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THE NEWSPAPER FOR THE CHEMICAL AND LIFE SCIENCE MARKETS

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Find out what trends influenced the industry in 2011

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Effective scheduling is absolutely critical to achieving sustained success in chemical production.

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AkzoNobel is investing €45 million in a new DCP plant at its Ningbo multi-site in China.

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Saudi Arabia: Rise of a Global Chemical Hub

The Petrochemical Powerhouse in the Gulf Region is Aiming for Downstream Diversification

Changing World – With its bounty of oil reserves, Saudi Arabia has established itself as a major player in the worldwide petrochemicals market. The country's largest public company, SABIC, has joined the ranks of the world's top 10 chemical companies, thanks largely in part to its secure access to affordable feedstock. However, the country knows that its feedstock advantage is a finite one; with the Saudi Downstream Initiative, it hopes to compete higher in the value chain through specialty and performance chemicals. Brandi Schuster asked Dr. Josef Packowski, Managing Partner at Camelot Management Consultants and Abdusalam Al-Mazro, CEO of Al-Mazro Consulting and Camelot's regional partner about the initiative and the prospects for foreign companies looking to invest in Saudi Arabia.

Dr. Josef Packowski
Managing Partner at Camelot Management Consultants

Abdusalam Al-Mazro
CEO of Al-Mazro Consulting

CHEManager Europe: The Saudi government supports the building of a global chemicals hub massively through the "Saudi Downstream Initiative." What are the drivers of this initiative?

Dr. J. Packowski: In the market outlook "Arabic Spring," Camelot has analyzed the four phases of economic development of Saudi Arabia: In the early 1980s the Kingdom developed an integrated strategy for petrochemicals mostly based on the associated natural gas. Then, until the millennium, the oil price boomed and led to an increased ethane production. This is why the manufacturing complexes increasingly based on mixed feedstocks.

In the third phase, other countries followed the Saudi example until the available ethane was almost fully utilized. The limited availability of natural gas resulted in oil and naphtha as remaining base for the chemical production.

The current fourth phase is marked by downstream diversification towards specialty and performance chemicals in order to profit from higher parts of the value chain. The changeover to naphtha offers a broader chemical base. This strategy is backed up by massive governmental support: With an estimated investment volume of $170 billion over the next five years, the Gulf region is about to become one of the leading global hubs for the global chemical industry.

Does Saudi Arabia have the work force to handle this expansion?

A. Al-Mazro: Besides the economic reasons, the Saudi Downstream Initiative is also meant as a reaction to the demographic development: The size of the Saudi labor force has risen from 1.2 million in the late 1960s to 3.2 million 40 later. And it is still increasing by an average annual rate of more than 3 %. Especially the skilled labor has grown: The student enrollment has increased from 0.6 million to almost five million – this means an average annual growth of 7 %. The government is supporting this development by sponsoring the Human Resources Fund, which provides for the training of operators and technicians in selected institutes in Saudi Arabia. Forecasts show that by 2020, there will be around five million more people of working age in Saudi Arabia with a further seven million by 2035. The Kingdom is rapidly building human resources for a knowledge-based economy that is less dependent on oil. But of course all these highly-qualified people must be provided with highly-qualified jobs.

Which role does the Gulf Petrochemicals & Chemicals Association (GPCA) play for the global chemical industry?

Dr. J. Packowski: The GPCA was the first trade association in the Gulf region. Camelot has been an associated member since the foundation in 2006 next to few other companies from abroad like BASF or Linde. The founding members include SABIC, Tasnee, Qapco, QVC, Borouge, GPIC, PIC and Equate. Today the members of the GPCA represent a significant share of the non-oil GDP of the Gulf region as major providers of jobs and the source of vital raw material for a wide range of downstream industries. For Camelot, the annual GPCA Forum is one of the most important events in the industry — with representatives from almost all leading global chemical companies participating. This year the forum will make a clear statement on growth: In contrast to almost all other regions of the world the GCC region is still growing. The message is that petrochemicals growth and the investment climate in the region remain very attractive.

How is the evolution of the GCC economies changing the global chemical industry?

A. Al-Mazro: The global chemical value chain is changing dramatically right now. More and more of the established chemical companies are entering the Gulf states through partnerships with the new local players. These partnerships are not just locally active; they are expanding and diversifying their activities to growth markets like the Asia-Pacific region or new industries. Just take a look at two of the GPCA mebers: Borouge, a leading provider of plastics solutions, was created as a venture between the Abu Dhabi National Oil Company (ADNOC), one of the world's major oil and gas companies, and Austria based company Borealis, a leading provider of chemical and innovative plastics solutions.

In 2010 Borouge tripled its annual production capacity in Abu Dhabi to two million tons and an additional 2.5 million tons per year will be introduced by mid-2014 to create the world's largest integrated polyolefins plant. But Borouge is not just a regional player: The company is also investing in plants and logistics hubs in Asia.

Or take Tasnee, the National Industrialization Company as an example for diversification. The company was founded 1985 as the first Saudi Joint-stock company wholly owned by the private sector. Tasnee has invested selectively in many diversified downstream industries since its establishment. Today the company erects, manages, operates and owns petrochemical, chemical, plastic, engineering, and metal projects.

How open is Saudi Arabia to 100% foreign investment? Chemical companies setting up in the region would be up against tough competition — 70% of SABIC's shares are owned by the Saudi government and private-sector shareholders are from Saudi Arabia and the GCC.

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The end of the world as we know it? With its Saudi Downstream Initiative, the country is looking to enter into markets higher in the value chain to diversify away the finite world of petrochemicals.

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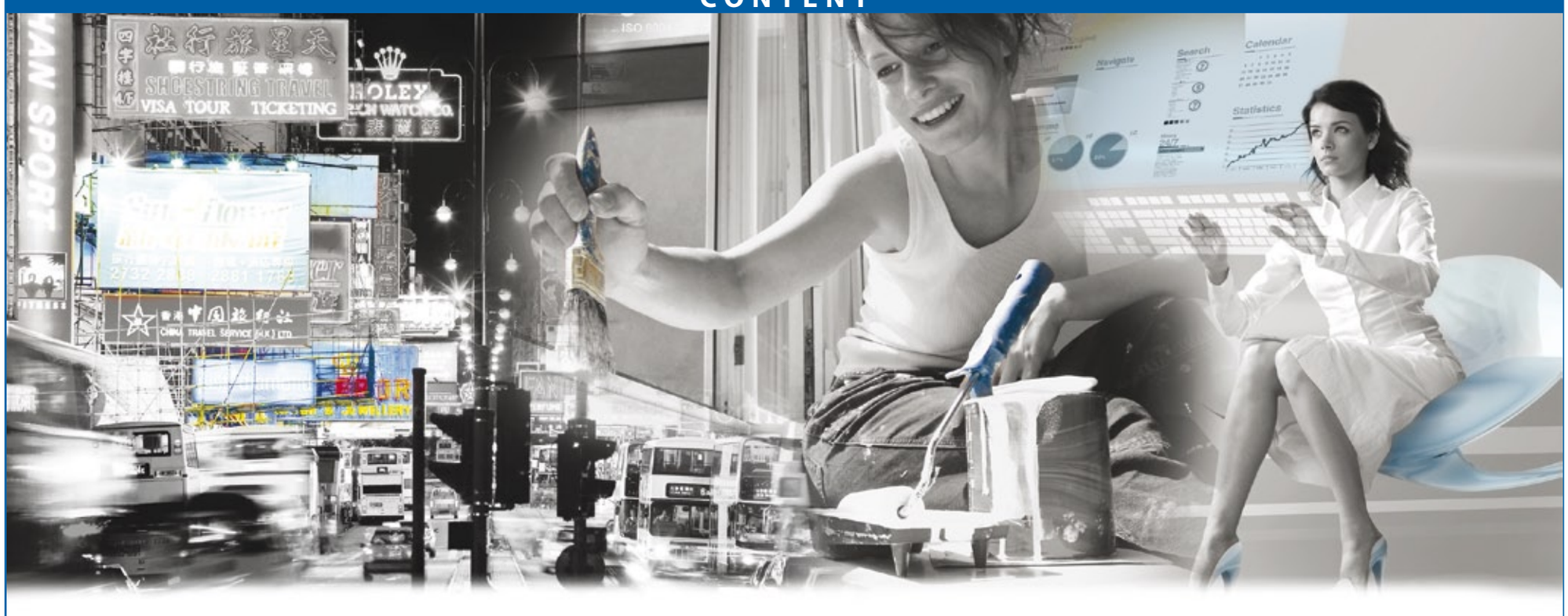


Bayer CropScience Targets Non-GMO Wheat Traits

Bayer's CropScience unit plans to develop new heat- and drought-resistant wheat traits over the next decade without the use of genetic modification, a top executive said. But Europe, the world's top wheat producer, must overcome its fear of agricultural innovation such as genetically modified (GM) crops or risk undermining its own food security, the division's chief executive officer, Sandra Peterson, told Reuters in an interview.

Bayer has announced a series of deals and partnerships to increase its access to wheat seed traits, or "germplasm," as part of its program to develop improved varieties of the world's biggest cereal crop by planted area.

"The thing that has not had enough attention is really thinking about how to use modern breeding techniques to really look at the germplasm pools and find ways to actually improve yields, and to improve the heat and drought tolerance of these crops," Peterson said.

By using marker-assisted breeding techniques, which enable plant breeders to screen huge numbers of seeds for desired traits such as drought-resistance, Petersen said the company will be able to develop new varieties much more quickly.

Sandra Peterson
CEO, Bayer CropScience

Anti-Technology

According to extracts of a speech she was due to give at the World Agricultural Forum in Brussels, Peterson warned European Union policy makers that such technological innovations will only be possible in the right regulatory environment.

"Our industry is not concerned that we might run out of innovative ideas to safeguard crops, but we are concerned about the regulatory and political obstacles on the last mile to the market."

Public opposition to genetically modified crops has led several EU governments to ban their cultivation, and at less than 100,000 hectares, GM crop production in Europe is a tiny fraction of the global total.

Recent proposals to reform the EU's €55 billion-a-year farm policy, including plans to make European farmers adopt new environmental practices, went in the wrong direction, she told Reuters.

"Saying you must rotate three crops a year, a certain %age of your land must be set aside, and some of the other proposals, my sense is that it's a little anti-technology, and the ability of European farmers to feed Europe is reduced as a result."

"It's critically important for Europe to have a different way to think about the role of agriculture in society and the economy here. Unfortunately, the trajectory we're on is not necessarily the right trajectory for the economic health, but also the social health of Europe." ■

Arkema Sells Vinyl Unit to Klesch Group

Arkema is offloading its loss-making vinyl division to Switzerland's Klesch Group, as it refocuses on products that are less sensitive to volatility in raw material prices and the economic cycle. The transfer of the division, which has suffered from a downturn in the European construction market, should lead to exceptional net expenses of around €470 million ($634 million) in 2011, including a cash charge of about €100 million for Arkema, the company said in a statement.

"It's before the large cyclical reversal everyone was waiting for, so even if they pay €100 million to get rid of it, it's not the end of the world," Societe Generale analyst Patrick Lambert said.

He added that the market now no longer had any reason to apply a discount on the shares based on the cyclical nature and negative impact of the vinyl business.

Arkema said the project would not entail any restructuring of the manufacturing plants involved, while 1,780 employees in France and 850 outside the country would be transferred to the new entity, headquartered in Lyon.

Arkema's Vinyl division generated 19% of group sales in 2010 against 25% in 2005. Sales reached €1.1 billion and have remained little changed since 2008.

The division made a loss before interest, tax, depreciation and amortization of €14 million in 2010, after a €31 million loss in 2009.

"This divestment of the loss-making vinyl division is a strategic good move for Arkema," a Paris-based trader said.

Vinyl is one of Arkema's three business segments, alongside industrial chemicals and performance products. ■

AkzoNobel, Fluorchemie Create CF Carbons JV

AkzoNobel Industrial Chemicals and Fluorchemie have announced the establishment of joint venture called CF Carbons GmbH. The JV will be used for the production, marketing and sales of the fluorocarbon HCFC22 (R22) in Frankfurt, Germany. Financial details were not disclosed.

The 50/50 joint venture of CF Carbons which will be effective as of Jan. 1, will formalize an existing relationship and will provide long term stability to AkzoNobel, Fluorchemie and the customers of R22. AkzoNobel brings to the joint venture its knowhow about chlorine production, whereas Fluorchemie brings the production assets and its fluorine knowledge. The R22 plant has a production capacity of 24kt/year.

The joint venture will have its operation in Frankfurt am Main, where AkzoNobel is investing €140 million to convert its chlorine plant in Frankfurt to state-of-the-art membrane electrolysis technology. ■

BASF Ups 2020 Sales Goal to €115 Billion

German chemicals company BASF raised its 2020 sales target a quarter to €115 billion, banking on population growth in emerging markets to drive demand. BASF, the world's largest chemical company by sales, said it expected earnings before interest, tax, depreciation and amortization (EBITDA) to reach €23 billion by 2020, helped by cost-cutting and growing sales in emerging markets.

On the way to that target it aims to have 2015 EBITDA of €15 billion, up from €11.1 billion last year. Its prior 2020 sales target was €90 billion. In the long term, emerging markets should account for 45% of sales at its core chemicals and plastics business, excluding its oil and gas unit, up from about a third last year.

