



## Economy

European chemical players boosted by euro's weakness in first half of 2015

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THE NEWSPAPER FOR THE  
CHEMICAL AND  
LIFE SCIENCE MARKETS

## Production

Ferrostaal and Haldor Topsoe target major petrochemicals projects

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## NEWSFLOW

### M&A-News:

Monsanto has raised its offer for Syngenta to \$46 billion.

Pfizer can progress its \$17 billion purchase of Hospira after receiving final regulatory approvals.

Valeant Pharmaceuticals has agreed to pay \$1 billion for Sprout Pharmaceuticals.

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### Pharmaceuticals:

Eli Lilly developed a new experimental drug that raises hope of Alzheimer's breakthrough.

Novartis buys rights to multiple sclerosis drug Ofatumumab from GlaxoSmithKline.

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### Investments:

Solvay has started up a new fluoroelastomers plant at Changshu, China.

Emerald Kalama Chemical will increase its production capability for benzaldehyde at Rotterdam, the Netherlands.

Air Liquide has started up its global-scale hydrogen production site at Yanbu, Saudi Arabia.

Hallstar has opened an application R&D center in Suzhou, China.

More on Page 9 and 11 ▶

### Companies:

BASF plans to combine all of its pigments activities into a global business unit.

Brenntag will become the first distributor to join the initiative "Together for Sustainability".

More on Page 2 and 3 ▶

### People:

Bayer appointed Patrick Thomas and Frank H. Lutz as CEO and CFO respectively of the engineering plastics spin-off Covestro.

More on Page 15 ▶

## Significant Value Creation

### The Merger of Merck Millipore and Sigma-Aldrich Creates a Leader in the Global Life Science Market

In September 2014, Merck announced the €13.1 billion acquisition of Sigma-Aldrich, which by mid-August has received antitrust clearance from all relevant jurisdictions including the US, Japan, Brazil, and China, and has some pending final divestiture commitments in the European Commission. The deal is regarded to create significant transformational opportunities for the life science business of the German pharma and chemicals company and will establish one of the leading players in the €100 billion global life science industry. Dr. Udit Batra, CEO of Merck's Life Science business, who will lead the combined activities of Merck Millipore and Sigma-Aldrich after the closing of the acquisition, speaks with Dr. Michael Reubold about the rationales for the acquisition and the trends the company will support in the global life sciences market.

**CHEManager International: The M&A carousel in the global life science industry is turning fast driven by an ongoing consolidation in the pharma sector, and the life science equipment industry makes no exception. What are the reasons for this consolidation?**

**U. Batra:** For the pharma industry, one key driver is the growing amount of genericization of blockbuster and other drugs coming off patent. Another is the increasing regula-

tory requirements which are lowering the approval probability and delaying the approval time of new drugs. Both factors are putting serious challenges on the companies' R&D pipelines. There are positive trends like the growth of biologics and emerging market growth. But here again, in countries like China regulations can change quite quickly and are, thus, challenging.

If you translate that to our industry, I see the genericization challenge for the pharma industry not

necessarily as a negative for our industry. In particular I'm speaking of biologics because the market for biosimilars is growing in many emerging countries. Our goal is to supply solutions to customers who provide medicines and vaccines to people everywhere. For instance, our disposable bioreactor systems have low capital intensity and can easily be implemented in emerging markets.

I do also believe that the increase in regulations is beneficial for us, although it creates a burden because there is backward integration of regulations to the supplier industry. But as this requires more investment and more training and readiness for inspections, it is an advantage at the end since the market entry barrier is getting higher so that not everybody can enter this business.

**Consolidation often has cost cutting as a driver. Has this also been a rationale for the acquisition of Sigma-Aldrich?**

Continues Page 12 ▶



Dr. Udit Batra, CEO, Merck Life Science

### K+S in Legacy Potash Deal with Koch Fertilizer

The US subsidiary of Germany's K+S has signed an exclusive supply agreement with Koch Fertilizer Trading for potash from its upcoming Legacy mine in Saskatchewan, Canada.

The deal comes just days after K+S' private shareholders overwhelmingly supported the management's rejection of a €7.9 billion takeover bid from Canadian rival PotashCorp.

K+S believes the offer does not reflect its true value; the contract with Koch could certainly be seen as underlining Legacy's attractiveness to North American customers.

Koch Fertilizer Trading gets rights to a projected volume of about 453,000 t/y granular potash for its US customers. Scott McGinn, Koch Fertilizer's president, said: "This is



Norbert Steiner, CEO, K+S

an exciting opportunity to grow our portfolio of fertilizer products to US retailers."

Legacy's capacity will reach about 2 million t/y by end 2017. The mine is on track to be commissioned next summer with the first ton of potash due by end 2016.

Burkhard Lohr, chief financial officer at K+S, described Legacy as a game changer for the company. "It will be one of the lowest cost mines in Canada with a life of over 50 years. The value and financial

contribution of Legacy must not be underestimated," he said. The mine will generate free cash by 2017 and break even by 2018. "It will help to increase our cash flow by more than 10% year by year," noted Lohr.

Once Legacy is operational, K+S said it would be the only potash supplier with mines in Europe and USA. Norbert Steiner, chairman of the board of executive directors at K+S, said: "Legacy expands our global presence, expands the average lifetime of our mines and reduces the average cost of production, which will also benefit our German sites."

He added: "Our existing customers in Brazil, Southeast Asia, China and India are already demanding more products from us and there are certainly US and Canadian customers who are eagerly awaiting a second choice." (eb)

### Solvay Takes Cytec for \$5.5 Billion

With its agreement to acquire all shares of US-based Cytec for \$5.5 billion in cash, Solvay is moving into the high-performance plastic composites sector.

Headquartered in New Jersey, Cytec has 4,600 employees worldwide. For 2014, it had sales of \$2 billion and a 20% REBITDA (recurring earnings before interest, taxes and depreciation) margin.

The company's main market is aeronautics, for which it manufactures and markets primary and secondary structural parts such as carbon- and glass fiber-reinforced prepreps for aircraft.

Solvay said it will gain "critical scale and immediate customer intimacy" in aerospace. In automotive,



Jean-Pierre Clamadieu, CEO, Solvay

the group's own strong positions with OEM manufacturers and tier-one suppliers will boost Cytec's growth.

Cytec, said to be the leader in tailored specialty chemical formulations to enhance mining separation processes, is also developing new technological applications for composites in the automotive sector.

Solvay will integrate the businesses into its Advanced Materials segment. The mining chemicals as well as niche additives and phosphate specialty chemical businesses will become part of Solvay's Advanced Formulations unit.

The acquisition "marks a major step change in Solvay's portfolio upgrade," said CEO Jean-Pierre Clamadieu.

He said it is "a unique opportunity for Solvay to boost its customer offerings in lightweighting with advanced materials in aerospace and automotive, as well as to strengthen its know-how with activities in mining chemicals."

Cytec CEO Shane Fleming said Solvay's focus is "perfectly aligned with our businesses, while the technology synergies with their specialty polymers and formulations expertise should accelerate our growth." (eb)

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### BASF to Merge, Then Carve Out Pigments Business

BASF plans to combine all of its pigments activities into a global business unit (GBU) as of January 2016 before carving out the entire business into separate legal entities in the second half of the year.

All employees of the pigments business will be transferred to the new business unit, which is likely be headquartered in the Ludwigshafen area. Alexander Haunschild, senior vice president of the regional business unit Pigments and Resins Europe, will head the new GBU.

The German chemical giant did not say whether it intended to spin off or sell any of the businesses, which had combined sales of about €1 billion in 2014 and 2,500 employees globally.

By creating an organization fully dedicated to pigments, BASF will be better able to adapt to the challenges in the pigments industry and its customers benefit from tailored services and higher responsiveness, Haunschild said.

"We have achieved and maintained a leading position in the pigments market through acquisitions and a series of successful restructuring measures. The new global business unit will fully concentrate on the pigments business and thus be even more focused on supporting the needs of our pigments customers," said Markus Kramer, president of the Dispersions & Pigments division. (dw)

### Boehringer Sells US Generics Arm to Hikima

Boehringer Ingelheim has sold its US generics business for \$2.7 billion to London-based Jordanian-British Hikima Pharmaceuticals. At the same time, it has taken a 6.7% stake in the company. The acquisition price for Roxane is \$1.2 billion, but Boehringer is also picking up \$40 million in Hikima shares along

with milestone payments of up to \$125 million. Nucleus of the German company's generics arm is Roxane, based in the US state of Ohio. The firm produces and markets generic versions of Boehringer's products. In 2014, Hikima already bought Boehringer subsidiary Bedford Laboratories (dw)

DSM has completed the merger of its caprolactam, acrylonitrile and composite resins businesses into a new joint venture with private equity group CVC Capital Partners. The new company known as Chemical Invest is comprised of the Dutch chemical group's Polymer Intermediates and Composite Resins business units carved out earlier to facilitate the merger.

CVC will own 65% and DSM 35% of the joint venture.

Announced in March of this year, the transaction was said to have an enterprise value of €600 million. Altogether, the production units concerned had pro forma third party sales of €2.1 billion and EBITDA of €106 million in 2014.

Along with its global caprolactam activities in Europe and North America, DSM is contributing its 60% stake in DSM Nanjing Chemical Company (DNCC) in China – a joint venture with state-owned chemical conglomerate Sinopec and a Chinese private investor – as well as the related licensing business.

A second Chinese JV with Sinopec, Jinling DSM Resins (JDR), is also part of the deal as well as the Dutch group's 65% stake in Sitech Services, which operates its Chemelot Industrial Park at Sittard-Geleen.

CVC has bought and sold stakes in several international chemical industry players in recent years. It currently owns stakes in companies including Evonik and Univar. (dw)

### Evonik Seeks Sale or Partner for Performance Materials Business

Specialty chemicals company Evonik Industries is looking to sell or find a partner for its Performance Materials unit, which includes acrylic sheet and resin, as well as other specialty plastic materials.

In an interview on August 17 with the Dow Jones newswire, Evonik's finance director Ute Wolf said the company could not achieve the economies of scale that were necessary for the long-lasting competitiveness of the Performance Materials unit.

"There are certainly other investors, corporations and industry groups which could make more of it," she said.

Based on sales, Performance Materials was the smallest of Evonik's three operating units in the first half of 2015. The unit posted sales of €938 million, a 4% fall compared with the first half of 2014, representing about 27% of Evonik's total sales. EBITDA was essentially flat at €82 million. (eb)

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### Clariant Forms Subsidiary for Plastics & Coatings Business

Clariant is to establish a separate subsidiary for plastics and coatings, comprising the three business units for masterbatches, additives and pigments. The new subsidiaries will be fully owned by Clariant and will start operating as of January 1, 2016. Company CEO, Hariolf Kottmann, said: "The new plastics &

coatings subsidiary will further enable differentiated business steering with a clear focus on absolute profitability and cash generation to further safeguard and improve competitiveness in already mature markets. This step will also enable us to make appropriate investments in our growth areas." (eb)

### LyondellBasell Sells PP Subsidiary in Argentina

LyondellBasell has accepted an offer for its wholly-owned Argentine subsidiary, Petroken, from YPF and Grupo Inversor Petroquímica (GIP). Argentina's state-owned energy company YPF and Spain's GIP will each hold 50% of Petroken which is one of the country's leading PP producers with an 180,000 t/y plant at Ensenada, adjacent to YPF's La Plata complex.

The transaction is valued at \$145 million on a debt- and cash-free ba-

sis. LyondellBasell expects proceeds of \$162 million based on working capital estimates on June 30, 2015. The sale is expected to close in late 2015 following approval from Brazil's antitrust authority CADE.

Meanwhile, YPF and GIP are acquiring equal shares of a 92% stake in Petroquímica Cuyo, another PP producer which operates a 130,000 t/y plant at Lujan de Cuyo, in western Argentina, next to YPF's refinery complex. (eb)

## Monsanto Drops \$46.5 Billion Bid for Syngenta

Monsanto has abandoned plans to acquire Syngenta, a merger which would have created an agricultural giant, after the Swiss seeds company rejected its latest bid of Swiss Francs 470 per share.

In a statement, Monsanto said while it continued to believe a combination with Syngenta would have created tremendous value for shareholders of both companies and farmers, the enhanced proposal did not meet Syngenta's financial expectations.

"Without a basis for constructive engagement from Syngenta, Monsanto will continue to focus on its growth opportunities built on its existing core business to deliver the next wave of transformational solutions for agriculture," Monsanto said.

Syngenta confirmed it had rejected the sweetened offer because it significantly undervalued the company and was fraught with execution risk. The company added that Monsanto did not provide sufficient detail

on certain key issues which would have allowed Syngenta to properly assess the new entity, which would have been 30% owned by Syngenta shareholders.

The issues which Syngenta said lacked clarity were: an estimate of total cost and revenue synergies; assumptions regarding net sales proceeds of seeds and traits; the nature and extent of regulatory covenants that Monsanto was prepared to offer; the assessment of risks and benefits from a tax inversion to the UK.

Michel Demaré, chairman of Syngenta, said: "We engaged with Monsanto in good faith and highlighted those key issues which required more concrete information in order to continue a dialogue. Our board is confident that Syngenta's long-term prospects remain very attractive with a leading portfolio and a promising pipeline of new products and technologies. We are committed to accelerate shareholder value creation." (eb)

## Valeant to Acquire Sprout and Enter Sexual Health Market

US specialty drugs company Valeant Pharmaceuticals has agreed to pay \$1 billion in cash, on a debt-free basis, for female sexual health firm Sprout Pharmaceuticals. Under the terms of the agreement, Valeant will pay around \$500 million upon closure of the deal, subject to customary purchase price adjustments, plus another \$500 million in the first quarter of 2016, as well as a share of future profits based upon achieving certain milestones.

The transaction is expected to close in the third quarter of 2015, subject to the usual conditions and regulatory approval, including anti-trust clearance.

On August 18, just two days before the acquisition was announced, Sprout received approval from the US Food and Drug Administration (FDA) for its New Drug Application (NDA) on flibanserin, a female sexual health treatment.

The oral pill, to be marketed as Addyi in the US, is a treatment for premenopausal women with acquired, generalized hypoactive sexual desire disorder (HSDD), characterized by low sexual desire which is

causing marked distress or relationship difficulties. Sprout, formed out of Slate Pharmaceuticals in 2011, has been solely focused on finding a treatment for women with HSDD.

Valeant expects Addyi to be available in the USA in the fourth quarter of this year through prescribers and pharmacies that are certified under the FDA's Risk Evaluation and Mitigation Strategy (REMS) program.

Sprout also has worldwide rights for flibanserin and Valeant said it will leverage its global scale to register the drug internationally.

Following completion of the acquisition, Sprout will become a division of Valeant but its headquarters will remain in Raleigh, North Carolina. Cindy Whitehead, Sprout's CEO, will join Valeant and lead the division dedicated to introducing and commercializing Addyi worldwide.

