

# CHEMManager

## EUROPE

### Markets

European Commission proposes to modernize the EU's trade defense instruments

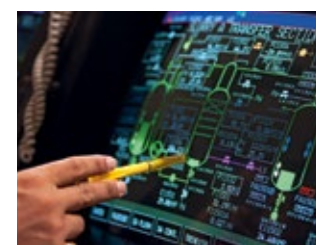
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### Production

IChemE highlights the role of the chemical engineer in delivering better quality of life

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THE NEWSPAPER FOR THE  
CHEMICAL AND  
LIFE SCIENCE MARKETS



### NEWSFLOW

#### M&A-News:

Life Technologies has accepted a \$13.6 billion cash buyout proposal from scientific and laboratory instruments company Thermo Fisher Scientific in one of the year's biggest corporate takeovers.

Elan's board of directors has unanimously rejected a formal bid from Royalty Pharma in the on-going takeover struggle for the Irish drug maker.

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#### Companies:

Dow Chemical increased its group EBITDA by 29% year-on-year to \$2.2 billion in the first quarter of 2013, as sales declined by 2% to \$14.4 billion.

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#### Investments:

BASF and Petronas are joining forces to build a \$500 million integrated aroma ingredients complex at the site of their joint venture BASF Petronas Chemicals in Gebeng, Kuantan.

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#### Pharma:

DSM Pharmaceutical Products announced that their new cGMP custom biopharmaceutical manufacturing, biologics plant of the future will open in Australia in June 2013.

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#### Collaborations:

Arkema will acquire a 25% stake in Indian castor oil producer Ihsedu Agrochem, a subsidiary of Jayant Agro, in a deal set to be finalized in the third quarter.

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#### Feedstock:

Cefic said that European investments in shale gas exploration and development are taking place at a crawl. Developing shale gas has the potential to strengthen industry's competitiveness and create jobs in Europe, according to the European Chemical Industry Council.

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## Boosting Global Expansion

Shell Chemicals Aims to Achieve Growth with Help of its Own Process Technologies and Integrated Sites

**Business** – Shell Chemicals held a ground-breaking ceremony last month for the building of facilities for making high-purity ethylene oxide (HPEO) and ethoxylates at its site in Singapore, part of its global network of regional hubs. The event exemplified the current direction being taken by the chemicals arm of the Anglo-Dutch oil and gas giant in a programme of major expansions in Asia and North America but without any big alteration to the strategy it has been following for several years.

"Our strategy in chemicals is unchanged but our level of aspiration is increasing," Graham van't Hoff, executive vice-president of Shell Chemicals, said at a recent press briefing in London. "We are looking to grow the business significantly over time."

The ground-breaking was for a high-purity ethylene oxide (HPEO) purification column with an initial capacity of 140,000 tonnes a year and two world-scale ethoxylation units with a combined capacity of 140,000 tonnes per year.

Like with other expansion schemes of Shell Chemicals, which in 2011 had sales of \$47 billion from an output of 18.8 million tonnes, the new units are being constructed on a highly integrated site close to a refinery and/or sources of advantaged feedstocks.

Also, they will be part of a value chain in which the business is already well established at the bulk end across the world and in which it has leading proprietary process technologies. Shell has been for over 50 years a leader in ethylene oxide, from which HPEO is derived, and in ethoxylates.

In addition, like with other projects, the products are being targeted at fast growing regional markets such as those for detergents and personal care items markets such as but also ones which support sustainability by encouraging greater energy efficiency.

"The demand for alcohol ethoxylates in Asia is expected to increase at approximately 6-7% annually over the next few years," said Graham van't Hoff in Singapore (photo below). "The key driver for this is the move by consumers from laundry powders and soap bars to liquid detergent and liquid soaps."

The alcohol ethoxylates which are made through the processing of HPEO with alcohol, have formulation advantages in the rapidly expanding liquid detergents sector in Asia. Concentrated liquid detergents work more effectively at lower wash temperatures and they do not leave residues.

The Singapore complex, in which Shell is debottlenecking its ethylene cracker to increase capacity for olefins and aromatics by 20%, is one among a number of Shell sites in which the company is planning to expand output of ethylene oxide/ethylene glycol and their derivatives, including HPEO and ethoxylates.

At Geismar, Louisiana, in the US where Shell has one of the world's largest EO and ethoxylation facilities, the company is considering large-scale debottlenecking of EO assets so that it can make more use of its HPEO and glycol infrastructure on the site.

At Moerdijk in the Netherlands—another of Shell's major regional hubs – Shell's investment plans include a debottlenecking of crude EO capacity and the building of a new HPEO purification column.

In EO and its derivatives Shell has the competitive benefits of its own OMEGA process technology which is the world's first entirely catalytic process for producing EO/EG. For making mono-ethylene glycol (MEG) from EO it achieves a conversion efficiency of over 99%, compared with around 90% for conventional processes.

Another product area in which Shell is rapidly expanding is polyols, which are reacted with isocyanates in the manufacture of polyurethanes. This is an example of another material which supports sustainability in end-use sectors like insulation of building and the making of low-weight components for automobiles to help reduce fuel consumption.

It is also another segment in which Shell has proprietary technologies, including its styrene monomer/propylene oxide (SMPO) process. Propylene is a key intermediate for the making of polyols.

In Singapore Shell is increasing its polyols production by over 100,000 tonnes a year to add new grades to its Asian polyols portfolio by 2014.

In the Middle East, where Shell is expecting a fivefold rise in de-



Graham van't Hoff, executive vice-president, Shell Chemicals

mand for polyurethanes as the region catches up with per-capita consumption levels in Europe, the company is aiming through Saudi Petrochemical Co (Sadaf), its joint venture with SABIC (Saudi Basic Industries Corp.), to produce a full range of polyols. Propylene oxide would be supplied by an SMPO plant at the venture's site at Al Jubail, Saudi Arabia.

At Pernis in the Netherlands capacity production capacity is being increased for propylene-oxide based polyol grades for application in coatings, adhesives, sealants and elastomers (CASE).

Raw materials for polycarbonates, another energy-saving and strongly growing polymer, are another target for expansion. Shell, which is already a major supplier of aromatics like cumene, phenol and acetone for polycarbonate production, has been developing a new process for making the intermediate diphenyl carbonate (DPC) which enables polycarbonate to be

produced without the use of highly toxic phosgene.

The technology, which will be demonstrated at a 500 tonne-a-year unit at the Singapore site, is based on a multi-stage reaction involving carbon dioxide, phenol and either propylene or ethylene oxide with catalysts which achieve 99-percent selectivity.

The development of the DPC process reflects Shell's renewed optimism in the future of the C6 aromatics chain. It believes demand for its aromatic chemicals, especially benzene, will be helped by the global drive for sustainability because of their ability to reduce energy demand and emissions and help conserve food and water.

One of Shell's biggest scheme still in the feasibility stage is a world-scale ethylene cracker at Monaca, Pennsylvania, whose main derivative will be polyethylene. This is a product in which Shell has no market presence except through a joint venture with Chinese National

Offshore Oil Co (CNOOC) at Nanhai, China, which has 500,000 tons a year of low and high density polyethylene capacity.

Otherwise Shell got out of the polyethylene sector when Basell, its global polymers joint venture was BASF, was sold to the investment company Access Industries in 2005.

The attraction of having a cracker in Pennsylvania is that it will be close to one of the world's biggest concentration of polyethylene converters in Northeast US and is also located on top of the Marcellus shale gas reservoir, the biggest in the country. This ensures a supply of low-cost gas liquids feedstocks. "The US cracker complex is under evaluation," said Graham van't Hoff. "We are not committed to anything at this stage. We've said that the production of polyethylene is part of that evaluation. There is a key question of where the polyethylene technology would come from – whether by buying it off the shelf or doing something ourselves."

Shell has a number of joint venture schemes being planned or in the early construction phase which will be using some or most of its major process technologies to produce core products in its portfolio.

In Qatar, the engineering company Fluor has recently been awarded the front-end engineering design contract for a new petrochemicals complex to be jointly owned by Qatar Petroleum and Shell. Its output will include MEG using the OMEGA process and linear alpha olefins applying the Shell Higher Olefin Process (SHOP). With Qatar Petroleum International (QPI), Shell is working with PetroChina on the development of an integrated refinery and petrochemicals complex in Shanghai.

Shell is not revealing what its target for growth is in chemicals. But at the Shanghai ground-breaking ceremony Mr. van't Hoff did cite a prediction that petrochemicals global demand in 2030 would be double that in 2010. It seems likely that Shell will achieve a similar increase in its sales by that time.

Author: Sean Milmo, freelance science and business journalist

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## Evonik Share Launched in Frankfurt and Luxembourg

Following approval of its securities prospectus by German financial supervisory authority BaFin and the green light by Luxembourg financial authorities, shares of Essen-based chemical producer Evonik began trading in Frankfurt and Luxembourg on April 25. The initial public offering confirmed earlier by the chemical company and its principal owners, the coal mining foundation RAG Stiftung and private equity company CVC Capital Partners, had been expected by the end of the month.

The stock launch prepared by Deutsche Bank and investment bank Mainfirst followed two rounds of private placements with institutional investors in February and March, estimated to repre-

sent 12% of Evonik's share capital. Alongside German investors, Singapore-based sovereign wealth fund Temasek was rumoured to be among the buyers.

On the day before trading began, the shareholders as advised previously sold an additional 2.5% bringing the total of shares floated to 14.5% of the company's capital, worth roughly €2.2 billion and valuing the company as a whole at €15.4 billion. In the first hours of trading, the stock outperformed the Stoxx 600 Europe chemicals sector index, which was up 0.1%. Evonik CEO Klaus Engel said he expects the company to be listed in Germany's mid-cap index M-DAX by September of this year.

Dow Chemical increased its group EBITDA by 29% year-on-year to \$2.2 billion in the first quarter of 2013, as sales declined by 2% to \$14.4 billion. The weaker sales performance is blamed on stagnant volumes in North America and a 12% setback in Western Europe. Overall, volumes were down 3% against the 2012 period. All but two of the group's operating divisions posted higher EBITDA.

CEO Andrew Liveris said the quarterly performance demonstrates Dow's "continuing determination" to deliver growth despite economic uncertainty. As the outlook for 2013 "does not call for material macroeconomic improvements," management is focusing on "aggressive measures." The CEO said the group continues to implement cost and cash flow actions,

## Dow Lifts Q1 EBITDA 29% with Most Businesses Seeing Higher Earnings



Andrew Liveris  
CEO, Dow Chemical

pay down debt, improve its return on capital and concentrate on portfolio measures, targeting near-term divestitures worth \$1.5 billion.

For its Electronic and Functional Materials segment, Dow reported a 2% sales rise to \$1.1 billion. Revenue declined slightly in Electronic Materials, but Functional Materials revenue grew due to increased volumes. EBITDA for the segment declined by 11% to \$273 million.

Coatings and Infrastructure Solutions reported sales of \$1.7 billion, down 2%, as prices held flat and

volumes sank 2%, due especially to difficult conditions in the European and US building sectors, along with restructuring in Europe. EBITDA fell 9% to \$186 million.

With record Q1 sales of \$2.1 billion, up 14%, Agricultural Sciences lifted EBITDA by 7% to \$484 million, another first-quarter record. Sales records were posted by Crop Protection and Seeds, Traits and Oils as the three units saw a combined revenue increase of 37%. Sales of new crop protection products grew "significantly."

Sales of Performance Materials declined 4% to \$3.3 billion on softer demand, which counteracted price increases. "Notable price improvements," Dow said, were achieved in Polyurethanes, Formulated Systems and Oxygenated Solvents. Epoxy and Polyurethanes saw lower volume

sales as management "aggressively pursued price increases to improve underlying profitability." EBITDA rose 33% to \$440 million.

In Performance Plastics, sales shrank 3% to \$3.5 billion, as volumes fell on weak market demand, primarily in Europe. The shutdown of a HDPE facility in Belgium also took its toll. EBITDA rose 33% to \$952 million.

Sales of Feedstocks and Energy decreased by 13% to \$2.6 billion. Volume sales were down 14%, due mainly to slower demand in Europe, which reduced operating rates. The ramp-down of supply agreements after divestment of the polypropylene business also hit volumes. The segment's EBITDA increased by 21% to \$240 million.

## Drugmaker Eli Lilly May Cut 1,000 US Jobs

Facing new generic competition for its top drugs, US pharmaceutical manufacturer Eli Lilly plans to eliminate around 1,000 domestic sales jobs, according to reports the company has not yet confirmed. The cuts, about a quarter of its 17,000 US workforce, are said to include both full-time and contract sales employees.

The drug maker has confirmed that it is restructuring its sales force to adapt to changes including the expiration of two patents, and said

it would expand its diabetes sales force.

Lilly's 2012 earnings fell 6% in 2012 after it lost its US patent protection for top-selling schizophrenia drug Zyprexa. At the end of 2013, the antidepressant Cymbalta will lose patent protection. What's more, generic versions of its \$1 billion-a-year Evista osteoporosis drug are due on the market in 2014. In Q4, Lilly took a charge of \$64.7 million for global restructuring, which included an unspecified number of layoffs.

In a landmark decision handed down in April, India's supreme court dismissed Swiss drugmaker Novartis's attempt to win expanded patent protection for its cancer drug Glivec. The ruling, said to set a benchmark for intellectual property cases in India, does not bode well for foreign firms engaged in ongoing disputes in India, including Pfizer and Roche, analysts commented.

Indian authorities denied the Swiss pharmaceutical giant's initial attempt at a patent update in 2006 on grounds that the new version was only slightly different from the old.

Rejecting charges of evergreening (making only minor changes to a formulation, to enjoy longer patent protection), the company appealed a subsequent negative decision, arguing that the original compound was not suitable for making into a pill.

Developing the final chemically stable form of Glivec, used to treat certain forms of leukemia and gastrointestinal cancer as well as some rare tumors, took years of extra work and it was this effort that marked the real breakthrough, Novartis asserted. However, the supreme court held that the new for-

mulation did not satisfy the test of novelty or inventiveness as required by the law.

Domestic drug makers Cipla and Natco Pharma, which already sell a generic version of Glivec at around one-tenth of the price of the branded drug, could be among the chief beneficiaries of the ruling against Novartis. India, where generic drug makers are among the world's biggest, remains a difficult market for international pharmaceutical manufacturers and sellers. The country only began affording patent protection in 2005.

A lawyer for Cipla told news agencies that the court ruling would in future prevent international drug makers from securing fresh patents for updated formulation of their drugs. US industry trade group Pharmaceutical Research and Manufacturers of America, or PhRMA commented that the decision reflects a deteriorating environment for innovation in India. "To solve the real health challenges of India's patients, it is critically important that India promote a policy environment that supports continued research and development of new medicines," it said.



## BASF Profits from Strong Agricultural Demand in Q1

In the first quarter of 2013, BASF increased sales by 5% to €19.7 billion. EBIT before special items rose by 10% to €2.2 billion.

CEO Kurt Bock said BASF profited in particular from "intensified demand" for crop protection products and higher volume sales in the Oil & Gas segment. Higher margins in the Chemicals segment also helped to boost the EBIT total.

BASF is leaving its forecast for full year 2013 unchanged, despite an increasingly volatile market environment. "We stand by our outlook for 2013. We continue to aim to exceed the 2012 levels in sales and EBIT before special items," the CEO said.

Development in the Ludwigshafen group's newly restructured business segments (c.f. page 10) varied. Chemicals saw its sales fall 3% year-on-year to €4.4 billion. Nevertheless, as a result of better margins, EBIT before special items rose 17% to €650 million.

Sales of the Performance Products segment decreased by 2% due mainly to lower prices and negative currency effects in some product

groups. EBIT before special items declined 16% to €379 million.

Turnover in the Functional Materials & Solutions segment remained flat at the Q1 2012 level. The Performance Materials division, which includes engineering plastics, saw higher sales volumes, but poor weather hit Construction Chemicals. The segment's EBIT before special items receded by 7% to €239 million, due to a weaker contribution from the Catalysts division.

The Agricultural Solutions segment saw sales revenue rise by 17% to €1.6 billion, thanks to a good start to the planting season in Europe and North America as well as to higher prices and the acquisition of Becker Underwood. EBIT before special items improved by 19% to €498 million.

BASF's Oil & Gas saw a quarterly sales boost of 20% to €4.7 billion, due to higher production and trading volumes and despite lower crude oil prices and pressure on gas trading margins. EBIT before special items, however, was down 2% to €630 million.

## Bayer HealthCare and Crop Science Ahead in Q1 but MaterialScience Flat

Bayer lifted its overall sales by 2% in the first quarter of 2013 to €10.3 billion, while EBITDA before special items rose 0.4% to €2.53 billion. Adjusted for portfolio effects, the sales improvement was 3.7%. The 6.8% gain in emerging markets was nearly three times larger than that of industrialized countries, CEO Marijin Dekkers told the annual general meeting.

Dekkers attributed the group's relatively robust performance to new high-growth pharmaceuticals and strong demand for crop protection products. The high-tech plastics business was stagnant on the back of cost pressure from the petrochemical upstream.

For full year 2013, the CEO left the group forecast unchanged. Sales are expected to rise by 4-5% to around €41 billion in 2013. Bayer management continues to see "attractive perspectives for 2013 overall," Dekkers said.

Adjusted sales of the HealthCare subgroup in Q1 2013 increased by 2.3% to €4.4 billion, thanks largely to new ethical drugs. EBITDA before special items improved by 8.1% to €1.28 billion. Along with Pharmaceuticals, the Consumer Care business experienced a strong quarter, as did the veterinary activities.

Adjusted sales of the Pharmaceuticals segment advanced by 1.9%, with adjusted sales 5% higher. New products, the anticoagulant Xarelto, the eye treatment Eylea and the cancer drug Stivarga made a strong contribution with combined sales of €244 million. Sales of oral contraceptives were hampered by generic competition in Western Europe.

Bayer CropScience increased sales by nearly 6% in Q1 to €2.8 billion and EBITDA by just under 10% to €1.1 billion, thanks mainly to price increases and higher volumes.



Marijin Dekkers  
CEO, Bayer

Growth was especially strong in North America, due to "persistently high price levels for agricultural commodities," but other regions also showed positive development," said Dekkers. Seed treatment products saw the best performance.

Sales of Bayer MaterialScience (BMS) in Q1 were flat at €2.8 billion. In a weak market environment, Dekkers said the subgroup was able to increase selling prices to compensate for lower volume sales in both Europe and North America. EBITDA before special items declined by nearly 27% to €204m. During the quarter, BMS had to contend with sharp rise in raw material prices amid an over-supplied market for polycarbonate, lower sales volumes and an expensive maintenance shutdown for polyurethane starting material TDI in North America. Alongside price increases, BMS benefited from savings generated by efficiency improvements.

In full year 2013, Bayer HealthCare expects to increase EBITDA before special items and slightly improve the EBITDA margin before special items.

CropScience still expect to see business outpace the market, with sales advancing by a high-single-digit percentage and EBITDA before special items up by a high-single-digit percentage figure. For Bayer MaterialScience, a slight increase in sales to about €12 billion is forecast. EBITDA before special items is thought likely to be flat at the 2012 level of €1.3 billion.