Dr. Kurt Bock
CEO, BASF

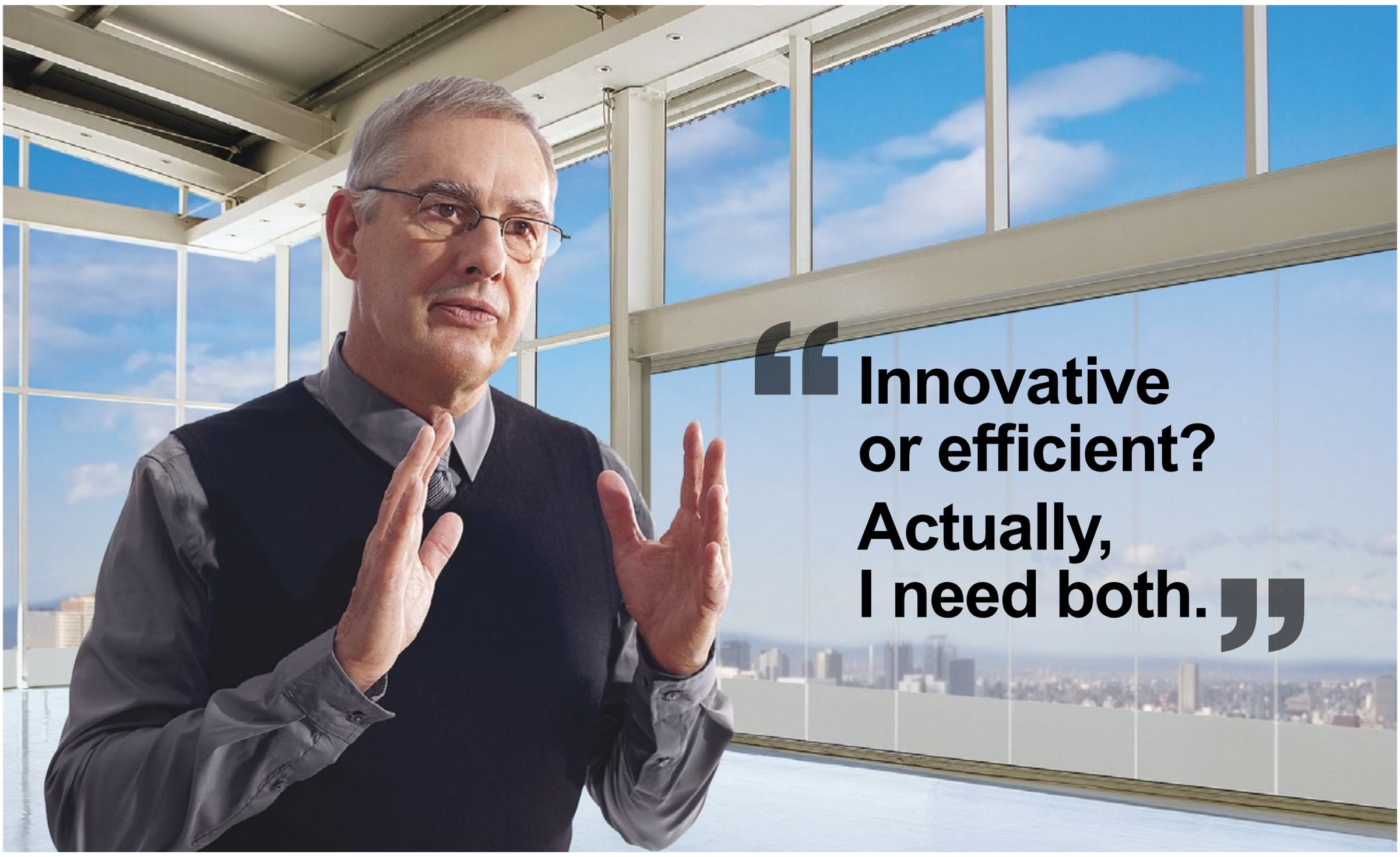
"We already have leading positions and fast growing businesses in emerging markets, and this is something we will build on," chief executive Kurt Bock said.

The group said it expected the chemical industry's annual production volume to rise an average 4% and that BASF would grow two percentage points faster than this. ■

India's Piramal to Boost Financial Business

Piramal Group plans to lend up to $193 million to real estate projects in the current fiscal year to March as it focuses on building its newly launched financial arm, its chairman Ajay Piramal said.The group also aims to set up a team by the end of March to look for opportunities to fund large projects such as power and road construction, sectors in which the government is hoping to rope in private-sector participation in a big way.The financial arm, which was launched this year, aims to lend between 7.5 billion rupees ($145 million) and 10 billion rupees by next March.

Piramal made global news last year for selling his India drugs business to Abbott Laboratories for $3.72 billion. Later, the group sold its diagnostic services unit to India's Super Religare Labs for about $132.6 million.Post the two major divestments, market speculations have swirled about the group's investments outside the pharmaceutical sector. Besides the financial business, Piramal said there were other investment opportunities the group would consider to tap in the near future but declined to elaborate. ■



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Deal Decline

PwC's Latest Report Examines M&A in the Chemical Industry


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Megadeals – What trends are influencing deals in the chemical industry? There are several, according to the latest edition of PricewaterhouseCooper's (PwC) Chemical Compounds report, which analyzes M&A activity in the global chemical industry. The report finds that while the number of M&As dropped during Q3 2011, the proportion of megadeals (deals valued at $1 billion or more) increased. This also suggests that strategic investors are remaining active. Also, a desire to supplement organic growth and to expand into new markets is driving many companies' M&A efforts. Chemical companies continue to benefit from recent cost cutting and streamlining initiatives, and as cash balances increase, resources are becoming available for larger and more ambitious deals. The report also shows that deals in China dropped more than 55% in volume and value compared with the previous quarter. However, the analysts weren't surprised: Growth in the slowing Chinese economy – impacted by recent domestic policies and weaker international demand for the country's goods – is expected to fall below double digits for the near term, and China's targeted economic growth rate is 7%, the report states.

2Q & 3Q 2011 Deal Activity and Value Lowest Since Q4 2009

While deal volume continued to decrease in Q3 2011 compared with the previous quarter, deal value improved slightly, to $16 billion. Fewer deals are closing, but they are larger; However, with the exception of Q2 2011, this quarter's deal values are the lowest since fourth-quarter 2009.

The number of deals announced in third-quarter 2011 declined almost 20% from the second quarter, from 286 to 231. However, for the same period, total deal value increased, gaining almost 6.4%, to $16.7 billion. This improvement in deal value was driven in large part by increased deal value for megadeals in the third quarter. While the number of megadeals announced remained steady at four, deal value increased almost 12% to $11.7 billion. Total deal value for medium-sized deals (valued at more than $500 million but less than $1 billion) improved as well, increasing from zero to almost $2 billion. On the negative side, however, smaller deals (valued at $50 million up to $500 million) declined almost 43%, from $4.2 billion to $2.4 billion this quarter.

The Role of Private Equity

Over the past few years, private equity firms have faced considerable fundraising challenges, deterring their participation in the deal environment. Until recently, their involvement remained weak, as availability of credit and low returns constrained M&A activity. In 2010, financial investors' contribution to M&A activity increased to the highest levels since the recession began, setting the stage for further improvement. However, that trend reversed this quarter, as financial investments accounted for only 1.25% of deal activity. This is the lowest proportion since PwC began tracking activity by investor group in 2006. This shift may be due to the relative advantage that strategic investors have given their ample cash stockpiles. Although the largest deals announced this quarter were not private equity exits, it seems reasonable that currently high M&A valuations could lead PE investors to seek to divest chemical portfolio holdings to strategic investors. This would seem to be the preferred exit strategy for many PE firms, as compared with initial public offerings, given the recently poor equity market performance.

Four Megadeals in Q3 2011

There were four megadeals in the third quarter, the same as in the second quarter. However, deal value for the third quarter megadeals was $11.7 billion, compared with $10.5 billion in the second quarter. Of the four megadeals announced in the third quarter, three were valued between $1 billion and $5 billion, and the fourth was valued at more than $8 billion. Three of the four were by U.S.-based acquirers, and the fourth involved a U.S.-based target.

The highest valued deal this quarter was the announced $8.11 billion merger in July of U.S.-based cleaning and sanitation products manufacturer Ecolab with water treatment chemical producer Nalco Holdings.

In the second deal, in September, U.S.-based Tronox, the world's third-largest producer and marketer of titanium dioxide pigment, agreed to acquire the mineral sand operations of Exxaro Resources, a South Africa-based iron ore and coal mining company, for approximately $1.3 billion. Exxaro's mineral sands operations produce the key titanium bearing ore feedstock used in the production of titanium dioxide pigment.

In the only mega-deal not involving a U.S.-based acquirer, it was announced in July that Switzerland's Lonza Group will acquire all of the shares of U.S.-based Arch Chemicals. The deal is valued at $1.2 billion. The merger helps Lonza Group diversify its product line, and after completion of the deal, Lonza will have the world's largest microbial control business.

Also in July, U.S.-based specialty chemicals manufacturer OM Group announced that it would acquire Vacuumschmelze of Hanau, Germany, a global market leader in advanced materials and specialty magnetics. The deal was completed in August with consideration in the form of cash and common stock valued at approximately $1 billion. The acquisition of Vacuumschmelze, which makes advanced materials for industries such as automotive, clock manufacturing, electrical engineering, and electronics, is expected to help OM Group enter the alternative energy market.

Finally, although not included in the deal activity, it should be noted that in July, the Dow Chemical Company announced a joint venture with Saudi Aramco to create a chemical company called Sadara to develop the world's largest integrated chemical site. With an expected annual capacity of 3 million tons, the facility will be located in Jubail Industrial City II (Saudi Arabia). Valued at approximately $20 billion, construction is expected to begin by year-end. This deal is an example of further movement into this region.

What About BRIC?

In line with lower deal activity in the third quarter, the level of activity related to BRIC countries for deals valued at $50 million or more declined as well. Of nine deals announced for BRIC targets, four were for targets in China, and four were in Brazil. Of nine deals announced by BRIC acquirers, four were by Chinese companies and two were by Brazilian companies. While an improvement for Brazil, this was a decline in activity of more than 55% for Chinese targets and acquirers. Of the four Chinese deals, all were local market, and while the Chinese market may continue to consolidate, some overseas expansion can be expected in the future by the largest producers. Overall, Chinese deal activity fell to 49 deals (all values including undisclosed) in the third quarter, a decline of almost one-third from the previous quarter, indicating that recent consolidation activity might be slowing.

North America and Europe Drive Local Deal Value

North America and Europe drove local deal value in the first three quarters of 2011, with $30.9 billion and $18.6 billion, respectively. Deal volume was driven by 31 local deals in Asia and Oceania, many involving China. However, these deals were, on average, substantially smaller than those in more developed regions. The increase in North American deals was driven by activity in the United States, with a variety of regions making deals there; all four of the megadeals involved either U.S.-based targets or acquirers. Europe, on the other hand, was the primary driver for outbound volume and value, with 13 deals valued at $8.6 billion in the first three quarters of 2011. This could be due to European investors seeking higher growth rates than may be available from domestic economies, as well as concerns about local economic conditions.

Conclusion

The third quarter saw a further decline in deal volume, but as the proportion of megadeals increased compared with the previous quarter, deal values climbed. Average deal value increased more than 50% over second-quarter 2011, although it remains below recent levels. Financial deals declined drastically during the third quarter, falling to only 1.25% of total deal volume. Given economic concerns, financial investors might be looking to less cyclical sectors for new investment. Debt fears in the eurozone also add to a general pessimism regarding the economy.

While financial uncertainty remains a reality for global markets, PwC said it expects continued recovery in the chemicals deal market, although at a slower pace than had been predicted earlier last quarter.

To read the report in full, go to: http://ht.ly/7CBok

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Johnson Matthey H1 Beats Forecasts, Sees Stronger H2 Johnson Matthey, the world's largest supplier of catalytic converters, posted a 24% rise in first-half profit, helped by truck sales in North America, and said it expected a stronger second half thanks to resilient demand.The specialty chemicals company said customer demand was holding up in most regions, despite some "fragility" in southern Europe, with key segments like the North American truck market also holding up in the face of a global slowdown.That allowed the group, for whom emissions legislation is key to demand, to forecast second-half results "slightly ahead" of the first six months of the year.

Underlying profit before tax came in at 203 million pounds ($317.6 million), up 24%, compared with a consensus of analysts' forecasts of 194.1 million, according to Thomson Reuters I/B/E/S.

Lanxess Achieves Record Q3 Lanxess achieved a record third quarter in 2011 due to ongoing strong demand especially for its synthetic rubbers and high-tech plastics. The company also reiterated its full-year outlook for EBITDA pre exceptionals to grow about 20% year-on-year and thus exceed the €1 billion mark for the first time in the company's history. Sales increased by 26% year-on-year to €2.3 billion. Lanxess increased prices in all segments in order to fully pass on higher raw material costs. Volumes were stable and currencies were negative due to the weak dollar. There were positive portfolio effects from recent acquisitions, above all the Keltan EPDM rubber business.

Israel Chemicals Upbeat as Q3 Profit Jumps Fertilizer and specialty chemicals maker Israel Chemicals (ICL) posted sharply higher third-quarter net profit, boosted by strong demand, price increases and acquisitions and sees European fertilizer demand picking up in early 2012.ICL, the world's sixth-largest producer of potash, said the financial crisis "is darkening the economic atmosphere" in Europe.

"Farmers and fertilizer distributors are wary of commitment and are especially anxious about holding on to stocks lest prices fall if a crisis occurs," ICL said.

But, it added: "As the spring fertilizer season approaches in Europe fertilizer demand is expected to resume at the end of the fourth quarter 2011 and the first quarter of 2012."

Kemira Cuts Profit Outlook on Weak Chemicals Demand Finland's Kemira warned full-year profit could fall as demand for chemicals from its paper industry and municipal water authority customers weakens. The company said it now expected full-year core operating profit to be at the same level or slightly lower than the €162 million reported in 2010. It had previously forecast an increase.