"Delivering a first-ever treatment for a commonly reported form of female sexual dysfunction gives us the perfect opportunity to establish a new portfolio of important medications that uniquely impact women," said Valeant's chairman and CEO, J. Michael Pearson. (eb)

## Roche Agrees to Buy Kapa Biosystems to Boost Next-generation Portfolio

Swiss drugmaker Roche has signed an agreement to acquire Kapa Biosystems, a provider of genomic tools in the life sciences sector that uses proprietary technologies to optimize enzymes for next-generation sequencing (NGS). The company is based in Wilmington, Massachusetts, US and has a R&D and manufacturing facility in Cape Town, South Africa.

Kapa is developing solutions to accelerate genomics research that can affect the future ability to diagnose, monitor and treat cancer and complex inherited and infectious diseases.

Its proprietary protein engineering technology is highly customizable and allows for the generation and screening of large numbers of enzyme variants. Tailored enzymes with improved performance for specific applications can be selected rapidly, expediting product development timelines. Its portfolio of NGS reagents includes enzymes such as novel DNA polymerases with the potential to improve the performance of the entire sequencing workflow.

Financial details of the acquisition, which is subject to the usual closing conditions, were not disclosed.

Earlier this month, Roche agreed to acquire GeneWeave BioSciences, an in vitro diagnostics company focused on clinical microbiology. The company's proprietary Smarticles technology uses biology to rapidly detect drug resistance and measure susceptibility information without the need for enrichment, culture or sample preparation.

Under the terms of the agreement, Roche will pay GeneWeave's shareholders \$190 million upfront and up to \$235 million in contingent product-related milestones. Once the transaction has closed, GeneWeave will be integrated into Roche Molecular Diagnostics.

GeneWeave's first system in development is the vivoDx — a fully automated, random access system designed to meet laboratories' needs to address the detection of multidrug-resistant organisms and antibiotic therapy guidance. The technology is currently being evaluated in multiple sites across the US. (eb)

## PPG Agrees to Buy Remaining Stake in ChemFil Canada JV

Coatings company PPG Industries has reached an agreement to buy the remaining share in ChemFil Canada, its joint venture with Madinal Enterprises. The transaction is expected to close in the third quarter, subject to the usual closing conditions. Financial terms were not disclosed.

ChemFil Canada produces pretreatment products, as well as

some general industrial chemicals, for automotive original equipment manufacturers (OEMs) and industrial customers in Canada.

Once the deal has been finalized, an affiliate of Madinal Enterprises will own the production plant in Windsor, Ontario, as well as certain non-pretreatment business and product lines that will continue to use the ChemFil name. (eb)

US-based Ecolab, the global leader in water, hygiene and energy technologies and services, has agreed to buy the US operations of Swisher Hygiene for approximately \$40 million.

Based in Charlotte, North Carolina, Swisher Hygiene provides hygiene and sanitizing solutions for the foodservice, hospitality, retail and healthcare markets. Sales in

2014 for the operations included in the agreement were approximately \$176 million.

The transaction is expected to close in the fourth quarter of 2015, subject to approval from Swisher Hygiene's stockholders as well as the usual closing conditions.

Ecolab posted sales of \$14 billion in 2014. (eb)

## Tosaf Completes Acquisition of Adtec Colorant in the US

Israel's Tosaf Group, a manufacturer of plastics additives, compounds and color masterbatches, has finalized the acquisition of US-based Adtec Colorant. Adtec manufactures specialty color concentrates, liquid and additive masterbatches for the injection-molding, blow-molding, film and extrusion markets. Financial terms were not disclosed.

Amos Megides, Tosaf's chairman and CEO, said that Adtec's service offering would now be complemented by Tosaf's many additional proprietary products as well as its extensive R&D capabilities. Tosaf is a joint venture between Megides Holding and Belgian plastics group Ravago with 10 manufacturing plants in Israel, Turkey, Germany, the Netherlands, the UK and China. (eb)

Germany-based Brenntag will become the first distributor to join the initiative "Together for Sustainability" (TfS) established in 2011 by six multinational chemical producers and now counting 13 members, mostly Europe-based. The distributor said it aims to complete the TfS on-boarding process by 2016. Aim of the initiative is to establish a standardized global program for the

responsible procurement of goods and services in the chemical industry, and to improve ecological and social standards at supplier companies. "Brenntag fulfils an important key function in the supply chain of the chemical industry. As a result, sustainability has long been part of our business model and is firmly integrated into our processes," said Karsten Beckmann. (dw)

## Ecolab to Acquire Select Assets of Swisher Hygiene

## Brenntag Joins "Together for Sustainability"

# Sustainable Chemistry Conference Start-ups Pitching Session

## Meet "Chemiewende" Start-ups in Berlin

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The "Chemiewende" (German for *Chemistry Transition*) describes the shift of the chemical industry based on finite fossil fuels to renewable feedstocks. The transition is underway. In 2011, 14 percent of all resources for chemical production were already bio-based.

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With growing recognition of this huge innovation potential for industry, Germany has begun to create an enabling environment for spin-offs from research institutes. These start-ups offer models of change demonstrating untapped green business opportunities to sectors still based on fossil fuels and other older technologies.

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# Global Chemicals Markets Still

## European Players Boosted by Euro's Weakness

Around the globe, market conditions for chemical industry players remained volatile and challenging, corporate chieftains said unanimously in reporting on the second quarter and first half of 2015. Benefiting from the euro's weakness, multinational European companies were largely satisfied with earnings development, even if some had to reduce selling prices to match lower-cost starting materials. Most said they expected earnings to remain stable this year.

US companies saw minus signs in front of sales figures, reflecting a strong dollar, weak agriculture markets and lower prices for some products due to cheaper raw material and energy costs. At the higher end, however, demand for performance materials and restructuring efforts of past years helped many preserve or even increase earnings.

### BASF Expected Higher Growth

Despite a sharp drop in selling prices, BASF, world's largest chemical producer, improved EBITDA before special items by 3% to €3 billion in Q2, as sales rose 3% to €19.1 billion on higher volumes in Oil & Gas trading and positive currency effects. CEO Kurt Bock said growth in both the global economy and individual markets lagged expectations throughout first half. For the second



Kurt Bock, CEO, BASF

half, the German group forecasts somewhat weaker growth but still aims to match 2014 EBIT before special items of €7.4 billion.

### Bayer Sees "Very Good" Earnings Growth

The German market's second largest player, Bayer, stood out with 33% improvement in Q2 EBITDA before special items to €1.8 billion and a sales rise of 18% to €12 billion. CEO Marijn Dekkers pointed to "very good" earnings growth in all three subgroups, HealthCare, CropScience and MaterialScience – the engineering plastics business to be spun off in September. For the full year, he confirmed his earlier forecast: adjusted EBITDA before special items is targeted to rise by a high-teens percentage.

### Upswing For Evonik

Evonik, another German global player, increased adjusted EBITDA by 40% in both the second quarter and the first half, to €661 million and €1.3 billion respectively. Sales grew 8% both periods to €3.5 billion and €6.9 billion respectively. The upswing is attributed in part to



Marijn Dekkers, CEO, Bayer

the "sustained good volume trend," building on new production capacity, higher selling prices and slightly lower raw material costs. Evonik's adjusted EBITDA margin in H1 widened to 18.9% from 14.5%.

### Lanxess Realignment Successful

At Cologne-based Lanxess, CEO Matthias Zachert credited the "rapid implementation" of a corporate realignment scheme, now in its second phase, for the better-than-expected Q2 performance. Sales rose 4.3% to €2.1 billion, with EBITDA pre-exceptionals up 13% to €270 million on higher volumes and currency effects. The EBITDA margin pre-exceptionals widened to 12.8% from 11.8%. Management has raised full-year guidance slightly.

### Merck KGaA Sees Organic Growth

German chemicals and pharmaceuticals producer Merck KGaA reported a rise of 6.3% in EBITDA pre-exceptionals to €899 million, with sales up 14.4% to €3.2 billion. CEO Karl-Ludwig Kley said all three segments contributed, with organic growth of 2.2% driven by life scienc-



Mark Garrett, CEO, Borealis



Jean-Pierre Clamadieu, CEO, Solvay



Thierry LeHenaff, CEO, Arkema



es. "Significantly positive" currency effects of 10.2% and portfolio effects were attributed to the integration of newly acquired AZ Electronic Materials.

### K+S Shows "Outstanding" Performance

At Kassel, Germany-based K+S, currently the object of a hostile takeover attempt by Canadian rival Potash-Corp, CEO Norbert Steiner said an "outstanding" performance in the Salt business and above-average prices in the Potash and Magnesium Products unit propelled EBITDA forward by 11% to €247 million in the second quarter and by 25% in the first half to €630 million. Revenues improved by 16% in Q2 to €914 million.

### Wacker Chemie "Well on Track"

Another German player, Wacker Chemie, reported a 43% rise in Q2 EBITDA to €329 million. CEO Rudolf Staudigl said the sales rise of 10% to €1.37 billion reflected double-digit growth in all chemical divisions as well as the recently floated electronics subsidiary Siltronic. Higher volumes and favorable exchange-rate effects are credited. The CEO said the Munich firm is "well on track" to achieve its 2015 targets.

### Linde Increases Operating Profit

Finally, German industrial gases and engineering group Linde achieved

11% operating profit growth to €2.1 billion in the first half. Adjusted for positive exchange rates, the rise was 0.4%, said CEO Wolfgang Büchele. Sales grew 10% over the six-month period to €9 billion. In Q2, the Gases division continued to improve, and the full-year forecast has been revised upward. For the Engineering division, hit by lower capital spending at customers, the outlook points lower.

### Strong Demand Buoyed Arkema Results

In France, Arkema CEO Thierry Le Henaff said "a marked increase" in demand in June buoyed Q2 results. EBITDA improved by 52% to €320 million, with all product lines except acrylic monomers contributing. Sales advanced by 39% to €2.1 billion. New acquisition, adhesives producer Bostik, padded overall earnings and sales. The weakening euro also had a positive effect. For the full year, Arkema expects a "slight" increase in EBITDA.

### AkzoNobel Reports Positive Earnings

AkzoNobel in the Netherlands continued to see the positive impact of its focus on profitability and leadership in sustainability in Q2, said CEO Ton Büchner. The company reported positive earnings in all three business areas, with operating income up 38% to €486 million, thanks to efficiency programs, lower costs, reduced restructuring expenses,

divestments and favorable currency translations. Sales rose 6% to €3.9 million, and the return on sales to 12.3% from 9.5%.

### DSM Shows "Solid" Performance

DSM, another major Dutch player, reported a 6% hike in EBITDA to €279 million in Q2, on the back of a "solid" performance, which saw sales increase 12% to almost €2 million, supported by foreign exchange rates and 3% volume growth. The Nutrition segment was driven by organic growth, Performance Materials by lower input growth and strong volumes. CEO Feike Sijbesma said "the priority of improving operational performance is starting to deliver results."

### Solvay Confident of "Solid" Growth

Belgium's Solvay reported a rise of 8.1% in recurring quarterly EBITDA (REBITDA), with improved foreign exchange rates of 9% more than offsetting the effects of 3.6% lower volumes and 1.3% lower prices. The REBITDA margin widened to 19% of group net sales, which rose 4.2% to €2.67 billion. CEO Jean-Pierre Clamadieu said he remains confident of "solid" REBITDA growth for the full year.

### Clariant Delivers Solid Results

In Switzerland, specialty chemicals group Clariant improved Q2 EBIT-



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## Pfizer Gets Green Light for Hospira Acquisition

Pfizer can now progress its \$17 billion purchase of Hospira after receiving final regulatory approvals from the USA and Brazil.

The clearance from the US Federal Trade Commission (FTC) is subject to Pfizer divesting four of its sterile injectable drugs, notably antibiotic clindamycin, antifungal agent voriconazole, chemotherapy drug melphalan, and acetylcysteine which is used to prevent liver damage after a paracetamol overdose.

Brazil has approved the deal with no conditions. The transaction is expected to close early in September.

The merger, first announced in February this year, was approved in Australia and Europe in early August. The European approval was contingent upon Pfizer divesting various sterile injectable drugs as well as its biosimilar version of Johnson & Johnson's arthritis drug Remicade, which the European Commission was worried would cease development under the merger.

US-based Hospira is the world's leading provider of injectable drugs and infusion technologies and a global leader in biosimilars. Pfizer plans to significantly expand the reach of Hospira's products to Europe and key emerging markets. They are currently distributed mainly in the USA.

According to Pfizer, the global markets for generic sterile injectables and biosimilars are predicted to be worth \$70 billion and \$20 billion, respectively, in 2020. (eb)

# Volatile and Challenging

## in First Half as Strong Dollar Hits US Rivals



Ton Büchner, CEO, AkzoNobel

DA before exceptional items from continuing operations by 9% in local currencies to 211 million Swiss francs, as the EBITDA margin rose to 15% from 14%. CEO Hariolf Kottmann said sales from continuing operations were stable in local currencies but down 8% in Swiss francs. The three high-margin businesses Care Chemicals, Catalysis and Natural Resources are all on track to meet their respective guidance, the CEO said, confirming earlier 2015 guidance.

### Syngenta Expects "Broadly Unchanged" Revenue

At Swiss agrochemicals giant Syngenta, being pursued by US rival Monsanto, first-half EBITDA of \$2 billion was 5% lower in reported terms but 21% higher at constant exchange rates. The EBITDA margin was 29% at constant exchange rates. Sales of \$7.6 billion were up 3% at constant exchange rates but down 10% as reported. CEO Mike Mack said Syngenta expects to maintain revenue and EBITDA "broadly unchanged" for the full year.

### Lonza Shows Steady Improvement

A third Swiss player, Lonza, reported H1 improvement of 8% in core EBIT at constant exchange rates, both in Swiss and local currencies, with sales up 6%. Specialty Ingredients improved profitability on the back of strong demand and further portfolio optimization, while Pharma&Biotech benefited from strong momentum in commercial biologics. Full-year sales are expected to be flat, with core EBIT growth of least 5%. "This steady improvement gives us the stability to look at further optimization of our portfolio and our asset footprint," said CEO Richard Ridinger.

### Borealis Reports "Record" Results

Austria's Borealis reported a big jump in second-quarter net profits, which it attributed to strong margins and pricing. Net profit of €351 million was an increase of 145% on the 2014 period. First-half net profit doubled to €489 million. CEO Mark Garrett said the "record" results reflect improvement across all three profit centers, in particular polyolefins. He said Borealis is "well positioned" to take advantage of oppor-



Hariolf Kottmann, CEO, Clariant

tunities for margin growth as it has upgraded its European asset base.

### Dow Chemical Sees Growth Momentum

Across the Atlantic, US giant Dow Chemical returned Q2 EBITDA of \$2.4 billion, or \$2.5 billion on an operating basis – up 9.5% on the 2014 period. The operating EBITDA margin expanded to 19%. Gains were led by Performance Plastics, Performance Materials & Chemicals and Agricultural Sciences. Sales fell 13% to \$12.9 billion, primarily on the stronger dollar and lower oil prices. Going forward, Andrew Liveris said he sees growth momentum in construction, packaging and automotive outweighing some softness in agriculture and energy markets.