## Eastman Lifts Q1 Profit 50% but Sales Including Solutia Flat

US chemical producer Eastman increased its operating profit by nearly 50% in the first quarter of 2013 to \$393 million from \$264 million a year earlier. Sales revenue improved by 27% to \$2.3 billion, including figures for Solutia, acquired in mid-2012. Pro forma combined sales sank by 1%.

"Our portfolio of specialty businesses continued to deliver strong earnings despite uncertain global economic conditions," said CEO Jim Rogers. For full year 2013, the company "remains on track to achieve a fourth consecutive year of double-digit earnings growth."

Eastman's Additives and Functional Products business, including the Solutia portfolio, reported pro

forma operating profit of \$98 million, up 4%, due primarily to lower raw material and energy costs. The Adhesives and Functional Products business saw earnings slump by 25% to \$49 million, due to lower sales volume for adhesives resins. In Advanced Materials, earnings rose 6.5% to \$65 million on slightly volumes and increased sales of higher-margin products.

Operating profit for Fibers rose 13% to \$114 million, with higher selling prices more than offsetting higher raw materials and energy costs. Pro forma combined operating earnings for Specialty Fluids & Intermediates increased by 30% to \$95 million on lower raw material and energy costs.

## Lonza Q1 Performance in Line as Expected with Pharma, Biotech Slow

Swiss specialty chemicals producer Lonza turned in a "solid" performance, in line with expectations, said CEO Richard Ridinger. While Specialty Ingredients showed a good performance, Pharma&Biotech had a slow start as anticipated.

Repeating earlier guidance of around 10% growth in 2013, Ridinger said the performance for 2013 will be geared towards a stronger second half-year 2013. Strong cost controls and process improvements toward performance and efficiencies will continue across the organization. "The newly focused organization is taking hold while delivering on our first quarter results," the CEO added.

Lonza's Pharma&Biotech segment saw "good pipeline develop-

ment" across all technologies in Q1. As expected, capacity utilization rates were lower, due to higher product changeover; however, the company forecasts "a continuous ramping-up" in the quarters ahead. In the Specialty Ingredients market segment, overall market demand in most areas is described as "decent," with all growth projects are on track.

Ongoing efficiency programs expected to result in enhanced profitability include the closure of the Swords site in Ireland in June of this year and the restructuring of the Visp site in Switzerland. Lonza has also initiated also a review of corporate functions to achieve "sustainable improvements and savings."

## Arkema to Take €125 Million Charge for KemOne Exposure

Arkema will take a €125m non-recurring charge in its Q1 2013 balance sheet covering total financial exposure to its bankrupt former PVC business now trading as Kem One. The French chemical producer is contributing €68 million to a six-month financing plan devised by a commercial court in Lyon to keep the business afloat until mid-June of this year.

Kem One, acquired in July 2012 by Klesch group, declared bank-

ruptcy on 27 March. Klesch said it planned to sue Arkema for €310 million, claiming that the seller misrepresented the business's financial state, an allegation the French company denies.

French unions have called on the national government to facilitate restructuring of the country's PVC industry, especially as multinational players such as Ineos and Solvay have cast doubt on their long-term commitment to the business.

## Lanxess Expands Production, Acquires Biocides Firm, Opens Asian Development Center

April was a busy month for German specialty chemicals company Lanxess. The company announced plans to expand its water treatment business with a €10 million investment in a new production line for weakly acidic cation exchange resins at its home site of Leverkusen, acquired Singapore-based biocides producer PCTS Specialty Chemicals, started up a new leather chemicals plant in China and opened a new Asia-Pacific Application Development Center for its high-tech plastics.

The investment at Leverkusen, due to be completed in 2014, includes a state-of-the-art facility for food-grade-standard filling and packaging. Lanxess has meanwhile rebranded the ion exchange resins business unit as Liquid Purification Technologies (LPT) reflecting the significant expansion of the product portfolio to include membrane

filtration technology for reverse osmosis.

The acquisition of Asian biocides specialist PCTS from majority owner NIPSEA Technologies will give the German company access to biocides for environmentally friendly water-based paints and modern production facilities near its Singapore headquarters. PCTS, which reported sales in the "single-digit million euro range" in 2012, including 60% in China, will be integrated into the Lanxess business unit Material Protection Products (MPP). The company's base will become MPP's new Asia-Pacific headquarters.

Lanxess' new €30 million, 50,000 t/y leather chemicals plant in China's Changzhou Yangtze Riverside Industrial park is claimed to be the largest of its kind in the People's Republic and is designed to strengthen its position as a local producer. The

plant will manufacture a full range of products for the Chinese market, the world's largest. Next to the Changzhou plant, Lanxess is currently building a plant for EPDM rubber, at €235 million its largest ever investment in China.

The plastics development center at Hong Kong will function as a technology hub for Lanxess customers in the region, providing engineering services in all development stages, from initial feasibility studies to high-tech testing for a range of products from injection moulded and blow moulded parts to composite sheet. Complementing the current R&D testing centre in Wuxi, China, it will focus on external co-operation and follow the expanding "green mobility" trend by providing testing services for plastics applications in the auto industry, Lanxess said.

## SABIC European Restructuring Will Cost 1,050 Jobs

As part of a restructuring scheme for its European assets and organization, Saudi Arabian petrochemical giant SABIC plans to close several production facilities and reduce staff by 1,050 positions up to 2014. The bulk of restructuring will take place in The Netherlands, where the group has its European headquarters. About two-thirds of the job cuts will affect SABIC employees, a third will hit contractors.

Earmarked for closure are two older 100,000 t/y polypropylene plants at Gelsenkirchen, Germany, acquired by Sabic in the 2002 takeover of the DSM petrochemicals business with which it built its European business, as well as the smaller of two polyphenylene oxide (PPO) units at Bergen op Zoom.

Business of the PP plants will be moved to a third facility at the site and production of PPO transferred to the Selkirk, New York site acquired from GE Plastics in the 2007 takeover of the US company's polymers activities.

While trimming operations, the Saudi group will also continue investing in plant improvements, new technologies and innovation. "Once the restructuring process has been completed, I am confident that SABIC will be in an even stronger position to meet customer needs, support its employees and contribute to the communities and environments within which we operate," said European president Koes van Haasteren.

In announcing the plans, SABIC's management said "the European

market is facing structural changes that are likely to set a new course for future competitive challenges." In particular, reduced consumer spending on houses, cars and appliances and investments in infrastructure "have resulted in squeezed margins." Additionally, competition has intensified from other regions, especially from the US, which has the advantage of shale gas development, and Asia, which has increased local production capacity and consumption.

CEO Mohamed al-Mady said SABIC is initiating restructuring "because the situation demands it. At the same time, he described Europe as a "special case" and said the continent would remain a very important market for the company, even in bad times.

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# The Shale Gas Game

## Part 2: What does it imply for Downstream Players?

**Resources** – In part 1 (c.f. April edition CHEManager Europe 4/2013), Stratley thoroughly reviewed the available global resources and elaborated on expected shale gas production developments in China and Europe. The main thing we learned was that the shale gas boom will remain predominantly focused on the USA for roughly the next decade and that, in the long term, significant commercial production activities are also expected to evolve in China and selected European countries. This means that, in the near future, the USA will keep its competitive gas cost advantage compared to other large economic regions. While this insight appears to be straightforward, the implications on many chemical companies have not yet been investigated. In the following, we aim to create awareness of the complex interdependencies between shale gas development and the downstream business of chemical companies and possible strategic issues involved.



**What Shale Gas-Driven Changes Can Be Expected in the Global Alkene Supply?**

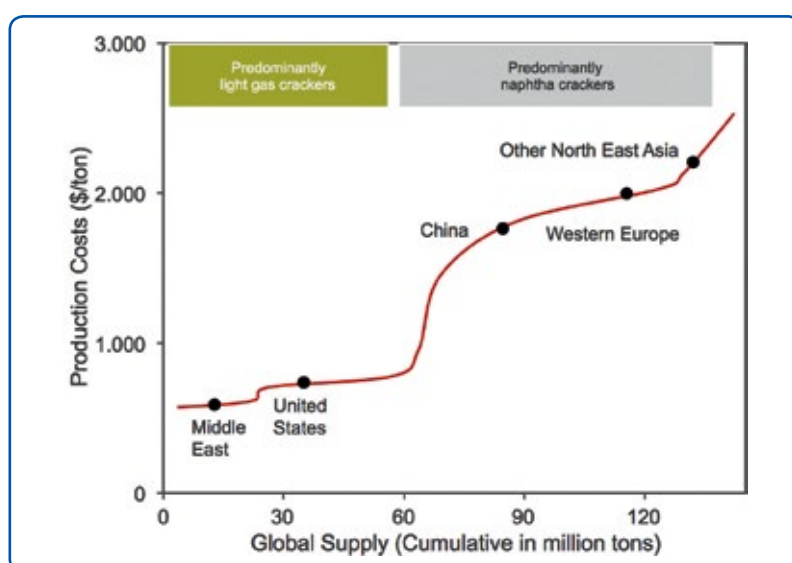
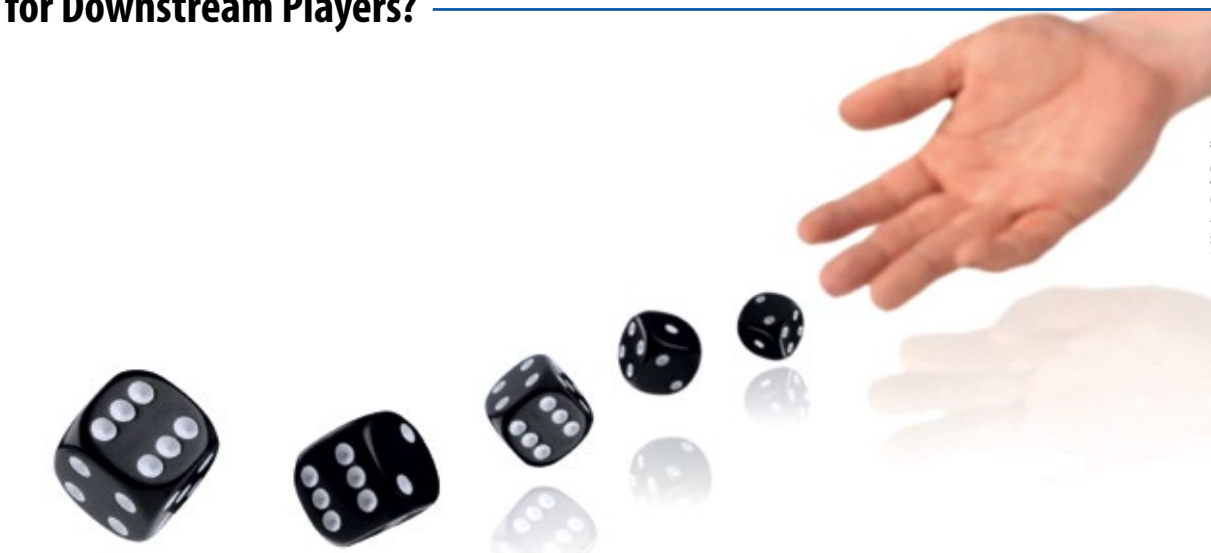
Cracker operators and investors in the U.S. have presumably done a thorough assessment of the resource range and assumed that there will be enough of an additional ethane and propane supply from U.S. shale gas for the coming decades. Thus, the cheap supply of natural gas liquids and especially of ethane has enabled U.S. ethane cracker operators to supply ethylene at prices in a very competitive global position (Fig. 1).

Consequently, U.S. flexi-crackers have been switching to ethane in recent years and new ethane crackers are under construction. This will lead to an increased supply of ethylene in the next several years and, at the same time, to a stagnating trend in butadiene and to a declining trend in propylene and BTX supply from crackers in the U.S. (Fig. 2). The trends can be derived by considering changes in naphtha and ethane cracking capacities and their typical output of alkenes.

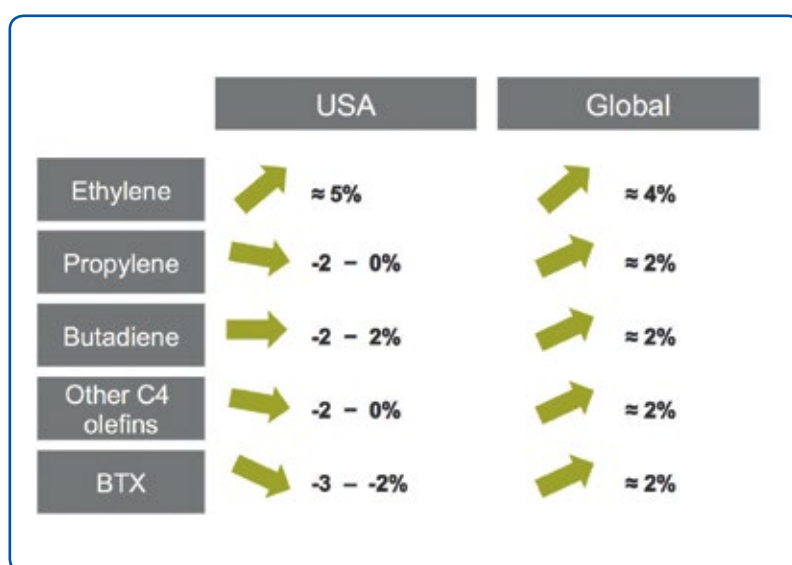
New projects to produce propylene on purpose by the dehydrogenation of propane, such as announced by Dow Chemicals, are expected to compensate for the regional shortage of propylene. However, butadiene and BTX production from crackers will presumably remain short in the U.S. in the mid-term.

Similar shale gas-induced projects are not expected to occur in the other two large economic regions, China and Europe, in the foreseeable future. In China, the shale gas resources are presumably mostly dry, and competitive production technologies have to be installed. In Europe, only few governments are supportive and, similar to China, technology is still in its infancy.

Hence, naphtha crackers will remain predominant in those regions. In China, large new naphtha cracker capacities are being built so that the propylene, butadiene and BTX supply from crackers is expected to increase globally by 2 % per year until 2017.



**Fig. 1: Global ethylene supply curve 2011**  
Source: Expert discussions on Shale Gas Insight Conference 2012; Stratley analysis.



**Fig. 2: Development of olefin production capacities by cracking 2011 to 2017**  
Sources: NPC North American Resource Development Study; Oil & Gas Journal; ICIS; Stratley analysis. Note: BTX = blend of benzene, toluene and xylenes. U.S. alkene capacity trends for C3+ depend significantly on how much of the ethane cracker output stream is fractionized. Global trends are calculated on cracker projects in major economies only. Other effects on olefin supply (e.g. dehydration) are not considered in Figure 2. All figures are estimates.  
Sources: American Chemistry Council (ACC), Expert discussions on shale gas conferences, ICIS, National Petroleum Council (NPC), Oil & Gas Journal, Stratley China office, Stratley experts in Germany, Stratley project experience.

Based on new capacity announcements and our analysis, chemical companies in the U.S. will face favorable ethylene price conditions. Overall, propylene supply in the U.S. will presumably remain healthy. The butadiene and BTX supplies from crackers show a stagnating or declining trend in the US. However, supply and price indications beyond cracker production capacities for butadiene and BTX are very difficult due to a complex set of supply and demand market drivers beyond cracker capacities. The butadiene price, in particular, has been very volatile since 2007, and we have observed an increasing butadiene market supply shortage in the US. Experts indicate that new U.S. cracker capacities will not considerably ease the U.S. butadiene shortage on the market. One reason is, for example, that a significant percentage of the cracker output is not fractionized due to currently poor underlying economics. Furthermore, on-purpose production of butadiene does not appear to be profitable with established technologies. An analysis of butadiene and BTX market drivers is required for a comprehensive assessment.

In contrast to the US, new naphtha cracker capacities in China will increase C3+ alkene supply, although below GDP growth rate. In Europe, alkene production from crackers will remain stagnant or show a declining tendency.

Which Strategic Issues Might Evolve Beyond The Obvious?

- What are the region-specific implications for aromatic chemicals, and will planned investments need to be re-evaluated?
- In what way do supply/price changes in propane, butane, propylene and butadiene justify innovative investments such as research for new catalyst and dehydrogenation technologies?
- Which new production routes based on ethylene as a platform chemical are economically feasible?
- Will 'methane to olefins' become competitive?
- What effect will changes in alkene derivatives prices have on suppliers of additives (e.g. comonomers for polyethylene)?

There are no straightforward answers to these questions. To address the questions adequately, profound expertise in both the shale gas business and the chemical industry is a prerequisite. This is a challenging requirement, as typical upstream companies do not focus on downstream drivers and vice versa.

Furthermore, deriving strategic implications for concerned players requires a customized evaluation considering the player's product portfolio, regional sites, strategy and other specifics of the company and related markets. We recommend chemical companies evaluate corresponding opportunities and threats to their own business and, where applicable, also for their suppliers' and customers' portfolio.

A specialized consultancy can be an important partner when it comes to designing and implementing a customized strategic concept. Closely monitoring developments in the shale gas and associated industry, we at Stratley are well positioned to support chemical companies in turning potential shale gas-related threats into attractive new opportunities.

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## Asahi Kasei Licenses PMMA Process to Thailand's PCC

Asahi Kasei Chemicals has licensed its PMMA production technology to PTT Public Company Limited (PTT) of Thailand, its partner in the joint venture PTT Asahi Chemical Co. (PTTAC). The Thai company is a manufacturer of acrylonitrile and methyl methacrylate (MMA). Its new

plants in Thailand began full-scale commercial operation in January.

PTT can produce 40,000 t/y of PMMA, leveraging MMA feedstock from the joint venture PTT Asahi Chemicals said awarding the license will further strengthen its relationship with PTT.

## Russia's First ABS Plant on Stream

Russian plastics producer Nizhnekamskneftekhim started up the country's first ABS production facility at its headquarters site of Nizhnekamsk, Tatarstan, in mid-April. The plant with a capacity of 60,000 t/y complements facilities for commodity plastics polyethyl-

ene, polypropylene and polystyrene as well as their feedstocks ethylene, propylene and styrene. The company also produces petrochemical precursors butadiene, benzene and MEG and has a growing synthetic rubber business.

## Clariant Buys Bayer's Nano-Silver Ink Technology

Clariant has acquired the nano-silver ink technology platform developed by Bayer under the trademark Bayink. The transaction comprises all related patents, know-how and materials. The Swiss group plans to work closely with existing customers and cooperation partners to further

develop the technology and its applications. Nano silver inks are printable on various substrates. They are used in a wide variety of emerging applications for printed electronics, including printed circuit boards, radio frequency identification devices (RFID) or photovoltaic panels.

# Shale Gas Presents Opportunity for Europe

European investments in shale gas exploration and development are taking place at a crawl, the European Chemical Industry Council (Cefic) says. Developing shale gas has the potential to strengthen industry's competitiveness and create jobs in Europe, according to a position paper recently released by Cefic. The paper concludes that European policymakers must accelerate the responsible exploration and production of indigenous shale gas. The shale gas revolution in the U.S. is having an impact on the European chemical and manufacturing industries, the paper notes, as the availability of energy and feedstock from shale gas is creating a significant competitive advantage for the U.S. industry. Other world

regions are also primed to ride the shale gas wave, while Europe is delaying the development of shale gas despite having significant potential shale gas resources. Cefic urges European authorities to speed up the responsible exploration and production of indigenous shale gas.