It also said mild weather in Europe had put back its de-icing product deliveries for airport runways, while high raw material prices also squeezed the company's bottom line.

Thai PTT Q3 Profit Meets Forecasts, Sees Q4 Recovery PTT, Thailand's top energy firm, reported a 0.4% fall in quarterly net profit, held down as expected by foreign exchange losses, lower gas sales volume and weaker profits from its refinery and petrochemical businesses. Earnings at PTT, Asia-Pacific's third-biggest listed oil and gas firm by market value, are expected to improve in the fourth quarter as a recovery in gas demand and higher oil prices should help offset the impact of floods in Thailand, analysts said.

Thailand's largest listed company by market value posted a July-September net profit of 21.6 billion baht ($703 million), or 7.57 baht per share, down marginally from 21.7 billion baht a year earlier.

Nine analysts polled by Reuters had on average estimated net profit would be 21 billion baht.

PTT earnings were weaker than those of regional peers, which reported a rise in quarterly net profit as strong oil and gas production growth offset refining losses.

Braskem Books Deep Loss on Currency Swing Brazil's Braskem, the largest petrochemical company in the Americas, booked a steep third-quarter loss as Brazil's tumbling currency drove up the cost of its foreign debts. Braskem posted a net loss of 1.046 billion reais ($588 million) compared to a 532-million-real profit a year ago.

The plunging local currency drove up the cost of Braskem's debts, 70% of which are denominated in dollars, adding to a financial loss of more than 2 billion reais.

Braskem said the currency swing had no short-term effect on cash flow, as the company's dollar debts have an average maturity of 17 years.

Earnings before interest, taxes, depreciation and amortization, a gauge of operating profit known as EBITDA, fell 9% to 940 million reais on the rising cost of raw materials and mounting competition in the Brazilian market.

Arkema Q3 Sales Volumes Down 4% French specialty chemicals group Arkema revealed a near 4% fall in third quarter sales volumes on, showing how tough times could lie ahead for the industrial sector in Europe. Arkema, which kept its earnings goals for this year and through to 2015, said some clients had become increasingly cautious in managing their stock levels at the end of the third quarter and added this would likely amplify the usual slowdown in its business in the last three months of the year.

Third-quarter sales volumes dropped 3.7%, which Arkema blamed on a tougher construction market in Europe, echoing comments by rivals such as Bayer and industry leader BASF.

Arkema, like its peers, is sensitive to the economic cycle as it makes a range of ingredients for products like paints, detergents and shampoos used in a host of industries including construction, packaging, cars and electronics.

Construction accounts for about 20% of Arkema's sales and the group's activities centre on PVC or plastics in Europe, including pipes for gas or water or window profiles.

Market Drivers

Trends in the Chinese Chemical Industry

Chinese Overview – Throughout the year 2011, we covered several aspects of the chemical industry in China, ranging from R&D cooperation to strategy development and the tendency of multinationals to localize their China activities. We also specifically looked at the situation in specialty chemicals.

Dr. Bernhard Hartmann
Managing Director, A.T. Kearney China

Dr. Kai Pflug
CEO, Management Consulting – Chemicals

It seems fitting to finalize this series with a general overview of current trends in the Chinese chemical industry. We will describe trends in the production of chemicals, in the market for chemicals and in the way companies adapt their strategies to the changes in China (fig. 1).

Trends in the Production of Chemicals

One of the most striking trends in China is the continued buildup of capacity even for those products for which capacity utilization is already quite low. PVC is a good example for this phenomenon. In 2010, there were approximately 20 domestic projects leading to growth of PVC capacity (either setup of new lines or expansion of existing lines). Given that domestic consumption increased by 17% from 2009 to 2010 and that China imported substantial amounts of PVC, this expansion at first glance seems to make some sense. However, capacity utilization in 2010 was only around 50%, severely limiting the prospects of the new capacity coming onstream. And China's antidumping tariffs on PVC coming from selected countries shows that the domestic industry may simply not be sufficiently competitive. The overall situation is quite similar for methanol while for other chemicals such as aniline, capacity utilization is far below 50%.

With regard to production technology, China is striving for upgrades. In titanium dioxide, this means that local Chinese producers shift from the low-end anatase varieties to the higher-end rutile varieties. At the same time, China is also looking at technologies not fully established elsewhere and trying to gain technology leadership. The most prominent example is the rise in coal chemical projects.

Environmental protection is becoming increasingly important in the production of chemicals – particularly as the government has to cope with protests from the emerging middle class, which have occasionally been directed at chemical factories such as a planned PX plant in Xiamen. This trend is particularly strong in the more developed regions in China's east, where more and more chemical production is shifted to dedicated chemical parks.

At the same time, production capacity is shifted to Western and Central China. While the weaker environmental regulation in these poorer areas is one reason, another is the government promotion of more evenly spread nationwide development. Currently, Chongqing in central China is such a focal point of investment, with BASF followed by other multinationals in setting up production.

Trends in the Market for Chemicals

Domestic overcapacity has led to severe price pressure for some chemical products in China, such as polysilicone. This will lead to further reduction of investment in this area and has also led to government restrictions with regard to buildup of new capacity. For other chemicals, price pressure comes from cheap imported materials. Antidumping rulings are an indication of such price pressure. Though the number of antidumping cases has been slightly declining, it is still relevant for several important chemicals such as methanol, chloroform, butandiol and phenol.

Exports will increasingly have a positive effect on the Chinese chemical industry. Several producers of bulk chemicals such as acetic acid, but also of more special type materials (e.g., in water treatment) have already done substantial efforts to achieve Reach registration in order to open up the European market. Strengthening export segments for Chinese producers include areas such as pesticides, which increased by about 20% from 2009 to 2010. Feed additives and vitamins are other well-known segments with strong Chinese exports. For some chemicals such as vanillin, exports probably account for around 80% of Chinese production, and this figure may rise further.

Perhaps the most important trend in the Chinese chemicals market refers less to the type and more the quality of chemical products produced. Indeed the quality of many basic chemicals such as MDI has now achieved global standards, while in other areas such as specialty and high-end chemicals there still is room for improvement. Indeed, as described elsewhere, the competition between domestic and multinational chemical companies will largely take place in the growing mid-level segment of the chemicals market. This market is targeted by domestic companies from below – which mainly required improving the quality of their products – as well as from the top by multinationals – which requires the adaptation of global products to domestic cost structures.

The underlying reason for the shift towards higher quality is the growth of the Chinese middle class. Apart from this general shift, the more consumption-oriented middle class will also have specific effects on the growth of individual chemical segments. Chemicals used in the production of small and large consumer goods, such as pigments for cosmetics or plastics for cars, will have a higher growth rate than purely investment-driven chemicals.

Reactions of Domestic Chemical Companies

Domestic Chinese chemical companies are aware of the trends in their environment and adapt their business activities to them. While in the Western world chemical companies have already for a long time moved from commodities to specialties, this trend is still in the earlier stages in China. A leading player is ChemChina, a company trying to establish itself as a domestic leader in specialty chemicals. Other major companies such as Sinochem so far have only made minor moves in this direction, even though it seems from discussions with their management that the need for such a development is recognized. However, for every example of a Chinese chemical company expanding into specialties, another example of a specialty company looking for upstream integration into raw materials can be found. Therefore this trend will progress quite slowly.

A clear trend has been for major petrochemical companies to secure raw materials supply abroad. Pushed by the Chinese government, Sinopec, CNOOC and Petrochina all will continue to acquire gas and oil resources outside of China. A related move is to invest in coal-to-chemicals processes as domestic chemical companies see coal as a more reliably available source than crude. However, it is unlikely that the current boom in these projects will continue as China's coal reserves are not unlimited.

In contrast to securing raw materials, there have so far only been surprisingly few acquisitions with the goal of improving market and technologies, such as the Sinochem JV with DSM in anti-infectives or the acquisition of Makhteshim Agan by ChemChina. Many more of these deals will happen if Chinese specialty chemicals companies truly want to become global players.

A final trend among domestic companies is to cooperate or even to consolidate operations. This is partly due to the fragmented nature of many markets. However, more and more it is also active government policy to promote consolidation. One of the tools is to establish minimum capacities for newly established production of many chemicals, another to tighten environmental regulation.

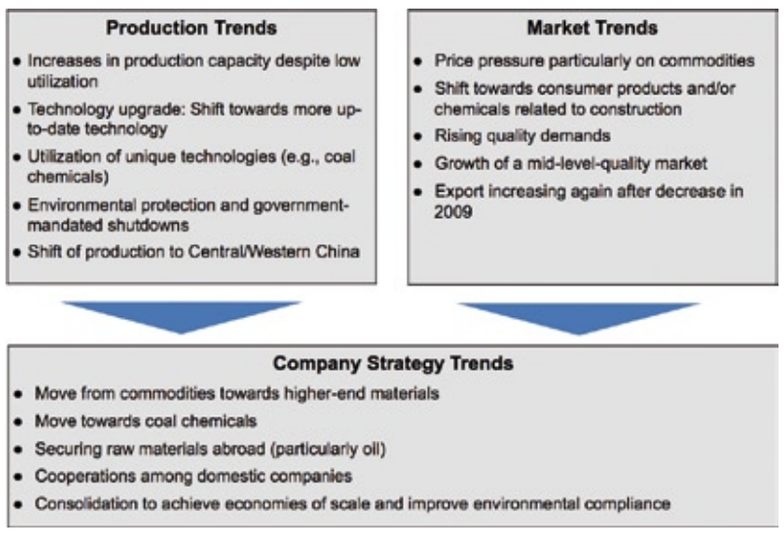

Fig. 1: Trends in the Chinese chemical industry

So What Is Really Different from the Rest of the World?

Whenever discussing trends in the chemical industry, similar buzzwords tend to come up. Commoditization, consolidation, globalization, innovation, sustainability, etc. All these issues are also relevant for China. The key difference compared to Western countries is the larger role the government plays in these developments. It is much more active – though not necessarily more successful – in steering production capacities, merging companies, creating domestic champions and promoting innovation. Only with regard to environmental aspects, its role is roughly similar to that of Western governments. This big difference will also shape all chemical industry trends in China, and give them distinctly Chinese characteristics.

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Sustainable Or Not?

The Importance of Life Cycle Analysis for Chemical Companies

Great Benefit – The assessment of sustainability is widely discussed, yet sustainability analysis already provides a great benefit for companies. Dr. Andrea Gruss talked about this with Dr. Rainer Griesshammer, member of the executive board at the Öko-Institut in Freiburg, Germany.

Dr. Rainer Griesshammer
Member of the Executive Board, Öko-Institut (Institute for Applied Ecology)

CHEManager Europe: How can we analyze sustainability of a chemical product?

Dr. R. Griesshammer: For this purpose, the entire life of a chemical has to be tracked, from raw materials through production and application to recycling. The entire product life cycle should be analysed in terms of innovation potential, benefits, and ecological and economic impacts. The chemical industry is doing this successfully for many of their innovative products: A prime example is the development of new materials for thermal insulation or lightweight materials for automotive applications.

Is an analysis also carried out for the sustainability of chemicals whose benefits are called into question?

Dr. R. Griesshammer: The method PROSA – Product Sustainability Assessment – principally also analyses the benefit of products, which is the crucial factor in determining whether or not the product is successful on the market. If there are negative social or environmental aspects, it is obviously important to know whether the benefits of the product are significant or not. This becomes particularly obvious in the EU chemicals legislation Reach, which requires a socio-economic analysis (SEA) for "substances of very high concern" on whether the social benefits can offset the disadvantages.

Another example: In spite of small amounts of mercury, energy-saving light bulbs are currently being promoted, and rightly so, as they save a lot of energy and electricity. This notion will be retained until the alternative – LED lamps – have become better and cheaper.

Since when have you been involved with the sustainability analysis at the Öko-Institut?

Dr. R. Griesshammer: We presented a study in 1986 on the product-line analysis in which we suggested evaluating products on the basis of their ecological, social and economic impacts throughout their entire life cycle. Back then, however, the market was not ready for this innovative method. In contrast to the alternative method of LCA, PLA was only rarely used in the following years. This method only began gain acceptance in 1992, when the German Bundestag's Enquete Commission "Protecting People and the Environment" was established two years after the Rio Declaration on Sustainable Development. It took quite some time until the realization sank in that the entire product line needs to be evaluated.

A major breakthrough came with Öko-Insitut's co-operation with the former chemical group of Hoechst, which wanted to develop a company-specific method for the sustainable management of their product portfolio and products. While fulfilling this task, essential elements of this product line analysis were integrated into the PROSA. PROSA considers the entire product line, analyzing and evaluating the ecological, economic and social opportunities and risks of future development pathways.

Since when have the social impacts also been analyzed within the assessment of products?

Dr. R. Griesshammer: About 10 years ago, we began to assess the social impacts of a product on an international level. This assessment included a wide variety of criteria, such as the wages of workers, abolition of child labor, the proportion of women in leadership positions, the possibility of co-determination for unions and much more. Some of these data are easily quantifiable, while some of them are very difficult to determine. Besides, these criteria show a great diversity between regions and thus must be identified and separately evaluated for each region in which the product is produced or sold.

Where do you see shortcomings in today's sustainability analysis or rankings?

Dr. R. Griesshammer: Many assessments already evaluate a variety of criteria, such as the CO_2 balance, the proportion of women in leadership positions, the corporate social responsibility activities or the supplier management of a company. In contrast, the evaluation of products or, in other words, the actual business performance, is only carried out partially and subordinately. Usually, only individual premium products are evaluated, but not the entire product portfolio.

Why is it important to assess the entire portfolio?