### Huntsman Pressured by Strong Dollar

Currency headwinds pressured Huntsman. The US chemical producer saw adjusted EBITDA grow 6% to \$385 million, with the strengthening dollar depressing the figure by \$49 million. Sales declined 8%. Performance Products and Advanced Materials, which account for half of adjusted EBITDA, saw combined earnings growth of 20%. CEO Peter Huntsman said the Texas player is "delivering on announced restructuring savings and growth projects."

### DuPont Earnings Erode

DuPont saw earnings erode by 3.8% to just over \$1 billion in Q2 on a sales drop of 11.4% to \$8.6 billion. Following the spin-off of Performance Chemicals, now trading as Chemours, CEO Ellen Kullman said DuPont is leveraging its innovation platform to drive greater growth and value, with a continued emphasis on cost productivity, active portfolio and the disciplined return of capital. Chemours' quarterly operating profit sank 55%, and the now standalone company made a loss of \$18 million.

### Eastman Expects Continuing Growth

At Eastman, reported Q2 operating profit improved 7.6% to \$469 million, as revenue rose 3% to \$2.5 billion, due primarily to acquisitions such as amines specialist Tamincio, as well as Commonwealth Laminating & Coating and an aviation turbine oil business. In the established



Richard Ridinger, CEO, Lonza

businesses of specialty fluids and intermediates as well as fibers, earnings deteriorated. CEO Mark Costa said he expects business momentum to continue into the second half year.

### Chemtura Impacted by Tepid Demand

For its core business segments, Chemtura reported a 13% quarterly year-on-year rise in adjusted EBITDA to \$60 million, despite "somewhat tepid demand" that depressed reported operating profit by 15% to \$44 million and net sales by



Feike Sijbesma, CEO, DSM

24% to \$464 million. Lower manufacturing costs helped to partially offset lower volumes. "Our task in the second half year is to sustain the performance improvements we have made in the first half," said CEO Craig Rogerson.

### Air Products Reports Higher Earnings

In its fiscal third quarter, which ended July 30, US industrial gases producer Air Products posted 9% higher adjusted EBITDA of \$758 million. The EBITDA margin improved to



Ellen Kullman, CEO, DuPont

30.7%. Sales fell 6% to \$2.47 billion, reflecting unfavorable currency and lower energy pass-through, but volumes rose 3%, primarily in Industrial Gases-Asia, Materials Technologies and the LNG business. For 2015, CEO Seifi Ghasemi has raised guidance from continuing operations by 13%.

### Songwon Delivers Robust Results

In Asia, Korea-based Songwon, which has a substantial European presence, saw a "more predictable



Andrew Liveris, CEO, Dow Chemical

and robust" Q2 after a "significantly improved" gross profit margin in Q1. This was achieved despite continued instability in Europe, strong currency devaluations and sinking oil prices. Year-on-year, EBITDA surged ahead to 787% to 25.9 billion Korean won from 2.9 billion. Sales fell 9% to 157 billion, due mainly to the euro's devaluation.

*Dede Williams,  
freelance journalist*

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## DSM Cuts Costs, Strengthens Focus

DSM has announced a reorganization plan that will result in the loss of 900-1,100 full time jobs by the end of 2017. Roughly half of the job losses will be in the Netherlands.

The changes will save the company between €125-150 million by the end of 2017. One-off restructuring charges, including severance costs, are estimated in the range of €150-175 million before tax.

DSM's support functions will be provided on a global basis to capture scale-benefits and perform at

lower cost. Processes will be further standardized and duplications eliminated resulting in a more efficient pooling of resources. DSM said the optimized support functions will enable the business groups to increase their business and market focus and enhance their operational agility.

In addition, a business (growth) improvement and efficiency program is being developed for the Nutrition business. DSM said it will provide more details on November 4. (eb)

# How to Run a Circular Economy in Europe

Chemical Industry, NGOs and Others Diverge over the Rules, Can New Proposals Sort Out the Differences?

Since the industrial revolution in Europe the amount of waste in the region has been constantly increasing. This is because its economies have been based on a “take-make-consume-dispose” pattern of growth derived from a linear model in which resources are considered to be abundant, easy to source and cheap to dispose of.

Recently this model has been looking outdated. So Europe has been going circular by adopting a resource efficiency agenda, under which the added value in products is retained as long as possible. The aim is to reuse, repair, refurbish and recycle the great majority of materials and products.

Europe desperately needs to be more resource efficient because it is the region in the world which is most dependent on imported raw materials.

Leaders of the European chemical industry and most other industrial sectors, politicians, environ-

mentalists, economists and virtually everyone else of influence agree that the objective of a circular economy is the right direction in which to move.

Despite these potential outcomes, opinion is divided — particularly between industry and NGOs — about the best way to create a flourishing circular economy. “Everyone knows where to go but there’s a lot of disagreement about how to get there,” says Jeremy Wates, secretary general of the European Environmental Bureau (EEB).

Even the last European Commission, which left office in November 2014, took a different approach than its predecessor to the European Union’s regulatory framework needed to support the development of a circular economy.

## Package Withdrawn

A Circular Economy Package of legislative proposals, put forward by the previous Commission and including tougher recycling targets, was withdrawn by the existing one, headed by Jean-Claude Juncker, to be replaced by a new, “more ambitious” regulatory initiative, details of which would be announced by the end of this year.



of collaboration among businesses working in isolation from each other.

“We have become very good at working efficiently within silos, in very specialist processes but we fail to spot opportunities across different systems,” says Veneman. “We simply don’t ask ourselves the right questions – would someone else want this waste product? Could we harness it as a power resource? Could it be used somewhere else in the cycle?”

## Design Stage

AkzoNobel believes that coatings and specialty chemicals producers like itself need to become involved in the design stage of product development.

“If our customers want to produce products that can be 100% reused and recycled we should think how we can help our customers to design these,” he continues.

The Commission has indicated that in order to cover all key stages of a product’s life cycle, its legislative plans for the circular economy may include a broadening of the scope of the existing Ecodesign Directive, at present mainly restricted to energy performance needs.

One concern in the chemical industry is that this change could result in potentially dangerous chemicals, particularly those already classified by the European Chemicals Agency (ECHA) as being substances of very high concern (SVHC), could be banned at the design stage from being used in all new materials and products, even those which are re-manufactured or recycled.

This would be a move which would be supported not only by certain NGOs but also brand owners and retail chains anxious to project a green image to consumers.

## SVHC-Free Products

A representative of the furniture chain Ikea told the Brussels stakeholders conference that it is already applying a policy of all its products being SVHC-free, whether they con-

*Ultimately it’s not about using less and less but about thinking in a completely different way to find a new cycle that works.*

Andre Veneman, AkzoNobel

mentalist, economists and virtually everyone else of influence agree that the objective of a circular economy is the right direction in which to move.

## Value in All Materials

“Ultimately it’s not about using less and less but about thinking in a completely different way to find a new cycle that works,” says Andre Veneman, AkzoNobel’s corporate director for sustainability and health safety and the environment (HSE).

“This requires us to see value in every material that we use,” he explains. “It is not about corporate social responsibility but about good business sense, as a scarcity of raw materials, combined with a rapidly growing global middle class, puts pressure on our current linear model. The rewards from a circular economy would be impressive. Materials needs would fall by up to 24% by 2030 as a result of improvements in resource efficiency. Better use of resources could save European industry as much as €630 billion annually, according to European Commission figures.

Yet transferring the Commission’s new proposals into legislation approved by the European Council, representing the EU’s 28 member states and the European Parliament, could take time. This is particularly because of lingering discontent among some government ministers on the Council and among members of the European Parliament (MEPs) to the shelving of the first package.

*Everyone knows where to go but there’s a lot of disagreement about how to get there.*

Jeremy Wates, European Environmental Bureau

On the other hand large sections of industry were unhappy about the last Commission’s proposals.

The European Chemical Industry Council (CEPIC) considered that they were too narrowly focused on waste management. Business Europe, an umbrella group representing industry as a whole, thought they should have “taken an overarching approach” which would have covered all the interlinked stages in a

circular economy while striking a balance between environmental and business impacts.

These views were echoed by the new Commission. It also regarded its predecessor’s package as concentrating too much on waste issues without exploiting synergies with other policies such as the need for well-functioning markets for secondary raw materials.

## Business Needs

Now the chemical and other industries are waiting in anticipation details of the Commission’s new legislative plans.

CEPIC has been stressing the importance of EU circular economy policies which take into account the needs of business. “In the final analysis, the circular economy must still be an economy,” it says in

a position paper on what it wants in the new package. “We are calling on the Commission to encourage investment in economically viable solutions, rather than imposing burdens that could undermine competitiveness.”

The industry has shown through its own history of innovation the major contribution it can make to the creation of a circular economy.

“The chemical industry is one of the most prominent innovators because we design new molecules,” Hartwig Wendt, CEPIC’s executive director for sustainable development, told a circular economy stakeholders conference in Brussels in June organised by the European Commission.

He cited as an early example of resource efficiency the development over 100 years ago of the Haber-Bosch process for the artificial fixation of nitrogen to make ammonia fertiliser on a commercial scale.

## Lignin Research

Chemical industry researchers are now working on the use of carbon dioxide as a raw material for chemi-

cal compound and also of lignin, a by-product of paper production.

“Every year millions of tons of lignin are disposed of as waste, predominantly through incineration,” Wendt said. “It has the potential to be turned into a basic chemical building block which can be dropped into a number of existing processing pathways.”

Europe’s chemicals sector has also been doing a lot to establish local circular economies through its networks of clusters throughout the region where the concept of waste has been extended to the underutilisation of manufacturing, energy, and water treatment capacity.

*The chemical industry is one of the most prominent innovators because we design new molecules.*

Hartwig Wendt, CEPIC

Chemical clusters have been pioneering the spread in Europe of industrial symbiosis, based on the collaboration between two or more companies, usually on the same site, in the use of each other’s surplus materials and energy.

## Central Government Funding

“Local circular economies are being set up in these clusters as a result of whole supply chain working together,” explains Stan Higgins, chief executive of the North East of England Process Industry Cluster (NEPIC), based at Teesside, the UK’s and one of Europe’s largest chemical clusters.

“What’s important is not so much the right regulations but central government support for the running of clusters,” he adds. “Companies tend to operate separately from each other unless they are brought together by organisations like ourselves. We actually have to do without government funding while clusters in countries like Germany are all helped by governments financially.”

AkzoNobel, which has developed its own Resource Efficiency Index (REI) to measure its creation of more value from fewer resources, has also highlighted the difficulties

tain virgin or recycled materials.

“Our products stay in homes for a long time and we want our customers to feel secure that they remain safe for the entire family,” she said.

Wendt warned that when judging which substances to leave in recycled or reused materials or products it was important to take a risk-based approach. “Otherwise it would be difficult to close the loop,” he said. “We would have to reject for recycling far more products than we want.”

The Commission’s imminent proposals for an extended ecodesign directive could turn out to be a major point of difference between the chemical industry and NGOs and others on controls within the circular economy. MEPs have been calling for more restrictive ecodesign rules. New ecodesign regulations could even have implications for the future of REACH.

Discussions on a legal framework for a circular economy at the EU level have been going on now for almost three years. They look likely to continue a lot longer.

Sean Milmo, freelance science and business journalist, Essex, United Kingdom

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# Poised For Growth

## Chemistry Is at the Heart of the US Economy

Chemistry: it's in everything and it's everywhere. In fact, nearly all manufactured goods are directly touched by chemistry, either as a material, in processing, or in some other value-added means. The US is a global leader in chemical production, providing over 15% of the world's chemicals and representing 14% of all US exports. It is also one of the US's largest manufacturing industries, an \$801 billion enterprise providing 804,000 high-paying jobs.



Heather R. Rose-Glowacki,  
American Chemistry Council

Essential to our everyday lives, the business of chemistry is a \$5.4 trillion global industry. Innovations in chemistry have contributed to countless economic and social benefits: longer and healthier lives through medical advancements, improved standards of living from fertilizers and water treatment, and instant access to information from anywhere thanks to smartphones (and other "smart" devices), just to name a few. Over 96% of all manufactured goods — from permanent-press clothing to protective packaging materials to strong and light composite materials in aircraft — are directly touched by chemistry.

In 2014, the US produced 1.2 billion t of these essential chemicals and chemical products, valued at \$801 billion (the value of the US chemical business is measured along the lines of the value of its shipments, as reported by the US Bureau of the Census). Generally speaking, the composition of chemical shipments by segment in the US mirrored global activity. Basic (or commodity) chemicals made up \$334 billion (42%) in shipments; of those, more than half were bulk



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petrochemicals and intermediates, followed by plastic resins, and inorganic chemicals. The second largest segment was pharmaceuticals, including prescription and over-the-counter drugs and other pharmaceutical preparations for both human and veterinary use, with \$178 billion (22%). Specialty (or performance) chemicals, like adhesives and sealants, catalysts, coatings, electronic chemicals, and plastic additives, accounted for \$150 billion (19%), followed by consumer products (\$91 billion, 11%) and agricultural chemicals (\$46 billion, 6%).

Chemicals (and chemical products) are produced in nearly every US state; however, most production of basic chemicals is concentrated

in the Gulf Coast region, where petroleum and natural gas raw materials are more readily available than in other parts of the country. In fact, about 70% of all primary petrochemicals are produced in Texas and Louisiana. The business of converting these basic chemicals into plastics, synthetic fibers, rubber, and other chemical products is not as heavily concentrated on the Gulf Coast and tends to be more diffused. For example, the majority of synthetic fiber production occurs in the Southeast, while production of other chemical products is more widely dispersed among the states.

Although chemical production is relatively concentrated, geographically speaking, the industry's economic impact is not just about geography. Not only does it support nearly 25% of the US GDP, the chemical industry directly employs over 800,000 people in roles such as equipment operators, engineers, sales managers, scientists, and environmental protection professionals. An additional 2.6 million jobs are supported by the suppliers to the chemical industry, jobs such as

equipment manufacturers, wholesalers, contractors, construction workers, and transportation operators. Moreover, another 2.5 million jobs are supported through the indirect purchases of the industry's suppliers and its employees. For every direct job created by the chemical industry, more than six additional jobs are generated elsewhere in the economy, totaling nearly 6 million jobs.

### Investments in Plants and Equipment

The chemical industry's investment in its employees is significant. The complex nature of the business of chemistry often demands highly-trained, skilled and educated workers, and these workers are well compensated, both in terms of salary and benefits. In fact, the average annual pay in the chemical industry is 47% higher than the average in manufacturing industries as a whole.

Chemistry is a capital-intensive industry and employment is only part of the investment picture. The business of chemistry is consistently one of the largest US private-sector investors in new plants and equipment (P&E), to the tune of \$33 billion in 2014. A majority of that investment went toward major process equipment.