Cefic Industrial Policy Director Jose Mosquera said: "Shale gas could be a game changer for Europe in terms of chemical industry competitiveness, putting us on a more level playing field with other regions. It would also tackle greenhouse gas emission reduction targets in a cost-effective manner, reduce energy dependence and help fill intermittent gaps often left by renewable energy."

### Shale Gas Use in Chemicals Sector

Shale gas is a naturally occurring hydrocarbon gas mixture that is trapped in shale rock formations. Two existing techniques, hydraulic fracturing – often referred to as "fracking" – and horizontal drilling, have opened the taps on a once unrecoverable resource.

In Europe technically recoverable resources are estimated at 16 trillion cubic metres (tcm), compared to 47 tcm in the U.S. The chemicals sector can use "dry" gas, consisting mainly of methane, as an energy source, while "wet" shale gas – consisting of methane plus "Natural Gas Liquids", composed mainly of ethane, propane, and butane – primarily as a petrochemical feedstock.

To ensure that Europe does not lose this opportunity to strengthen its industrial competitiveness and maintain and generate growth and jobs,

this can be done by avoiding the creation of unnecessary regulatory barriers, giving appropriate attention to human health and the envi-

ronment, and providing the public with solid facts on the economic benefits of shale gas.

Mosquera added: "Delaying the development of shale gas in Europe will increase dependence on gas and oil imports, reduce inward investment, and – over time – lead to less jobs and a weakened manufacturing base. It would really put Europe's real economy in a more precarious spot."

www.cefic.org



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# Reacting to a Changing Market

## Commission Proposes to Modernize the EU's Trade Defense Instruments

**Politics** – The European Commission made a proposal that aims at adapting the EU's rulebook to tackle unfair competition from dumped and subsidized imports to the contemporary challenges facing the EU's economy.

The proposed changes would make the EU trade defense work better for all stakeholders, including both EU producers and importers. Anti-dumping and anti-subsidy instruments will be more efficient and better enforced to shield EU producers from unfair practices of foreign firms and from any risk of retaliation. At the same time, importers will enjoy greater predictability in terms of changing duty rates, which will make their business planning easier. The entire system will become more transparent and user-friendly.

"This is a balanced package with real improvements for all stakeholders affected by trade defense duties – producers, importers and users," EU Trade Commissioner Karel De Gucht said. "We want to equip EU businesses better to tackle unfair trade practices abroad, while not negatively affecting EU consumers or companies that rely on imports."

According to the legislative proposal, the Commission will:

- Improve the predictability for businesses by informing them about any provisional anti-dumping or anti-subsidy measures two weeks before the duties are imposed;
- Offer importers reimbursement of duties collected during an expiry review in case it concludes that there is no need to maintain

the trade defense measures in place after five years;

- Protect the EU industry by initiating investigations on its own ("ex officio"), without an official request from industry, when a threat of retaliation exists;
- Discourage other trading partners from engaging in certain unfair trading practices by imposing higher duties on imports from countries which use unfair subsidies and create structural distortions in their raw material markets. In such cases, the EU would deviate from its general 'lesser duty' rule that keeps the additional tariff within the limit of what is strictly necessary to prevent an injury for an EU industry.

The legislative proposal must be approved by the Council and the European Parliament and will probably not become law before 2014.

Additional non-legislative proposals will

- Facilitate cooperation with firms and trade associations involved in investigations by extending certain deadlines during the investigations;
- Improve monitoring of trade flows;
- Allow ex-officio anti-circumvention investigations to ensure faster action against illegal evasion of measures.

In parallel, a DG Trade working paper sets out 'draft guidelines' in four particularly complex areas:

- The expiry review of a trade defense measure, which is an investigation at the end of the usual five-year application of duties to determine if dumping and injury

are likely to continue or recur if measures expire;

- 'The Union interest test', i.e. the way the Commission determines whether a trade defense measure would serve the overall economic interests in the EU – including interests of the domestic industry concerned, importers, industries that use the imported product and, where relevant, consumers.
- Calculation of 'injury margin', which requires an examination of the volume and prices of dumped imports and their consequent impact on the EU industry;
- Choice of an 'analogue country', which is used to determine existence of dumping for products coming from a country without "market economy status".

These draft procedural guidelines will now be subject to a three-month public consultation. Afterwards, the Commission will analyze received comments and adopt the final version in order to make it easier for EU companies and the general public to understand EU trade defense procedures.

### Background

Anti-dumping and anti-subsidy duties are often the only way in which the EU can shield its producing industries from the damage caused by foreign companies' unfair trade practices. It is necessary to ensure that the EU's trade defense system – largely unchanged since 1995 – remains relevant to new challenges across the changing economic landscape.

The Commission's proposal comes after an eighteen-month reflection including a public consul-



tation on the issues EU companies have to deal with when faced with unfair practices. The proposal also takes into account the conclusions of an independent study evaluating the current trade defense system and the Commission's experience of anti-dumping and anti-subsidy investigations.

At the end of 2012, the EU had 102 anti-dumping and 10 anti-subsidy measures in force. The European Union is a moderate user of the trade defense instruments compared to other WTO members. Anti-dumping and anti-subsidy measures impact around 0.25 % of EU imports.

### EU Trade Defense Instruments Must Ensure Fair Access to Raw Materials

As an ardent supporter of free trade, the European chemicals industry supports the modernization of EU trade defense instruments

(TDI). Cefic is concerned, however, that the balance of the EU TDI system will be weakened at the expense of EU manufacturers by the Commission proposals recently announced. TDI modernization should not solely be geared towards more flexibility for importers, but first and foremost safeguard the ability of industry to produce jobs and growth in the European Union. The European Union already has the most liberal and non-protectionist set of instruments in the whole WTO community.

Cefic Director General Hubert Mandery said: "The Commission's attempt to modernize trade defense instruments must keep the balance right between the needs of importers and manufacturers in Europe. If the balance gets out of kilter, Europe's real economy will be more vulnerable to unfair trade than other parts of the world."

The Commission should ensure balance when updating certain aspects of TDIs to better address pressing challenges brought by an increasingly global and intertwined marketplace. Unfair raw materials trade practices should be tackled first. Cefic is pleased to see that the Commission is addressing this issue in its proposal.

Mandery concluded: "Fair access to raw materials is the biggest challenge that our industry faces. We need a tool with sharp teeth to combat dual pricing, export duties and subsidies that unfairly hit us."

► [www.cefic.org](http://www.cefic.org)

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## EU Chemicals Output Down 1.5 % in 2012

Thanks to a better than expected fourth quarter, chemical production in the EU was down only 1.5 % in full year 2012 against 2011, the federation of chemical industry associations, Cefic, said. The figures were in line with those of the first 11 months, reported by the organization at the end of February and better than the 2 % output decline predicted earlier. Overall EU chemi-

cal production levels remained 6.2 % below the 2007 peak.

Monthly data for December 2012 show a 1.2 % increase in EU-wide output compared with 2011, the third consecutive month of above-zero index readings. Petrochemical production jumped 3.4 % year-on-year, with consumer chemicals and polymers up 2.6 and 2.4 % respectively. By contrast, basic inorganics

production fell 2 % year on year. Specialty chemicals output decreased slightly, by 0.2 %.

In December, producer selling prices were 3 % higher and 2.7 % higher for the full year. Basic inorganics prices, up 3.2 % year-on-year, saw the biggest gains in 2012, with prices for petrochemicals and consumer chemicals rising by 1.4 % and 1.3 % respectively. ■

## Polish Treasury sells 12 % of Azoty Tarnów

Poland's state treasury has sold 12.1% of its stake in chemical conglomerate Azoty Tarnów to investors, including a 5.75% share package to the European Bank for Reconstruction and Development (EBRD) for zł.296.4 million (about €72,100).

The news agency Reuters said it was told the move was aimed at blocking Russia's Acron from increasing its holding in the company. Recently, Acron announced that it had raised its stake in Azoty Tarnów to 12.9% and said it would continue to buy shares. It also proposed a strategic partnership.

Lucyna Stańczak, EBRD director for Poland, said the bank's involvement is aimed at "actively promoting and supporting the company's



privatisation process by aiding with restructuring and introducing best corporate governance standards. She said Poland "has taken decisive action to consolidate the chemical sector and the next step now must be to make the players fit to compete on the global market." ■

EBRD is obliged to hold the stock for the next 12 month, when the treasury will have preemptive rights to buy it back. The Polish treasury had to sell the 12% shareholding stake by April 24 to cut its interest to less than 33% or be legally bound to increase it to 66%. This would have placed a strain on the national budget

The treasury had increased its stake in Azoty Tarnów to 45% as a result of the chemical group's merger with ZA Puławy, which began last year and was completed early this year. The chemical group, which is now the largest in Poland and Europe's second largest fertilizer producer, has now officially changed its name from Zakłady Azoty Tarnów (ZAT) to Grupa Azoty. ■

## Italian Ban on Non-Biodegradable Carrier Bags

On May 27, Italy will begin enforcing its new law banning handouts of petrochemical-based carrier bags in retail outlets. The law enacted in early 2012 prohibits the use of bags containing oxo-biodegradable additives and specifies only compostable applications as defined by the EN 13432 degradability standard. Retailers who do not comply with the legislation could face fines ranging from €2,500-25,000 – in some cases higher.

Exceptions are being made for certain food and pharmaceutical applications and for some bags containing recycled plastics. The new legislation "normalizes the uncertainties that have hindered the development of the production chain, promotes green chemistry and puts Italy in line with the EU," said Italian environment minister Corrado Clini. In early March, the European Commission launched a

public consultation on how to make plastic products more sustainable and reduce the environmental impact of plastics waste.

US bioplastics producer Cereplast expects to profit from Italy's switch to biodegradables, calculating its "total addressable opportunity" to supply the country's market at USD 50m. Demand has "increased steadily" ahead of the bag legislation taking effect, the company said. ■



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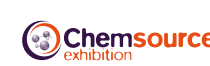
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# Securing Product Supply in Pharma

PHARMA Management Radar Examines Business Climate and Success Factors in the Pharmaceutical Industry

**Views from Different Angles** – Europe’s pharmaceutical industry is in the midst of fundamental change and threats appear from a wide-range of sources: demand and growth potential is increasingly shifting to the so called “Pharmerging” markets and the generic segment, price pressure is at an all-time high, regulatory hurdles are increasing and value chain challenges are proving hard to overcome. Extensive adjustments to business models are necessary, and it seems that at the moment, especially in the area of product supply, reliability is a critical problem spot for globally active pharmaceutical companies.

This is the picture that emerges from the first Camelot Management Consultants PHARMA Management Radar survey, a bi-annual survey that serves to examine the general climate in the pharmaceutical industry and, additionally, takes an in-depth look at varying management topics. In a four-week period during February and March 2013, almost 60 executives from globally active pharmaceutical companies based in 16 countries and spread over four continents, participated in the online survey. Companies with a business model predominantly characterized by developing and/or commercializing innovative medicines (“Innovators”) comprised roughly two-thirds of respondents; one-third were participants from companies predominantly active in the generics segment (“Generics”). Survey participants represent almost two-thirds of the global Top 20 pharmaceutical companies. The focus topic of the first Pharma Management Radar is Product Supply Reliability.

**2012 Review and Outlook**

Although 2012 may well be considered as one of the more tumultuous years in the pharmaceutical industry’s history, the surveyed experts were generally quite positive in their estimation of the current business climate. Interestingly, they were more subdued when considering the business climate in the next 12 months. Not only is no significant improvement expected for the pharmaceutical industry, one-third of respondents are even anticipating deterioration. Shaken by their experience of patent expiration, this sentiment is particularly pronounced among Innovators, with more than half of all respondents downbeat about the sector’s business prospects over the next twelve months. The producers of

crisis of the Eurozone quite well and profit from comparably good macro-economic framework data benefiting also the healthcare systems.

**“Pharmerging” Markets**

The so-called “Pharmerging” markets have also kept their appeal. Innovators see continued high demand growth particularly in China, Russia,


the Generics segment currently view insufficient product supply as the greatest risk to their business. Indeed, issues with important suppliers and insufficient product supply top the list of challenges that Generics say could severely impact their business.

**Challenges**

Innovators however worry about a whole clutch of fiscal and political threats. Most Innovators rank government regulation/healthcare system directives as their top business risk over the next twelve months. One-third of them also worry about the Eurozone crisis. One-quarter also view the withdrawal of legal/political recognition of patent protection as one of their greatest risks, as evidenced by current developments which show that these concerns are to be taken seriously. Among Innovators, the predominant trend by far is the focus on product innovation, which was the top answer for more than two-thirds of respondents, followed with some distance by “Supply Chain Agility”. Research collaboration is seen as the most promising answer to the need to increase the output of product innovation.

A pharmaceutical company’s business model plays a large role in shaping where risks and op-

**“ As the primary beneficiaries of the so-called patent cliff, Generics survey participants are unanimously positive in their assessment of the current business environment. Innovators however are more critical, with one-third of these executives viewing the existing business climate as being ‘mostly bad.’ ”**



Dr. Josef Packowski, Managing Partner, Camelot Management Consultants

**Critical Success Factors**

Given that Generics view product supply reliability as their greatest risk, it is worrisome that one-third of these surveyed executives feel that product supply reliability has deteriorated over the past two years. They are not alone in their estimation: Almost one-quarter of Innovators also feel that product supply reliability has decreased in the same time period. None of the interviewed experts believe product supply reliability has increased significantly.

Pharmaceutical companies are introducing a number of measures to tackle this problem, with risk management featuring prominently. More than 80 % of participants from the generics segment think that risk management is the key to increasing the reliability of product supply. An

key to increasing the reliability of our product supply. The sustained trend towards external sourcing means that improved information and data exchange with suppliers has become essential for increasing the agility of modern supply chains.”

Innovators are introducing a mixed batch of measures to increase product supply reliability. Since supply chain agility is promoted, it makes sense that respondents from this business model cite areas such as people, capabilities/skills, internal processes and information/data exchange with suppliers as those with the greatest potential for increasing their product supply reliability. The clear goal, however, of all these measures and programs is to guarantee successful product launches. Innovators are also introducing these improvement programs to increase customer service levels, prevent stock-outs and protect their value chains against demand volatility. Generics, in contrast, strive mainly for improved margins when introducing programs to increase the reliability of product supply.

**Authors: Dr. Josef Packowski, Managing Partner; and Michael Jarosch, Head of Pharmaceuticals & Life Sciences, Camelot Management Consultants**

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**“ Improving agility is the key to increasing the reliability of our product supply. The sustained trend towards external sourcing means that improved information and data exchange with suppliers has become essential for increasing the agility of modern supply chains. ”**



Sean O'Sullivan, European Supply Chain Manager, Mundipharma

Generics have a strongly more positive assessment. Heightened competition and price pressure dampen the 2013 business development outlook of Innovators, with only a very small fraction of below 5 % expecting sales to grow by more than 10 % in fiscal year 2013 compared with the previous year. More than half of the participating Innovators anticipate either only modest sales growth of 0-5 % or even a reduction in sales performance. Generics, in contrast, are far more upbeat, with more than 85 % of executives in this segment expecting sales to grow at rates above 5 %, while almost 30 % even expect significant growth above 10 %.

**Patents Terminating**

While the end of patent exclusivities alone creates a difficult business environment for some companies, the pharmaceutical industry has experienced an extra jolt in the form of the Eurozone crisis. The severe economic difficulties encountered by Spain, Portugal, Italy and Greece have negatively impacted demand expectations for Southern Europe. At the same time, the crisis has thrown into sharp relief the promise of Eastern Europe. Innovators and Generics alike rank Eastern Europe as one of the top regions for demand growth worldwide. Some of the Eastern European countries have mastered the

Eastern Europe and Brazil. With rising purchasing power, a growing middle class and better healthcare systems, these are clearly the markets of the future. The highest growth rates in demand for Innovators are expected in Africa, albeit starting at a very low level.

**New Investments**

As can be expected, the investment focus of pharmaceutical companies for the next 12 months largely mirrors anticipated regional demand growth. Both Generics and Innovators plan to invest significantly in the USA/North America, still the world’s largest pharmaceutical market. A significant share of Generics producers also plans to invest in Eastern Europe. Given that Innovators anticipate the strongest demand growth in Russia and China, they are investing strongly in these two countries.