Dr. R. Griesshammer: I can give you an example: At the beginning of the Dow Jones Sustainability Indices, BMW ranked best, although the company's strategy was to build fast, big cars. From a sustainability perspective, this is not a successful concept in the medium term. If the entire portfolio had been evaluated at that time, the product development probably would have started earlier and the E models would have reached the market earlier, too.

Accordingly, sustainability assessments can have a high strategic value for companies?

Dr. R. Griesshammer: Yes, sustainability assessments help a company to learn a lot about social processes and expectations and thus on future markets. Even those who do not think much of sustainability should carry out a sustainability analysis, if only for their own economic benefits and the financial position of their company. Hence, those companies which not only have their mega-trend or sustainability analysis carried out by specific departments, but where the issue has become part of the everyday corporate life, i.e. in the context of procurement, supplier management or product development, are particularly effective.

Can even smaller companies afford to analyze their product portfolio?

Dr. R. Griesshammer: In most cases, sure. That specifically depends on how many products they produce. A large corporation like BASF manufactures over 30,000 products. A small chemical company, however, has sometimes only two or three main products, which account for 70% of sales. The relative expenditure is not so much higher than that of large companies. The situation is different for small businesses that sell hundreds of products.

Specifically for small and medium enterprises, we have developed a simplified PROSA analysis in which the main sustainability criteria are translated into questions. By answering these questions, you will often quickly realize without a detailed analysis: Where are the critical points? Where are more efforts required in terms of a due analysis before a product can be developed? A simple PROSA analysis costs between €20,000 and €30,000. This money is wisely invested in order to spur innovation and to avoid mistakes.

What do you think are the greatest challenges in the assessment of sustainability?

Dr. R. Griesshammer: There is no such thing as an objective evaluation of sustainability assessments. The area, where this succeeds best is ecology. In this field, universally accepted evaluations for LCAs gain ground.

Even though one would not reasonably expect it, it is quite difficult to handle comparability of economic assessments. This is the result of many different assumptions and presuppositions that play a role in this process, such as: What resources do I use and which price do I charge for them? What is the rate of remuneration that I will get for my investment? What is the appropriate time period to which I have to refer? Do I have to take into account external costs or not? Do I carry out the analysis from the point of view of the customer, the user or the company? Hence, the uncertainties are much larger than for the environmental area.

In addition: The assessment of social assessments will always be linked to societal values. All this is contrary to an objective evaluation of sustainability assessments, but does not impair their usefulness for the development and optimization of products or a business strategy.

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Saudi Arabia: Rise of a Global Chemical Hub

◀ Continued **Page 1**

A. Al-Mazro: There were some hurdles for foreign investors in the past — from financing through national banks to working their way through the responsible government institutions and finding the right local resources. But the government is aware that the feedstock advantage needs to be offered to both Saudi companies as well as to international investors willing to build specialty chemical businesses in Saudi Arabia – otherwise national support will translate into blocking international investments and job creation.

Saudi Arabia has seen a number of improvements to its competitiveness in recent years, which have resulted in a solid institutional framework, efficient markets and sophisticated businesses: The Kingdom is ranked 17th in the Global Competiveness Report by World Bank Group and second in the region. In the report "Ease of Doing Business 2011" published by the World Bank Group, Saudi Arabia has landed on rank 11. In categories like "starting a business," "construction permits" or "flexibility of employing workers," Saudi Arabia has outperformed the OECD average.

Dr. J. Packowski: To secure future growth and thus to be able to create the amount of jobs needed the region depends on international and local manufacturing firms participating in the transformation process. The investment environment reflects traditions of open market, led by private enterprise and with investment laws that allow 100% foreign ownership of industrial firms and properties. There are no restrictions on foreign exchange and repatriation of capital and profits. However, the recent announcement of a $20 billion joint venture by Dow Chemical to build one of the world's largest integrated chemical facilities with the world's largest oil company, Saudi Aramco, shows once again that joint ventures still are the easiest way to enter this huge market.

In light of the fact that oil-supplies are finite, it is clear that the Middle East must also find other areas of revenue in order to secure long-term growth. What specific measures are taken to boost investments outside the petrochemical industry in the region?

A. Al-Mazro: The government is encouraging foreign investors and the country's own private sector to become involved in the economic development. Therefore the Saudi Industrial Property Authority called MODON, was founded in 2001. MODON is a government organization responsible for the development and supervision of industrial estates and technology zones all over the Kingdom. The projects currently implemented range from an advanced petrochemicals and new material technology zone, an energy and environment technology zone, a life sciences and biotechnology zone, to an information and communication technology zone. The 20 industrial cities enabled by MODON spread on a total area of approximately 280 million m2 and employ more than 300,000 workers.

Which industries will be developed in the near future and how?

Dr. J. Packowski: The industries in Saudi Arabia have a strong base that was developed from oil to resource intensive industries in the first step and then to more manufacturing value added. Currently, manufacturing only contributes to 12% of the Saudi GDP. But the government is determined to diversify the economy and increase the manufacturing contribution of the GDP to 20% by 2020. Therefore the government launched a number of initiatives like the National Industrial Strategy.

A. Al-Mazro: For example, the National Industrial Clusters Development Program: This initiative was founded with the clear mission to nurture and grow export-oriented products from manufacturing clusters that can be sustainable and competitive in the long run. The program is focusing on five clusters: Minerals & Metals, Automotive, Plastics & Packaging, Home Appliances and Solar Energy.

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No Longer Waiting for Godot

In Euro Zone Crisis, Companies Plan for the Unthinkable

Contingency Plan – When Novo Nordisk's chief financial officer met marketing colleagues, the conversation moved far beyond the usual discussion of sales and performance. Jesper Brandgaard asked a simple, far-reaching question: How would the firm set prices for two pivotal new insulin products if the euro collapsed?

The Danish firm sits outside the euro zone but sells into it. It's a question that is being echoed in the boardrooms of banks, brokerages, trading houses, law firms and the world's leading manufacturers.

"It's hard to make detailed plans but we need to think through how our pricing strategy would fare if there were suddenly a dismantling of the euro," Brandgaard told Reuters. "How do we avoid falling into a trap? This is the first time I've asked such a question. It's a topic that is increasingly on the radar."

In the case of the products in question – Degludec and Degludec-Plus, two ultra-long-acting insulins – Novo Nordisk has time on its side. The new drugs are still working their way through the regulatory approval process and probably will not reach the market until late 2012.

Planning for a breakdown of Europe's 17-nation single currency is not easy. Like many business leaders, Brandgaard views a break-up of the euro as possible though not yet probable – but the odds are increasing. In a Nov. 23 Reuters poll, 14 out of 20 economists said the single currency would not survive in its current form – and companies are starting to plan for a worst case scenario.

Their trepidation is best summed up by Martin Sorrell, the head of the world's biggest advertising agency WPP. "The complexity fills everybody with such appalling fear and is so complicated that the last thing in the world you want to happen is that," Sorrell told Reuters. "But the honest answer is that, like everybody else, you try and contingency plan for any break-up of the euro zone."

Drawing on interviews with company officials, bankers and lawyers in Europe, the United States and Asia and companies' regulatory filings, Reuters has pieced together a picture of patchy preparedness for the possible demise of the 12-year-old euro currency, an event that would be unparalleled in recent history.

Some of the most active contingency planning is happening in European countries outside the euro zone that have strong trading links with the currency bloc – Denmark and Britain being leading examples. Of the 33 companies with the biggest exposures to the euro zone in sales terms, five are British, according to Thomson Reuters data. Health care, energy and consumer goods are among the most exposed industries.

Testing The System

Banks, brokers and exchanges are in the front line.

ICAP, the world's top broker for foreign exchange and government bonds, said it has tested its trading system to handle the collapse of the euro zone and re-emergence of national currencies.

A senior banker at a large investment bank said he had a team of 20 people globally running all kinds of scenarios all the time. That team was now spending a lot of its time on the possible break-up of the euro. Among other things,they had simulated a weekend crisis by running through the different stages of Friday night, Saturday and Sunday in one full working day.

"It's my job to assume the worst. You can test all kinds of benign scenarios, but if something really bad – let's say a sudden overnight default of Italy – were to happen and we hadn't tested that, I wouldn't be doing my job properly. If that latter scenario were to occur, things would look very ugly indeed. There simply wouldn't be enough time to sort out all the various trading positions and look at all the paperwork," the banker said.

In his estimation, a return to the drachma in euro zone minnow Greece was the least of his concerns. He likened Greece to bankrupt U.S. broker-dealer MF Global – annoying but not a real issue – and Italy to Lehman, whose collapse marked the start of the 2008 financial crisis.

U.S. firms are testing their systems, too. A.M. Best Co, the main ratings agency for the insurance industry, said on Nov. 22 it is doing additional stress testing on insurers given deteriorating conditions in Europe. The agency, which just conducted a similar review two months ago, said it is looking at underwriters' exposures on a case-by-case basis to see if any have additional risk from the weakening euro zone.

Safeguarding The Cash

For non-financial firms, a key focus of efforts for firms worried about a euro collapse is in trying to safeguard their cash. Corporate balance sheets currently are very strong with upwards of $1 trillion net sitting on them, a reflection of companies' reluctance to invest in adding capacity or in buying other firms.

The chief executive of a European company with annual revenues of more than $10 billion a year told Reuters during a recent visit to London that his board had discussed how to handle a euro zone collapse but that it had proved a very short meeting. Other than ensuring their cash deposits were in the safest possible banks and relying on the broad international nature of their business, executives quickly concluded there was little more they could do.

Treasury department teams are shifting money to safe havens and rehearsing rapid-action scenarios. Budgets for 2012 are being looked at again. And outside consultants are being brought in to advize on exposure to peripheral Europe – Greece, Ireland, Spain, Portugal and Italy.

Central bank data shows a decline in deposits from banks in weaker euro zone countries. Separating data on corporate deposits from personal bank accounts data is nigh on impossible, but anecdotal evidence points to corporations moving euro accounts to safe havens. Some big firms such as engineering group Siemens and carmakers BMW, Daimler and Volkswagen, are licensed to deposit funds with the European Central Bank, the safest of all safe havens in the euro zone.

Siemens finance chief Joe Kaeser said in a media call on the group's quarterly results that a considerable proportion but less than half of its €12 billion in liquidity had been parked with the ECB. About a year ago, Siemens acquired a banking license to be able to deal directly with the ECB.

Similar caution emanated from companies in other industry sectors.

Simon Henry, chief financial officer of oil company Royal Dutch Shell, said as a consequence of Europe's debt crisis it was taking extra care in investing its $20 billion cash pile. "It's with secure counterparties and its short term," Henry said.

Drugs firm AstraZeneca told Reuters it was carefully monitoring its exposure to the banking sector in light of the debt crisis and had increased its holdings of U.S. government Treasury bills.

The chairman of another company in Britain's FTSE 100 index of leading firms said the shortage of AAA rated banks was complicating life. British firms don't have access to the ECB because Britain is outside the euro zone.

Different industries also have differing abilities to reduce exposure to risky markets.

Pharmaceuticals is one sector where firms have limited wiggle room, since companies have an ethical obligation to supply life-saving medicines, even when payments are uncertain. In fact, drug makers have already been through something of a "dry run" in Greece, after being forced to accept government bonds instead of cash for some outstanding debts. Those bonds were either sold immediately at a discount to face value or are still sitting on their books at even lower value today. Greece accounts for only around 1% of the global pharmaceuticals market, so the impact on major international companies has been minimal. Italy and Spain, however, are much bigger markets.

Company Filings

A significant number of U.S. companies in a wide range of industries, including one in three members of the widely watched Dow Jones industrial average, warned investors of their rising concerns about Europe in quarterly regulatory filings.

"Western Europe appears to be experiencing increasing challenges given the uncertainty around fiscal and monetary policy direction, which likely impacts consumer confidence," diversified manufacturer 3M said in a filing with the U.S. Securities and Exchange Commission.

And drugmaker Merck warned shareholders that cutbacks in spending by cash-strapped European governments could take a toll on how much it can charge for its medicines.

Work For Insurers, Lawyers

The prospect of a euro break-up raises a mountain of legal and financial questions. Lawyers and bankers have begun combing through loan agreements, leases and other financial contracts to see how they would survive any serious euro disruption.

Most contracts failed to foresee a collapse or partial disintegration of the euro and the stroke of a lawyer's pen a decade ago could have heavy repercussions today, stemming from the choice of jurisdiction or the laws governing individual contracts. Some banks have already started thinking about how to revise the standard documentation used in future loan agreements to anticipate a break-up of the single currency.

"From the late 1990s onwards, commercial contracts were written to include express provisions to deal with the transition to the euro but I am not aware of any being written so far that contemplate any country exiting the euro," said Jamie Wiseman-Clarke, a senior associate at London law firm Berwin Leighton Paisner, specializing in aviation, rail and shipping. "The euro was assumed to be stable," he added.

It is a high-risk process. Ill-judged wording might result in a creditor having to recover its money in the currency prevailing on the day in a country departing the euro area rather than the euro. There are also concerns that a euro exit would tip some companies into default on their loans. The redenomination of their local currency could trigger a drop in revenues that would in turn prevent them meeting their obligations on euro-denominated debt or force them to break loan covenants.

A rash of technical payment defaults on all the loan borrowers from a departing country is a Doomsday scenario that would keep the lawyers busy as they fix documentation that failed to envisage such an outcome, bankers said.

More likely than a mass technical default is that some companies would simply be unable to pay or meet loan conditions because of the dire economic conditions and drop in demand that some economists are predicting from a break-up of the euro.

Worse still, UK law firm Clifford Chance has warned there might be practical difficulties in recovering payments since any decision to quit the euro would probably go hand in hand with exchange controls. Depending on how courts read the background to the decision that could lead to a stand-off between the laws of different states.