The reasons for investing in P&E are numerous, and those reasons shift over time. Data collected by ACC from its members indicate that

major motivations of capital spending were replacing worn-out plant and equipment, expanding capacity for existing products, and projects for improving efficiencies. In fact, in 2014 companies reported spending more on capacity expansions for new and existing products (as a percent of total spending) than had ever been reported (since ACC started collecting data in 1992).

### Investments in Research and Development

Indeed, spending on capacity for new products has doubled in the past decade. And these new products, which are key to the competitiveness and economic growth of the industry, are made possible through investments in research and development (R&D).

The chemical industry is constantly evolving, and it has to. R&D is a critical component of competitiveness; basic and specialty chemical companies typically allocate 2-3% of their annual sales toward R&D. In the pharmaceutical segment, that number can be as high as 25%. In 2014, the US chemical industry invested \$59 billion in R&D, leading to improved process technologies, new chemical compounds and new applications, all of which are driving forces of the continued competitiveness of the US chemical industry, both domestically and internationally.

The chemical industry, like others, has become increasingly global in nature, particularly in recent history. World economic growth and the reduction of tariffs, as well as advances in technology, telecommunications and air transportation, continue to foster this globalization. During the past decade, world trade in chemicals, more than a third of which is intra-company in nature, grew faster than global output.

In the US, the chemical industry is the largest single exporting sector. Canada is the largest national market for US chemical exports, followed by Mexico; other large markets include Western Europe, Latin America, China and Japan. Imports also represent a significant portion of US chemical trade: more than half of US chemical imports are inputs used for domestic production. Canada is one of the largest exporters to the US, mostly plastic resins and commodity chemicals. With increasing pharmaceuticals trade (48% of chemical imports to the US are pharmaceuticals), Ireland has also become one of the largest exporters of chemicals to the US. On a regional basis, the US imports the largest amount of chemicals from Western Europe, a significant portion of which is trade between related parties.

From around the world to our own backyards, chemistry is all around us. The US chemical industry is vital to continued economic expansion, job creation, and the return of a strong domestic manufacturing sector and, right now, the US chemical industry is poised for growth. The business of chemistry is a good business to be in.

Heather R. Rose-Glowacki, Director Chemical & Industry Dynamics, American Chemistry Council, Washington, D.C., USA

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Additional graphics from the Guide to the Business of Chemistry are presented on page 16.

### The Guide to the Business of Chemistry

ACC's annual Guide to the Business of Chemistry divides the \$801 billion business into more than thirty categories of production, and highlights the distinct characteristics, including growth dynamics, markets, new developments, and other issues affecting each sector. Individual sections cover a variety of topics in detail, including financial performance, trade, innovation, capital investment, employment, environmental, health and safety, energy, and distribution. Charts and graphs help illustrate data and provide comparisons for the past ten years. The Guide to the Business of Chemistry is available at <http://store.americanchemistry.com>.

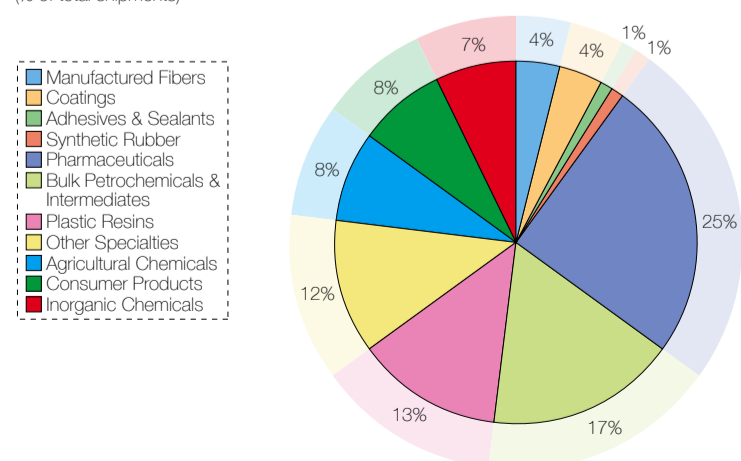
### Total Jobs Generated by the Business of Chemistry in 2014 (in thousands)

	Direct	Supplier	Induced	Total
Chemicals	804			804
Agriculture		70	50	119
Mining		77	10	88
Utilities		35	9	44
Construction		52	26	78
Manufacturing, excluding Chemicals		457	116	573
Wholesale Trade		274	76	350
Retail Trade		147	315	462
Transportation		184	77	261
Information		62	45	107
Finance and Insurance		172	300	472
Professional, Scientific, Technical Services		277	126	404
Management of Companies and Enterprises		347	26	373
Administrative and Waste Management Services		256	147	403
Health Care and Education		1	533	535
Arts, Entertainment, and Recreation		28	79	107
Accommodation and Food Services		60	290	349
Other Services		65	226	291
Government		43	31	74
Total — All Industries	804	2,608	2,483	5,895

Source: Bureau of Labor Statistics and American Chemistry Council analysis

### Global Chemical Shipments by Segment in 2014

(% of total shipments)



Source: American Chemistry Council

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9/2015



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## A Combination of Competences

### Joint Venture of Ferrostaal and Haldor Topsoe Targets Major Projects in the Petrochemicals Sector

In April, Ferrostaal, based in Essen, Germany, and Haldor Topsoe, headquartered in Copenhagen, Denmark, founded the joint venture Ferrostaal Topsoe Projects with registered office in Essen. The German project developer and the Danish supplier of catalyzers and process technology for petrochemical plants both have an equal share in the jv. Having already been working together for some time the partners now intend to expand their business activities in the petrochemicals segment further and to position the new company as a leading provider for the planning, financing and realization of major projects in the petrochemicals segment as well as in refinery and environmental technology. Ferrostaal managing director Dr Klaus Lesker explained the strategy to CHEManager International.

**CHEManager:** Mr. Lesker, which services are Ferrostaal and Haldor Topsoe offering as a joint venture?

**Dr K. Lesker:** We can now offer our customers a very special combination and partnership. In the new business we combine our decades of experience in project planning including investment issues with the technology of a world market leader in catalyzers. For our customers this means attractive financing possibilities, support in the further development of the business plan, use of our worldwide network, the best possible technical and procedural planning and the implementation of investments from the very beginning.

**What is the special feature of this offer?**

**Dr K. Lesker:** We integrate all the necessary partner companies, structure project companies and also participate with capital. In addition, together with partners we control the EPC contracting — i.e. planning, module supply and assembly — and the operating of the plants in order to secure strategic investments and their sustainable development. All these activities are embedded in a continual risk assessment and fulfil all social and environmental requirements. Ferrostaal Topsoe Projects is a perfect combination of competences along the value-added chain. With this we are offering a product that is unique throughout the world.

**Technology is sure to play a central role in these competences.**

**Dr K. Lesker:** Yes! It is an advantage for our customers that we have the technology of Haldor Topsoe on board from the very beginning of

the project conception. As a market leader in many sectors of technology and thanks to their extensive investments in research, Haldor Topsoe ensures that there are always innovative solutions available for our customers. The result is that, thanks to our integrative project development in comparison with separate tendering procedures for industrial projects, our customers can sell their products on the market up to nine months earlier. This also means a considerable increase in profits and in the profitability of investments, so that we create the best solution for the sustainable use of raw materials.

**On which projects are you already cooperating with Haldor Topsoe?**

**Dr K. Lesker:** We are currently cooperating on two large ammonia plants in Tanzania and Cameroon. In Mtwaru, in the south of Tanzania, we are involved in the development of a large plant together with the Tanzania Petroleum Development Corporation. With a volume of more than US\$ 1 billion this project is the largest German investment project in the country and will have a considerable effect on its economic development. In particular the farmers in Tanzania are looking forward to this as ammonia is the main component of fertilizers. Agriculture is responsible for a third of the gross domestic product of Tanzania and employs more than three quarters of the population.

**You just mentioned social and environmental requirements. Can you explain these in more detail?**

**Dr K. Lesker:** Part of our mutual business policy is that we wish to pay a



**Dr. Klaus Lesker, member of the management board, Ferrostaal**

positive contribution to the development in emerging countries that can use their natural resources such as gas or also coal. In this way we put these countries in a position to produce important petrochemical products for their country and for export into the regions. That creates jobs and a sustainable economic growth in these countries.

The example of Tanzania demonstrates this well: By enabling investments of more than US\$ 1 billion in the fertilizer complex, Tanzania can exploit the enormous gas resources with a high benefit for the economy and infrastructure. With the building and operating of the new fertilizer factory, due to be completed in 2019/2020, around 5,000 direct and indirect jobs will be created.

**In which countries are you currently flying in order to publicise the joint venture?**

**Dr K. Lesker:** We most recently flew together to Indonesia to meet representatives of the economy and politics. We intend to realise a large petrochemical complex here together with local partners. Also, in Tanzania I had the opportunity

**“The low oil price presents risks and opportunities at the same time.”**



Together with partners, Ferrostaal constructed a complex comprising seven individual petrochemical plants in Point Lisas, Trinidad. Put into operation in mid-2010, the complex is refining natural gas into ammonia, urea ammonium nitrate and melamine.

of speaking with relevant decision makers on the occasion of a mutual visit together with Federal President Gauck. Our new cooperation in the joint venture now offers the optimal 360-degree solution for such industrial projects and has already met with great response. From the onset we have been well networked in the relevant markets as both Ferrostaal and Haldor Topsoe are already sought-after market participants in the petrochemical segment.

**Where do you envisage the greatest order potential?**

**Dr K. Lesker:** We mutually envisage great market potential especially in the strongly growing emerging countries, but are also optimistic for the receipt of orders from regions such as North America.

**What impacts do the external conditions such as instable political relations have in many countries in Africa?**

**Dr K. Lesker:** We are currently active in Africa, as already mentioned, in particular in Tanzania and Cameroon. Here the conditions are much more stable and organised than they appear to be if observed from Europe. Here, our long years of experience in these countries form an important basis for assessing the security and attractiveness of investments for our project partners. In such emerging countries in particular we can refer to successful projects involving billions of dollars in Trinidad or Venezuela.

**And how do you estimate that the current low oil price will affect your business prospects?**

**Dr K. Lesker:** The low oil price offers risks and opportunities at the same time. On the one hand a low oil price with oil and gas price fixing will lead to lower feed stock prices or rather low expectations with regard to gas prices, on the other hand low oil prices are negative for investment decisions in the exploration industry.

In this respect investments in oil/gas fields, that mainly benefit from the prospective income from the sale of oil, will possibly be slowed down in their further exploration, which in turn can also have a decelerating effect on the availability of gas in our projects. Which aspect prevails depends on each individual case.

**What are the next targets and milestones?**

**Dr K. Lesker:** We presume that we can work profitably from the very beginning. We have a series of ambitious and demanding projects in the pipeline that could be realised as early as 2016/17. Furthermore, we expect a positive impulse for the financial markets and investors, a considerable boom in the demand for our technology products and new access to complex and highly profitable projects for the joint venture. (mr)

## Solvay Starts New Plant for Fluoroelastomers in China

As part of the ongoing strategic expansion of its site at Changshu in China's Jiangsu Province, Solvay Specialty Polymers has started up a new fluoroelastomers (FKM) plant. The Belgian chemical producer said the new capacity will meet demand for the specialty polymers from Asia's fast-growing automotive industry and multiple other high-end markets.

Solvay said its global business unit's third production plant worldwide for the fluoroelastomer unit, sold under the Tecnoflon brand name, will benefit from the site's existing Specialty Polymers operations and infrastructure, as well as from secure raw material supplies

through its joint venture with nearby Shanghai 3F New Materials.

"This state-of-art fluoroelastomers facility considerably strengthens our global industrial footprint, extending our reach from Europe and the United States to Asia," said Augusto Di Donfrancesco, president of Solvay's Specialty Polymers global business unit.

At the same site, the polymers subsidiary is building a plant to produce polyvinylidene fluoride (PVDF), due to go on-stream early 2017. In addition to fluoroelastomers, Solvay's operations at Changshu include compounding, based on its specialty polymer resins. (dw)



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# Corrosion Protection

## How the Chemical Industry Achieves the Goal with Various Materials

Fluoropolymer system solutions are increasingly used in chemical plants for corrosion-protection tasks. They usually offer considerable advantages over alternatives such as stainless steel, enamel-coated steel or glass in dealing with corrosion. Practice has shown, however, that the plant operator's expectations could not always be completely fulfilled. Therefore, in this article, influencing factors such as the selection of the right materials, the application, the appropriate manufacturing methods or component design are analyzed in more detail in order to provide the designer and the operator of a chemical plant with additional information for a successful, durable plant design.



The chemically modified second-generation PTFE, 3M Dyneon TFM Modified PTFE, is a PTFE in which the molecular chains of the polymer have been chemically modified by perfluoropropylvinylether (PPVE), a similarly perfluorinated modifier. At the same time the molecular weight of this second-generation PTFE was lowered in order to significantly improve the particle fusion of this PTFE. It is being processed using press-sintering methods or paste extrusion.

If we consistently continue the polymer modification by lowering the molecular weight in combination with the incorporation of the co-monomer PPVE, then we obtain a perfluoroalkoxy polymer, better known under the name PFA. Thanks to the low molecular weight, the representatives of this product group can be processed using the common thermoplastic processing methods like extrusion or injection molding and thus significantly extend the product range of the perfluorinated polymers.

Whereas resistance lists are normally used with materials in connection with corrosive chemicals or solvents, this is not the case with PTFE, modified PTFE or PFA. These materials can be said to exhibit almost universal chemical resistance. Only a few critical exceptions have to be taken into consideration. Among these are fluorinated hydrocarbons; alkali metals; monomers such as styrene, butadiene or acrylonitrile; or, finally, high-energy radiation, which can destroy the polymer itself.

### Constructive Measures Necessary Despite Special Property Profile

Against the background of their use in the corrosion protection, de-

mands are made of fluoropolymers in particular with regard to their excellent chemical resistance, high temperature stability and very high barrier effect, i.e., low permeation rates in relation to the chemical mixtures that arise. Their good non-stick properties facilitate cleaning, even when CIP (cleaning in place) or SIP (sterilization in place) procedures are applied.

The aforementioned perfluorinated polymers fulfill all of these properties.

Despite the excellent barrier properties of modified PTFE and PFA, however, it must be considered that a not-inconsiderable permeation takes place, in particular at higher temperatures. The gaseous chemical components enter the polymer material on the side in contact with the product, cross through it, and exit the material again at the "rear side." Since permeation increases strongly with temperature, the values were determined at 100 °C for realism. Under these conditions TFM allows the lowest permeation, followed by PFA. The influence of the thickness of the barrier layer in the range between 1 and 3 mm also proves to be particularly significant. Therefore, linings should have a thickness of more than 2 mm if possible. Non-modified PTFE, which exhibits the highest permeation values, should therefore only be used conditionally as a barrier for corrosion protection in corrosive environments. However, standard PTFE also proves to be a good problem solver in full fluoropolymer constructions in which temperature and chemical resistance are demanded, but where the

barrier properties can be classified as subordinate.