**Sourcing**

External sourcing is an ongoing trend that has lost none of its strength. More than 70 % of respondents expect to increase the volume of external sourcing in the next 12 months. Yet the challenges of increased external sourcing have not been completely mastered, particularly by Generics. Almost three-quarters of the participants from

**“ Innovators are nervous about a whole clutch of fiscal and political threats such as government regulation or healthcare system directives. Generics are concerned about government regulation too, but almost three quarters of them view insufficient product supply as their greatest business risk by far. ”**

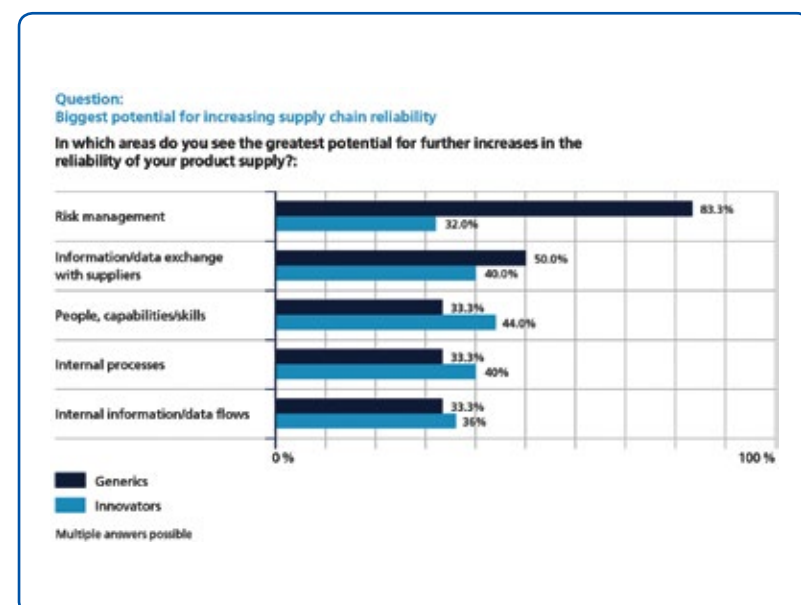
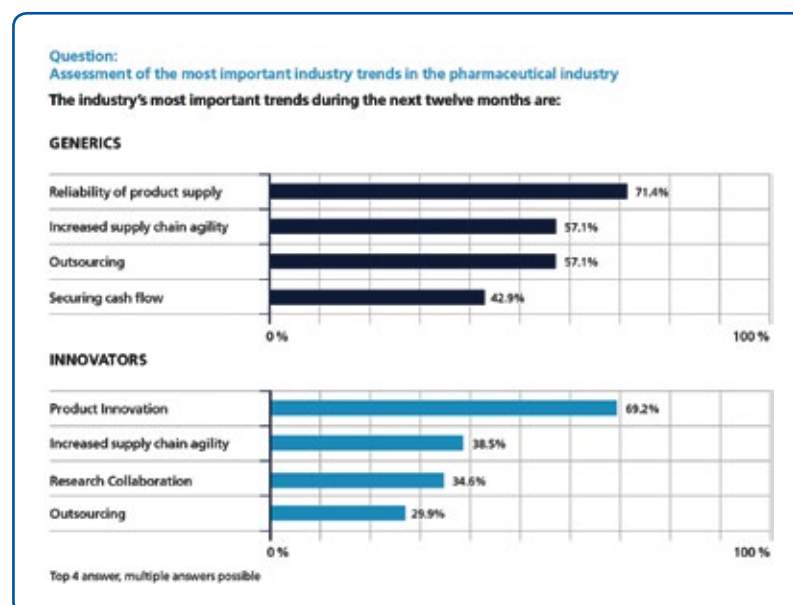
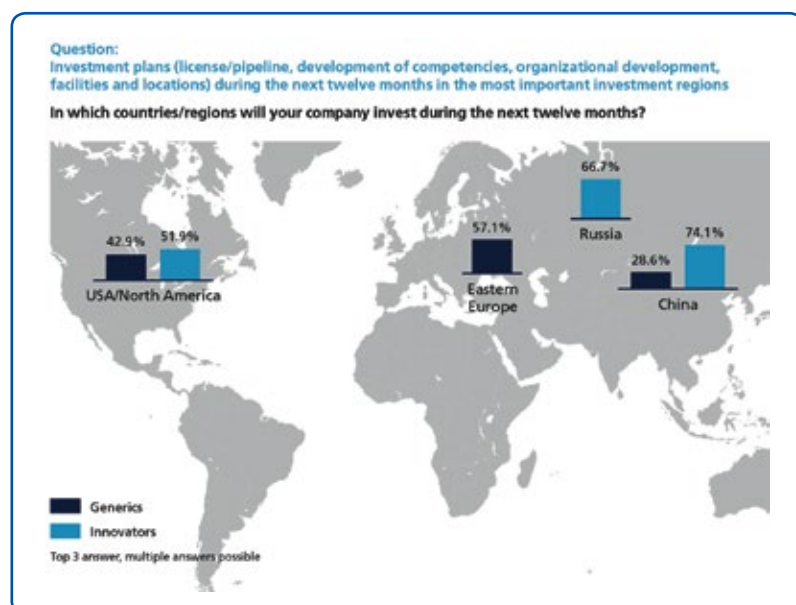
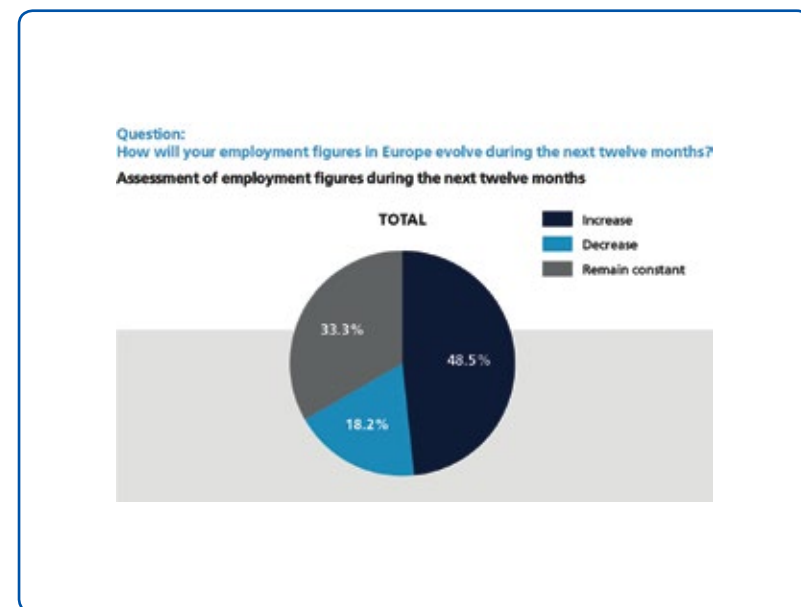
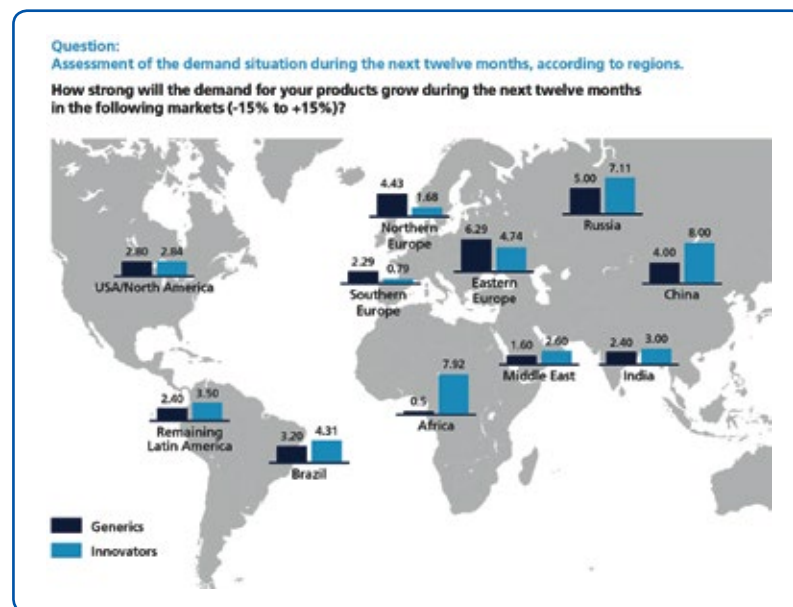
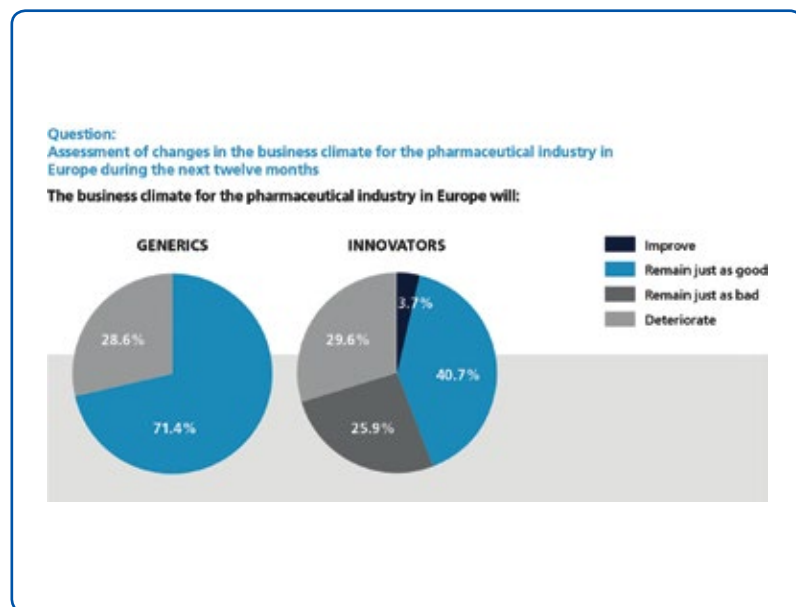


Michael Jarosch, Head of Industry Segment Pharmaceuticals & Life Sciences, Camelot Management Consultants

portunities will be seen. Based on the survey, it is clear that Innovators largely see danger in external factors that are chiefly out of their control and in many instances political, while Generics are still most engaged with their own organization and the integration of external suppliers into their value chains.

additional central lever to improve supply chain reliability is improved information/data exchange with suppliers, which again highlights the ongoing outsourcing trend and its accompanying challenges.

As Sean O’Sullivan, European Supply Chain Manager at Mundipharma says: “Improving agility is the





# The Biosimilar Market

## Staying on Top Amidst Looming Competition

**Pharmaceuticals** – Many biologic drug developers can be pleased with how well their products have performed in the market place. Blockbuster products such as Abbvie's (ex-Abbott) Humira (adalimumab) and Roche's Mabthera/Rituxan (rituximab) are examples of the success biologic products have experienced over the past ten years. Both of these products, as well as many others such as Remicade (infliximab), Herceptin (trastuzumab) and Enbrel (etanercept), are expected to continue to be multibillion dollar products for years to come.

This bodes well for API manufacturers of biologic products such as Lonza and Boehringer Ingelheim. Lonza currently manufactures commercial quantities of both rituximab and adalimumab for the innovator companies at their Portsmouth, New Hampshire and Porrino, Spain sites, respectively. But follow-on versions of these products, known as biosimilars, could diminish revenues for both the marketer and manufacturer.

Europe continues to lead the way for biosimilar competition, and this doesn't appear to be changing anytime soon. Multiple biosimilar products have been competing in the EU for over five years, establishing a market that is still growing. Most recently, Korea's Celltrion submitted an application for a biosimilar infliximab product, the first MAB bio-

similar application to be received in the EU. Even more MAB competition could be expected from companies such as Sandoz (Novartis) as early as the end of 2013.

### Competition-free U.S. Market

In the U.S., biosimilar competition has yet to commence. The Biologic Price Competition and Innovation Act (2010) created an abbreviated approval pathway for biologic drugs that are proven to be highly similar to products already on the market. This framework has created a lot of buzz in the pharmaceutical industry, but it is still uncertain exactly how big of an impact biosimilars will have on the U.S. biologics market. Nonetheless, innovator companies are not taking any chances and are bracing themselves for competition.

Roche's rituximab may be the first monoclonal antibody (MAB) with multiple biosimilars in the U.S. market. Currently, Sandoz and Boehringer Ingelheim are both in late stage trials with a rituximab biosimilar, while Celltrion and Pfizer are in the lab with their own candidates. Both Teva and Samsung continue to stay in holding patterns with their respective rituximab products, leaving some to question if manufacturing similar versions of the MAB are too difficult.

### One Step Ahead

However Roche isn't waiting around to see if development of rituximab biosimilars will indeed prove too challenging for potential players. The company has already

	FDA Approvals by Indication		
	Adalimumab	Rituximab	Infliximab
RA	X	X	X
NHL		X	
PsA	X		X
AS	X		X
CD	X		X
JIA	X		
UC	X		X
CLL		X	
PsO			X
GPA		X	
MPA		X	

### FDA Approvals by Indication

partnered with Emcure for the development and commercialization of rituximab and trastuzumab for the Indian market, a situation similar to an authorized generic. Versions of the products will be sold by both companies, but under different brand names, offering an inexpensive option and increasing patient access across the developing economy.

But that's just the tip of the iceberg for Roche's defense against biosimilars. Roche's clinical development program for obinutuzumab, the Swiss-based company's glyco-engineered type 2 anti-CD20 MAB, is designed to show superiority to rituximab in both non-Hodgkin's lymphoma (NHL) and chronic lymphocytic leukemia (CLL). If proven to be safer and more potent, biosimilar versions of rituximab could be competing over a smaller pie than originally hoped, with physicians more likely to prescribe the better therapy to new patients.

### Expanding the Scope

Roche and Chicago-based Abbvie both continue to gain approval for new indications for their blockbuster products. Expanding the scope of indications for a biologic presents an opportunity to generate additional revenue and soften the impact of biosimilar competition.

Currently, rituximab is approved for rheumatoid arthritis (RA), CLL, NHL and most recently granulomatosis with polyangiitis (GPA) and microscopic polyangiitis (MPA). Adalimumab received FDA approval for the treatment of adult patients with moderate to severe ulcerative colitis (UC) in September of 2012, its seventh approved indication in the U.S. In addition to UC, adalimumab is approved for moderate to severe RA, moderate to severe polyarticular juvenile idiopathic arthritis (JIA), psoriatic arthritis (PsA), ankylosing spondylitis (AS) and moderate to severe Crohn's disease (CD).

### Legal Options to Eliminate Competition

In addition to increasing indication approvals, Abbvie is pursuing legal options to brace for, or even eliminate, biosimilar competition for adalimumab. In March, Abbvie filed a request for injunction to prevent the EMA from allowing access to adalimumab data. This move follows the citizen petition Abbott filed in the U.S. with the FDA in April of 2012 regarding the protection of analytical, preclinical and manufacturing data used to support adalimumab's BLA application. Both efforts aim to limit companies rights to use information for competition, which could not only have a major impact on adalimumab biosimilar hopefuls, Boehringer Ingelheim and AET Biotech/BioXpress Therapeutics, but also on developers of biosimilars overall.

Meanwhile, Amgen, the manufacturer of multiple biologics including etanercept, has decided to embrace competition by investing in its own biosimilar programs. In late 2011, Amgen teamed up with Watson (now Actavis) to develop biosimilars, although the California-based company had been preparing to develop similar versions of biologic products prior to the announcement. This past February, Amgen offered more insight into their biosimilar plans. The company plans to launch biosimilar versions of top selling biologic products, including rituximab and adalimumab, starting in 2017.

Moves have already been made by Amgen for the development of a biosimilar trastuzumab product. Netherlands-based Synthron and


Actavis came to terms on a global licensing agreement for the Dutch firm's trastuzumab biosimilar. The deal grants Actavis and its biosimilar partner Amgen global rights to the marketing and manufacturing of Synthron's product. The companies will work together to transition the development of the trastuzumab biosimilar to Actavis/Amgen for worldwide development and Phase 3 clinical trials.

If Amgen's move into biosimilars can help the company back-fill revenue gaps created by competition from biosimilar versions of their own products, perhaps companies like Abbvie will follow suit. Regardless, until the biosimilars market in the U.S. becomes more established, it is far more likely innovators will stick to protecting what they already have instead of investing in the unknown.

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## AstraZeneca Settles Crestor Dispute, Buys Biotech Firm

AstraZeneca has taken another step toward settling US patent disputes over the top-selling cholesterol drug Crestor. Watson Laboratories, a unit of Actavis, and Egis have now conceded that the substance patent of that the two companies were accused of circumventing is valid.

The British-Swedish drug maker also has made two acquisitions with outside partners, part of new CEO Pascal Soriot's strategy of building a more solid pipeline to contend with the wave of patent expirations.

### Crestor

The patent settlement follows on a US appeals court ruling in December that also involves other companies embroiled in similar disputes. Under the latest deal, Watson may sell a generic form of Crestor from May 2, 2016, at a fee to AstraZeneca of 39 % of net sales, until the end of pediatric exclusivity on the drug ends on July 8, 2016. Egis, Watson's partner, will also benefit from sales of the product. AstraZeneca's partner Shionogi is also a party to the agreement.



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Crestor, AstraZeneca's biggest seller, had worldwide sales of \$6.25 billion in 2012, including \$3.16 billion in the US market. The drug is especially crucial to the company already struggling with generic competition. Rivals for the cholesterol drug will be unavoidable from mid-2016, when its patent expires.

### Bind Therapeutics

In other news, AstraZeneca will pay privately owned Bind Therapeutics up to \$200 million to develop a cancer drug using Bind's nanotechnology drug delivery system. Under the terms, the US biotech firm could receive upfront and pre-approval milestone payments of \$69 million, as well as more than \$130 million in regulatory, sales milestones and

other payments. It will also be entitled to royalties on future sales, if the new injectable drug is eventually approved.

Bind's nanotechnology is said to offer a method of drug delivery with fewer side effects. AstraZeneca previously had to abandon clinical trials due to toxicity issues. New trials are to begin in 12-18 months. The biotech company's knowhow leverages work done at Massachusetts Institute of Technology and Harvard Medical School. Its nanoparticles, called Accurins, can be made to accumulate in tumours, where they will have the maximum impact.

### AlphaCore Pharma

AstraZeneca also has boosted its early-stage pipeline of experimental heart drugs with the acquisition of privately held US biotechnology company AlphaCore Pharma, which is developing a new type of cholesterol medicine. Terms of the deal were not disclosed; however, analysts said the amount paid "will have been modest," as the buyer was not obliged to disclose it as a material investment.

## South Africa Seeks to Close Evergreening Loophole

South Africa has said it will overhaul its intellectual property laws to restrict evergreening, a practice in which drugs soon to go off-patent are slightly modified and patented as a new entity. If a government proposal is approved by parliament, this could lead to cheaper medication for cancer and HIV/AIDS in a country with one of the world's highest HIV infection rates.

MacDonald Netshtenzhe, head of policy at the Department of Trade

and Industry, told news agencies that South Africa, as an emerging economy with pressing public health needs, wants to improve access to medicines, including generics, and is ready to fight pharmaceutical makers who oppose the proposed patent law changes.

The government is receiving support from the lobby organization Doctors Without Borders (MSF). "South Africans are missing out on affordable versions of life-

saving medicines because generic competition is blocked by frivolous patents that prevent or delay generic competition," MSF said. It added that, in contrast to India, South Africa has granted secondary patents on imatinib extending Novartis' monopoly until 2022, meaning that it costs \$34,000 a year to treat a patient – 259 times more than the cheapest Indian generic alternative.

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# Driving Expansion in Central Europe

NNE Pharmaplan's Strategy is to Establish Offices in Pharmaceutical Clusters

**Pharma & Biotech Hub** – NNE Pharmaplan covers all segments from biopharmaceuticals and vaccines to medical devices and helps customers develop, establish and improve their product manufacturing. In December 2011, the consulting and engineering company decided to open a new office in Belgium, accommodating the demand of several of their existing customers. The office is located in Rhode-Saint-Genèse, the southern Brussels area, which is a pharmaceutical hub for vaccine and biotech. CHEManager Europe talked to Stefan Berg, CVP Central Europe, and Yavuz Baykara, General Manager Belgium, about the reasons for opening an office as well as the current business development of the Belgium site.

**S. Berg:** NNE Pharmaplan has worked for customers in Belgium for several years. We executed the projects from our other offices in Europe, like from Denmark or Germany. Our strategy is to be close to our customers and to serve them locally. Therefore, we establish NNE Pharmaplan offices in pharmaceutical clusters – like in Brussels. We intend to proceed in this way in the future and to open one new office each year.

**Mr. Baykara, how has the business developed in the last year, and how is the feedback from your customers?**

**Y. Baykara:** We are satisfied how our business has developed in Belgium since we have opened our office in Brussels last year. Since the beginning of the year, we have been able to grow our team to 15 people. We are working on interesting projects and are following interesting leads at the moment. Our customers responded with very positive feedback on the office opening in Belgium. They can see the benefits of working with a local team and at the same time have the possibility to access a large pool of specialists through our other offices in Europe and worldwide. Also when it comes to work for a customer in different countries, they can always rely on that the projects are executed with the same approach, procedures and standards. At the time being we are working for several focus customers in Belgium. For one of them we



NNE Pharmaplan office in Rhode-Saint-Genèse, Belgium.

implemented an additional project in Switzerland before.

**How do you see the development of NNE Pharmaplan in Belgium in the next years?**

**Y. Baykara:** The Belgian market gives us a lot of room for development. The high-tech market in Belgium mainly producing liquid steriles needs special know-how and emphasis on the high demands on the facilities. With our comprehensive experience and

expertise in this field, we can help our customers to achieve the best result in their projects.