Planning is not made any easier by the fact that many continental European companies tend to be more politicized than their counterparts in the United States, so the question of a break-up is virtually taboo. Franco-German-led aerospace giant EADS, for example, is often described as the industrial counterpart to the euro. Its stakeholders include the French government and, soon, the German state. During much of its 11-year history it was a conduit for Franco-German tensions.

"If people learned that a big CAC40 (French blue-chip) company was preparing a worst-case scenario it would spread anxiety and would be interpreted as a very damaging blow to the euro," said a communications adviser to a number of top French companies, asking not to be identified.

As for a complete collapse of the currency, the consequences are so unpredictable – and unthinkable to a post-war generation immersed in European integration – that many say there is little point in running models. What counts more, they say, is a nose for survival.

"We are not running contingency plans like that. We want the euro to survive but we make tangible things. We would not die without the euro," said the chief executive of one of Europe's largest manufacturing companies.

Ben Hirschler and Scott Malone, Reuters

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Scheduling Optimization

Achieving Success with Software Solutions

Road To Recovery – The specialty chemicals sector has proven to be more resilient than most process industries to the negative effects of the economic downturn. Today, the recovery is underway and growth prospects are looking ever more positive for the industry. Business Insights recently forecast that the global market will grow at a CAGR of 2% during 2010–14 to reach a total value of approximately $319 billion in 2014. The 15 leading European companies generated $44.9 billion sales in 2009, accounting for 15.6% of the $288 billion global specialty chemicals market.

Ruben Gil
Director Business Consulting, EMEA, AspenTech

While the majority of these players were affected by falls in industrial input costs, Business Insights' revenue growth index nevertheless found that during the downturn, specialty chemicals businesses of European players performed better than their non-specialty operations.

Barriers To Success

Significant issues do remain across the sector if growth is to be sustained. Specialty chemicals are a complex and highly demanding marketplace. The industry is characterized by the need to deliver high-quality products quickly while taking into account constantly shifting needs and expectations from customers for innovative products and shorter lead times. Added to these challenges are issues around escalating raw material costs, intense global competition driving prices down and conflicting production strategies (make-to-stock versus make-to-order).

In addition, companies have to deal with a dynamic manufacturing environment where they need to optimize trade-offs between inventory levels, customer service and manufacturing costs and to manage variable demand across a broad portfolio of products. Perhaps most significantly of all, the industry has to tackle complex manufacturing processes involving tightly coupled multi-step batch processing with mixing and blending operations.

Planning And Scheduling

In the specialty chemicals sector, the key to addressing these challenges successfully is the ability to optimally plan and schedule production processes while taking into account continuously shifting customer demands and operating constraints previously referenced.

The traditional approach used to plan and manage the production of a suite of products at geographically distributed production sites, for geographically distributed customers, relies on a two step process involving long range (12 months) production planning across all assets and short term (one week to one month) local production scheduling.

The goal of the production plan is to assign production quantities for each asset while taking into account asset capacities, recipe unit ratios, raw material and transportation costs and product prices. The goal of the production schedule is to determine the timing of and the material produced by each batch run on a reactor, as well as cleaning tasks, while taking into account inventory replenishment needs and inventory capacities.

Ideally, the two should work together to deliver operational efficiencies and achieve optimization across the specialty chemicals production process.

The Importance of Scheduling Optimization

Effective scheduling is absolutely critical to achieving sustained success in this sector.

Specialty chemicals solutions can typically perform critical operational functions that are beyond any planning system. On account of sequence dependent product change-over costs, the short term product schedule for a given asset can have a significant impact on its capacity and, therefore, the long range production plan. However, the production plan does not directly account for change-over costs but instead uses discounted capacities for each asset. Likewise, the production plan does not consider inventory constraints.

Scheduling decision software tools bring process industry manufacturers several key advantages over and above what a planning solution could deliver. These include the ability to schedule under current operational constraints, taking into account equipment, capacity and customer order deadline issues.

Equally, these solutions deliver the ability to schedule to optimized technology constraints including minimal cleaning and set-up time. The best of these can provide greater efficiency through increased capacity to evaluate multiple alternatives and the ability to achieve quicker, more detailed evaluation of more production scenarios.

The best scheduling tools also potentially deliver increased flexibility, including the ability to react quickly to unplanned events. They should be able to save time allocated by management and the scheduling team for scheduling and shift the focus of the schedulers from creating schedules to improving the value of the schedules they produce.

Delivering Value

So, the potential benefits specialty chemicals manufacturers could achieve from process industry software scheduling solutions are clear. The scale and urgency of requirement is dependent on a range of other factors. One of these is complexity. Highly complex specialty chemical plants, where there is less visibility into the workings of the plant, typically have a higher need for scheduling than plants with less complexity. It is certainly true that most plants with large numbers of products and operational constraints would benefit from a plant scheduling system.

It is also broadly true that the more dynamic the manufacturing environment, the more urgent the need for scheduling solutions. As one customer commented recently to AspenTech, a leading global provider of mission-critical process optimization software solutions, "The ability to react is what keeps us in the game."

In the most fluid, fast-changing environments, typical in the specialty chemicals sector, operators urgently need the agility to react quickly to disruptions or operational upsets. In the most dynamic scenarios, operators typically require on-time order fulfillment while keeping inventory at acceptable levels and they often need to be able to analyze complex trade-offs to minimize the impact on the schedule.

At the same time, in dynamic environments, operators will need to frequently synchronies schedule updates with the enterprise resource planning (ERP) system and obtain rapid visibility into the schedule and the real-time performance of the plant.

The third issue driving urgent implementation of scheduling solutions is ease-of-use. Companies with fewer resources or a more inexperienced user base will typically require easy-to-use scheduling tools with intuitive user interfaces to help bridge the skills gap. In commenting about scheduling systems, one AspenTech customer recently said: "The user interface is the single, most important piece of the overall solution."

Finding An Answer

So, how can specialty chemicals manufacturers choose scheduling solutions that best address these urgent drivers? In order to address the need for complexity effectively, they need a solution that models complex processes with enough fidelity to accurately evaluate alternatives. They also need to be able to time multi-stage operations that simultaneously consider all manufacturing constraints and provide optimal sequencing of setups and transitions to minimize off-spec production and enhance asset utilization.

To effectively support a dynamic manufacturing environment, they should look for process industry software to enable business responsiveness and agility required to satisfy increasingly demanding customers. These tools provide what-if analysis to simulate and understand the impact of schedule changes and supply forward visibility of inventory positions.

Also, to provide the necessary ease-of use, manufacturers should be looking for solutions that deliver automation of the data gathering task to allow schedulers to focus on analysis rather than data management, standard interfaces and workflows and scalability of standard scheduling solutions to fit simple or complex plants.

In Conclusion

The health of the specialty chemicals sector is vital to the health of the chemicals sector generally. Specialty chemicals have the potential to deliver rapid product upgrading and high added value in the sector, as well as all areas of the national economy.

Yet, if the potential within the sector is to be fulfilled, manufacturers will need to deploy efficient scheduling across their operations to address their most urgent challenges. The fast changing environment, high demand and the need for greater operational visibility are just a few points of concern. Fortunately, innovative process industry software solutions are now available and delivering good return on investment for specialty chemicals companies today. Tackling such complexity is vital. These tools will help to achieve best practices, optimize the scheduling process and enable manufacturers to see significant value across the asset lifecycle to gain a significant competitive advantage in the marketplace.

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New Cyber Attack Targets Chemical Firms

At least 48 chemical and defense companies were victims of a coordinated cyber attack that has been traced to a man in China, according to a new report from security firm Symantec Corp. Computers belonging to these companies were infected with malicious software known as "PoisonIvy," which was used to steal information such as design documents, formulas and details on manufacturing processes, Symantec said.

It did not identify the companies, but said they include multiple Fortune 100 corporations that develop compounds and advanced materials, along with businesses that help manufacture infrastructure for these industries. The bulk of the infected machines were found in the United States, Bangladesh and United Kingdom, Symantec said, adding that the victims include 29 chemicals companies, of which some developed advanced materials used in military vehicles.

"The purpose of the attacks appears to be industrial espionage, collecting intellectual property for competitive advantage," Symantec said in a white paper on the campaign, which the company dubbed the "Nitro" attacks.

The cyber campaign ran from late July through mid-September and was traced to a computer system in the United States that was owned by a man in his 20s in Hebei province in northern China, according to Symantec.

The Nitro campaign is the latest in a series of highly targeted cyber attacks that security experts say are likely the work of government-backed hackers. Intel Corp's security unit McAfee in August identified "Operation Shady RAT," a five-year coordinated campaign on the networks of 72 organizations, including the United Nations, governments and corporations.

In February, McAfee warned that hackers working in China broke into the computer systems of five multinational oil and natural gas companies to steal bidding plans and other critical proprietary information.

Symantec said that the Nitro attackers sent emails with tainted attachments to between 100 and 500 employees at a company, claiming to be from established business partners or to contain bogus security updates.

When an unsuspecting recipient opens the attachment, it installs "PoisonIvy," a Remote Access Trojan (RAT) that can take control of a machine and that is easily available over the Internet.

While the hackers' behavior differed slightly in each case, they typically identified desired intellectual property, copied it and uploaded it to a remote server, Symantec said in its report.

Symantec did not identify the companies that were targeted in its white paper and researchers could not immediately be reached. Dow Chemical was not immediately available to comment. A spokesman for DuPont declined comment. ■

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Under Construction

Sinopec, KPC Begin $9.3 Billion Petrochemical Project
China Petroleum & Chemical Corp (Sinopec) and Kuwait Petroleum Corp have started building their joint refining and petrochemical complex in the southern Chinese province of Guangdong, the top Chinese oil refiner said. The 59 billion yuan ($9.3 billion) project, including a 300,000-barrel-per-day refinery and a 1-million-ton-per-year ethylene cracking unit, was expected to come on line in 2015.

The project will secure Kuwait, the world's seventh-largest crude exporter, a stable outlet for its oil as it aims to more than double crude exports to China to 500,000 bpd, while giving the world's second largest oil buyer a steady supply as demand keeps pace with solid economic growth.

AkzoNobel to Invest €45 Million in Ningbo Plant
AkzoNobel said it will invest €45 million in a new dicumyl peroxide (DCP) plant at its Ningbo multi-site in China to meet a growing local, regional and global demand. The new facility will expand AkzoNobel Functional Chemicals' DCP production capacity by more than 30% to 25,000 metric tons and allow for future expansion as the market continues grow. Expected to be completed by mid-2014, it will be the fifth plant built on the multi-site and benefit from the shared infrastructure and state-of-the-art facilities.

Eastman Completes Dutch Production Expansion
Eastman has completed the expansion of its hydrogenated hydrocarbon resins facility in Middelburg, The Netherlands. The Middelburg expansion, which is the third expansion of its Regalite hydrogenated hydrocarbon resins, has doubled capacity at the site since 2006. The company said the Middelburg tackifier resin plant is one of the largest in the world, producing a range of hydrocarbon resins, rosin resins, and dispersions.

Air Liquide Signs Major Contract with Sinopec
Air Liquide and Sinopec have agreed on the supply of gaseous oxygen and nitrogen to Maoming branch of Sinopec (MPCC) 200,000Nm³/h coal-to-hydrogen project and existing refinery in Maoming, China. After completion of the project, MPCC will become one of the biggest refineries in China with a capacity exceeding 20 million-ton oil refining per year. The supply will be based on the investment in a new ASU with a capacity of 3,000 tons of oxygen per day which will be the largest ASU to be built in China. The new ASU, expected to be commissioned in the first half of 2013, will also produce liquid oxygen, nitrogen and argon to meet the strong and growing demand in the industrial merchant market in South China. The global investment of the joint venture will be around €85 million.

GEA Receives €32 Million in Orders
The GEA Group has received orders worth more than €32 million for the supply of a Heller indirect dry cooling system for a new power plant in Turkey and for the rebuilding of a wet cooling tower in a petrochemical site in the United States. Both orders will be handled by the segment GEA Heat Exchangers.

Bayer Dedicates TDI Plant in Shanghai
Bayer recently inaugurated a new TDI production facility with a planned capacity of 250,000 tons per year at the company's Integrated Site Shanghai. The plant is based on a new process technology that reduces solvent use by some 80 percent compared with plants of a similar size that use the conventional process. It also lowers energy consumption by up to 60 percent. The use of this technology also enables substantial savings on operating costs and a reduction of roughly 60,000 tons per year in carbon dioxide emissions. In addition, the new technology cuts the investment costs for large-scale plants of this type by around 20 percent.

Dow Unlocks CAA Capacity
Dow Chemical's Performance Monomers business has announced an incremental expansion strategy has unlocked an additional 15% of crude acrylic acid (CAA) capacity at its Deer Park, Texas facility. This capacity increase is a result of various improvement projects implemented in the CAA Oxidation facility. These projects not only increased capacity, but enhanced process safety and improved technology and reliability, the company said in a press release.

Sinopec Jinling to Delay Start of 160,000-Bpd Crude Unit
Sinopec said it will delay the startup of a new 160,000-barrel-per-day (bpd) crude oil unit at its Jinling refinery until June next year, six months behind an earlier timeline, a company official said. The Jinling facility will likely be the only main addition to crude refining capacity Sinopec brings online next year, following about 260,000bpd in new capacity started up over the past few months. This would potentially cap growth in China's crude oil imports after a modest rise of about 6% in the first 10 months of this year. The delay comes after a series of accidents in the Chinese refining sector, the company said.

Wacker Expands Mumbai Technical Center
Wacker said it has expanded its technical center in India. This center of excellence located in Goregaon, a suburb of Mumbai, now also includes laboratories, applications technology and test equipment for polymer dispersions for coatings and paint applications. The company said the expansion was made necessary by India's strong economic growth, particularly with regard to sophisticated coatings applications. Wacker expects the measure to help bolster its position in vinyl acetate-ethylene copolymer dispersions.