The barrier properties change at the different temperatures that occur in chemical plants. PFA exhibits the best barrier properties for hydrogen chloride gas up to temperatures of around 80 °C (355 K); at higher temperatures modified PTFE proves to be the material with even lower permeation.

Especially at elevated temperatures, permeation cannot be entirely avoided. This must be considered to achieve the goal of a durable construction. When lining chemical reactors, columns, tanks and pipes with a film of modified PTFE or PFA according to the "loose shirt method," i.e., fixing the liners by clamping between the flanges, care must be taken to ensure effective back ventilation. This ensures the removal of the gaseous corrosive substances diffusing in low amounts through the protective liner, and the dew point TD in the space between the liner and the wall of the duct is not reached. The system remains dry and therefore no corrosion can occur.

### Systems Made Of Fluoropolymers

So which fully fluorinated products are used in chemical plants requiring corrosion protection? The table provides information on plant components for corrosion protection, the polymers that come into question and the polymer-specific production methods. The inclusion of the sintering material "standard or modified PTFE" on the one hand as well as the thermoplast-processible PFAs on the other hand enables the complete production of the required range of products.

The various options for polymer selection, the combination with the associated different processing methods, the presence of alternatives for most applications as well as the consideration of special design criteria for the layout of durable system solutions mean that a round-table discussion at the start of the project is an important component for success.

### Closing the Cycle with End-of-life Products

Although corrosion protection systems based on fluoropolymers are usually durable system solutions, it may nevertheless be necessary because of the very aggressive conditions to partially or completely replace components and systems during inspections. Using the new Up-Cycling process developed by Dyneon, a subsidiary of the multitechnology company 3M, these waste products can now be split back into their raw components, the monomer tetrafluoroethylene (TFE). After purification, the TFE obtained is subsequently converted again into new fluoropolymers, which are no different from the original products in terms of their properties.

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Plant components for corrosion protection, polymers that come into question and the polymer-specific production methods

Plant components for corrosion protection	Which polymer is suitable?	Production method
Films and sheets for the lining of distillation columns, reactors applied at high temperatures using the "loose shirt method"	Modified PTFE, TFM Modified PTFE (S-PTFE)	Skiving the film from large sintered blocks or hollow cylinders
Glass- or carbon-fabric-backed films and sheets for the lining of tanks applied at ambient or slightly elevated temperatures using the "bonded shirt method"	Modified PTFE, TFM Modified PTFE (S-PTFE) PFA	Skiving the film from large sintered blocks or hollow cylinders, followed by a laminating step. Extruded film (chill-roll method) or sheet, simultaneously laminated with glass or carbon-fabric backing
Tubes, straight or convoluted, general purpose or heat exchanger	PFA	Melt extrusion
	Modified PTFE, (E-PTFE)	Paste extrusion
Lining of complex components such as pumps, valves	PFA	Transfer molding
Molecular structures of PTFE, PFA, and TFM		
PTFE	PFA	TFM

## News from China

### The Tianjin Explosions and Their Implications

On August 12, a fire at a dangerous goods warehouse operated by Ruihai Logistics at the Tianjin harbor quickly turned into a disaster as it triggered two substantial explosions, very likely due to chemicals stored in the warehouse. These included 700 tons of sodium cyanide, 800 tons of ammonium nitrate, 500 tons of potassium nitrate and unknown amounts of calcium carbide. More than 100 people died, many of them firefighters, and several hundred people were injured, many of them residents in apartment complexes near the warehouse.

#### Insufficient Implementation of Existing Regulation

In the aftermath of the explosions, local media uncovered several examples for regulation being ignored at the Tianjin site. For example, the amount of sodium cyanide stored at the warehouse exceeded the legal limit by a factor of 70. The warehouse is located only 600 meters away from residential buildings, not the mandated 1,000 meters. And state media revealed that the organization operating the warehouse had only received its authorization to handle dangerous chemicals less than two months earlier, meaning that it had been operating illegally between October 2014 and June 2015.

*China is better at establishing decent regulations than at implementing them.*

Dr. Kai Pflug, CEO, Management Consulting — Chemicals

#### Lack of Qualified Emergency Response

Other criticism has focused on the emergency response. According to a spokesperson of the fire department, it was known to the fire fighters that calcium carbide was stored at the warehouse, but the exact location was not known. Other sources such as the Beijing News state that the firefighters were not aware of the fire involving chemicals at all. In any case, the firefighters tried to stop the initial fire using water rather than sand or foam, which would have been the appropriate approach. This may have caused the formation of acetylene from the calcium carbide and the subsequent explosions. The apparent ignorance of firefighters regarding their approach may be partly explained by the two-tier structure of China's firefighting force, in which a substantial share of the staff is low-paid and presumably has limited training as well.

*So far the government has taken a fairly open approach in their response to the disaster.*

#### Initial Government Reactions

So far the government has taken a fairly open approach in their response to the disaster. For example, the State Council Work Safety Commission stated that the Tianjin blasts revealed a lack of safety awareness and lax implementation of safety regulations. The commission also mentioned other problems including inadequate safety management of dangerous materials at ports, irregular practices among workers, weak emergency responses to incidents and lax supervision by authorities. Other government measures include the arrest of the warehouse management and investigations regarding the current director of the State Administration of Work Safety, who also is a former deputy mayor of Tianjin. On a more proactive note, the government has announced that in the period until September 10, they will check all dangerous substances across the whole country.

*Western companies need to be willing to choose their Chinese business partners based on their broader adherence to elevated standards.*

#### Long-term Implications

It remains to be seen whether this disaster will actually have substantial longer-term implications for the chemical industry — as always, China is better at establishing decent regulations than at implementing them. Currently such implementation certainly has some momentum. For Western chemical companies operating in China, a stricter implementation of existing regulation would certainly be a good thing — they generally adhere to this regulation already but sometimes suffer from local competition with laxer standards. On the other hand, some of the regulation is likely to lead to higher cost of doing business in China, for example when knowingly or unknowingly using the services of companies such as Ruihai in providing logistics services. Western companies therefore also need to be willing to choose their Chinese business partners not only based on price, but also on their broader adherence to elevated standards.

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## Groundbreaking for Yara-BASF Ammonia Plant

Norwegian fertilizer giant Yara International and BASF, the world's largest chemical producer, have broken ground for a world-scale ammonia plant at BASF's Freeport, Texas, site.

Engineering contractor KBR has been awarded the fixed price turnkey contract for engineering, procurement and construction of the facility, expected to come on stream in 2017 with capacity of about 750,000 t/y.

The \$600 million plant will be owned by a 68:32 joint venture of Yara and BASF. It will be operated by BASF, while Yara will manage construction. Each company will off-take ammonia in accordance with its equity share.

As part of the project, Yara will build an ammonia tank at the BASF terminal, and BASF will upgrade its current terminal and pipeline assets for the export of ammonia from the new plant.

The German group plans to use its share of ammonia output to produce caprolactam as a feedstock for polyamide. Yara will market the remainder mostly to industrial cus-

tomers in North America, in addition to supplying the agricultural sector.

The two companies said the hydrogen-based process to be used in the new plant significantly reduces capital expenditures and maintenance compared to a traditional natural gas-based ammonia plant.

A long-term supply agreement for nitrogen and hydrogen has been signed with North America's largest industrial gases producer Praxair, linking the feedstock variable cost to the advantageous natural gas prices available at the US Gulf coast.

Torgeir Kvidal, president and CEO of Yara, said construction of the Freeport ammonia plant is "a firm demonstration of how we deliver on our growth strategy."

Wayne T. Smith, CEO of BASF Corporation and a member of the group's managing board, said "BASF is in a period of significant investment in North America. Through the joint investment with Yara, we can take advantage of world-scale production economics and the attractive raw material costs in the US." (dw) ■

## Emerald Kalama to Expand Benzoic Acid

Emerald Kalama Chemical, a part of Emerald Performance Materials, will add a second 100,000 t/y train for its high purity benzoic acid sold under the Purox B trademark, and at the same time increase production capability for benzaldehyde at its facility in Rotterdam, the Netherlands, up to late 2016.

The expanded production is designed to support growing demand for the company's benzoic acid flakes, sodium benzoate granules and liquid benzoic acid, used in food and beverage, personal care, pharmaceutical and a variety of industrial applications. Benzoic acid and benzaldehyde from the company's reactor train are key intermediates used to make products such as plasticizers and aroma chemicals.

"Reassessing our long-term strategic plan for our key intermediates,

our expectations for benzoic acid continue to show strong growth and track according to plan," said Hubert Degens, vice president of the Emerald Kalama Chemical Benzoates and Intermediates business.

"In addition," Degens said, "our recent acquisition of Innospec Widnes's aroma chemical business and growth plans for that platform are in line with our increased production capacity for benzaldehyde."

The company has been producing benzoic acid at its Rotterdam and US operations for more than 50 years. Emerald Kalama Chemical's portfolio of benzoic acid products is FDA-approved and GRAS-classified. The Rotterdam operation is also certified to meet or exceed a number of important quality standards. (dw) ■

## Lubrizol Takes Daelim License for US Polyisobutylenes Plant

Specialty chemical and lubricant producer Lubrizol has signed a licensing agreement to use Daelim's polyisobutylenes (PIBs) technology for a new plant in Deer Park, Texas, USA. PIB is a key raw material for Lubrizol's proprietary dispersants.

Daelim's technology can produce a wide range of PIBs from conventional PIB (CPIB) to highly reactive PIB (HR-PIB). Lubrizol will now start initial engineering on the project which is expected to be ready for commercial operation in a minimum of three year's time.

Lubrizol said the license is consistent with its efforts to renew its additives infrastructure. The company is upgrading and enhancing its global capabilities as part of a

10-year phased investment program.

Meanwhile, additional coatings capabilities have been added to Lubrizol's Innovation Center in Singapore over the past several months. These include the addition of full plastics extrusion capabilities that allow testing of Solplus polymeric dispersants in masterbatch and compounding applications; new automotive paint spray facilities for testing water- and solvent-borne formulations; coating formulation capabilities; and advanced equipment for measuring surface effects.

Lubrizol said the center is already looking at how nanotechnology can enhance the durability of coatings. (eb) ■

## Hallstar Opens China Research Center

Leading global specialty chemical company Hallstar has opened an application center in China. Located in Suzhou, the Hallstar New Material Science & Technology (Suzhou) Company will serve as an R&D and technical support base in the Asia-Pacific region, carrying out advanced research for applications in two core markets.

For the beauty and personal care market, this will include sun protec-

tion, anti-ageing, whitening and new ingredients that mimic the skin's natural functions. For the industrial additives market, this will include polymer plasticizing, surface enhancement and processing improvements. Hallstar said a significant portion of the work will be based on green and renewable chemistry.

In the near future, sales, service and logistics support will also operate out of the facility. (eb) ■

## Solvay Building H<sub>2</sub>O<sub>2</sub> Plant in Italy, Maybe in Russia

The Special Chem global business unit of Belgian chemical group Solvay has joined forces with an unnamed partner — described as "one of the world's leading electronics producers" — to build a high-volume high purity hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) plant in Italy to meet the fast growing demand of the partner's facilities.

Almost simultaneously, Solvay has announced the signing of an agree-

ment with Russian pulp producer Siberwood to explore building an H<sub>2</sub>O<sub>2</sub> plant in the Krasnoyarsk region of Siberia. It would be part of the Russian company's greenfield project with output totaling 900,000 t/y of pulp.

The plant could use Solvay's "my-H<sub>2</sub>O<sub>2</sub>" technology, which is primarily designed for customers that require on-site production in remote areas. (dw) ■

## Neste Jacobs Selected as FEED Contractor on Borouge Project

Finnish technology and engineering provider Neste Jacobs has been chosen by Borouge to provide front end engineering and design (FEED) services on a polyethylene plant modification in Ruwais, United Arab Emirates. This is the third FEED project in a row that Neste Jacobs will deliver to Borouge under a long-term service (Tier 1) contract that the two companies signed previously.

Neste Jacobs' office in Abu Dhabi will carry out the work which will be completed this year.

Meanwhile, Borouge's new ethylene/polyethylene complex, Borouge 3, is nearing the final phase of commissioning. All five polymer plants have started operation with the remaining unit for cross-linked polyethylene due to go online by the end of this year. (eb) ■

## Air Liquide Starts Hydrogen Site at Yanbu

French industrial gases producer Air Liquide has started up its €350 million global-scale hydrogen production site at Yanbu Industrial City in Saudi Arabia, where it has a long-term contract to supply the new YASREF refinery operated by a joint venture of Saudi Aramco and Sinopec.

Hydrogen production is planned to be ramped up in parallel with

the refinery's operations over the course of 2015. Altogether, Air Liquide will have two hydrogen plants with capacity of 340,000 Nm<sup>3</sup>/hour — bringing the company's overall output forward by nearly 20%. The site will also include a purification unit.

The region's largest refinery will process 400,000 b/d of heavy crude. (dw) ■

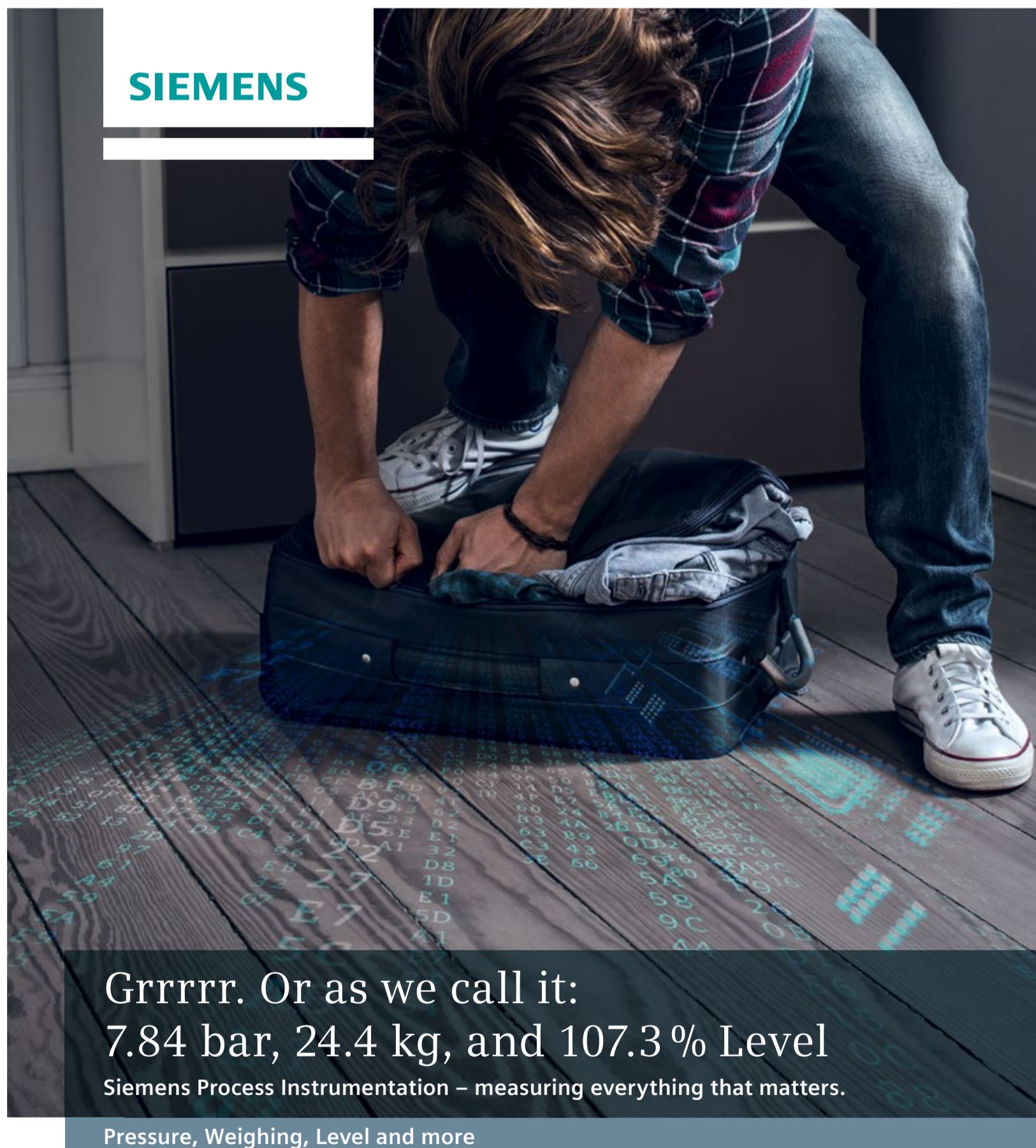
## PTTGC and Japanese Firms Pursue Thai PO/Polyols Complex

Thai chemical company PTT Global Chemical (PTTGC) has signed two agreements with Japanese firms Toyota Tsusho and Sanyo Chemical Industries (SCI) to jointly carry out engineering studies for a propylene oxide (PO) and polyether polyols complex.