The dynamic development of the biotech sector requests smaller and more flexible biotech facilities based on single-use technology. To address these requirements, NNE Pharmaplan has established a standard biotech facility concept called "Bio on Demand".

**S. Berg:** Also in regard to the future requirements on automation and IT towards a paperless production for

the pharmaceutical industry in Belgium, we see a good potential to support our customers to achieve future-oriented automation strategies.

Our target is to grow our number of employees significantly, to have approx. 100 engineers, scientists and GMP specialists locally in Belgium. Our goal is to be the market leader for life science engineering services in Belgium.

► [www.nnepharma.com](http://www.nnepharma.com)



Yavuz Baykara  
General Manager Belgium, NNE Pharmaplan



Stefan Berg  
CVP Central Europe, NNE Pharmaplan

**CHEManager Europe:** Mr. Berg, in an interview with you in late 2011 we talked about the reorganization of NNE Pharmaplan, that the group has now a regional organi-

zational structure consisting of five regions. Last year, you opened a new office in Belgium. What were the main drivers for you to open this new location?

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# Chemical Engineering Matters

## The Role of the Chemical Engineer in Delivering Better Quality Of Life

**Solutions For Society** – The

Institution of Chemical Engineers (IChemE) issued a poster in the 1980s, extolling the virtues of chemical engineering. The narrative went something like this: "If you don't wash, or use deodorant, shave, or wear cosmetics, eat, feed your pets, work on a farm, wear wellies, drive a car, play music, go on holiday — or stay at home, sleep on a mattress, take medicine, comb your hair, or wear a hat, go to the movies, watch television, listen to the radio, buy books, or read magazines, drink water, or breathe then ... chemical engineering doesn't affect your life!"

The effectiveness of this promotional campaign was limited in an era when the best engineering graduates were often seduced by highly paid jobs in the financial sector. Nonetheless, the central message remains true: Chemical engineering matters.

**Talent Pipeline in Crisis**

UK chemical engineering was facing a crisis by the mid-1990s. Applications to study the subject were forecast to plummet and many departments were struggling to secure students with the good A-level grades that are a prerequisite for success on a demanding degree course. Urgent intervention was called for and a new campaign, dubbed "whynotchemeng" ([www.whynotchemeng.com](http://www.whynotchemeng.com)), was launched in 2001 with substantial backing from industry and many UK universities. The campaign highlighted the product and lifestyle outcomes supported by chemical engineering. Based on careful market research, whynotchemeng was both focused and targeted, features that are often lacking in many science, technology, engineering and mathematics (STEM) careers campaigns. Whynotchemeng has triggered substantial growth in the number of young people applying to study chemical engineering in the UK Universities and Colleges Admissions Service (UCAS) reported a record



Andrew Furlong  
IChemE

number of applications in 2011, with 2,201 chemical engineering students commencing their studies last September. This increase represents growth of 134% since the launch of whynotchemeng and an improvement that surpasses other mainstream engineering disciplines. New programs have been launched, or are under consideration, at Lancaster and Liverpool John Moores, adding to recent additions at Aberdeen, Bradford and Hull, while other departments have expanded intake numbers. Meanwhile, the quality threshold for applicants has soared. At undergraduate level, the UK's chemical engineering talent pipeline has never been in better shape.

**Public Understanding**

Despite this positive backdrop, chemical engineering remains opaque to the wider public, as well as among opinion formers and policymakers. Opinion research carried out for IChemE consistently reveals that less than a third of the public claim any real understanding of what chemical engineers do. Ignorance is never bliss, however, and IChemE continues to work through its 38,000 members to improve public understanding of chemical engineering and science and technology more generally. Engagement with others to promote the development and use of chemical engineering and the appreciation of its importance is a key component of the institution's plan and one that is fully aligned with its charter obligation to act with integrity and in the public interest.

**What Does Society Need?**

IChemE celebrated the 50th anniversary of the granting of its Royal Charter in 2007. This presented an ideal opportunity to take stock and to scope out the role of the discipline in delivering sustainable solutions to the challenges confronting humanity. IChemE published the "Roadmap



for 21st Century Chemical Engineering" ([www.icheme.org/roadmap2007](http://www.icheme.org/roadmap2007)), and this report, which was widely welcomed, addressed a simple compelling question, "What does society need — what are the desirable outcomes and how chemical engineers can work in partnership with others to make it happen?" The report set out 20 goals, underpinned by a series of action plans that would need IChemE support.

The report was written before the onset of the global financial crisis. Iraq was still under military occupation and the Arab Spring lay around the corner. The events at Fukushima and in the Gulf of Mexico were yet to unfold. The potential of shale gas was still not fully understood, and concerns around access to rare earth metals and other strategically important resources had not materialized. Predicting the future is a risky business, but despite the uncertainties of geopolitics and its influence on the world of chemical engineering, IChemE has made progress since 2007 and a good deal

of the ambition set out in the report has been realized.

Predictably, some weaknesses were identified in the original report. Insufficient prominence was given to wealth creation. The essential role of the chemical engineer in food production and industrial biotechnology was understated and some stakeholders viewed the action plans as too narrow or too vague. Further work was needed to build on the "Roadmap for 21st Century Chemical Engineering" and five years on, the time had come to re-evaluate the report, assess its fitness for purpose and outline new ideas for the next period.

**Chemical Engineering and Quality of Life**

IChemE's review of its technical strategy was published in January 2013. "Chemical Engineering Matters" ([www.icheme.org/chemengmatters](http://www.icheme.org/chemengmatters)) has moved away from the traditional roadmap approach in favor of a more open-ended look at options for progress. The new report is an exploration of possibilities and a vivid illustration of the versatility and wide-ranging application of chemical process solutions to human challenges. It positions the discipline as a vital piece of the jigsaw that is the quest for sustainable living in the 21st century. The work is organized around delivering solutions in four challenge areas: food

and nutrition, health and well-being, water, and energy. At the same time, attention is drawn to the need to embrace a series of essential issues and concerns in every aspect of chemical engineering practice, including sustainability, process safety, education and training, fundamental science, collaborative working, and the need to accelerate the transformation to a "bio" economy.

The report contains four vista diagrams — one for each challenge area. The diagrams seek to capture the current status and some specific challenges under each heading and propose some options for action by chemical engineers and others. External factors are also addressed in the context of the four challenges. The vistas represent the beginning of a process, rather than an end. They are intended to provoke debate and stimulate target-setting. Individuals and organizations with an interest in science and technology are invited to download the report, which examines a number of contentious issues, including shale gas, carbon capture, water reuse, food security and bioengineering.

**Reaching A Wider Audience**

In addition to an analysis of the technical contribution that chemical engineers can make to secure, maintain and improve quality of life all over the world, the report


also examines the relationship between the profession and policymakers and the public at large. The whynotchemeng campaign has already done much to raise the visibility of chemical engineering as a career choice; "Chemical Engineering Matters" seeks to continue that work by enhancing the reputation of the profession more widely.

IChemE is politically neutral. However, the institution recognizes that government decisions, including those that affect funding and the regulatory framework within which chemical engineers must operate, should be evidence-based and supported by the strongest possible input from engineers. The report commits the institution to work with its members to develop coherent policy goals that will form the basis of engagement with opinion-formers and policymakers all over the world.

"Chemical Engineering Matters" also challenges IChemE to rethink its public engagement work. The chemical and process industries support many of the technological advances that have improved the lives of millions of people in the UK. However, lifestyle commentary and media reports present chemicals as something that can be avoided or eliminated. The reality is very different. Everything is made of chemicals, and people are often anxious without reason. IChemE will encourage its members to engage productively in the public conversation about the influence of chemical processes and products. The institution will work with science media centers and other nongovernmental organizations to address the disconnect between lifestyle commentary and chemical realities.

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### BASF and Petronas to Build Malaysian Integrated Aroma Ingredients Complex

German chemical giant BASF and Petronas Chemicals Group Berhad (PCG), part of Malaysian oil and petrochemicals mammoth Petronas, are joining forces to build a \$500 million integrated aroma ingredients complex at the site of their joint venture BASF Petronas Chemicals in Gebeng, Kuantan. The products will be sold to the flavors and fragrance markets, primarily in Asia-Pacific.

At the heart of the complex will be citral and precursors, but the JV partners also will invest in downstream units for aroma ingredients

including a world-scale plant for L-menthol as well as a plant for citronellol. The first stage of the complex is due on stream in 2016.

The aroma complex adds further value creation to PCG's existing

product streams and the company is strengthening the joint venture by leveraging its partner's technology and expertise, said Dr. Abd Hapiz Abdullah, CEO of PCG.

### Linde to Build Gas Plant Complex for Reliance in India

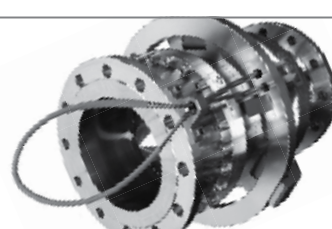
Linde Group has received a major contract from India's Reliance Industries to build several plants to generate and purify gases in Jamnagar, India. Under the contract, Linde's Engineering Division will

supply four air separation units for production of gaseous oxygen to feed massive streams of oxygen to the Indian company's proposed petroleum coke and coal gasification facilities.

To treat the synthesis gas generated during the gasification process, Linde will also supply two "Rectisol" acid gas removal units as well as supplying license, process design, detail engineering and procurement services. The Munich, Germany-based group also will build two additional air separation units to supply high-purity oxygen to RIL's ethylene glycol facilities in Jamnagar.

A Linde spokesperson said the group is committed to contribute to the expansion of one of the world's key refinery and petrochemical hubs.

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# Less Can Be More

## ISA 18 Alarm Management Supports Stability of Production Processes

### Fine-Tuning The Alarms

Avoiding operating upsets along with minimizing reject rates and outage times is gaining ever-increasing importance in today's process industries. Achieving these goals requires stable production processes and an efficient work environment for employees.

An important step in this direction is the introduction and optimization of suitable alarm methods to qualify the increasing flood of alarm messages and reduce them to a manageable level. Processes that generate more than 2,000 alarm messages per day even during normal operation are nothing unusual. According to EEMUA (Engineering Equipment and Material Users' Association), alarms requiring immediate action by the operator must be relevant, unique, timely, prioritized, understandable, diagnostic, indicative and focused. For alarms to be manageable by the operator, the long-term average alarm rate should not exceed one alarm every 10 minutes.

### Set The Standard

One of the leading institutions dealing with this topic is the U.S.-based International Society of Automation (ISA). This globally active organization has been making a major contribution to the development of international automation standards. Since its establishment in 1945, ISA has developed and published more than 150 industry standards. More than 30,000 members are working as volunteers in more than 140 ISA committees, subcommittees and working groups.

From Sept. 22 to 25, ISA members convened at Automation Week in Orlando, Fla. This industry tradeshow, initiated by ISA, presents the latest developments in the field of automation technology. The spotlight of the 2012 Automation Week was, however, on driving business value



Rainer Spies  
Spiratec

through the automation of business processes and the automation industry's answers and solutions to these specific customer needs.

At the same time, the ISA Fall Leaders Meeting in conjunction with Automation Week is one of ISA's most important face-to-face events. This year, more than 1,200 ISA volunteer leaders met in committees to exchange information on current projects and their status.

ISA18 Instrument Signals and Alarms is one of 40 main committees managed under the umbrella of ISA. Established in 1955, this committee began work on the development of standards, technical reports and guidelines for alarm systems including alarm annunciators and process control systems in 2003. To date, ISA18 has developed and issued two standards.

ISA-18.1-1979 (R2004), first published in 1979, deals with annunciator sequences and specifications and applies primarily to electrical annunciators. This standard is being revised and updated by an ISA working group.

The second standard, ANSI/ISA-18.2-2009, addresses the management of alarm systems for facilities in the process industries and sets out requirements and recommendations for their life cycle. This standard was written on the basis of excellent upstream work provided by ASM (Abnormal Situation Management Consortium), EEMUA and NAMUR (Automation Systems Interest Group of the Process Industry).

### Facilitate Efficiency

Speyer, Germany-based company SpiraTec has been an active member of ISA18 since 2010. The company's



representative, Rainer Spies, head of process and discrete automation, is active in both the Enhanced and Advanced Alarm Methods and the Alarm Design for Batch and Discrete Processes working groups. In 2012, he and his working group peers finalized the ISA-TR18.2.6-2012 and ISA-TR18.2.4-2012 technical reports.

ISA-TR18.2.4-2012 "Enhanced and Advanced Alarm Methods" provides practical guidance on how enhanced and advanced alarm methods can modify alarm behavior or improve operator guidance to achieve efficient alarm management. The report provides operators with practical guidance and offers solutions where basic alarm systems and methods fail to accomplish the goals. Potential, costs and risks are made transparent, thus facilitating business decisions on the introduction and selection of suitable meth-

ods/systems. By providing clear instructions and practice-oriented examples, this report supports industrial users in the successful use of the alarm methods covered, thus establishing the basis for the implementation of ISA18.2.

ISA-TR18.2.6-2012 "Alarm Systems for Batch and Discrete Processes" covers the application of ISA18.2 to batch and discrete processes. The focus and intent of this report is, however, not on problem prevention in alarm management. Instead, its aim is to help identify and address the alarm specification, design and options of alarm management and match them specifically to batch and discrete processes. ISA18.2 can also help minimize nuisance alarms that could complicate and frustrate an operator's awareness, understanding and response to abnormal situations. This ensures that important alarm messages re-

quiring immediate operator action are recognized, and upsets are corrected without delay.

These two reports were published in 2012 together with the Technical Report TR5, "Alarm System Monitoring, Assessment and Auditing." They were the first of six reports expected to be published by the end of 2013 in support of the application of the ISA18.2 standard.

### Process Progress

The ISA Spring Leaders Meeting scheduled for June 2013 will likewise have an abundance of new developments. Thus, a new working group was formed in autumn 2012 to take up work on a report termed "Alarm Management for Packaged Systems in the Process Industries." This report will deal with the integration of lower-level systems such as cooling units, heating boilers or

package units into a broader control system environment to enable a consistent alarm management. This move comes in response to the current trend toward increased use of package units in the field of process automation.

Another subject will be the work of the IEC (International Electrotechnical Commission) on the basis of the existing ANSI (American National Standards Institute) standard. This standard was handed over to the IEC some time ago and has been updated with the support of participating countries such as Germany, Japan, Brazil, Australia and the United Kingdom. The preliminary version is awaiting approval voting for adoption as an international standard. Should the IEC 62682 standard be adopted, its publication is expected in 2014. An approval of this standard would also benefit the ISA 18.2 Committee, which is considering taking this IEC standard as a basis for its work.

The publication of IEC 62682 as an international standard would mark one of the major milestones of the ISA18 Committee since 2003 — the development of a standard terminology and standard methods of alarm management with the aim of improving process safety in the process industries.

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## Songwon Names Sun Ace Distributor And Starts OPS production in Texas

South-Korean Additives manufacturer Songwon has appointed Johannesburg, South Africa-based Sun Ace as its new exclusive distributor for antioxidants in Sub-Saharan Africa. The portfolio includes Sabostab Hindered Amine Light Stabilizers, Songsorb ultraviolet light absorbers, One Pack Systems, rubber chemicals, tin intermediates, SAP and ink binders.

Separately, Songwon Additive Technologies Americas planned to begin production of One Pack Systems at a new US plant in Houston, Texas, this month. The facility, operated as a joint venture Pan Gulf

Holding Company of Saudi Arabia and Polysys Industries of Abu Dhabi, has a capacity of 7,000 t/y. It follows Songwon's investment in Austria's Additives Technology Greiz (ATG) in 2011, which doubled capacity in 2012 to 14,000 t/y.

Songwon Additive Technologies and Polysys Industries previously announced that they will establish a new company Polysys Additive Technologies, to build and operate an OPS plant in Kizad (Khalifa Industrial City of Abu Dhabi). This would go on stream in the first quarter of 2014 and also will have a capacity of 7,000 metric t/y.

## DSM Opens cGMP Biopharma Manufacturing in Australia

DSM Pharmaceutical Products, the custom manufacturing and technology business of DSM, announced today that their new cGMP custom biopharmaceutical manufacturing 'biologics plant of the future' will open in June 2013.

The DSM facility was built with cooperation from the Queensland and Commonwealth Governments of Australia.

Australia has a vibrant biotechnology industry, but previously had no custom mammalian-based biopharmaceutical manufacturing operation in country. The Queensland Government formed BioPharmaceuticals Australia (BPA), who has part-

nered with DSM to bring this new facility and operation to Brisbane.

The DSM operation will provide cGMP mammalian cell-culture contract manufacturing services from process development through to commercial manufacturing. DSM Biologics operates with all standard technologies and also has a portfolio of proprietary technologies for the optimization of biopharmaceutical manufacturing, reducing the cost and risk of mammalian cell culture. The facility has an output capability of 500kg and has expansion space available for further capacity utilization.

## Arkema Buy into Castor Oil and Polymers Companies

In a deal set to be finalized in the third quarter, Arkema will acquire a 25% stake in Indian castor oil producer Ihsedu Agrochem, a subsidiary of Jayant Agro. The Arkema participation will enable the Indian company to enhance its castor oil production and provide the French chemical producer with long-term access to this strategic raw material for renewable polyamides.

One of the main suppliers of Arkema's biosourced specialty polyamides 10 and 11, Ihsedu Agrochem claims annual capacity of close to 200,000 t/y and sales of around \$200 million. The company is a pioneer of the cas-

tor oil industry in its home country with more than 60 years of experience in processing castor seeds into oil. In 2012, Arkema acquired China's Hipro Polymers and Casda Biomaterial, both of which produce PA 10 and sebacic acid from castor oil.

Earlier in April, Arkema acquired a majority of AEC Polymers. The Bordeaux company with annual sales of €3.5 million and 25 employees manufactures a range of methacrylate-based structural adhesives (two-component adhesives based on an Arkema technology) and MS polymers (sealants curable at ambient moisture).

## Lanxess Opens New Headquarters for Rubber in The Netherlands

Lanxess has inaugurated the new headquarters of its Keltan Elastomers business unit in Sittard-Geleen in the Netherlands. With immediate effect the producer of synthetic rubber is managing its global busi-

ness for ethylene-propylene-diene monomer high-performance rubber (EPDM rubber), marketed under the Keltan brand, from the modern complex of buildings on the Chemelot Campus.

## Brenntag Acquires US Lubricants Distributor

Brenntag has agreed to acquire the assets of Lubrication Services (LSI), one of North America's leading multi-regional distributors of lubricants and chemicals headquartered in Oklahoma City. LSI serves the Oil & Gas industry through a network of facilities in six states that cover

many of the US shale gas plays. The acquisition is subject to contractually agreed closing conditions.

For the financial year 2012, LSI generated sales of \$135 million, gross profit of \$16 million and EBITDA of \$7.5 million. The investment amount will be \$42 million.

