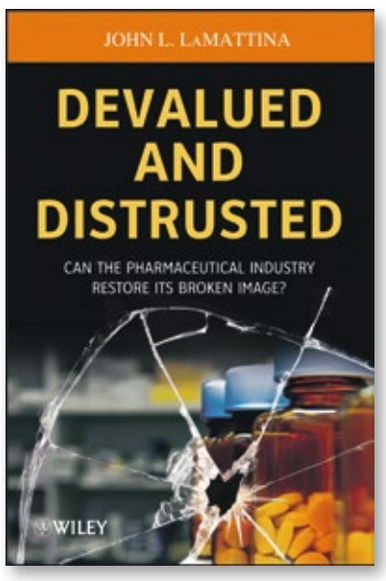
- www.displayweek.org

Chemspec Europe 2014, 18 — 19 June 2014, Budapest, Hungary
The annual European fine and specialty chemicals exhibition will take place in Budapest for the first time, providing a gateway to the Eastern European markets for custom, fine and specialty chemicals. Showcasing a series of conferences, seminars and workshops for both exhibitors and visitors to attend, the event offers a broad spectrum of information on products, technologies and regulatory issues. They include the RSC Speciality Chemicals Symposium, a Pharma Outsourcing panel discussion, an Agrochemical Intermediates conference, the Regulatory Services Zone, and Pharma as well as Green Chemistry Workshops. On the day before the exhibition opens, the European Fine Chemicals Group (EFCG) holds their 5th annual Crop Protection & Fine Chemicals Forum the afternoon of 17 June at the Chemspec venue.

- www.chemspeceurope.com

An Expert's View on the Pharmaceutical Industry

As a thirty-year veteran of the pharmaceutical industry and former president of Pfizer's Global R&D Division, Author John LaMattina is internationally recognized as an expert on the pharmaceutical industry.



- Devalued and Distrusted
  John L. LaMattina
  Wiley
  Price: $ 29,95
  ISBN 13: 978-1118487471

His first book, Drug Truths: Dispelling the Myths About Pharma R&D, was critically acclaimed for clearing up misconceptions about the pharmaceutical industry and providing an honest account of the contributions of pharmaceutical research and development to human health and well-being.

The book answers the questions about the process and costs of pharmaceutical R&D in a compelling narrative focused on the discovery and development of important new medicines. It gives an insider's account of the pharmaceutical industry drug discovery process, the very real costs of misperceptions about the industry, the high stakes — both economic and scientific — of developing drugs, the triumphs that come when new compounds reach the market and save lives, and the despair that follows when new compounds fail. In the book, John LaMattina, weaves themes critical to a vital drug discovery environment in the context.

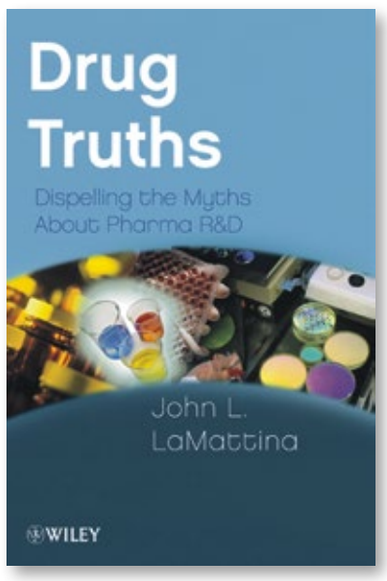
As he toured the country discussing Drug Truths, Dr. LaMattina regularly came across people who were filled with anger, accusing the pharmaceutical industry of making up diseases, hiding dangerous side effects, and more.

LaMattina's second book, Devalued and Distrusted: Can the Pharmaceutical Industry Restore its Broken Image?, was written in response to that experience, critically examining public perceptions and industry realities.

Starting with "4 Secrets that Drug Companies Don't Want You to Know," Devalued and Distrusted provides a fact-based account of how the pharmaceutical industry works and the challenges it faces. It addresses such critical issues as:

- Why pharmaceutical R&D productivity has declined
- Where pharmaceutical companies need to invest their resources
- What can be done to solve core health challenges, including cancer, diabetes, and neurodegenerative diseases
- How the pharmaceutical industry can regain public trust and resuscitate its image

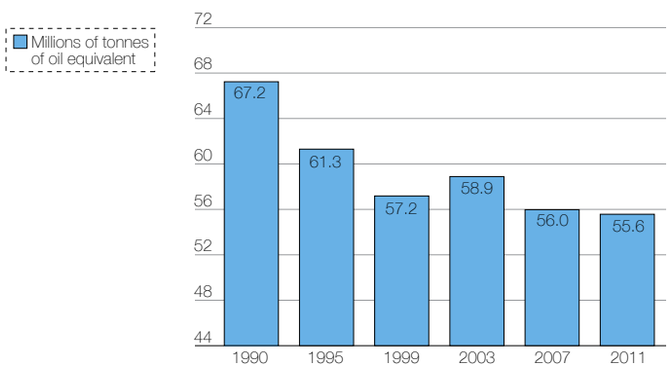
Our understanding of human health and disease grows daily; however, converting science into medicine is increasingly challenging. Reading Devalued and Distrusted, you'll not only gain a greater appreciation of those challenges, but also the role that the pharmaceutical industry currently plays and can play in solving those challenges.