Integration Is The Key

Chemplast Sanmar New PVC Resin Plant Installation in Cuddalore

Groundbreaking Project – When planning a new chemical plant, the engineers at Chemplast Sanmar had to consider many aspects such as safety, quality, efficiency, law and the environment. They proved that it is possible to meet all these requirements with state-of-the-art technology. For their greenfield plant in Cuddalore, India, Chemplast chose the Foundation fieldbus H1 High-Power Trunk concept to achieve an outstanding production plant. The complete fieldbus equipment and safety barriers were supplied by Pepperl+Fuchs India. This report gives a basic overview of this groundbreaking project.

Fig. 1: The Chemplast plant in Cuddalore, India, produces PVC resins.

Chemplast Sanmar, the flagship company of the Sanmar Group, is a major player in the chemical industry in the state of Tamil Nadu, India. Chemplast manufactures a variety of high-quality PVC (polyvinyl chloride) resin products having a wide range of end-use applications.

Background Details

For their greenfield project in Cuddalore, Chemplast set up a Foundation fieldbus H1 environment to meet the state-of-the-art technology. The facility, commissioned in September 2009, has an annual capacity of 170,000 tons. This greenfield project is the largest chemical project to come up in the state of Tamil Nadu for over a decade. Chemplast Sanmar's aggregate capacity of 235,000 tons makes it one of the largest PVC producers in India.

The new PVC plant was licensed by the British company Ineos Vinyls and engineered by Jacobs H & G, which is located in Mumbai, India. The plant was designed according to the highest-quality standards known today. These standards are evident in the plant's highly-sophisticated quality control lab, foolproof safety system, and environmental management system. For a smooth end-to-end automation of batch process as well as continuous process production, Chemplast selected a control system from one of the world's leading DCS vendors, Honeywell.

Five control stations were installed with redundant controllers and a hybrid system which is capable of communicating via both, HART and Foundation fieldbus H1 protocols. Pepperl+Fuchs India partnered with the DCS vendor to develop the fieldbus infrastructures. FieldConnex Power Hubs, power supplies, Advanced Diagnostic Modules (ADM) and Segment Protectors are integrated to form 82 Foundation fieldbus segments.

Design Phase

During the design phase, the project team selected the Foundation fieldbus network type as well as all corresponding components and field devices. In order to fulfill Chemplast's functionality requirements, it was necessary according to the latest rules to verify that all instruments have the Fieldbus Foundation tickmark.

With the proper segment design, the type of cables and cable lengths etc. could be selected and planned accordingly. Field device vendors received all necessary information at an early stage, allowing the instrumentation to be configured up front. Finally, Honeywell Technologies in Bangalore performed a final "Host Integration System Test" for the complete system before the installation phase started.

Chosen Topology

For this plant, the High-Power Trunk concept was chosen. With this topology, a main line (the trunk) carries energy and data into the field. The energy and data is distributed with one device each connected to a branch line (the spur). A fieldbus network is divided into multiple segments, which are usually electrically independent and can have an overall cable length of up to 1,900m each.

◀ Fig. 2: Hi-tech lab for process

At Cuddalore, field devices are located in Zone 2. Using spurs, the field devices are connected to Segment Protectors which provide short-circuit protection to the trunk line.

The trunk terminates in a cabinet located in the safe area. This is also where the FieldConnex Power Hubs and Fieldbus Interface Modules (FIM) are installed. These power hubs are designed especially to fit the chosen DCS system. The power hubs deliver high output power, great signal quality, and redundancy.

The Advanced Diagnostic Module (ADM) is a plug-in module for the power hub and makes the Foundation fieldbus H1 physical layer manageable. ADM automates commissioning and documentation, monitors the fieldbus segment online, and identifies faults in real time. ADM automatically triggers alarm messages and allows remote access for troubleshooting from the control room. With surge protection, plant availability has increased, as this protection eliminates or at least reduces power surges to ground potential.

Installation And Commissioning

Excellent preparation in the design phase helped speed up installation and commissioning. Completing cable-laying work as well as checking and validating the loops was achieved very quickly and communication worked flawless right from the start.

Fig. 3: ▶ Fieldbus power hub cabinets

Fieldbus installation is based on digital communication, which has a high accuracy and enables better control of process parameters. By using Foundation fieldbus technology, Chemplast saved plenty of time during commissioning. Compared to conventional instrumentation, fieldbus instrumentation costs were marginally higher. This cost was compensated by the reduction installation and commissioning time of these devices.

Experiences during this project show that the Foundation fieldbus device information is comprehensive and easy to access. Troubleshooting was very easy because of the availability of a host for field device diagnostics tools. Additionally, the Advanced Diagnostic Module was a great support for monitoring the physical layer and could be operated comfortably using Chemplast's asset management system. The ADM monitored the physical layer for an error-free operation of the control system. If any failure occurred, ADM guided the user to possible causes and remedies using actionable information in plain language.

Since then, the PVC plant runs smoothly. Chemplast is very satisfied with the collaboration, the course of the project and its result.

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Finding The Missing Link

Investigating the Root of Workplace Accidents

Finding The Cause – Accidents can happen anytime and anywhere. Dr. Prof. Franz Schmalz at the Swiss Federal Institute of Technology at Zurich has indentified four categories as the main cause of workplace-related incidents. Incidents occur because the concerned organization or person did not know the hazard; knew the hazard, but did not consider it; considered it, but made a wrong assessment; or made the right assessment, but did not implement or maintain precautions. In practice for any given incident, the failure is on a different level for different organizations or persons involved.

Dr. Georg Suter
Director,
Swissi Process Safety

Of course these four categories cannot cover each and every element in the hundreds and thousands of event chains that ultimately lead to an incident.

Hot Work Incidents

In the last 20 years, the U.S. Chemical Safety Board (CSB) has identified over 60 fatalities due to explosions and fires from hot work activities on tanks. In 2010, CSB issued a bulletin with key lessons to prevent worker deaths during hot work in and around tanks.

Eleven Incidents were analyzed and lessons were derived. Regarding the categories above, it is obvious that the scientific facts related to the ignition risks during hot work in presence of flammable vapors are well established, and the respective framework of legal requirements exists.

In all the other cases missing hot work permit procedures and – related to that – lack of risk analysis were identified as the major cause on company level. Operators were therefore often not appropriately informed and instructed, but often lacked also the qualification to ask for the necessary information. In one case, bad maintenance was an important contributing factor and only in one case existing safety rules were not observed by the operator.

Dust Explosions

A special investigation of dust explosions states very clearly: "The CSB found that industry and safety professionals often lacked awareness of combustible dust hazards. Neither the OSHA (Occupational Safety and Health Administration) hazard communication standards nor the ANSI [American National Standards Institute] guidance … provide clear requirements or instructions for including and warning about combustible dust explosion hazards (in MSDS).

The facilities failed to follow the widely recognized standards of good engineering practice … .As a result, facilities did not implement appropriate engineering controls, adequate maintenance and housekeeping, and other measures that could have prevented the explosions."

Obviously, the root cause is a lack of knowledge both on the organization and the operator level, resulting subsequently in deficiencies in the implementation safety concepts. Again, the necessary information and know-how was clearly available in the public domain.

Regulation And Standardization Authorities

Almost any major accident in the process industries has resulted in new rules and regulation: The release of a reaction mass containing tetrachlorodibenzodioxin (TCDD) in Seveso, Italy, resulted in the European Directive on the control of major accidents, still known today as Seveso II Directive.

The big warehouse fire in Schweizerhalle, Switzerland, after which contaminated fire water severely polluted the Rhine river, led to numerous new national standards on chemical warehouses.

Two years after the 2001 fertilizer factory explosion at a Toulouse chemical plant, the French regulation on risk management was updated. After a 2005 BP refinery explosion in Texas City, numerous measures were initiated based on the Baker Report, for example new standards on reporting of process safety incidents.

CSB also systematically analyses the legal situation related to incidents. In almost all incidents analyzed by CSB, gaps and lack of clear requirements were identified and respective recommendations were made. In about one third of the cases considered here, the gaps were significant.

Below the legal level, industry standards play an important role. The following examples show potential deficiencies on this level, which contributed to process safety incidents:

Two explosions were examined by CSB, which occurred when natural gas piping were cleaned using the "gas blow" method, whereby natural gas is forced through the piping at a high pressure and volume to remove debris. The natural gas and debris are subsequently released directly to the atmosphere. In its analysis, the CSB recommended National Fire Protection Association revise the National Fuel Gas Code (NFPA 54) and address the explosion risks of this practice.

These facts might indicate that legislation and standardization are always behind the industrial development and the associated risks, in other words, they are reactive instead of proactive. Whether or not this should be changed is a matter of political discussion and the mutual agreement between industry and the public.

Basically, the legal (and standardization) framework should set only the very general rules, leaving the detailed technical issues to the direct responsibility of the industry. Too detailed and strict rules cause excessive costs and sometimes even hinder innovation. On the other hand, such a liberal agreement requires good citizenship practices and reliable accountability on the industry side.

In the above example, this would mean that the explosion risk related to the release of natural gas is carefully considered based on long existing common knowledge and also existing standards (NFPA 497) which clearly addresses a physically comparable situation without waiting for a revision of the specific standard (NFPA 54).

Lack of Scientific and Technical Foundation

In the cases considered above, the scientific foundation for preventive measures was clearly available. The following two examples show, that – albeit rarely – there are incidents which can only be explained based on new scientific findings.

The first example is related to three tanker explosions, which occurred in 1969 when cleaning empty dirty cargo tanks with high pressure water jets. It turned out the explosions were caused by static discharges between charged water slacks falling over internal steel structures in the tanks and the tank wall.

Another is the explosion of a polyethylene powder silo in the 1970s that could – after extensive research work attributed to cone discharges. Since then this type of ignition sources is routinely considered in explosions risk analysis and has become common knowledge.

From published incidents analyses it can be concluded that lack of scientific and technical foundation is clearly not the missing link.

Does this mean that we can stop research in the area of process safety?

If the motivation was reduction of incidents the answer would be yes. The focus should be more on knowledge transfer and knowledge management if the most frequent gaps are to be closed.

Nevertheless, safety research is necessary. First of all, there may still be hidden potentials. Second, we have to make sure that the scientific and technical foundation for safe processes is also available for new technologies (e.g. new material, processes under very high pressure, at high temperatures and under very reactive atmospheres, e.g. pure oxygen). And finally, to design more economic processes: If more fundamental details on a process are known, the safety concept can be tailored more specifically, which often means that safety margins (introduced to compensate missing information) can be reduced and production costs lowered.

Knowledge Transfer

The missing link is the transfer of the scientific and technical foundation for designing and running processes safely to plant managers, plant safety professionals and operators. To close the gap is by no means simple.

- Plant managers, plant safety professionals: Surveys by EFCE and EPSC have shown that many curricula for engineers do no comprise an adequate number of lectures in process safety. Thus process safety is often left either to post graduate courses or to training on the job. Moreover, outsourcing of engineering activities has led to a reduction of internal safety professionals. Although high quality safety know-how can be bought from excellent consultants today, an experienced internal counterpart is important for effective buying-in of know-how.
- The modern trend of job hopping is a great hindrance on the way to build-up a good and sustainable internal safety know-how. It has been shown that the increased frequency of changing the job is not associated with an increased frequency to change the employer; thus it is a company-internal phenomenon. Ways must be found, how competent safety professionals can make a remunerative career, without changing their field of activity every five years.
- Operators: It is evident that awareness for certain hazards and the knowledge on the respective preventive measures must be available at the front, i.e. where the processes are carried out and the work is physically done.

The reach the concerned persons is by no means a simple task:

- Plant design and construction is inherently complex and many different companies are involved, each company having its own schedule for their individual workers and a characteristic fluctuation pattern of personnel.
- Recently the situation has become similar in the field of operation and maintenance: Many tasks are out-sourced and performed by contractors and subcontractors.
- This complex situation is further made worse by a continuous acceleration of processes and an increase on the frequency of changes and modification.

Acceptance of these facts as a problem for plant and process safety may be the first step in solving the problem. To improve the situation, more emphasis must be put on

- Specification of know-how required for a given task
- Regular training on safety related topics including performance review
- Use of e-learning, to overcome the problem of scheduling courses
- Certification of contractors for specific tasks

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Greenhouse Gases Levels at Record, Accelerating

Greenhouse gases that cause climate change have reached record levels in the atmosphere and show no sign of receding, despite global awareness of the need to switch to alternative energy sources, the United Nations weather agency said.

In its annual Greenhouse Gas Bulletin, the World Meteorological Organization said carbon dioxide, methane and nitrous oxide were now more prevalent in the atmosphere than at any time since the industrial revolution.

The warming effect caused by greenhouse gases – the net amount of radiation coming into the atmosphere – has increased by 29% since 1990 and 1.4% from 2009 to 2010, the last year for which data is available, the WMO said.

U.N. scientists said this century will see more intense heatwaves, droughts, floods and storms because of the globally warming climate.

The WMO report measures the overall amount of greenhouse gases in the atmosphere, based on monitoring stations in more than 50 countries. That means it factors in natural emissions and absorption processes – so called "sources and sinks" – as well as emissions caused by human activity.

Carbon dioxide, responsible for 80% of the global warming effect over the past two decades, has increased rapidly with fossil fuel use. But almost half the carbon dioxide caused by fossil fuel use since 1958 has been removed by the oceans and plants on land, the report said.

The second most important greenhouse gas, methane, has been growing in the past five years after leveling off between 2000 and 2006, for reasons that are not fully understood.