## Saudi Aramco Starts Up Giant Manifa Oilfield



Saudi Aramco has started pumping oil from its giant Manifa field in the Gulf, allowing the world's biggest oil exporter to relax production from some of its mature fields onshore. The offshore oilfield — made up of rigs on manmade islands linked by 41 km of causeways and bridges over the Gulf — is expected to produce 500,000 barrels per day (bpd) by July and 900,000 bpd by the end of 2014. "It really opens a new page in terms of overcoming various hurdles and complexities most notably through human and technological innovation," Aramco's chief executive Khalid Al-Falih said in a statement.

Manifa, discovered back in the 1950s, will not boost the kingdom's sustainable production capacity beyond its stated 12.5 million bpd because Aramco plans to ease production at some of its mature reservoirs to increase their ultimate recovery rates in the long term, Falih has previously said.

Manifa will help the state-run company maintain export levels

without running its older fields so hard, while supplying a new 400,000-bpd refinery run by Aramco and France's Total at Jubail on the OPEC heavyweight's east coast with Arabian heavy crude. "You will not see a change in export and production capacities," a Saudi industry source said, adding "Production capacity will continue as 12.5 (million bpd) for Saudi Arabia."

The Manifa field will also be used to supply crude to an Aramco joint-venture refinery with China's Sinopec in Yanbu, on the Red Sea coast.

## Myriant Signs Distribution Agreement with BCD Chemie

Myriant Corporation, a global renewable chemicals company based in the United States, announced today that it has signed a distribution agreement with Hamburg, Germany-based BCD Chemie, one of the major European chemical distributors. BCD Chemie will market and distribute Myriant's bio-succinic

acid and Myrifilm solvent in Austria, Germany and Switzerland.

Globally, the annual worldwide market for succinic acid is estimated at approximately \$7.5 billion in existing and new applications, in the field of polymers, urethanes, plasticizers and coatings.



# Focal Point: Industrial Services

## Largest Segment Industrial Reflects Germany-based Bilfinger Group's New International Orientation

**Rebranding Strategy** – At the beginning of the year, Germany-based Bilfinger Group restructured its industrial segment that generated revenues of around €3.7 billion in 2012. Alongside Bilfinger Industrial Services of Munich, which is widely known simply by its abbreviation, BIS, it established Bilfinger Industrial Technologies in Frankfurt, a second subgroup specializing in planning and constructing industrial plants. Simultaneously, all the group companies now bear the Bilfinger name as part of the group's rebranding strategy. This means the BIS abbreviation has been relegated to the history books. CHEManager Europe asked the CEOs of the two subgroups — Dr. Michael Herbermann from Industrial Services and Gerhard Schmidt from Industrial Technologies — about the new group strategy and how their companies are positioned.

**CHEManager Europe: Bilfinger Group has evolved from a construction company into an international engineering and services group over the last few years. What are the ramifications of this as far as the reorganization of Bilfinger Industrial is concerned?**

**Dr. M. Herbermann:** The Industrial segment reflects the Bilfinger Group's strategic realignment as an international engineering and services group. We at the former BIS Group made a material contribution to widening the share of services compared

**Dr. M. Herbermann:** What we are doing is implementing a model that was already part of our DNA for a number of years. We had previously had companies in our Plant Technologies division specializing in planning, designing and assembling plants, plant components and supply facilities. Essentially, these companies have now been placed under the Industrial Technologies roof together with the Tebodin Group. At the same time, the companies specializing in maintenance have remained in the Industrial Services subgroup. We previously went to particular lengths



**Dr. Michael Herbermann**  
CEO, Bilfinger Industrial Services

pany, we are also able to handle complex large-scale projects with our own internal resources and capabilities.

**Dr. M. Herbermann:** Over and above the individual activities and services,



**Gerhard Schmidt**  
CEO, Bilfinger Industrial Technologies

one particular aspect of the approach taken by Industrial Services is that we constantly enhance our methodologies and processing skills and seek to share them throughout the entire group. At the international

level in particular, we are able to act as a strategic partner to our globally active customers thanks to our superior maintenance models and processes. We will be additionally bolstering this international orientation as one of our key strengths.

**Does this mean that you will be continuing your internationalization strategy and, if so, with what kind of emphasis?**

**Dr. M. Herbermann:** Portfolio expansion and internationalization have always formed the basis for our evolution to become the leading provider of industrial service solutions. Thus, for example, E/I&C has been part of our range for years. We have invested specifically in Central Europe and also Scandinavia and the United Kingdom to strengthen our regional activities in this area. Specific targets for further acquisitions include North America, India and Southeast Asia as well as Turkey and the Middle East.

**G. Schmidt:** For one thing, we want to additionally reinforce our engineering skills via acquisitions in the target markets we have defined, namely Northern Europe, North America, Australia and China. We see potential for plant engineering in Russia, Asia and the Middle East. In addition to this, internal collaboration within the Bilfinger Group — at the group, segment and also subgroup level — provides crucial leverage for reinforcing our market position. In this way, we want to additionally internationalize our business, for example by making use of the representative offices of our subsidiary Tebodin to access markets in growth regions for the delivery of plant components and execution of plant engineering projects.

[chemanager-online.com/en/tags/industrial-services](http://www.chemanager-online.com/en/tags/industrial-services)

**The new brand decisively underscores the importance of services business.**

Dr. Michael Herbermann, CEO, Bilfinger Industrial Services

with the Bilfinger Group's traditional construction business, so much so that they now account for over 80% of total revenues. With its strong international outlook, the Industrial segment alone provides around 40% of the group's total revenues. We have therefore obviously played a crucial role in Bilfinger's realignment. The new brand decisively underscores the importance of services business. The fact that our companies bear the Bilfinger name conveys to a broad public the core role that we play in the group's business.

**G. Schmidt:** Bilfinger Industrial Technologies got off to a very strong start at the beginning of the year. The reorganization of the segment coincides with the new subgroup's hour of birth, so to speak. Now we want to make use of the opportunities available to us for establishing ourselves even more clearly as a provider of

to harness the synergistic benefits arising from joint activities between these companies for the benefit of our customers and will continue to do so in the future.

**What services does Bilfinger Industrial offer its customers and how are they structured within the segment?**

**G. Schmidt:** Bilfinger Industrial provides its customers with services throughout the entire life cycle of an industrial asset covering such aspects as engineering, fabrication, assembly, startup, maintenance, optimization, conversion and also dismantling. The main focus of Industrial Technologies is on the first part of the life cycle. We offer advice and engineering and provide bespoke plant and infrastructure solutions in close collaboration with our customers. At the same time, we are able to offer activities individually

**Engineering skills and service orientation form a key element of our mindset.**

Gerhard Schmidt, CEO, Bilfinger Industrial Technologies

solutions for planning and constructing industrial plans and consider ourselves to have a good position at this stage. One of our advantages is that as a new subgroup we are able to benefit from the outstanding reputation our operating companies enjoy in the marketplace, and the group's renowned engineering skills and service orientation form a key element of our mindset as well as providing the basis for our business activities. What is more, with the integration of the international Tebodin Group, we have additionally broadened our consulting and planning skills.

**What specific goals are you pursuing with the reorganization of the Industrial segment?**

**G. Schmidt:** The new structures allow the two subgroups within the segment to focus more clearly on their respective core skills. At the same time, we are able to hone our profile as providers of solutions as a result of the adjustments to internal organizations. There is some overlapping between the two subgroups, both of which have a specific focus in terms of region and portfolio. Together we are pursuing the goal of addressing our customers' requirements on an even broader basis than before.

or in packages with the aim of minimizing time-consuming interfaces for our customers. In addition, we supply plant components incorporating our own technical expertise. Our companies supply, assemble and start up these engineered products around the world.

**Dr. M. Herbermann:** The second step of the life cycle chiefly involves maintenance, including scheduled turnarounds as well as modifications and modernization. These are the main activities pursued by the Industrial Services subgroup. This is supplemented by regional business such as tank and pipeline construction in the United States and production/assembly in India.

**What do you consider the specific strengths to be?**

**G. Schmidt:** The particular strengths of Industrial Technologies are to be found in engineering, engineered products and plant engineering. Our engineering skills range from special solutions to general planning and designing services. We define engineered products as turnkey plant components, which we develop for gas processing or biotechnology, for example. As a plant engineering com-



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# Less Data, More Information

## Automation Helps Water Industry to Move to Whole Life Asset Management

### Efficiency Through Technology

Regulators are driving the water industry to adopt whole life asset management as the best way to ensure overall efficiency, keep prices down and quality up. This has created a need, not for more data but for better information, so the recent Driving Innovations in the Water Industry Conference hosted by Mitsubishi Electric looked at how some companies are embracing the new regime.

Stephen Hawking's next best-seller is unlikely to be called "A Brief History of Data in the Water Industry," but such a study could illustrate some important issues. Go back just a few decades and the water industry was not automated at all, but as technology has progressed so has the adoption of automation technology in the sector.

This created a focus on efficiency — a drive to improve delivery, quality and reliability while reducing costs and containing head count. By the 1990s, many medium to large treatment works and pumping stations had installed SCADA (supervisory control and data acquisition) systems, and there was a definite increase in efficiency.

However, engineers realized that there was still a lot of work to do and spent the noughties networking the various SCADA systems together. Huge amounts of data were being collected and transmitted to the head office computer systems, but this did not create the step change in efficiency that many expected.

### New Architecture Builds New Capabilities

It took some head-scratching, but it was eventually understood that the head office was not actually using much of this extra data. Further analysis divided the data into two: that which was not particularly relevant to the head office and that which, while useful, was not in a format the head office would find easily understandable.

For instance, a data stream showing that a pump in a remote station had been switching on and off regularly for the last six months may lead a head office middle manager to think: "It ain't broke, so best not fix it."

Whereas a field engineer with a bit more affinity for machinery would probably know to check the pump.

Had this data been processed before a middle manager saw it, that manager may have understood the asset utilization or energy consumption ramifications, certainly meaningful issues to the head office.

So now, approaching the terrible teens of the new millennium, a new



concept is emerging. The idea is to let the users develop their own sub-systems and thus create an architecture that builds capability rather than warehouses data.

Mark Narbrough of systems specialist Grontmij UK explains: "We ask people what they do at work and what data would help them make decisions. Often the data is actually available on their system, but it needs repackaging into a format with which they are comfortable. Once they are using the data, we can look at options for improving what they do, expanding their role and communicating better with a wide range of colleagues."

The industry regulators are now looking at this issue very seriously,

and it is worth noting that in the last price review they had the power and willingness to levy penalties of hundreds of millions of pounds on water companies that could not

**The water industry has been advancing the adoption of automation technology to improve delivery, quality and reliability while reducing costs.**

support investment plans with data packaged in the formats they want. They are also pushing the industry toward a whole life asset management philosophy, or Totex — the combining of asset and capital expenditure accounting.

### Joined-up Thinking

"In fact the water industry is ahead of many other sectors in the way it joins up its management functions.

It should not feel that it is lagging behind other industries; it is actually blazing a trail that others will later follow," Narbrough said.

He explained that when designing a system, all users must be asked what data they need, how often they

need updates, how they process the information and what actions they initiate.

They also need to explain their overall rationale — how their activities fit into the bigger company-wide system. "We only collect data that is going to be converted into usable information, and we tend to report by exception rather than event — which is often the difference between data and information."

One company putting this into practice is Scottish Water, which is in the process of rolling out a new system across the Highlands and islands. Expressed in the simplest terms, field engineers who visit very remote sites file records on tablet PCs rather than on paper, but the deeper strategy is building a digital platform that will eventually network the whole organization and all of its functions.

"We have run a pilot at over 100+ sites, and we are now rolling out the project across Scottish Water," said Sheila Campbell-Lloyd, wastewater operations manager for the North region and one of the driving forces behind the adoption of the technology. "With the old paper system, central records could be months out of date. Currently the graphics on the tablet PCs are similar to the old charts and everybody has really taken to them. They are collecting the same data and the software is producing reports on process results, task schedules, routine and non-routine maintenance, energy, health and safety, and environmental parameters."

If everything seems OK, the reports are archived, but if there are indicators of potential issues a pre-emptive instruction is sent to either

the engineer or to the centralized Intelligent Control Center (ICC) as appropriate. Significantly, the tablets will alert the engineer if data is out of expected limits. Better use is already being made of data and later in the project the data collection will become more detailed, leading to a further improvement in management efficiency.

"The guys are already taking ownership of their sites and becoming custodians rather than meter readers," Campbell-Lloyd said. "Scottish Water recognizes this project as a game-changer. The digital platform will eventually cover all sites and the entire network infrastructure — and will interface directly with the business systems, so that the whole company has unified and intelligently managed information."

### From Raw Data to Reports

Ten years ago this level of systems integration would have been little short of science fiction but with today's plug-and-go technology it is perfectly achievable, as Jeremy Shinton of Mitsubishi Electric explained at the recent water industry conference:

"Manufacturing Enterprise Systems connect real-time technical data into high-level business systems, and they are simple to implement using state of the art modular PLCs, such as Mitsubishi's Q Series. These have a central processor unit plus a rack onto which you simply mount specialty modules, to create a bespoke controller for each situation."

At a remote pumping station, for example, you might want to monitor the temperature of three different bearings, a motor's load and its run time, the flow rate and turbidity. Simply adding the appropriate data-logging hardware and one or more communications options can retrieve this data.

Standard off-the-shelf analytical software tools or dedicated solutions from Mitsubishi can then convert the raw data into reports, each formatted appropriately for the intended user. For instance, a maintenance engineer would look at current temperatures and total run times; a process engineer would focus on flow rates and volume; and an environmental scientist would check the turbidity. Once the data is transferred to the head office, it is integrated with data from other pumping stations to produce management-level reports.

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## Inge UF Contracted for Ghana Seawater Desalination Project

BASF-subsi-dary Inge, a global provider of ultrafiltration technology, secured a major contract in Spain for realizing a large-scale desalination project in Ghana. The prestigious Spanish plant constructor Abeinsa EPC has been commissioned by Ghana's state-run Ghana Water Company to build a seawater desalination plant producing drinking water for Ghana's capital Accra and the surrounding areas.

Abeinsa picked Inge as its project partner to equip the plant with a total of 10 ultrafiltration lines as a pretreatment stage for reverse osmosis. Inge is offering an extended

package for this project also including the complete central header pipe and valve units provided in collaboration with the subcontractor Bauer Water.

Drinking water is a scarce resource in the Greater Accra Metropolitan Area (GAMA) which extends outwards from Ghana's capital city. To address this problem, the government has awarded a contract to build an ultra-modern seawater desalination plant featuring reverse osmosis in Nungua Township, some 12 kilometers from Accra. The plant is designed to produce 60,000 cubic meters of drinking

water per day for approximately 500,000 people in the Teshie-Nungua region.

The project is a build-operate-transfer (BOT) arrangement with a concession of 25 years. During this period, the company Befesa Desalination Developments Ghana will operate the facility on behalf of Ghana's public water utility GWCL, which will be responsible for supplying the water to consumers. At the end of the concession period, the ownership of the plant will be transferred to the public water utility.

## Sadara awards Packaging Center contract to Almajdouie De Rijke

Sadara Chemical Company, a joint venture developed by Saudi Aramco and Dow Chemical, has outsourced its Packaging Center activity for solids & liquids handling to Almajdouie De Rijke (Mdr).

The agreement was signed in April in Dhahran, Saudi Arabia between Ziad S. Al-Labban, CEO of Sadara, and Abdullah A. Al Majdouie, Chairman of Mdr. Signing of the contract by Mdr further reflects its capacity to be a strategic and reliable partner for supply chain activities related to the petrochemical industry.

Sadara is now building a fully integrated chemicals complex in

Jubail Industrial City II, in the Eastern Province of the Kingdom of Saudi Arabia. The Sadara complex will consist of 26 world scale manufacturing units, and first production is anticipated to come on stream in the second half of 2015.

The scope of Mdr includes support of pre-commissioning and commissioning activities of the logistic facilities; managing all on site logistic operations, such as unloading raw materials, internal transport, packaging and storage of finished products loading finished products, handling containers and railway wagons.

With the award of this contract, the joint venture established in 2006 between Almajdouie Group of Saudi Arabia and De Rijke Group of The Netherlands to serve the petrochemical market in the GCC is one of the largest petrochemical logistics companies in the world handling over 10 million tons of petrochemical products annually. Mdr exclusively provides supply chain services to the polymer and liquids industry.



# SOCMA's Annual Washington Fly-In

Members of the Chemical Society Advocate for Policies Supporting Competitiveness

**Industry Politics** – With more than 90 new elected officials in the U.S. Congress this year, chemical executives rallied in the nation's capital on April 10 to better educate lawmakers about the specialty chemical industry and advocate for policies that support the industry's competitiveness and market expansion.

Members of the Society Of Chemical Manufacturers And Affiliates (SOCMA) convened in Washington for SOCMA Connect's Sixth Annual Washington Fly-In – an opportunity for industry representatives to influence the future direction of chemical policy through face-to-face meetings with lawmakers and their staff.

More than 30 SOCMA members from across the country met with 65 congressional offices. Participants met personally with several Congress members including Senator James Inhofe (R-OK), Representatives John Barrow (D-GA), Steve Stivers (R-OH), Pat Tiberi (R-OH), Steve Stockman (R-TX) and Scott Perry (R-PA).

"As a highly innovative industry, specialty chemical manufacturers are strongly concerned about the stifling affect regulations can have on job creation and economic growth," said SOCMA President and CEO Lawrence D. Sloan. "It is now more important than ever to ensure that the economic impacts of regulations are given equal weight to the perceived benefits of those regulations."

#### The Cost of Federal Regulations

According to an August 2012 study by the Manufacturers Alliance for Productivity and Innovation, chemical manufacturing output could decrease 9 - 10 % on average over the next decade because of the cost of federal regulations. SOCMA members told lawmakers that the more time they spend complying with regulations, the less they have to spend on conducting research and development activities and developing innovative products that expand their businesses.

In addition to concerns about the impact of regulations, SOCMA

members advocated for passage of the Miscellaneous Tariff Bill and support for the establishment of the Transatlantic Trade and Investment Partnership with the European Union. Fly-In participants also urged Congress to reauthorize the nation's chemical security program, strengthen the research and development tax credit and support carefully tailored fixes to the Toxic Substances Control Act (TSCA).

"With the exception of regulatory reform, I think many of the issues specific to our industry were not at the forefront of their concerns," said Bimax President Ron Kreis, who returned to Washington for his fourth Fly-in. "So it was a good opportunity to reinforce issues like the research tax credit, TSCA reform, trade and other issues of particular importance to us."

#### R&D Tax Credit

The federal research and development tax credit, which is used by companies of all sizes, was another issue raised by SOCMA members. Because of the highly innovative nature of specialty manufacturing, much research and investment are devoted to developing products before they are sold. Members explained that an on-again, off-again credit influences companies' future R&D budgets, particularly when manufactures are courted by other countries with more generous and permanent R&D tax incentives and lower corporate tax rates.

One SOCMA member told his representative that the R&D tax credit funds one third to one half of his company's Ph.D. chemists, and Congress needs to make the credit permanent.

Members also took the opportunity to voice their opposition to legislation introduced that day in the U.S. Senate to overhaul TSCA. The Safe Chemicals Act, introduced by Senator Frank Lautenberg (D-NJ), would be nearly impossible to implement for both manufacturers and the US Environmental Protection Agency.