- Drug Truths
  John L. LaMattina
  Wiley
  Price: $ 29,95
  ISBN 13: 978-0-470-39318-5

Energy Facts of the EU Chemical Industry

Fuel and power consumption in the EU chemical industry — Fig. 1

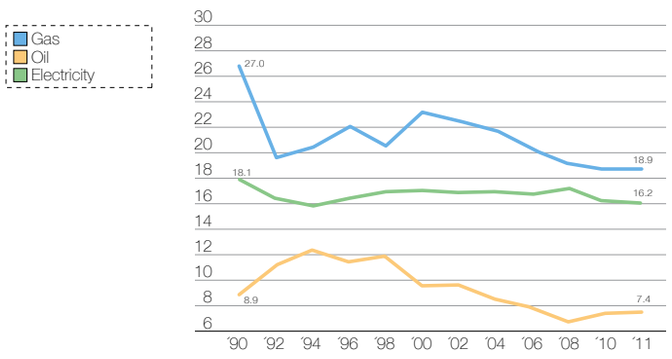


Source: Eurostat and CEFIC Chemdata International (2013)
Chemical industry includes pharmaceuticals, EU refers to EU 27 © CHEManager International

Fuel and Power Consumption

Energy costs represent a significant portion of the production cost of the chemical industry. Thus, rising energy prices impose financial pressure on companies. This is particularly true for Germany, Europe's most powerful industrial state that has embarked on its ambitious, but costly 'Energiewende' project. In April, after months of wrangling, Germany and the EU settled their differences over whether energy intensive companies in Germany can remain exempt from paying the so-called Renewable Energies Act surcharge (c.f. page 3). Taking a closer look at the energy use of the chemical industry it can be seen that the sector has constantly decreased its fuel and power consumption over the past years (Fig. 1).

Gas, oil and electricity comsumption of EU chemical industry — Fig. 2
Millions of tonnes of oil equivalent

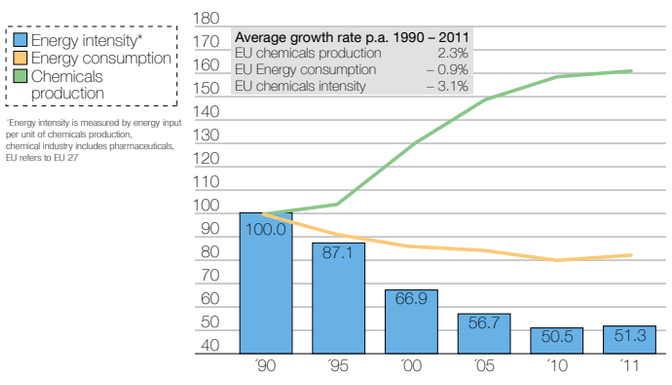


Source: Eurostat and CEFIC Chemdata International (2013)
Chemical industry includes pharmaceuticals, EU refers to EU 27 © CHEManager International

Energy and Raw Materials

According to the latest CEFIC Facts and Figures report providing the most up-to-date full-year data available the fuel and power consumption of the EU chemical industry amounted to 55.6 million tons of oil equivalent (TOE) in 2011 – down 17% from 1990. In 2011, the EU chemical sector used a total of 18.9 million TOE of gas. This represents a sharp reduction in gas consumption of 30% compared to 1990. At the same time, oil and electricity consumption decreased by 17 and 11%, respectively compared with 1990 (Fig. 2). Most of the energy and raw materials used by the chemical industry as feedstock is stored in products and can still be recycled.