The third biggest greenhouse gas is nitrous oxide, which can trap almost 300 times as much heat as carbon dioxide. Its main human source is the use of nitrogen based fertilizers, which the report said had "profoundly affected the global nitrogen cycle."

The impact of fertilizer use is so marked that more nitrous oxide is detected in the northern hemisphere, where more fertilizer is used, than in the south.

A report by U.N scientists urged countries to make disaster management plans because of the threat from global warming. However the WMO data showed no let-up in the growth of greenhouse gases, and the report's authors said more work needed to be done to help understand which policies would have the most effect.

So far, the clearest discernable impact of a policy decision was a decrease in chlorofluorocarbons, or CFCs, which were banned because they caused depletion of the ozone layer. But hydrofluorocarbons, or HFCs, the chemicals that have replaced CFCs, are also potent greenhouse gases and their abundance in the atmosphere, while still small, is now increasing at a rapid rate. ■

Chemagis, Infraserv Logistics Enter Partnership

Pharmaceutical company Chemagis has entered into a distribution agreement with Infraserv Logistics in order to supply its European customers. Chemagis has offices and production sites in North America, Europe and Asia. Infraserv Logistics, based in Frankfurt, Germany, will manage the entire distribution and transportation process, which includes everything from small containers to bulk quantities. The initial contract runs until 2014 with the potential for extension. ■

Merck Opens First Liquid Crystals Application Lab in China

Merck KGaA announced the official opening of its first liquid crystals application laboratory in China. The laboratory is located in Shanghai's Zhangjiang Hi-Tech Park, and occupies an area of 300m^3. It is aimed at providing flat panel display manufacturers in the Chinese market with comprehensive technological support and customer services.

Senior executives from Merck headquarters in Darmstadt, Germany, including Executive Board Member Bernd Reckmann and Head of the Performance Materials division Walter Galinat, as well as Managing Director of Merck Chemicals China, Alasdair Jelfs, helped to cut the ribbon for the new application laboratory.

The company said it plans to accelerate its growth in China, particularly in regard to liquid crystal materials. According to According to the Display Search market research institute, it is expected that over the next several years, China's production of LCD panels will significantly rise due to the investment boom. Following in the footsteps of Japan, Korea, and Taiwan, China will become another key market for liquid crystal materials. ■

Future's Fuel: Cellulosic Ethanol

Sustainable Biofuel Production Becomes Reality

Nature's Building Block – It looks like that the time of cheap oil is over. The challenge of this century will be the exploitation of alternative resources to secure growth and quality of life for an ever growing population. Thus, a small molecule has come into the focus of attention: glucose, nature's chemical building block. The conversion of sugars into chemicals such as ethanol offers new and sustainable alternative routes independent from fossil-based production to chemicals and fuels and with substantial savings in CO_2 emissions.

Sustainable Cellulosic Ethanol

One of the biggest consumers of crude oil is the transport sector – it uses up to 70% of global oil production every year, causing about 25% of global CO_2 emissions. Thus, biofuels are the primary route to more sustainable mobility and to more independence from fossil resources. Worldwide, bioethanol is the most important biofuel with an annual production of 85.8 billion liters in 2010, and counting. Recently, the sustainability of biofuels has been discussed intensively. Not only greenhouse gas emission savings vary widely depending on the used feedstock and process, also the competition to food and feed production and land use change issues may have a negative impact on the overall effect.

Cellulosic ethanol is bioethanol made from lignocellulosic feedstock such as agricultural residues or dedicated energy crops. Only non-edible parts of the plant are used for its production. It constitutes a new energy and chemical feedstock source, using an already existing renewable feedstock with no need for further production capacity, giving added value to a byproduct from agricultural food or feed production. High greenhouse gas emission savings of up to 100% can be achieved.

The demand for cellulosic ethanol is predicted to increase over the upcoming years in all industrialized countries and emerging markets. Legislative measures such as blending quotas or taxation and a growing demand for biobased ethanol from the chemical industry will support the market growth for cellulosic ethanol. In addition, agricultural by-products underlie less price volatility as the feedstock is not transportable over large distances and such is only locally marketable.

Huge Potential

The worldwide potential of biomass is huge. In the U.S., the annual production of agricultural residues (cereal straw and corn stover) reached almost 384 million tons in 2009 and Brazil alone produced more than 670 million tons of sugar cane in 2009 yielding more than 100 million tons of bagasse (dry basis).

Alone in the European Union, almost 300 million tons of crop straw are produced annually. At least 60% of the straw can be taken from the field without endangering soil quality and humus balance. Just the amount of cellulosic ethanol produced from this feedstock would be sufficient to substitute more than 20% of EU gasoline demand by locally produced biofuel. And these are rather conservative figures: a recent study by Bloomberg New Energy Finance estimates that until 2020 between 52% and 62% of the European predicted gasoline consumption could be substituted by cellulosic ethanol. This would result in potential greenhouse gas emission savings of 42% to 50%, according to the report.

Considering the fact that engine and automobile technology will advance continuously underlines the huge potential of this new technology. And this can be achieved just by the utilization of an already existing renewable feedstock, without needing any additional land or production capacity.

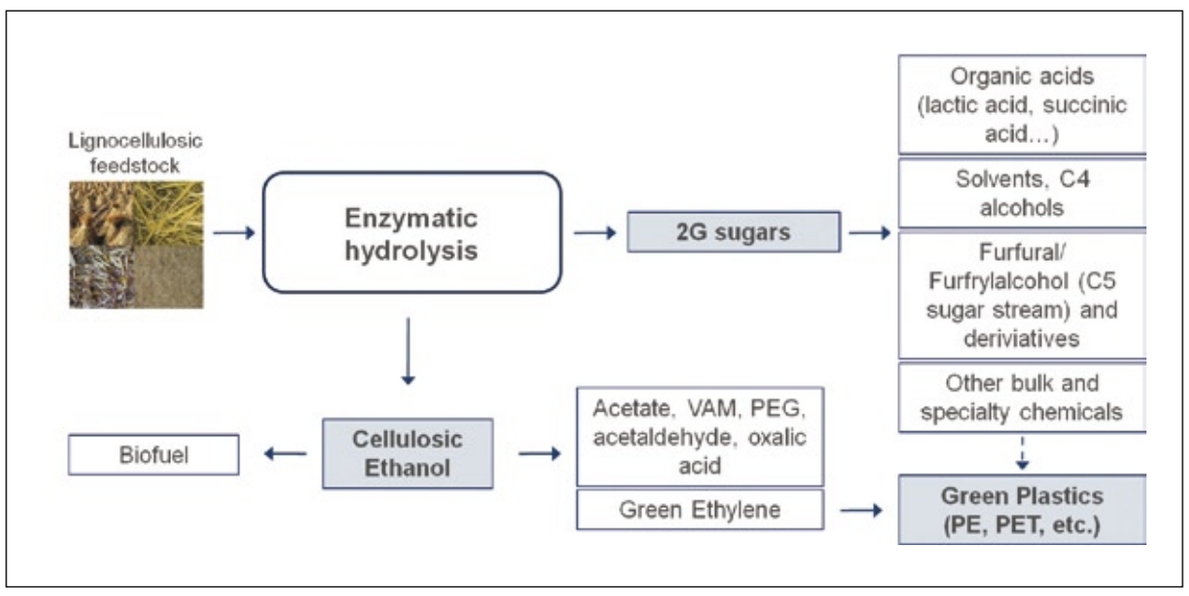
In the EU about 1,000 cellulosic ethanol plants would be needed only to exhaust the existing straw potential. This would result in additional income for the agricultural sector, the creation of several 100,000 new "green" jobs and would significantly reduce EU's oil dependency.

Straw for the Tank: More than a Vision

The technology for the production of cellulosic ethanol has matured a lot over recent years. Large scale production is more than a vision nowadays. First demonstration and pilot projects are up and running or soon to come. One of these projects is the sunliquid demonstration plant of Munich-based Süd-Chemie, a member of the Clariant group, is a leading specialist in catalysis and adsorbents technologies as well as biocatalysis. The sunliquid technology sets a good example for how to overcome the most important challenge in cellulosic ethanol production: the costs.

The main technological challenge in the production of cellulosic ethanol is the breakdown of the stable lignocellulosic structure into sugar monomers. To achieve this, an enzyme mixture is added to the pretreated feedstock. These enzymes used to be one of the major cost drivers. Through intense optimization, Süd-Chemie developed highly feedstock and process specific enzymes that convert the plant material into the corresponding sugars with high efficiency, hence, resulting in high yields at short reaction times. The enzymes are produced process integrated on a small portion of the feedstock, keeping costs to a minimum and avoiding short passes in supply or price volatility.

Another way to reduced production costs is optimization of ethanol yield. Süd-Chemie's sunliquid uses a fermentation organism that can simultaneously convert C5 and C6 sugars into ethanol in a one-pot reaction, thus increasing ethanol yield by about 50% compared to other processes that use only C6 sugars. A new separation technology and the holistic process design optimized energy demand so the process is energy self-sufficient by only using the residual lignin further contributing to its overall economic viability.



A new sugar platform for second generation green chemicals and biofuels

All-Rounder Glucose

But cellulosic ethanol is not just valuable as a biofuel. It is the fundamental building block for green chemicals. Through further conversion it can be transformed into bulk chemicals like acetate or acetaldehyde or to ethylene, the monomer of polyethylene production, the most important plastic worldwide.

Furthermore, the sugars obtained after the first hydrolysation step of lignocellulosic feedstock open up a variety of different product routes. Via fermentation these second generation sugars can be converted into further specialty and bulk chemicals. Big companies like Coca-Cola or Procter & Gamble have set themselves targets to increase the biobased content of their products. Thus, the demand for green chemicals has increased over the last years and will further grow. A second generation sugar platform is essential to fulfill this need in a sustainable and efficient way by avoiding a food competition.

Summary

Biomass will play an important role in our way to a more sustainable society. In transport as well as in the chemical industry, cellulosic ethanol and green chemicals from lignocelluloses can make a major contribution. The technology is there and ready for commercialization. What is needed now is a stable environment for investors to unlock its whole potential and to secure Europe's leading position in chemical innovation. Support measures are needed to bridge the so-called "Valley of Death" from research to innovation. Only with these measures in place, cellulosic ethanol and green chemicals from lignocellulose can make a difference in the short to medium term.

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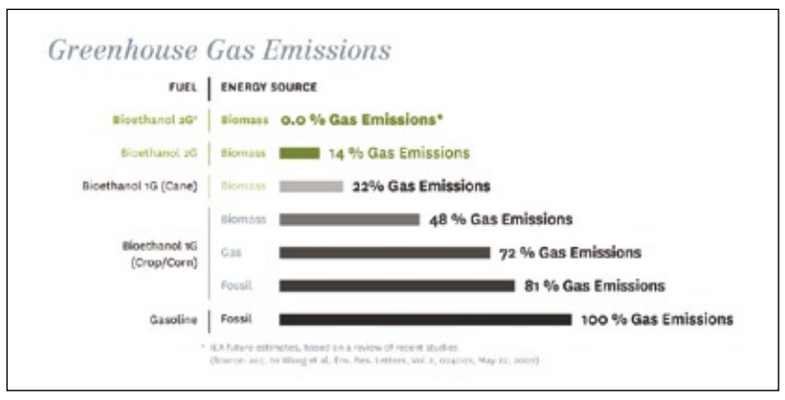
60% of straw available for ethanol production	
Cereal straw [Mio. t]	294
Surplus cereal straw [Mio. t]	176,4
Conversion rate straw to ethanol	0,22
Cellulosic ethanol [Mio t.]	38,8
Number of plants in EU (capacity 50 kt/a)	**776**
% gasoline substitution	**35%**

Potential of cellulosic ethanol in Europe



Greenhouse gas emissions of different fuels according to feedstock and process

UK to Give £250 Million Help for Energy Intensive Firms

British finance minister George Osborne announced £250 million ($390 million) of support for energy intensive industries, part of measures to boost a flagging economy, a Treasury source told Reuters.

Osborne is under intense pressure to find ways to revive an economy that has barely grown over the last year, and these measures will be announced in his autumn statement on Nov. 29 among other initiatives aimed at boosting growth.

A first element of the package is to compensate high energy users for the carbon price floor, a tax on fossil fuels which the UK will introduce in 2013, and which business lobby groups have said will lead to large increases in bills for energy-intensive firms. Osborne is expected to say the government will compensate firms to the tune of £40 million in 2013/14, rising to £60 million in 2014/15.

The government will also help to offset indirect costs arising from the European Union's Carbon Emissions Trading Scheme, with payments of £12 million in 2012/13, rising to £50 million pounds in each of two successive fiscal years.

In addition, Osborne will raise the discount relief on the Climate Change Levy fuel tax for firms that promise to improve their energy efficiency, to 90% from April 1, 2013 – an improvement on the increase to 80% from 65% announced in this year's budget.