"Most stakeholders agree that TSCA can be improved," said Bill Allmond, SOCMA's Vice President of Government and Public Relations. "To be successful, legislation must strike an appropriate balance between improving the public's con-

fidence in chemicals in commerce without hamstringing the innovation for which our industry is well known and on which the public relies."

#### Alternative TSCA Reform Bill

SOCMA members also met with the staff of Senator David Vitter (R-LA), who is working on an alternative TSCA reform bill that should garner bipartisan support. They shed light on how the 37-year-old law could potentially have a stifling effect on the ability for small and mid-sized companies to be competitive and expand their markets. They spoke to the need for carefully tailored fixes to the statute and how lawmakers should not emulate Europe's REACH. They also pointed out that the current model used to treat pesticides would also be inappropriate for industrial chemicals.

Several lawmakers also agreed to make plans to continue talks with members in their home state during member facility site visits.

In conjunction with this year's event, SOCMA also hosted a "Virtual Fly-In" for members unable to make the trip to Washington. Members send nearly 100 electronic letters to their representatives, rounding off a week of advocacy activities.

SOCMA's advocacy week activities are organized by the association's grassroots arm, SOCMA Connect, which supports and encourages members to shape the laws affecting specialty chemical manufacturers.

Contact:  
Society of Chemical Manufacturers and Affiliates (SOCMA)  
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SOCMA members gather on the steps of the U.S. Senate for a photo before meeting with members of Congress during SOCMA's 6th Annual Washington Fly-In.

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## Encouraging Economic Indicators Bode Well for the Process Industries

Good news for the chemical, food, pharmaceutical and other process industries. According to a recent survey conducted by the Chem Show, which takes place December 10 - 12 in New York City, and Processing magazine, production and capital spending will increase this year, and next. The jointly sponsored survey of process industries professionals revealed:

- 88 % said production will either increase (55 %) or stay about the same (33 %) over the next 18 months in the areas they work at in their companies.
- 73 % predict capital expenditures in 2013 will either increase (43 %) or be about the same (30 %) for equipment upgrades, new systems, etc., in the area they work.
- 72 % predict capital expenditures in 2014 will either increase (47 %) or be about the same (25 %) over 2013.

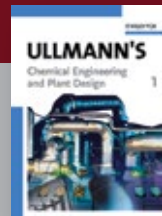
"These survey results indicate that processing companies will actively be planning to buy new equipment to increase their production, which is very encouraging news for both the chemical processing industry and the Chem Show," said Clay Stevens, President of International Exposition Company, which produces and manages the Chem Show. ■

The findings of the recent survey are consistent with other recent economic studies that indicate an improving economy will stimulate growth across many process industries, including:

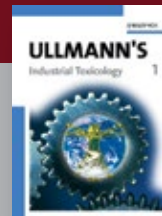
- The American Chemistry Council (ACC) calculates that chemical production could grow by nearly 5.4 % in 2014 on top of a 3 % gain in 2013.
- The global pharmaceutical industry is projected to emerge from its modest growth phase and rise 5 % to 7 % by 2016.
- According to Accenture, food production/processing is expected to grow at 3 % worldwide this year.
- The Manufacturers Alliance for Productivity and Innovation (MAPI) predicts equipment expenditures will be up in significant numbers, advancing 5.2 % in 2013 and 8.6 % in 2014.

Stevens concluded, "What all these positive economic forecasts mean for the several thousand process engineers, production/plant personnel and other CPI decision makers attending the 2013 Chem Show is that the timing couldn't be better to see and buy the latest equipment they need." ■

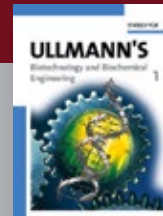
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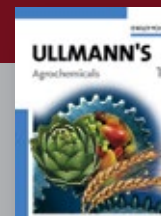
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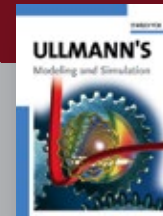
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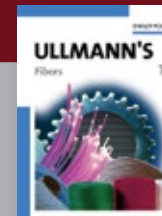
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# Chinese Crossroads

The World's Manufacturing Center is Becoming a Market of the Future

**A State Of Transition** – The Chinese economy has reached a crossroads. As economic conditions continue to evolve, the 30-year success story is gradually reaching its limits in some areas. The declining demographic dividend, higher labor costs, environmental problems and the maturity level of many industries are driving a paradigm change that will be unavoidable in the near future. This is already apparent in the chemical industry.

Is it the world economy, or are national factors also involved? The Chinese economy cooled considerably in 2012. Foreign investment is still the major driving force, accounting for nearly 50 % of gross domestic product in 2011. Now that some sectors such as the solar industry are showing signs of overcapacity, the government is taking active countermeasures by increasing private spending power. Export growth has slowed considerably. In a report released in October 2012, the Asian Development Bank (ADB) predicts, however, that China's sound government finances and government stimulus will keep the country relatively stable despite the turbulence in the world economy.

The transition from an investment to a consumer economy is reflected, among other things, in higher pay levels. According to a study by Boston Consulting, China has lost its labor cost advantage in many areas following annual pay increases of around 16 % over the past 10 years. The other side of the coin is a continual increase in domestic demand as incomes rise. Social factors also play a role. A rapidly aging population and increasing affluence have boosted growth in the health care sector, which has an annual expansion rate of around 20 %. Besides nursing homes and hospitals, pharmaceutical and medical equipment companies also find this to be a lucrative market.

Chinese government policy is aimed at transforming the country from a manufacturing center to a hub of high technology and innovation. The current Five Year Plan, which runs until 2015, defines seven key areas:

- Energy savings and environmental protection
- Alternative energy sources
- Alternative propulsion technologies
- New materials
- High-end production
- Next-generation information technology
- Biotechnology

#### Energy: Supply And Demand

Demand for raw materials remains high in China. The International

Energy Agency (IEA) estimates that China needs roughly 9.7 million barrels of oil a day, and the country is highly dependent on imports, particularly of oil and gas. Internal oil production stands at 204 million metric tons (mt) compared with 500 million mt of imported oil. As a result, efforts are being directed at the exploitation of domestic resources.

Coal production acts as a resource base for the chemical industry, and reports of successful shale gas production in the U.S. have generated significant interest in China. The country's reserves are, however, located much deeper and are often in remote locations. China does not have the necessary production expertise for shale gas. International corporations are attempting to form shale gas production partnerships with the Chinese government.

#### Energy Alternatives

China is also promoting regenerative energy production. The share of nonfossil energy sources in primary energy consumption is expected to rise to 11.4 % by 2015. €604 billion has been earmarked for investment in generation capacity and the distribution grid. Nonfossil energy sources include hydroelectricity, wind power, solar energy, biomass and nuclear power. Although per-capita energy consumption is significantly lower compared with the U.S. and Germany, China is nevertheless the world's largest energy consumer. In addition to new construction of nuclear power stations and a doubling of wind power generation capacity, a significant level of support is being directed at solar power. This policy is not entirely altruistic. Given the crisis in the international solar market, the survival of the domestic industry may well depend on stronger domestic demand. Electricity grid expansion is moving ahead in parallel. Government policy favors smart grid solutions, and a number of pilot projects are underway, which are based on the results of the country's own R&D programs.

In the past, biomass has attracted considerable attention as a raw material source, but availability is severely restricted. Land loss in the wake of environmental change and urbanization has shifted the emphasis of agricultural production to sustaining the food supply. Only liquid manure and agricultural residue may be used for biogas production. Sufficient quantities of these materials should be available to support 70,000 small and 8,000 large biogas production plants by 2015. According to the industry portal RenewableEnergyWorld.com, 700 million mt of rice straw accumulate on farmers' fields in China every year. The 150 million mt that are burned right on the fields could provide a significant amount of feedstock for energy production.

In the field of mobility, China is working on the development of electric vehicles, and biogasoline



will also play a major role. The goal in the current Five Year Plan is to double the consumption of bioethanol compared to the previous period. The figure is currently in the region of 1.7 million mt per year.

#### A Fragmented Industry

The chemical industry is China's third-largest industrial sector after the textile industry and machinery manufacturing. The chemical industry generates 10 % of GDP, and China is the second-largest consumer of basic chemicals after the U.S. Because of developments in world markets, growth rates decelerated in 2012, but growth is still impressive. According to figures released by German Trade & Invest (GTAI), production was up 32.3 % year-on-year. Exports rose by 31.1 %, and imports increased by 21.1 %.

The structure of the Chinese chemical industry differs significantly from that of the Western industrialized nations. The accounting firm KPMG reports that more than 33,000 companies are active in the industry. According to China Analysis 91 from September 2011, the 10 largest companies together have a 21 % share of the market. By way of comparison, the five largest corporations in Japan have a 39 % market share, and the corresponding figure for Germany is 67 %.

Because of the high level of fragmentation, which also exists within ChemChina Corp., a large number

of companies are unprofitable, and there is insufficient integration in the various stages of the value-add and material streams. Consolidation therefore appears to be long overdue. The steel, cement and coal industries have shown how rapidly this can take place. In addition, since September 2011, new projects that involve the production or storage of hazardous substances will be approved only

in an effort to redress economic disparity within the country, incentives were introduced for the western provinces, and that produced a "gold rush mentality" (GTAI) in some regions. While growth in the coastal regions has come to a virtual standstill, sufficient low-cost labor resources are still available in metropolitan areas such as Chongqing and Chengdu. Tax incentives are

**Sustainability and environmental factors have become significantly more important in China.**

within the boundaries of the industrial parks. This could lead to further concentration of chemical plants at industrial parks and contribute to the creation of integrated sites.

Foreign experts also point out that inequalities exist between Chinese state and private enterprises and foreign companies. These inequalities are most evident in access to raw materials and low-cost financing, according to A.T. Kearney. Domestic companies also have an advantage with regard to the length of the approval process. In addition, the Chinese government encourages state companies to invest outside the country and make acquisitions.

#### An Expanding Industry

Up to this point, the chemical industry has been primarily concentrated in the coastal and eastern provinc-

also being offered to encourage industry to locate in central and western China.

China is expanding its downstream capacity in the petrochemical industry, and it is also investing heavily in clean coal technology for the chemical industry. International corporations are also showing an interest. In partnership with Shenhua, Dow Chemical is investing \$10 billion in a project in Yulin, and Celanese has plans to build one or more coal ethanol plants based on a new process.

Change is not limited to the raw material mix. There is also movement in the product portfolio. Figures released by the Chinese National Bureau of Statistics indicate that growth in the special chemical sector is roughly three times higher than the industrial average. This sector is heavily fragmented as well. It is, however, high on the government policy agenda, because the products play a significant role in further development of the seven key technologies listed above. Demand for new materials for consumer goods is also driving change, especially as the Chinese government hopes that the resulting modernization of industry will enhance sustainability and environmental protection.

#### Changing Priorities

In general, sustainability and environmental factors have become significantly more important in China. The current Five Year Plan, which came into effect in 2011, contains aggressive goals in this regard: a 16 % reduction in energy intensity by 2015, a 45 % reduction in CO<sub>2</sub> intensity by 2020, lower SO<sub>x</sub> and NO<sub>x</sub> emissions, efforts to combat water pollution, and a reforestation program are only some of the main items on the policy agenda. Around \$500 million has been earmarked for this purpose. As a result, the outlook for the environmental technology market is bright. Annual growth rates are expected to be 15 %-20 %.

The water supply is a major priority. A combination of seawater desalination plants and large diversion projects will provide water to the dry Northeast. However, it is not only availability that is causing concern. The water quality figures are also alarming. The Ministry of Land and Resources has rated 57 % of the country's water supplies as poor or very poor. There is need for significant investment. The China Water Network mentions a figure of around \$420 billion in the current Five Year Plan. This creates opportunities for German suppliers as well. Exports of German pumps, valves, fittings and analysis equipment to China increased substantially in 2011. In contrast, there was a substantial decline in exports of filtration and water purification equipment to China, but demand was firmer for equipment accessories.

The developments in the chemical industry and related sectors are affecting the supply base. Imports of instrumentation and control systems are at a record level. In the past the market was dominated by the electronics industry, but GTAI is working on the assumption that process automation and environmental technology customers will become an increasingly significant factor.

#### Summary

China's industrial landscape is in a state of transition. Foreign companies will have to adapt as the situation evolves, but the new developments will create a wealth of opportunities both for investors and suppliers.

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### AchemAsia 2013

This article is based on a trend report developed by international experts and journalists on behalf of Dechema (Society for Chemical Engineering and Biotechnology), Germany, in preparation for AchemAsia 2013.

AchemAsia 2013, 9th International Exhibition and Conference on Chemical Engineering and Biotechnology, is organized by Dechema and the Chemical Industry and Engineering Society of China (CIESC) and will take place at the China National Convention Center in Beijing May 13-16, 2013

www.achemasia.de

## Solvay to Build Large-scale Alkoxylation Facility in Singapore

Solvay will build a large-scale alkoxylation facility in Singapore which is expected to start operations by 2015. The facility will be connected to Shell's new High Purity Ethylene Oxide (HP EO) unit located in the world-class, integrated petrochemical hub of Jurong Island. Through the alkoxylation process key monomers are produced that serve downstream surfactant development and manufacturing.

The investment comes after Solvay last week announced that it would build a specialty surfactant plant near Berlin, serving the Central and Eastern European markets.

Solvay Novocare is already Asia's largest specialty surfactant manufacturer with 11 production sites and two R&D centers in Singapore and Shanghai. The new plant will produce specialty alkoxylation surfactants which deliver targeted cleansing, dispersing, defoaming and emulsifying performance attributes in formulations.

The "on pipe" facility will be supplied by an ethylene oxide (EO) pipe from Shell to feed the alkoxylation activities, highlighting both Solvay Novocare's long-term commitment to sustainable production and growing demand from its end markets.

## Wacker Starts Up Production Plant for Dispersions in China

Wacker Chemie ramped up its new production plant for vinyl acetate-ethylene copolymer (VAE) dispersions at its Nanjing site (Jiangsu province, China). With the additional 60,000 metric tons from the second reactor line, the local VAE dispersion capacity is doubling to total 120,000 metric tons per year.

At the same time, the Group is currently building a new plant at Nanjing to produce polyvinyl acetate (PVAc) solid resins with an annual capacity of 20,000 metric tons. It is scheduled to come on stream in late 2013. Capital expenditures for both projects will amount to some €40 million.

The dispersion-plant expansion is Wacker's response to the rising demand for high-quality VAE dispersions, especially in China and Southeast Asia's emerging markets. The project goal is to ensure sufficient capacities for the strong demand for Vinnapas VAE dispersions now and in the years ahead.

Located in the Nanjing Chemical Industrial Park, Wacker's fully integrated site already manufactures VAE dispersions and dispersible polymer powders for the construction, coatings and adhesives sectors.

## Lanxess Starts Up Leather Chemicals Plant in China

Lanxess has started up a leather chemicals plant in Changzhou Yangtze Riverside Industrial Park. With a capacity of up to 50,000 metric tons per year, the plant is the largest of its kind in China. The German specialty chemicals company has invested €30 million in the facility, which employs about 150 people.

The plant will produce the full range of premium Lanxess leather chemicals for the local Chinese market. China is the world's single largest leather chemical market.

Major investment projects in Changzhou, Jiangsu province

At the Changzhou site next to the leather chemical plant, Lanxess is

currently constructing a plant for EPDM rubber. This plant worth an investment of €235 million represents the largest investment the company has made in China to date. Construction work is going according to plan.

Lanxess has also entered into an agreement with Changzhou National Hi-Tech District to additionally invest about €35 million in order to extend the research and development center as well as the facilities for the storage and transportation of chemical products.





## EVENTS

### Biosurfactants – Challenges and perspectives, 16 and 17 May 2013, Frankfurt, Germany

Surfactants and emulsifiers are widely used for food, cosmetic and pharmaceutical applications. Most compounds are still synthesized chemically from hydrocarbons. However, surface-active molecules of biological origin – so called biosurfactants – have gained considerable interest in recent years. This workshop intends to present the current state of biosurfactants in research and industrial application. International speakers will give overview lectures on topics of interest in the field of biosurfactants to show possibilities, limitations and challenges of this highly interesting class of compounds.

► <http://events.dechema.de/biosurf>

### International Conference on Energy Process Engineering, 3 to 6 June 2013, Frankfurt, Germany

The 3rd International Conference on Energy Process Engineering (ICEPE) organized by Dechema German Society for Chemical Engineering and Biotechnology) focuses on the Transition to Renewable Energy Systems. The event serves as an international platform for a comprehensive review and discussion of the present technological developments and latest research findings. Existing game changers and missing links will be addressed in the high level plenary and contributed talks, highlighting how the G8 goals of reducing 80 % of the CO<sub>2</sub> emission by 2050 could be achieved and how a major share of renewable energies could be realized by 2030.

► [www.ICEPE2013.com](http://www.ICEPE2013.com)

### Biochemicals and Bioplastics 2013 Summit, 19 and 20 June 2013, Frankfurt, Germany

The conference will be of interest to traditional chemical producers seeking to move into the world of renewables, as well as those who may be looking for alternative uses of renewable resources or conversion technologies. Key topics covered at the event are the Impact of Biorenewable Chemicals on Chemical Industry in the Next Decade, Global Market Drivers and Restraints of Biorenewable Chemical Industry, Bio-Based Feedstock Opportunities & Biomass Process Innovations, Latest Technological Advancements in Biorenewable Chemical Industry, and the Investor Perspective of Biorenewable Chemicals.

► [www.wplgroup.com/ac/conferences/](http://www.wplgroup.com/ac/conferences/)

### Turkcoat Eurasia 2013, 12 to 14 September 2013, Istanbul, Turkey

The 5th International coatings, inks, adhesives, insulation, sealants, construction chemicals raw materials and production technologies exhibition Turkcoat Eurasia will concurrently be held with the industrial coating technologies exhibition PaintExpo Eurasia 2013 and STT Eurasia that covers the topics pretreatment, surface treatment chemicals, machinery, equipment and technologies. The platform will bring the companies that produce and sell chemical, machinery, equipment and technology to the surface treatment sector, and other professionals of the coatings sector together under one roof in three days.

► [www.turkcoat.com](http://www.turkcoat.com)

### 2nd Asia-Tech: Asia Technology Forum, 9 and 10 October 2013, Bangkok, Thailand

The convention will cover the latest technologies for Refining, Residue Upgrading, and Petrochemicals and will bring together the leading regional operating companies with international technology and equipment suppliers to discuss best practice solutions to meet operational goals and achieve significant financial improvements. Last year's inaugural event attracted an audience of over 70 % operators. Topics include an Outlook for Asian Refining & Petrochemical Industries, the Impact of Shale Gas on Regional Markets, the Latest Technology & Catalysts for Clean Fuels, Operational Excellence, Energy Efficiency, Safety & Environmental Issues, Asian Refinery & Petrochemical Project Updates and Technology and Equipment Innovations.

► [www.eurochem.com/en/asia\\_2013](http://www.eurochem.com/en/asia_2013)

## CPhI, PharmaEvolution to Analyze Pharma Industry

CPhI Worldwide, a division of UBM Live, and its sister brand, Pharma Evolution will introduce annual and monthly reports covering key trends in the global pharmaceutical industry.