Energy intensity of EU chemical industry — Fig. 3
Index (1990 = 100)

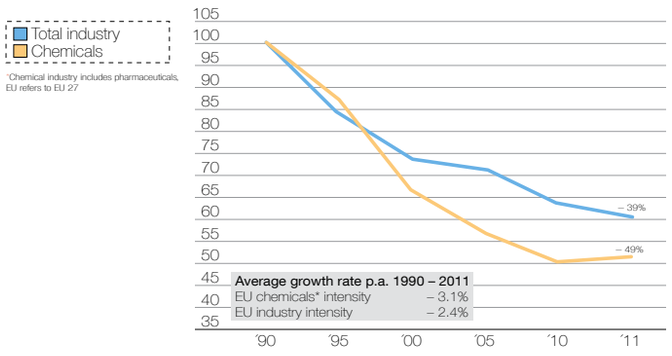


Source: Eurostat and CEFIC Chemdata International (2013) © CHEManager International

Energy Efficiency

The cost of energy and raw materials is a major factor in determining the competitiveness of the EU chemical industry on the global market. Thus, the industry has made strenuous efforts to improve energy efficiency by reducing its fuel and power energy consumption per unit of production. However, energy efficiency is subject to decreasing returns as the higher the level of energy efficiency, the more difficult it becomes to make further improvements. From 1990 to 2011, the EU chemical industry succeeded in continuously increasing its output while at the same time keeping its energy input constant. As a result, the energy intensity has been significantly lowered — on average by 3.1% per year (Fig. 3).

Comparison of energy intensity of EU chemical industry with total industry — Fig. 4
Index (1990 = 100)



Source: Eurostat and CEFIC Chemdata International (2013) © CHEManager International

Energy Intensity

The chemical industry has succeeded in decoupling resource use from production growth. By 2011, energy intensity in the EU chemical industry was nearly 49% lower than in 1990, whereas it only went down 39% during the same period for the whole of the EU manufacturing sector (Fig. 4). Still, further improving energy efficiency is paramount for the chemical industry. The sector accounts for 12% of total EU energy demand and for one third of EU industrial energy use. There are limits, however, to achieving energy efficiency gains. Fossil fuels as raw material cannot easily be replaced. In many processes, the industry has almost reached the maximum level of energy efficiency potential.

Foaming Bottled Beer Prank Explained

Mischievous beer drinkers in bars and pubs across the world have long known that a simple tap on the top of a buddy's open bottle of fizzy lager will cause an explosion of foam and spilled drink. Now researchers reportedly have solved the mystery with unexpected applications, including predicting volcanic activity.

A team of researchers led by Javier Rodríguez, a thermal and fluid dynamics professor at Universidad Carlos III de Madrid (UC3M) solved the problem by using a high energy laser to create a bubble at the bottom of a newly-opened bottle of beer then hit its neck. A high-speed camera, recording at 50,000 stills per second, found that the process had three distinct phases.

A vertical hit causes a shockwave that generates expansion and compression waves. When these reach the bottom of the bottle, the bubbles there burst into smaller bubbles, creating small balls of foam. These weigh much less than the surrounding beer and rise so rapidly to the top of the bottle that the result is similar to an explosion. In less than one second, virtually all the beer can be made to shoot out of the bottle.

This cavitation effect is similar to the effect in a mushroom cloud caused by a nuclear explosion, and occurs in part because there is more carbon dioxide (CO2) in the solution than it can maintain. Usually it would escape slowly, but a knock sets off a chain reaction that causes the gas to erupt.

While this may seem a frivolous piece of research, the researchers say that this research could have important applications. The knowledge could help predict the volume of gases that might erupt as a result of volcanic activity.

Andy Furlong, director of policy and communication at the Institution of Chemical Engineers (IChemE), said: "This research will be of wide interest including to chemical engineers who are the specialists behind the large scale brewing and bottling


© akcmedia - Fotolia.com

of famous household beer brands across the world.

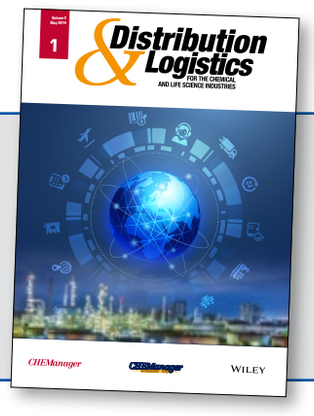
Pranksters also beware. Armed with this underpinning knowledge, it may not be too long before a clever chemical engineer finds a solution to keeping the beer in the bottle and removes this trick from the armory of bar-room pranks. ■

© Vincent Olivaud – Team Lalou Multi

Ocean Racer — Arkema–Région Aquitaine, the trimaran of skipper Lalou Roucayrol, has taken part in various ocean races. A veritable « Formula 1 craft of the Oceans », the boat's 50 ft multihull was built with materials and technologies developed by Arkema that help optimize its weight, strength and therefore performance. The project represents a vast testing ground for Arkema's innovative technologies, two of which are in fact on board. The cockpit window and the glazing shielding the two helms are made of Altuglas ShieldUp nanostructured acrylic sheet. Furthermore, many of the boat's components were assembled with structural glues from AEC Polymers, a company in which Arkema holds a 60% stake. The next official competition for the trimaran will be 2014 Route du Rhum later this year.

Supplement

This issue of CHEManager International contains the special supplement Distribution & Logistics for the Chemical and Life Science Industries.



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