A total investment of around \$1 billion will be made in the plants which will be located on the He-

maraj Eastern Industrial Estate in Rayong. Toyoto Tsusho will partner PTTGC to study a 200,000 t/y PO plant, with Sanyo Chemical Industries joining for the study on a 130,000 t/y polyols facility.

The engineering work follows the successful completion of a preliminary joint feasibility study which began early this year. (eb) ■



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## Significant Value Creation



Continued Page 1

**U. Batra:** When you consolidate, the costs come under pressure, and R&D is no exception. However, I see the consolidation in the pharma industry again not as a negative, because our consumables business scales with the number of projects, meaning the number of products in the pipeline, and not to the total cost base of R&D.

If you look deeper, the number of molecules that pharma is developing actually increases. So, nobody cuts the molecules, they streamline the infrastructure around it. As we probably constitute between 5 and 10 percent of the total R&D spending of the pharmaceutical industry, that is not a huge cost pool for them to go after. Clinical development is still the bigger part of the costs. Laboratory supply is not. Our products are largely on the consumables side and consumables continue to grow.

*What about consolidation on the supplier side? Does size matter in this market?*

**U. Batra:** Absolutely, scale matters in research. One of the critical factors for our customers is simplicity. They want all the products from a single interface, while somebody else should deal with the complexity. And this drove our thinking, especially on the laboratory side. There, scale absolutely matters, because that scale then makes it an entry barrier for competitors. The amount of investment required to handle so many products and deliver them to the customer the next day is massive. Here, Sigma-Aldrich is a key player, because they have perfected this business of ecommerce, supply and distribution working together. So, we see consolidation in particular in the laboratory space as quite beneficial.

*What about the overall fit of this acquisition? Is there any overlap?*

**U. Batra:** Very little, almost none. As an indication, the clearance we received from the competition authorities is only subject to a few divestment conditions in Europe.

That said, let me take you back to the rationale for the acquisition. The combined life science market that we will be in is about €100 billion in size and it grows between 3 and 5 percent per year, which is 2 to 3 percentage points ahead of the global economic growth. Leaders in this market have margins in excess of 22 percent. This is without a doubt a highly attractive market.

You can break down the €100 billion market into three segments. First, the research segment accounts for roughly €12 billion. It includes academic customers and pharmaceutical R&D customers, not unlike our colleagues at Merck Serono, who use a wide portfolio of laboratory chemicals, biologics and reagents. That market has been growing at around 3 to 4 percent, a bit slower than the average market because governments have pulled out funding after the recent

economic crisis and the market has slowed down a little bit. But it is starting to pick up especially in the US and the trend is very good in the future. There are over 3,000 R&D projects in the pharma pipeline that are viable projects, and those customers use our products. The FDA approved about 41 new products last year. This was double the number versus the previous year and one fourth of those products are biologics, which require a different level of understanding and a lot of our tools. So, I am completely confident that this market is going to remain attractive and continue to grow because the fundamentals are very good.

The second market segment we play in is the processing sector, which accounts for roughly €44 billion growing at 6 to 7 percent per year. This is the market of bioreactors and downstream equipment like our filtration products used for the manufacturing of APIs or formulated products. Together in this space Merck Millipore and Sigma-Aldrich are very complimentary. Again, if you look at the end market in particular, you find that the sales of monoclonal antibody-based therapeutics grew at about 17 percent over the last five years. In order to manufacture monoclonal antibodies customers often use our single-use reactors and filtration products. The second trend in that market is biosimilars. One hundred fifty or so biosimilars have been approved in the last five years, which is very good for the demand for processing equipment that we supply. And again, the trends for the future look very good.

And the third segment is called the applied market. Admittedly Sigma-Aldrich has a stronger presence here. That market accounts for approximately €44 billion and is the slowest growing out of the three at roughly 2 to 3 percent. In that market we include adjacent markets, for

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## Eli Lilly Raises Hope of Alzheimer's Breakthrough

A new experimental Alzheimer's drug, solanezumab, developed by Eli Lilly, has raised hopes for a breakthrough in the treatment of the disease. The progress was reported at the Alzheimer's Association's International Conference in Washington DC, USA, based on an extension of a previous phase III trial that failed to prove the efficacy of solanezumab when it ended in 2012.

While the trial was declared a failure, reports said a close reading of the data revealed a 34% slowdown in the rate of mental decline among more than 1,000 people with mild Alzheimer's. Patients in this category were allowed to continue taking the drug for a further two years and those who had previously been given a placebo were switched to solanezumab.

Eli Lilly said the benefit gained by patients taking the drug during the trial compared with people on placebo was maintained during the two-year extension period, suggesting that the change in the course of the disease was long-lasting rather than temporary.

The company said a new analytical method enabled it to assess whether solanezumab had an effect that is consistent with slowing progression of the disease by modifying the underlying disease progression, which until now had not been studied. "The results provide encouraging evidence that solanezumab could

indeed be acting on the disease processes that drive Alzheimer's," said Eric Karran, research director at Alzheimer's Research UK, the charity.

Solanezumab is counted among the most advanced of several drugs in development that aim to reduce the build-up of beta-amyloid that form plaques in the brain. Up to now, most treatments could provide only temporary relief of symptoms without being able to slow progression. More than 120 Alzheimer's drugs have failed in clinical trials since 1998. In one of the latest, Roche stopped one late-stage study of its gantenerumab last December because it did not meet its main goal of a cognitive benefit in people with early Alzheimer's symptoms.

Researchers believe, however, that Lilly's positive data will add to cautious optimism that a corner has been turned.

Biogen in March of this year announced positive results from a small, first-stage study of another amyloid-reducing medicine, aducanumab.

An effective treatment for Alzheimer's is considered one of the most urgent public healthcare priorities as an aging world population threatens to increase the number of people with the disease from an estimated 44 million today to 76 million by 2030. (dw)

instance, food and beverage. This segment is seeing a lot of growth, especially for our types of chemicals and approved regulatory products, because the amount of regulations in food and beverage is increasing quite dramatically. As a consequence, they need testing equipment not dissimilar to pharmaceuticals. It is only a matter of time until they get there and that is making this market attractive. The diagnostics industry is also a customer in that segment with molecular diagnostics growing between 16 and 20 percent annually.

So, all three end markets, process solutions, research and applied have been growing over the last few years and also have robust future growth trends.

*Let us go back to the fit. You said almost no overlap...*

**U. Batra:** Right, highly complementary! The combined company will be able to serve life science customers around the world with a highly attractive set of established brands and an efficient supply chain that can support the delivery of more than 300,000 products.

In that attractive market I just spoke about, you have Sigma-Aldrich and Merck Millipore. Both players have been growing in line with the market for several years. Last year Merck Millipore grew 4.5 percent, Sigma-Aldrich grew slightly shy of 4 percent. And year to date in 2015 both organizations are continuing to deliver solid growth. Sigma-Aldrich's profitability is 30 percent, ours is 25 percent. If you bring these two strong companies together, what do you get?

It is just superb! That gives me excitement and a little bit of worry as well, because it seems so good on paper that you need a strong strategy, the right teams and a methodical approach to take this combination beyond and to customers.

*Too good to be true?*

**U. Batra:** Almost. But in the end you have to prove to your customers

you can really match their expectations. The fit is perfect, this I am convinced of. The question is: how are we going to execute it? I expect that the integration will take about six to nine months because it is complex. I would say this is a reasonable timeframe, starting from the closing, which we expect very soon, when the new organization goes live. And by that I don't mean everything is done, but the broad parts would be there. And, make no mistake, there is a lot of work on integration planning that happens in parallel, but during this time the most important thing is focus on the customers, on delivering the products, and on communicating. Absolutely the number one priority is customer focus.

*You spoke about geographies. What challenges do you see in regional crises and what expectations do you have for emerging markets?*

**U. Batra:** While we have a geographic footprint that diversifies our risks rather nicely, we are absolutely exposed to it. Whatever happens in regions like Russia and the Ukraine or the Middle East impacts our business. The academic funding goes down as the economy slows down. We saw this in the United States over the last few years, and only now it starts to recover. In Japan, the academic funding has taken a huge slump that shows up in our business. So, I feel the macroeconomic situation impacts us, especially on the academic side, less on the industry side. And up to now, we had less exposure to the academic side, but with Sigma-Aldrich we will have a larger exposure. So that will be a challenge.

If you are in emerging markets that have above-average growth, you are also subject to some volatility. If you don't want to leverage the growth of emerging markets and deal with volatility, then don't be there. Compared with emerging countries, the still big markets, the US, Europe and Japan, have lower but more predictable growth. There

is no world — where I can see — that Europe or the United States or Japan are not important. The big decisions of pharmaceutical customers on the type of manufacturing facilities that they will build are made in the headquarters of the multinationals in Europe, Japan and the United States. That is not going to change overnight. The largest amount of R&D spending in

*Our purpose is awesome: solving the toughest problems in life science by collaborating with the global scientific community.*

the world still remains in the United States.

But that said, the investment dynamics in countries like China are mind-blowing. I will give you three examples from a recent visit to China with my leadership team. Novartis is investing \$1 billion in an R&D facility in Shanghai. This sheer ambition of a multinational to go into China and say, "I want to be big here" — they must know something. And even if they don't, they will

create something. Second, we had a chance to visit a national center for protein analysis. They had 14 mass spectrometers, one next to the other. And that also shows the amount of ambition that they have. And third, we visited this company called WuXi AppTec and they are going to put roughly 15 single-use bioreactors in parallel. Not one, not two, but 15 two-thousand-liter

single-use bioreactors. Many of our multinational customers take a long time to decide buying one. The ambition in China is a few orders of magnitude higher. This is a 'think big and act big' mindset. And we need to be part of it. So I guess it will not take long before we will be acting in China in a meaningful way.

*After the integration, will you keep the brands Sigma-Aldrich*

*and Merck Millipore and operate them under the Merck Life Science umbrella?*

**U. Batra:** We haven't yet fully sorted this out but somehow it will be Merck and within our Life Science business. Below this corporate brand it we would be short-sighted to remove any of the brands that have been known to many customers, be it Sigma-Aldrich, be it Supelco, be it Millipore, be it SAFC or others. Nonetheless, we cannot keep over 70 brands as we currently have. It has to be a handful and below that we can put any sub-brand we like. So we are going through a process by which we will organize them in a logical way, while ensuring our customers can still utilize the many innovative products we both provide.

*Are there some white spots left in your portfolio where you would do bolt-on acquisitions?*

**U. Batra:** We would not survive if we were not always looking to collaborate. But that said, we have done the largest acquisition in Merck's history and we need time to digest

this once closed, to bring the parts together. There is no focus on doing many more bolt-on acquisitions. There are very interesting ideas and as far as smaller collaborations are concerned, we will be happy to do them, but big acquisitions at this time are off the table.

*Fast forward: what is your vision for the Merck Life Science sector?*

**U. Batra:** We are in a wonderful business because we have the chance to solve problems for curious scientists and engineers. Our purpose is awesome: solving the toughest problems in life science by collaborating with the global scientific community. This purpose is embedded with the goal of helping to provide people all over the world, and especially in emerging markets, with access to medicines and vaccines. I mean, how exciting is that? That is my vision!

## Novartis Buys Rights to Multiple Sclerosis Drug from GlaxoSmithKline

Novartis is acquiring all the remaining rights to GlaxoSmithKline's (GSK) multiple sclerosis (MS) drug, Ofatumumab. A fully human monoclonal antibody which targets the CD20 molecule, Ofatumumab is being developed for relapsing remitting multiple sclerosis (RRMS) and other autoimmune conditions.

More than 2.3 million people worldwide are affected by MS, a chronic disorder of the central nervous system that causes progressive loss of both physical and cognitive functions.

Under the terms of the agreement, Novartis will make an initial upfront payment to GSK of \$300 million for buying the drug and a further payment of \$200 million following the start of a phase III study in MS by Novartis. Upon completion of pre-determined milestones, contingent payments of up to \$534 million may be made. Novartis will also pay royalties of up to 12% to GSK on future net sales of Ofatumumab in autoimmune conditions.

"Novartis is pleased to further reinforce our commitment to neuroscience and to add an exciting new treatment to our strong MS portfolio.

Our vision for patients with MS is to develop treatments that improve on current standards of care, meeting patients' needs at every stage of their disease with innovative and targeted drugs," said

David Epstein, head of Novartis Pharmaceuticals.

Ofatumumab is now ready to begin phase III pivotal studies.

Meanwhile, Novartis' skin cancer drug Odomzo has received European approval. Odomzo (sonidegib, formerly LDE225), in the form of 200 mg capsules, can treat adult patients with locally advanced basal cell carcinoma (laBCC) who are not amenable to surgery or radiation therapy.

BCC consists of abnormal, uncontrolled growths or lesions that arise in the skin's basal cells which line the outermost layer of the skin and accounts for more than 80% of non-melanoma skin cancers.

"The approval of Odomzo brings new hope in the form of a non-invasive option to help treat this disfiguring and potentially life-threatening disease," said Reinhard Drummer, professor and vice chairman at the University of Zurich's department of dermatology.