CPhI, which hosts a number of pharmaceutical conferences and exhibitions around the world, will leverage its longstanding independent position within the industry to analyze trends identified by its attendees and a group of expert advisors. Together with content partner, Pharma Evolution, a new peer-to-peer community website, CPhI will examine key topics and issues, and promote online discussion.

The first monthly report covering Formulation & Ingredients will be released in May and subsequent reports will examine such topics as outsourcing, biopharmaceutical de-

velopment and manufacturing and generic drug development.

The first annual report, which will review the current state of the global pharma industry, will be released in September, one month before the CPhI Worldwide conference in Frankfurt in mid-October. It will feature insights from thought leaders in key sectors of the industry, evaluating current practices and projecting near and long-term trends - as well surveying all CPhI attendees - providing an aggregated view of the industry from its most senior people for the first time.

By diversifying its content through the new partnership, and moving into industry research and analysis, CPhI aims to define and share best practices across the global pharmaceutical industry. ■

## DuPont Encouraged by TiO<sub>2</sub> Progress But Does Not Rule Out Sale

DuPont does not rule out a divestment of its titanium dioxide (TiO<sub>2</sub>) business. CEO Ellen Kullman said, without revealing any plans to do so. While telling that “we continually evaluate all of our businesses, and as always, we will do what is in the best interest of the shareholders,” she noted that the US chemical group has process technologies that give it a “sustainable competitive advantage.”

Kullman's remarks during the Q1 earnings conference call were in response to questions by Deutsche Bank analyst David Begleiter as to whether the business was still core.

In its report on the first quarter, DuPont said total segment operating

profit was down 8 % year-on-year to \$2.3 billion, due to a 56 % decline in earnings of the Performance Chemicals segment to \$251 million, which was blamed on substantial price declines for titanium dioxide and weak demand for fluoropolymers. TiO<sub>2</sub> volume sales were “essentially flat, but up 8 % from Q4 2012.”

DuPont's group sales increased 2 % in Q1 to \$10.4 billion, due to volume growth. A 1 % increase in selling prices was offset by currency fluctuations. Its largest division, Agriculture, was the strongest sales performer, showing improvement of 14 % to \$4.7 billion. The segment was the only one to substantially improve earnings. ■

## Thermo Fisher takes over Life Technologies for \$13.6 Billion

Life Technologies has accepted the \$13.6 billion cash buyout proposal from Thermo Fisher Scientific in one of the year's biggest corporate takeovers. Following the acquisition, Thermo Fisher Scientific has reported a higher-than-expected first-quarter profit, helped by a 10 % rise in specialty diagnostics sales.

The world's largest maker of laboratory equipment and scientific instruments reported a net profit from continuing operations of \$340.8 million, or 94 cents per share, compared with a profit of \$280.8 million, or 76 cents per share, a year earlier. Revenue for the quarter rose 4 % to \$3.19 billion.

Specialty Diagnostics saw sales rise 10 % to \$806 million, while sales from the Laboratory Products and Services unit rose 5 % to \$1.54 billion.

Sales from the Analytical Technologies unit fell to \$978 million from \$980 million a year ago.

The company has raised the low end of its full-year revenue view and lowered its 2013 earnings-per-share forecast to reflect its decision to suspend share buybacks as it prepares to pay for Life Tech. The acquisition, which will give Thermo Fisher a major presence in advanced genetic testing, is expected to close in early 2014. ■

## Elan Board Rejects Royalty Pharma's Sweetened Bid

In the ongoing takeover struggle for Irish drug maker Elan, the company's board of directors has unanimously rejected a formal bid from Royalty Pharma, saying the US buyout firm's offer of \$11.25 per share grossly undervalues the firm's worth. Royalty had previously lowered its bid to \$11.25 a share from \$12 after agreeing to tie its price to the result of Elan's \$1 billion share buyback.

The higher offer would have sweetened the deal to \$7.3 billion from \$6.6 billion but Elan management's declared aim is to thwart Royalty's grab for the company, whatever it takes.

The planned takeover received a further setback through the successfully orchestrated buyback which

took the form of a modified Dutch auction – a complex procedure in which shareholders are invited to tender at any price within a specified range and the offered price is lowered until a mutual agreement is achieved.

Through the buyback, Elan, which is listed in the US, said it had repurchased stock equivalent to 14.8 % of its issued capital for \$11.25 per share. US pharmaceutical giant Johnson & Johnson is said to have accounted for the lion's share. The purchase was to be financed with proceeds from the sale of Elan's 50 % stake in the multiple sclerosis drug Tysabri to its development partner Biogen Idec in early April. ■



**Harry Kirsch** has been promoted to CFO of Novartis. The surprise announcement is the second leadership change in as many quarters after Chairman Daniel Vasella stepped down in February. Before his promotion, Kirsch, 48, held the same position at the company's pharmaceuticals division. According to Novartis, Kirsch, who joined the company ten years ago having worked as CFO at Procter & Gamble's pharmaceutical business, had been “recognized for his ability to improve productivity.” Kirsch's deep knowledge of Novartis pharmaceuticals operations and his productivity focus will now benefit the full portfolio,” said CEO Joseph Jimenez in a statement. Jon Symonds, CFO for the past four years, will serve as adviser to the CEO until the end of the year.

**Dr. Ron Commander** (62), Head of Lanxess' Butyl Rubber business unit (BTR), will retire at the end of this year and until then will take on a new role within the company based in Canada, effective July 1, 2013. Dr. Guenther Weymans (55), who is currently Head of the Keltan Elastomers business unit (KEL) based in Geleen, the Netherlands, will succeed Ron Commander as Head of BTR based in Singapore as of July 1. Weymans successfully completed the integration of the EPDM-business from DSM, including the implementation of innovative ACE-technology. The successor to Dr. Weymans as Head of the Keltan Elastomers business unit will be Dr. Torsten Derr, effective June 1. The 43-year-old is currently responsible for the Lanxess Material Protection Products business unit (MPP), which he successfully realigned and expanded.

**Dr. Weiyan “Jackson” Zhu** has joined Catalent Pharma Solutions as Country General Manager for China, and Yufeng (Paul) Cao becomes the new Site Operations Director for the Catalent (Shanghai) Clinical Trial Supplies facility, which is currently under construction. Dr. Zhu and Mr. Cao will both be based in Shanghai. Dr. Zhu will play a pivotal role in Catalent's China growth strategy. He joins Catalent following a long tenure at Boehringer Ingelheim, where he had the distinction of being the company's first mainland China hire in its 120 year history. Cao will have overall day-to-day responsibility for Catalent and ShangPharma's China Joint Venture business and will be in charge of establishing the new Shanghai clinical trial operation. Prior to joining Catalent, he was most recently the General Manager for Fisher Clinical Service (Beijing, China).

**Dr. Markus Steilemann** (42) has been appointed as the new head of Bayer's Polycarbonates business unit. He succeeds Michael Koenig, who has joined the Board of Management of Bayer on April 1, 2013. At the same time, Steilemann has become a member of the Executive Committee of Bayer MaterialScience. Steilemann, whose previous role was head of Industrial Marketing of the Polycarbonates business unit, studied chemistry at the University of Aachen, Germany, and the University of Zurich, Switzerland. He holds a PhD in technical chemistry from the University of Aachen and, in addition, a Masters Degree in chemical economics. He joined Bayer in 1999. Since then he has held numerous positions with increasing responsibility. In 2008 he moved to Hong Kong to join the Polycarbonates business unit. In 2011 he relocated to Shanghai and the global headquarters of the Polycarbonates business unit.

**Wolfgang Siegel** (50) assumed leadership of Ter Hell Plastic as CEO and general management speaker on January 1, 2013. Before joining the plastics distributor, which is part of Ter Group in Hamburg, Germany, the plastics engineer and business administration graduate worked at EMS-Chemie, Switzerland, where he last led the business unit EMS Grivory Europe of EMS-Chemie after holding diverse management positions. As member of the Board of the Plastics Association Switzerland he also served on the Advisory Board of Plastics Europe.

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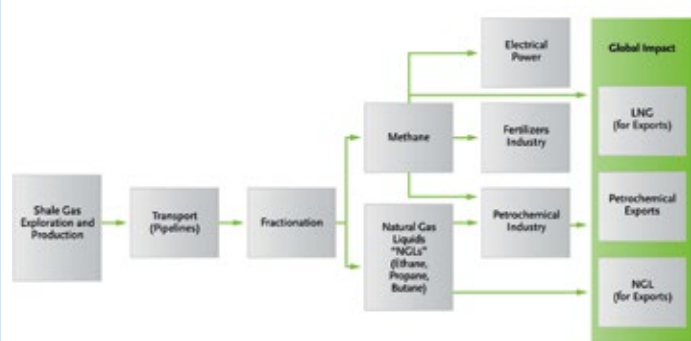
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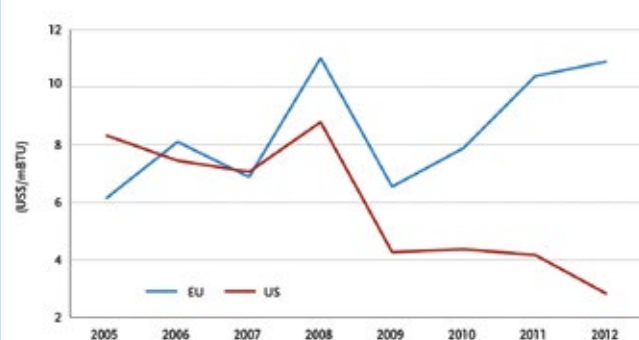
## The Impact of Shale Gas on the European Chemical Industry

Fig. 1: Impact of Shale Gas on the Chemical Industry



Source: The implications of the shale gas revolution for the European chemical industry. Cefic Position Paper.

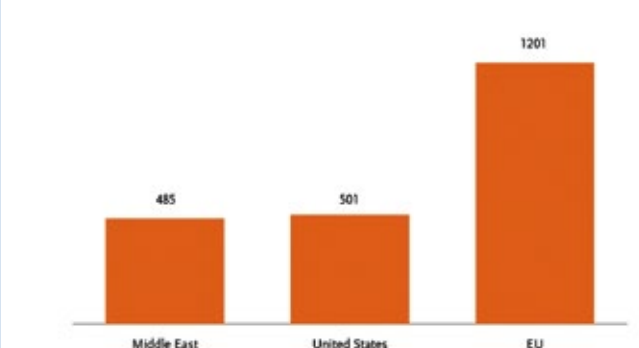
Fig. 2: Average Natural Gas Prices in the EU versus the US (US\$/mBTU)



Source: ICIS Heren European Gas Market and Cefic Analysis

Source: The implications of the shale gas revolution for the European chemical industry. Cefic Position Paper.

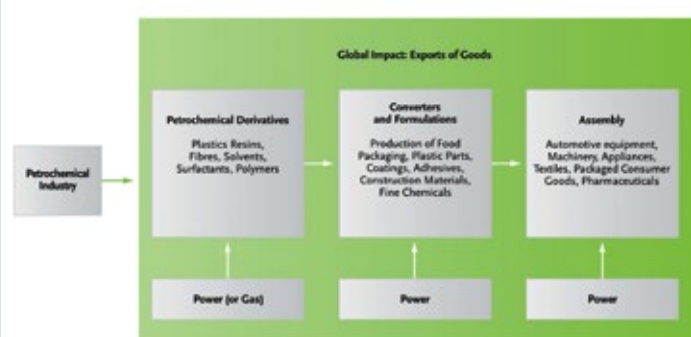
Fig. 3: 2012 Global Ethylene Cash Costs by Region (US\$/ton)



Source: ICIS Consulting and Cefic Analysis

Source: The implications of the shale gas revolution for the European chemical industry. Cefic Position Paper.

Fig. 4: Impact of Shale Gas on the Chemical Value Chain



Source: The implications of the shale gas revolution for the European chemical industry. Cefic Position Paper.

### Fuel and Feedstock

In its activities, the chemical industry uses significant amounts of natural gas, both as fuel and as feedstock. The arrival of shale gas in the US market has had an enormous impact on the gas price (from \$8 per mBTU in 2005 to 3 \$/m BTU in 2012), giving the US a major boost in competitiveness. Within the same time frame, gas prices in the EU have increased by more than 80%. The availability of advantaged shale gas is providing the US with the opportunity to become an export market, both for LNG (energy use), NGLs (feedstock use) and finished petrochemicals (Fig. 1). The US terminals that were mainly constructed to import LNG are being refurbished to become export terminals. The export potential of US shale gas is expected to mitigate some of the impact on the European market, potentially leading to more competitive energy and feedstock prices.

### The Petrochemicals Value Chain

Petrochemicals constitute the building blocks of the entire chemical industry. They represent directly 25% of EU chemicals sales but support a value chain that amounts to more than 80% of European chemical industry sales. The impact of shale gas on petrochemicals production is illustrated with the case of ethylene (Fig. 2). Ethylene is the largest basic building block for the chemical industry and largest volume organic chemical produced (~130 million t/y).

### Changing Cost Basis

In 2005 naphtha-based ethylene in Europe had a cost basis which was similar to ethane-based ethylene in the US. In 2012, the cost difference between the two regions became 700\$/t. On a European market of 20 million tons, this represents a cost advantage for the US of \$14 billion per year. With a transportation cost between the two regions of 100-300 \$/t, this makes Europe very cost-defensive compared to the US (in addition to the Middle East, which was an already existing situation). In summary, seven years ago Europe was in a comparable cost situation to the United States for the production of ethylene (the most advantageous was the Middle East, which has maintained its position). Now, with the emergence of shale gas in the US, Europe is essentially a "laggard" region from the cost competitiveness point of view (Fig. 3).

### Domino Effect

This shift in Europe's competitiveness impacts the entire ethylene value chain, making it globally uncompetitive. This could lead to a gradual petrochemical industry delocalization from Europe to regions like the US and the Middle East.

In addition to the impact on the petrochemical industry and its direct customers, there could potentially be an impact down the value chain, on the manufacturing industry in general (Fig. 4).

The impact will be twofold: Firstly, downstream industries will be confronted with more costly petrochemical-based raw materials. Secondly, downstream industries will see an impact on gas and also electricity markets.

These two factors will strongly affect the first column in Fig. 4, but will do so gradually along the value chain, in a "domino effect". The result can be a gradual move out of Europe of these value chains, with the resulting loss of wealth and employment.

## Cefic: Europe Should Accelerate Shale Gas Exploration

If chemical producers on this side of the Atlantic are not to be disadvantaged in competition with US players, European policymakers must accelerate the responsible exploration and production of indigenous shale gas, the European chemical industry federation Cefic said in a recent position paper (cf. adjacent charts and the article on page 4 of this issue). While other world regions are also primed to ride the shale gas wave, European investments in shale gas exploration and development are taking place at a crawl, the paper lamented.

In particular, Cefic said Europe should avoid the creation of unnecessary regulatory barriers, give appropriate attention to human health and the environment and provide the public with solid facts on the economic benefits of shale gas. Delaying the development of the unconventional fuel in Europe "will increase dependence on gas and oil imports, reduce inward investment

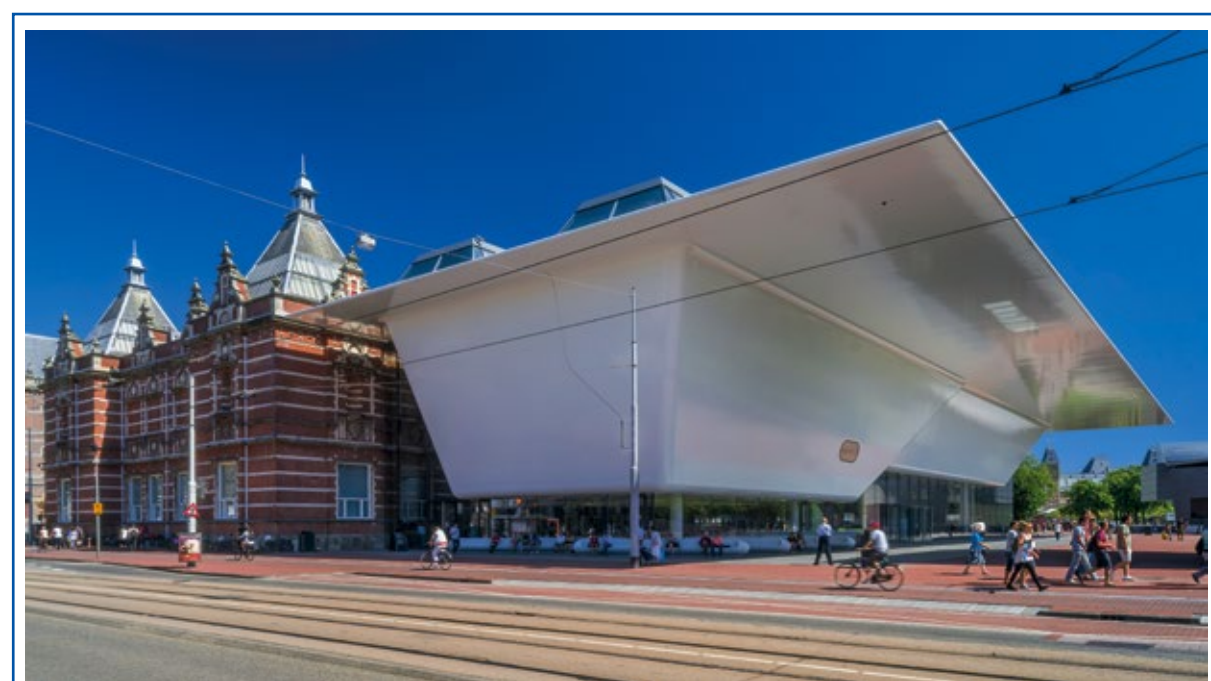
and over time lead to fewer jobs and a weakened manufacturing base," said Cefic Industrial Policy Director Jose Mosquera.

Besides putting European chemical companies on a more level playing field with other regions, exploiting shale gas would also tackle greenhouse gas emission reduction targets in a cost-effective manner, reduce energy dependence and help fill intermittent gaps often left by renewable energy, the director remarked.

According to Cefic, Europe has "significant" potential shale gas resources, with technically recoverable resources estimated at 16 trillion cubic metres (tcm), about a third of US estimated reserves of 47 tcm. The chemicals sector can use "dry" gas consisting mainly of methane as an energy source, while "wet" shale gas – consisting of methane plus natural gas liquids composed mainly of ethane, propane, and butane – can see use primarily as a petrochemical feedstock, the organization said. ■



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**The Bathtub** – Modern expressions of art have been on display since 1895 in Amsterdam's Stedelijk Museum of Modern Art. Now the storied museum boasts a stunning new entrance and exhibition space that stands as a piece of modern art in its own right. "The Bathtub," as locals call the addition, stands in stark contrast to the straight lines and decorative neo-Renaissance style of the original 19th century building to which it is linked. Massive aramid/carbon composite sandwich panels provided by Teijin Aramid and Toho Tenax, respectively, make the museum the largest composite-clad building in the world.

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