The approval applies to all 28 EU member states, plus Iceland, Norway and Liechtenstein. Outside the EU, Odomzo is approved in the USA, Australia and Switzerland. Additional regulatory submissions are being reviewed worldwide by health authorities.

Odomzo is currently in clinical development in other diseases. (eb)

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# Disintermediation 2.0?

## Peeking Behind the Curtain of E-Commerce, Chemical Distribution

In mid-2015, BASF opened its first e-commerce store in China, using the Alibaba B2B marketplace platform. According to the company press release, with this step, "BASF is making its solutions more accessible to small and medium-sized enterprises (SMEs)." This is one example of the growing importance of e-commerce in chemicals. What is the rationale behind these trends, and what are the likely developments?

Traditionally, the majority of chemicals are sold directly from the producers to the users. Given that chemicals are rarely directly used by consumers, most of the chemical buyers are businesses using chemicals to create a wide variety of finished goods including feed, food, paints, plastics and textiles. The other major distribution channel is via chemical distributors. These distributors get their goods from the chemical companies and then sell them on to the same broad group of buyers.

The main distinction between the first channel (direct sales) and the second one (indirect sales) is thus the presence of an intermediary. Typically per-order volumes of indirect sales are much lower (according to a Boston Consulting Group estimate, 79% of manufacturers outsourced their chemical distribution to distributors for customers buying less than €100,000 of products per annum while larger customers buy directly from the chemical manufacturers). Distributors partly compensate for this lower volume of each product sold to individual customers by offering a broader portfolio. Typically they are not restricted to a single chemical producer as supplier but try to offer complementary products focusing on the same customer segments.

### A New Channel

E-commerce marketplace providers offer the producers a third channel to sell to customers. While it may technically be regarded as a variation of direct sales as the platform involved typically does not take ownership of the product, it is different from direct sales in that order handling, logistics and customer fulfillment are automated and aggregated to reach higher volumes and lower costs.



Another main advantage to the producers is the high volume of traffic drawn to a multiparty e-commerce marketplace. In fact, looking at the BASF press release shows clearly that the company hopes to replace indirect rather than direct sales via this new channel. Target customers are SMEs: "For example, from Shandong, Sichuan, to Guangdong, China has over 10,000 feed processing factories, most of which are small and medium-sized enterprises. ... With BASF Alibaba online shop going live today, more small and medium-sized feed processing factories can learn about authentic feed additives from BASF and obtain relevant support."

Clearly, at least 99% of the 10,000 feed processing factories mentioned in the press release are currently not served by BASF directly but rather by distributors or not at all. Thus if taken up by the customers, the e-commerce channel will mostly replace sales via distributors, resulting in a potentially higher margin for BASF, though of course BASF certainly also hopes for additional sales to customers currently not covered by either channel.

Veteran chemical industry watchers will probably be somewhat skeptical about the power of e-commerce to effect disintermediation of chemical distributors. After all, chemical marketplaces have been around for more than 15 years, and at the same time broadly speaking chemical distribution has not grown any

slower than the industry as a whole. However, we feel that the integrated online marketing and offline distribution capabilities that the e-commerce marketplace providers offer to producers will accelerate their adoption by industry players. The recent rise of social media and online communities, built as part of the e-commerce marketplace platforms, can substantially increase the attractiveness of this channel. Consequently, e-commerce represents a real threat to the continued growth of traditional third-party chemical distribution.

### Distribution's Key Roles

Research published by Kin Bee Tay and John Chelliah in 2011 identified several important functions of chemical distribution, which at that stage could not be delivered by e-commerce platforms without support by local intermediaries. These were on-time delivery, product availability, credit payment and technical support.

Given the excellent network of courier services in China, it is likely that on-time delivery is no longer an issue if the e-commerce marketplace providers have their own delivery service and customer fulfillment capabilities, or use third-party logistics providers (3PL), and the time to fulfill customer orders does not need to be shorter than two to three days. This leaves a role for a third-party chemical distributor lo-

calated nearby only if the order needs to be fulfilled very quickly, or if the type of the chemical ordered is not suitable for normal courier delivery.

Similarly, product availability may actually be less of an issue for an online store than for an individual distributor. Given the delivery capabilities above, this will only require one warehouse per region. Thus adequate stock levels should be easier to maintain than at a multitude of locations of individual chemical distributors. In addition, the customer and delivery data gathered and accumulated by an e-commerce marketplace over time will allow a producer to employ big data and predictive analytics to perform accurate stock planning and demand forecasting, further increasing the average product availability.

However, credit payment is likely to remain an issue for e-commerce. Providing credit is an important function of third-party distributors in China, and it is unlikely to be provided by a company such as BASF, which lacks the knowledge of the credit trustworthiness of small customers. So this function is unlikely to be affected much by a rise in e-commerce unless an e-commerce marketplace provider is willing to take ownership of the goods and take the credit risk.

Finally, technical support is a function in which e-commerce marketplace providers can excel, especially with the advent of social media and online communities. Traditionally, big chemical producers did not give technical support to small customers because of the high costs, leaving this service to their distributors. By setting up online communities and technical discussion on the e-commerce platforms, chemical producers are able to offer timely and critical knowledge and information to their customers at fairly low costs. The BASF press release hints at this aspect when stating that "factories can learn about authentic feed additives from BASF and obtain relevant support."

### Benefits Of E-Commerce

The potential margin improvement of switching from third-party distribution to e-commerce marketplaces has already been mentioned. There are several other benefits. At the core is the better understanding of the market and keeping a close tab on the requirements of customers. Using third-party distribution, the producers will not be able to get hold of valuable customer data such as their purchase history, average order size, preferences and delivery schedule. The shift to e-commerce remedies this lack of transparency.

In addition, while initially the introduction of an e-commerce platform might lead to a conflict of interest with existing distributors, there is also the potential for later reduction of such conflicts, e.g., when a customer becomes bigger. It should not be a major issue

to transfer a customer from using an e-commerce platform to being served directly by the BASF sales force; however, switching from a distributor to direct sales routinely leads to conflicts.

E-commerce platforms by now have reached a level of maturity that allows even major players such as BASF to utilize them with confidence. The investment of such a step is low as the platform already exists, eliminating the need to establish an own solution. Customer traffic is already strong, reducing the need for specific marketing of the new channel. Overall, as additional functionalities will be added to platforms such as Alibaba, we expect the role of traditional third-party chemical distributors to shrink and to be mainly restricted to giving credit to less credit-worthy chemical customers and to providing emergency deliveries of chemicals. It remains to be seen whether these functions are sufficient for a sustainable business model.

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## Mallinckrodt to Buy Immunotherapy Firm Therakos

Irish drugmaker Mallinckrodt said it plans to acquire US immunotherapy company Therakos for \$1.33 billion from American private equity investor Gores Group. The deal is planned to close in the latter part of the calendar third quarter, which is Mallinckrodt's fiscal fourth quarter.

Based in West Chester, Pennsylvania, the immunotherapy company focuses on treatment platforms that harness the power of each individual patient's immune system to fight disease. It claims to be global leader in autologous immune cell therapy delivered through extracorporeal photopheresis (ECP).

Therakos' Cellex system collects immune cells from a patient's blood, treats the cells with ultraviolet light to activate them, and returns them to the body in order to attack a disease.

In the US the system is used to treat skin problems in patients suffering from cutaneous T-cell lymphoma and who have not responded to other treatments. It is approved in other countries to treat conditions such as Crohn's disease and organ transplants.

The acquisition would allow Mallinckrodt's specialty segment to expand its business in hospitals, giving it a larger presence in pain management and critical-care respiratory therapies in neonatal intensive care units.

According to Mallinckrodt, Therakos expects 2015 annual sales of around \$185-195 million and expects high-single-digit percentage growth. It added that the Cellex system has strong profit margins. (dw)

## Genzyme to Acquire AstraZeneca Rare Disease Therapy

Sanofi and its subsidiary Genzyme have agreed to acquire the Caprelsa (vandetanib) rare disease therapy of British-Swedish drugmaker AstraZeneca.

Sanofi said the acquisition builds on Genzyme's long-standing commitment and scientific leadership in the field of endocrinology globally.

Under the terms of the agreement, Genzyme will pay AstraZeneca up to \$300 million, including an upfront payment of \$165 million to acquire the global rights to sell and further develop Caprelsa, along with further development and sales milestone payments of up to \$135 million.

The transaction does not include the transfer of any AstraZeneca employees or facilities.

Currently available in 28 countries, Caprelsa is an oral kinase

inhibitor treatment indicated for the treatment of symptomatic or progressive medullary thyroid carcinoma in patients with unresectable locally advanced or metastatic disease.

The drug is in Phase III development for differentiated thyroid carcinoma, with trials expected to finish in the second half of 2015.

"Caprelsa is a strong strategic fit for our rare endocrinology portfolio and underscores Genzyme's commitment to addressing unmet needs in the thyroid community," said David Meeker, CEO of Genzyme.

The transaction is expected to be completed in the second half of 2015, subject to closing conditions that include antitrust clearance from the US Federal Trade Commission. (dw)

## American Chemical Society Lauds "Green" Bill

The American Chemical Society (ACS) has praised the House of Representatives' passage of legislation seeking to improve federal coordination, dissemination and investment in green chemistry research and development (R&D).

Purpose of the Green Chemistry Research and Development Act of 2007 is to provide safer, more sustainable technological options to replace traditional products and processes. Similar legislation was passed overwhelmingly by the House in each of the last two Congresses, but was not acted on in the Senate.

"Green chemistry is the ultimate proof that environmental and economic benefits in chemistry can be optimized simultaneously. The technologies that spin out of this novel research are the seeds that can

sustain small business ventures and green corporate practices," said ACS President Catherine T. Hunt. This, she said, "proves that that economics and environment are not mutually exclusive."

The bill dedicates resources at a number of federal agencies toward green chemistry R&D and improves interagency coordination. "By concentrating on sustainable economic practices in the chemical industry, we can move towards a more sustainable vision of the future," Hunt said.

Under the proposed legislation, the US National Science Foundation, the Environmental Protection Agency, the National Institute of Standards and Technology and the Department of Energy would work together to fund and coordinate green chemistry R&D. (dw)

## PEOPLE



Patrick Thomas

Patrick Thomas and Frank H. Lutz have been appointed as CEO and CFO respectively of the Bayer engineering plastics spin-off Covestro — the new name for Bayer MaterialScience (BMS) — with effect from Sept. 1. Thomas has been CEO of BMS since 2007, while Lutz joined the company in 2014. Lutz, whose responsibilities on the BMS Executive Committee up to now have included administration

and services along with the Europe, Africa and Middle East regions (EMEA / EEMEA), additionally will take over the function of labor director from Michael Bernhardt, who will leave the managing board to head an expanded Covestro Human Resources function.



Frank H. Lutz



Golnar Motahari Pour

Golnar Motahari Pour has been named as new president of DSM Dyneema. She succeeded Gerard de Reuver who stepped down after five years in the post on August 1. Motahari Pour is already familiar with DSM Dyneema, having been engaged with the company for several months, as an independent business strategy and operations consultant. She is well versed in materials sciences. From 1993 to 2007 she held several management positions at General Electric in the Plastics, Silicones and Consumer Products businesses. Prior to joining DSM, Motahari Pour was a member of the European Executive Committee responsible for Emerald Kalama Chemical's plasticizer business in Europe and the Middle East. She holds a master of arts degree & postgraduate studies in ecology from the University of Brussels.



Leonor Garcia

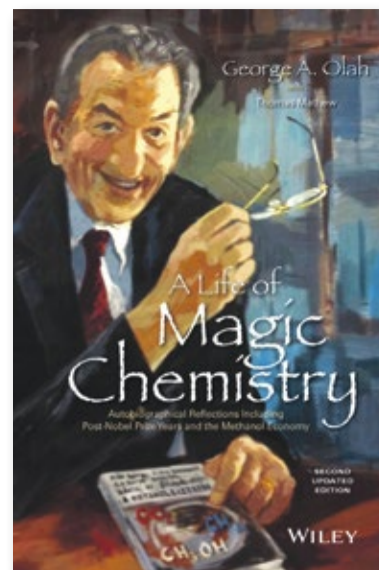
Leonor Garcia has been appointed as director public affairs of PlasticsEurope. She took up her new position on September 1, 2015. Garcia joined PlasticsEurope from Coca Cola, where she was director corporate scientific and regulatory affairs, responsible for providing thought leadership, strategic direction and driving all external advocacy and representation of the company's interests in external organizations related to food packaging safety. She also held positions at UCB Chemical Specialties (now Cytec/Allnex) and Exxon Chemical (now ExxonMobil). Garcia has dual Belgian and Spanish nationality and holds a PhD in physical organic chemistry from the Université Libre de Bruxelles.

## A Life of Magic Chemistry

In his autobiography Nobel Prize winner George Olah tells us about fascinating research into extremely strong superacids and how it yielded the common term „magic acids.“ Olah takes us on a remarkable journey from Budapest to Cleveland to Los Angeles-with a stopover in Stockholm, of course.

This book chronicles the distinguished career of a chemist whose work in a broad range of chemistry areas, and most notably that in methane chemistry, led to technologies that impact the processing and utility of alternative fuels. It is based on Olah's work on extremely strong superacids and inspires readers with details on his successful recent research on methanol, intended to help provide a solution to „the oil problem“.

An innovative scientist, George Olah is truly one of a kind. The book not only touches on his exhilarating life and pursuit for new chemistry but also reflects on the broader meaning of science in our perpetual search for understanding and knowledge.

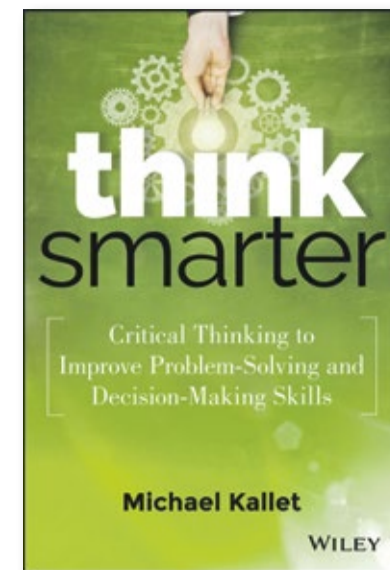


**A Life of Magic Chemistry**  
Autobiographical Reflections of a Nobel Prize Winner  
George A. Olah, Thomas Mathew  
John Wiley & Sons 2015  
Price: € 67.90  
ISBN: 978-1-118-84003-0

## Think Smarter

This is the comprehensive guide to training your brain to do more for you. Written by a critical thinking trainer and coach, the book presents a pragmatic set of tools to apply critical thinking techniques to everyday business issues. Think Smarter is filled with real world examples that demonstrate how the tools work in action. With dozens of practice exercises applicable across industries and functions, it is a versatile resource for managers and corporate training programs.

Thinking is the foundation of everything you do, but we rely largely on automatic thinking to process information, often resulting in misunderstandings and errors. Shifting over to critical thinking means thinking purposefully using a framework and toolset, enabling thought processes that lead to better decisions, faster problem solving, and creative innovation. Think Smarter provides clear, actionable steps toward improving your critical thinking skills, plus exercises that clarify



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## EVENTS



### „Chemiewende“ Start-ups Pitching Session, 25 September 2015, Berlin, Germany

The „Chemiewende“ (German for Chemistry Transition) describes the shift of the chemical industry based on finite fossil fuels to renewable feedstocks. More and more high-tech applications are developed in which expensive and harmful chemicals are reduced, re-used, and recycled leading to lower manufacturing costs. With growing recognition of this huge innovation potential for industry, Germany has begun to create an enabling environment for spin-offs from research institutes. These start-ups offer models of change demonstrating untapped green business opportunities to sectors still based on fossil fuels and other older technologies. At this unique side-event of the „Sustainable Chemistry Conference: the way forward“ 10 selected „Chemiewende“ start-ups will present their business models.

► [www.umweltbundesamt.de](http://www.umweltbundesamt.de)

### CPhI Worldwide, 13 – 15 October 2015, Madrid, Spain

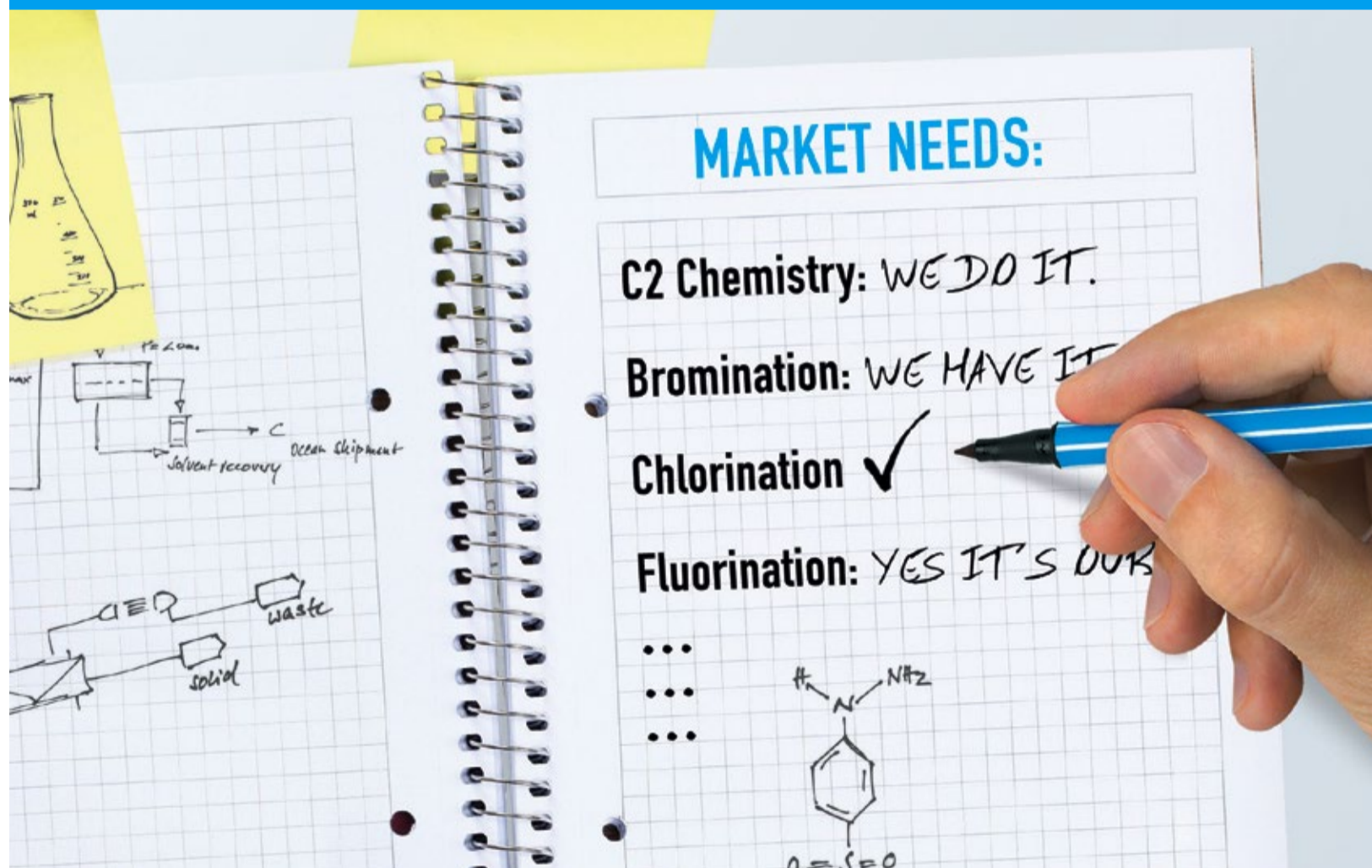
CPhI (Convention on Pharmaceutical Ingredients) Worldwide — the International exhibition on Pharmaceutical Ingredients and Intermediates — is the leading networking event and exhibition dedicated to pharmaceutical developments, trends, products and services, including contract services, excipients, ingredients, APIs, machinery, finished dosage forms and packaging. The show hosts over 36,000 attendees from 140 countries and 2,200 exhibitors, representing every step of the pharmaceutical supply chain from drug discovery to finished dosage. First held in 1990, 2015 marks the 26<sup>th</sup> edition of this prestigious and industry leading event.

► [www.cphi.com](http://www.cphi.com)

### Sustainable Cleaning Products Summit, 20 – 21 October 2015, Paris, France

The premier edition of this event will tackle the major technical and marketing challenges associated with green home care products. Organized by Organic Monitor, the aim of the summit is to advance sustainability in the home care industry by debating key issues in a high-level forum. The sessions and workshops will cover topics like trends & developments in the European market for green household cleaning products market, industry challenges & future projections, the growing array of green ingredients available for home care product formulations, green surfactants & emulsifiers, and how home care brands and ingredient firms can reduce their environmental footprints.

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



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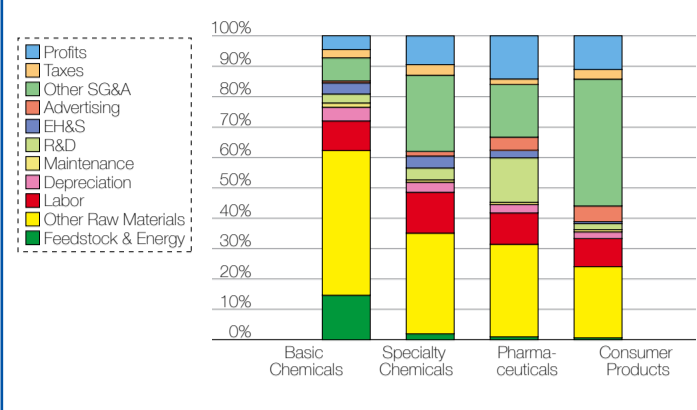
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## The US Business of Chemistry

Cost Structure in the US Chemical Industry by Segment

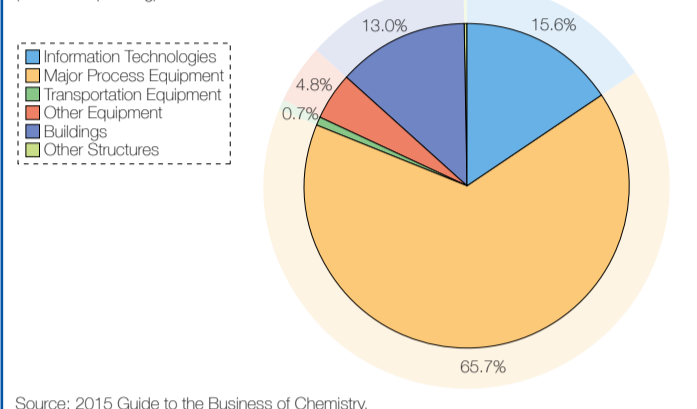


Source: 2015 Guide to the Business of Chemistry, American Chemistry Council © CHEManager International

Cost structure

The US is a global leader in chemical production, providing over 15% of the world's chemicals and representing 14% of all US exports. According to the Guide to the Business of Chemistry, published annually by the American Chemistry Council, the business of chemistry is also one of the US's largest manufacturing industries, an \$801 billion enterprise providing 804,000 jobs. Figure 1 presents typical cost structures over the business cycle for four of the five major segments of the chemical industry. Basic chemicals are dominated by costs for feedstock and materials. Pharmaceuticals and consumer products spend much more on advertising, research and development (R&D), and other sales, general, and administrative (SG&A) expenditures.

US Chemical Industry Capital Investment by Asset Type

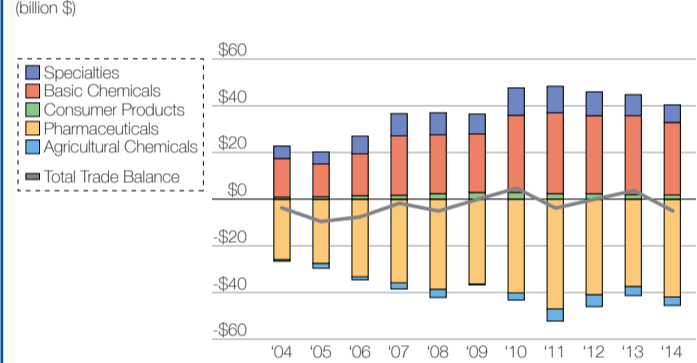


Source: 2015 Guide to the Business of Chemistry, American Chemistry Council © CHEManager International

Capital investment

The chemical industry has consistently been one of the largest US private-sector investors in new plants and equipment (P&E). Capital investment is comprised of two basic components: structures (e.g., buildings) and equipment (fig. 2). The equipment category is composed primarily of traditional process equipment such as storage tanks, heat exchangers, pipe, pumps, etc. A sizable portion of equipment spending in the business of chemistry is for information processing technologies. Investment in structures is mostly for industrial buildings and related structures, but also includes some minor spending for office buildings. Equipment is notably more important to long-term growth potential for the manufacturing sector and the business of chemistry as it is directly involved in the production process and embodies the latest in process technologies.

Trade Balance of the US Chemical Industry by Segment

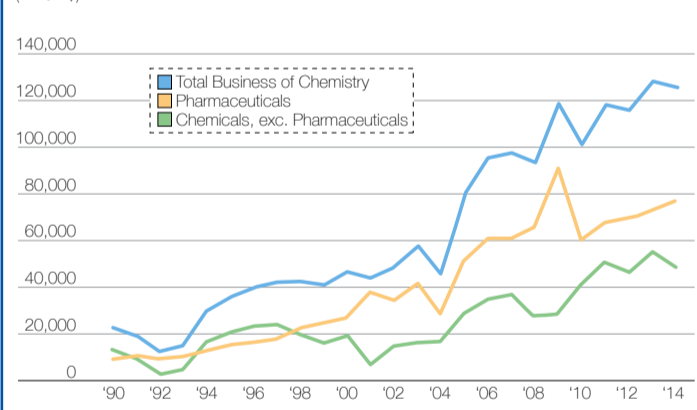


Source: 2015 Guide to the Business of Chemistry, American Chemistry Council © CHEManager International

Trade balance

From the 1920s through the early 2000s, the business of chemistry in the US maintained a trade surplus. The trade balance in chemicals reached a peak of \$20.5 billion in 1995. In 1997, the pharmaceutical segment posted a trade deficit for the first time, and that number has grown over the past two decades (fig. 3), indicating a continuing surge of finished pharmaceuticals, especially from Western Europe. In 2001, for the first time since reliable records were kept, the US (total) business of chemistry posted a trade deficit, a trend that continued over the subsequent decade. However, the United States' net trade in chemicals excluding pharmaceuticals has consistently achieved a trade surplus.

US Chemical Industry After-Tax Profits, 1990-2014



Source: 2015 Guide to the Business of Chemistry, American Chemistry Council © CHEManager International

Determinants of investment

Profit margins and capacity utilization rates are key drivers for P&E investment. One of the factors that drive the magnitude and composition of investment are after-tax profits (fig. 4). The 1990s were a period of slow and steady growth for companies engaged in the business of chemistry. In the early part of the 2000s, chemical companies were especially hard hit, as reduced capacity utilization, rising energy and other raw material costs, falling real prices, a downturn in end-use markets, and oversupply all contributed to declining margins. By 2010, the US business of chemistry began to experience another wave of growth, spurred in part by developments in shale gas, which made the US increasingly more attractive as a place to manufacture chemicals. (rk)

## Chemours to Close US TiO2 Plants as Part of Transformation Plan

Chemours, the former DuPont Performance Chemicals business, is to close its Edge Moor titanium dioxide (TiO<sub>2</sub>) plant located outside Wilmington, Delaware, USA, as well as a third production line in New Johnsonville, Tennessee.

The closures will remove roughly 150,000 t/y of TiO<sub>2</sub> capacity from the market. Chemours said the move will enhance production capabilities at its four other manufacturing plants and position it for growth in the TiO<sub>2</sub> industry.

The Edge Moor plant produces a grade of TiO<sub>2</sub> used in paper applications that have been declining steadily for years, resulting in underused capacity. Chemours said it will continue to provide customers with similar product from its Johnsonville plant.

Line 3 at Johnsonville is said by Chemours to be small scale and

high cost compared with its other production plants.

Production is planned to stop at both Edge Moor and Johnsonville at the end of September 2015. Chemours expects to complete decommissioning of the Edge Moor plant around March 2016 when it will begin dismantling the facilities which could take a year or longer, depending on the site's future use. The company said it will begin exploring options for the site's redevelopment immediately.

The closures are expected to reduce annual net costs by \$45 million. Non-cash charges of around \$110 million will be incurred in the third quarter, while additional restructuring and other related charges are expected to range between \$75 million and \$85 million during the next two to three years.

Approximately 200 people work at the Edge Moor plant and Chem-

ours said it will redeploy employees wherever possible.

The five-point transformation plan aims to transform the company by reducing structural costs, growing market positions, optimizing its portfolio, refocusing investments and enhancing its organization.

Restructuring initiatives are expected to save \$40 million in the second half of 2015, \$200 million in 2016 and \$350 million in 2017.

Chemours has begun evaluating strategic alternatives for its Chemical Solutions segment, excluding the cyanide business where it will focus on investing for growth. It will also continue to ramp up its Opteon refrigerants business.

An expansion of its Altamira TiO<sub>2</sub> production plant in Mexico is scheduled to start up in the middle of next year. (eb)



**Keeping an Eye on Safety** – With the arrival of summer, many people decide to get a new pair of stylish sunglasses. Regardless of style, sunglasses have to provide effective protection against harmful UV light and must be highly sturdy to avoid health damage. This combination of features represents a special challenge for manufacturers as sunglasses have to withstand enormous stresses like heat, sand, dust, and creams. Eyeglass frames and lenses made of high-quality materials such as Evonik's Trogamid don't become brittle or hard, but consistently maintain their quality. This material offers a wide range of creative choices, as it is flexible yet extremely resistant, and allows for highly delicate processing. Since the substance is also transparent, it can be tinted in any imaginable color. (rk)

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