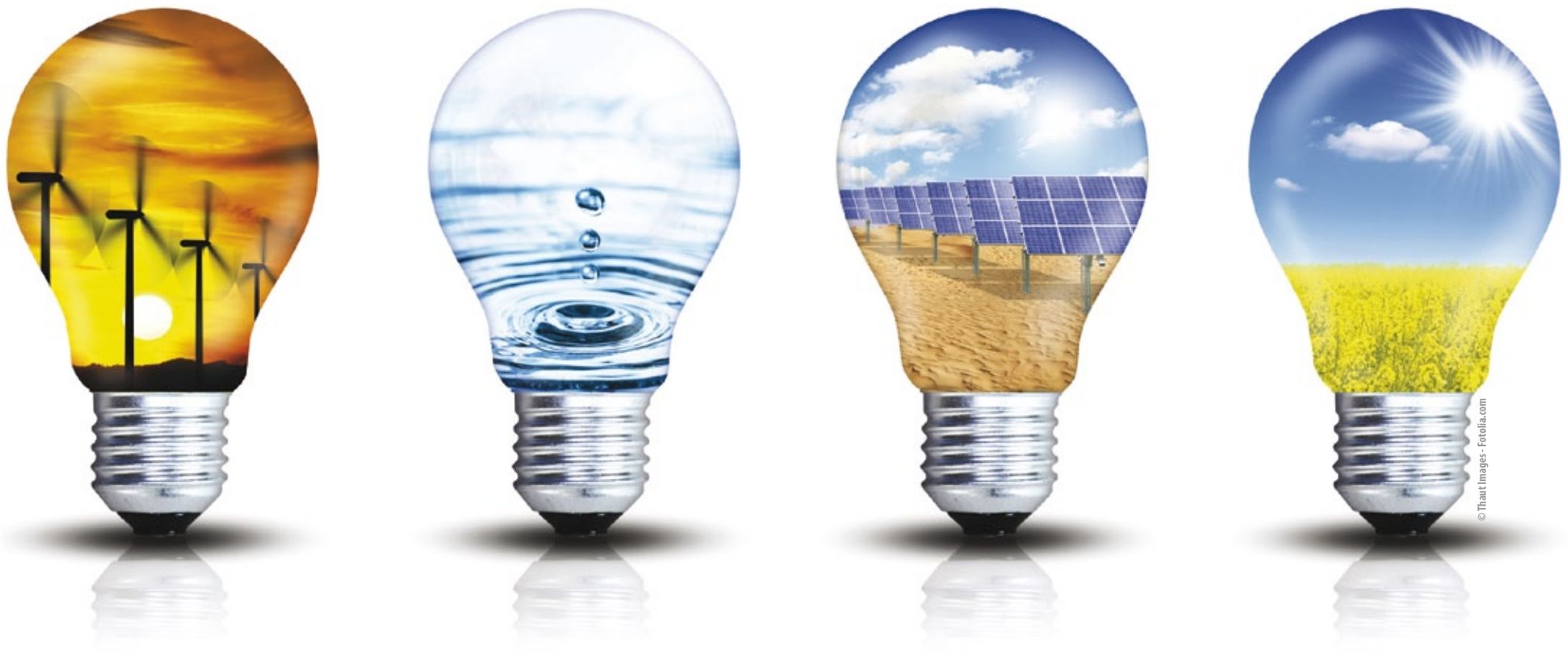
The relief will be available only to firms that sign up to a Climate Change Agreement setting energy efficiency targets, and will cost the taxpayer a combined £40 million for the 2013/14 and 2014/15 fiscal years, the source said. The government will also pledge to limit the impact on energy-intensive industries from an electricity market reform, plans for which were set out in draft legislation in July this year.

"(The measures) will help make sure energy intensive industries are internationally competitive, but the government remains committed to the green agenda and to cutting carbon emissions by 80% by 2050," the source said.

The new government support will cut the electricity costs of high energy users – such as steel and aluminum makers plus the cement, chemicals, glass and paper industries – by 5–10%, the source added. ■

Sustainable Biomass Gaining Significance

Why the Chemical Industry Should Become Certifiable



Discussion On Sustainability – Biomass is booming. It is one of the most important sources of renewable energy and will play an important role in tomorrow's energy supply as an alternative to fossil fuels. In the area of bioenergy, an EU directive prescribes the use of certified, sustainable biomass. But biomass is also widely used in other sectors, such as food production, animal feed production and the chemical industry. Although the use of biomass in these areas is not regulated by legislation, these industries must nevertheless address the discussion on sustainability.

Norbert Schmitz
Managing Director, International Sustainability and Carbon Certification

Not All Biomass Is Created Equal

In addition to sun and wind, biomass is now one of the chief sources of renewable energy. Its use has triggered public debate on how the use of raw materials which can be regrown affects the environment and the Earth's climate. We have all seen images of devastated tropical rainforests. In stipulating that only certified sustainable biomass could be used in the motor fuel sector from Jan. 1, 2011 onwards, the EU ruled out the use of carbon-rich and biodiverse land for biomass production in this sector. Over and above this, a requirement stating that biofuels must achieve a reduction in greenhouse gases of at least 35% in comparison to fossil fuels was put in place. However, a directive covering this area only represents a mere drop in the ocean. Only around 8% of palm oil, for example, is actually used for biofuel production. The bulk of the harvest is used by the chemical and food-producing industries. It follows that it makes sense to extend certification demonstrating the sustainability of biomass into these areas. Otherwise it will be virtually impossible to prevent the overexploitation of nature and changing landscapes at the expense of food production.

The coalition agreement of the German federal government provides for the extension of sustainability requirements to all areas of biomass use. Such an extension is also under discussion at EU level. While decisions on the introduction of binding legislation have yet to be made, enterprises in the relevant sectors can obtain certification voluntarily.

Certified Products Attract Premium Prices

Around 10% of the feedstock used by the chemical industry consists of biomass. The international chemical group Braskem has just had a plant in Brazil certified by International Sustainability and Carbon Certification (ISCC), establishing an importing precedent in the process. More and more of the chemical industry's customers are requesting proof of sustainability from suppliers. In the medium term, enterprises using non-certified biomass can expect that the prices for their products will drop. The general public is increasingly displaying an interest in sustainability-related topics which is not confined to products targeted directly at consumers. Enterprises' actions are increasingly being scrutinised to determine whether they are economically, socially and ecologically sustainable.

However, these are not the only aspects relevant to the decision to opt for voluntary certification. In the biofuels sector, premium prices are paid for ISCC certified products. Here, certification has become a selling point for producers to distinguish themselves from competitors. It can be assumed that this effect will also apply to other sectors in the future. It is crucial that the certification systems are of high quality.

Social criteria as well as purely ecological criteria should be audited; systems which do not consider social criteria are unlikely to be perceived as credible by the media and the society. The production of certified sustainable biomass helps to export social and ecological standards and to improve living and working conditions in countries outside the EU. The production of sustainable biomass can serve to generate incomes in countries or regions with poor infrastructure. For example, 140,000 small farmers in India grow jatropha for the Australian company Mission New Energy, which extracts oil from the plant for biodiesel production. Most of these small farmers live close to the poverty line in isolated regions. Jatropha is planted on fields which are not suited to food production. No chemicals are used, and only organic fertiliser is applied. The farmers cultivate the land using basic techniques and resources, and they are supported in their work by various Mission New Energy service centres. This allows subsistence farmers to profit from the growing demand for sustainable biomass by tapping into a new income stream. At the same time, greenhouse-gas emissions are reduced and agriculture for food production is not threatened. A classic win-win situation.

The sustainability discussion in the chemical industry is only now getting off the ground, but those involved in the sector are aware that the topic will continue to grow in importance and that it should be tackled head-on before legislative requirements are implemented. Pilot projects are currently being realised with various chemical enterprises. Competition in the area has heated up following the recent certification of Braskem. This is likely to result in increasing numbers of chemical enterprises seeking voluntary certification.

The more participants in the market join this process, the faster humans and the environment will benefit.

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chemanager-online.com/en/tags/biofuels

EU Shale Gas Delayed by Red Tape, Green Concerns

Opinion – Scaled-up European shale gas development is likely 10-15 years off as regulations coupled with little infrastructure, higher costs and mounting environmental concerns burden a lengthy licensing process.

U.S. and European shale gas development is a tale of two regulations, one marked by a free-for-all bonanza in some U.S. states which has cut national gas prices and imports and by a welter of legislation across the European Union.

Now the sight of a U.S. public backlash and back-pedalling regulators will only further stall a European rollout of hydraulic fracturing or fracking, the technique of blasting sand and fluids to force pockets of gas trapped in shale deposits deep underground.

The practice is currently banned in France, remains suspended in Britain following a magnitude 2.3 tremor associate with a test drill and is a subject of public debate in Germany.

The slow pace of progress suggests the EU may have erred too much on the side of caution while reflecting the reality of a more densely populated land mass naturally resistant to extensive onshore drilling.

EU states have barely broken ground on shale gas resources estimated at about three-quarters the size of those in the United States, with some 20 test drills compared with more than 25,000 U.S. wells.

The European Union's executive Commission doesn't foresee EU legislation directly regulating shale gas, much as no central directive regulates any other hydrocarbon production, senior European Commission energy official Philip Lowe told an SMi industry conference in London last week.

But that partly reflects existing environmental regulation encompassing water quality, environmental impact, planning permitting and safe use of chemicals which together capture key concerns of groundwater contamination and landscape blight.

A full regulatory picture in Europe must await an avalanche of reports, in true EU fashion, on the existing legal permitting framework (due in late 2011); groundwater contamination (early 2012); the economic impact (early 2012); climate impacts (mid-2012); and environmental impacts (mid-2012).

New regulation will be a last resort in a bloc which has plenty, and given the need for a domestic energy boost which could also strength Europe's arm in price negotiations on gas imports.

Concern

Growing U.S.concern has been for full disclosure of potentially toxic fracking chemicals used in drilling as well as leakage of natural gas. Fracking caused potentially harmful methane-contamination of water wells near drilling sites in the Marcellus shale formation in Pennsylvania, researchers concluded this year.

Now U.S. regulators plan to force chemicals disclosure regarding drilling on federal lands , and will release next year results of a study on effects on drinking water, adding to plans for rules on wastewater disposal by 2014. Groundwater contamination ranks alongside other concerns including earth tremors, leakage of greenhouse gases, air pollution, truck movements, landscape damage and water consumption.

In Europe chemicals regulation already requires the registration of chemicals used in fracking, and more diffuse concerns weigh. France, which has the bloc's second biggest shale gas reserves, in October cancelled fracking licences following an earlier ban given environmental concerns. In Britain, drilling remains suspended after leading explorer Cuadrilla Resources acknowledged that it had caused two small earthquakes. In Germany one regional moratorium has added to new public discussion. Poland has Europe's biggest reserves and among the least state resistance, so far.

What Next?

EU shale gas uptake has been further delayed by a lack of a U.S.-style drilling infrastructure, which raises costs, while urgency is less given expanding supply options through new planned pipelines from Russia and the Caspian Sea and imports of liquefied natural gas (LNG).

A combination of regulation, public doubts and higher costs implies a realistic timetable for scaled up European production from about 2025, and then still far below U.S. levels now, according to consultants Wood Mackenzie and Nexant.

New York state may provide a regulatory example, meanwhile. In proposed new rules for drilling, which would end a fracking suspension, it has imposed off-limits buffers around waterways. European public will likely demand additional buffers encompassing widespread protected areas.

Gerard Wynn, Reuters

chemanager-online.com/en/tags/shale-gas

Propane Substitutes for Water in Shale Fracking

Many controversies surround hydraulic fracturing of underground shale deposits in the quest for oil and gas, but a small Canadian oilfield services company has pioneered a way around one of them: the use of prodigious amounts of water in the process. "Fracking" generally involves blasting millions of gallons of water down a shale well to free up oil and natural gas, and then the water needs to be disposed of because it may contain toxic drilling byproducts like heavy metals.

Much of the water required for a so-called frack job is sourced from lakes, rivers or city water systems, and water is in short supply in some drilling areas, such as drought-plagued Texas.

GasFrac Energy Services is winning customers, including Chevron, by using a flammable propane gel instead of the water, chemicals and sand typically blasted into rock or tight sand formations to release trapped oil and gas. One benefit of the growing technology is that no water is used.

The gelled propane turns into a gas and exits the well with the natural gas or oil stream produced, eliminating the use of millions of gallons of water pumped into a well.

Growing

Most of GasFrac's frack jobs have been performed in western Canada, but the company is fracking more and more wells in North America. Their largest customer is Canadian oil and gas company Husky Energy. Now some of the world's largest companies are giving the technology a look, including Chevron and Royal Dutch Shell, the company's CEO said.

GasFrac said it has so far performed more than 1,000 propane fracks on 400 wells, it said.

The company began operations in Texas this summer, using its technology to frack a well in the Eagle Ford Shale for a small Canadian company called Jadela Oil Corp.

The well was fracked using propane, butane and sand instead of water. Texas is experiencing one of the worst droughts on record, and water use in the state has been an issue.

The company is also operating in the Marcellus Shale covering parts of the U.S. Northeast, where opposition to drilling has been the most fierce.

"This is the market that is booming," GasFrac President and CEO Zeke Zeringue said a day ahead of a trip to Houston to see potential customers. "I think this could be a game changer for the industry." ■

chemanager-online.com/en/tags/shale-gas

Meeting New Emission Regulations

How Coalescing Aids Can Help Paint Manufacturers

Adjusting Accordingly – There is a growing public and political concern for the environmental impact and safety of paint and other building materials. In France, legislation has been recently approved to label all indoor paint and construction products according to their level of emission. As a result, manufacturers of materials such as paints and coatings are looking to adjust their portfolios and production accordingly.

Paint manufacturers can meet today's strict industry regulations and performance needs by using coalescing aids in their products without the need for a complete reformulation and certification of their paint products.

The new French legislation – Grenelle de l'environnement – is in addition to the current European Union directive, 2004/42/EC, on volatile organic compounds (VOCs), commonly referred to as the Decopaint directive. It describes a mandatory emissions labelling of all construction products used indoors and includes paints and coatings amongst other construction products.

Effective from Jan. 1, any new building product, including paint, placed in the French market must have a label affixed containing one of four letter grades: A+, A, B or C, which indicate the level of emission produced by the product. Paints that are currently sold in the French market need to apply the same classification from Sept. 1, 2013. The mandatory letter-grade labelling is based on emission testing after 28 days via ISO 16000. The higher the emission, the less favourable the classification is, with A+ ratings being ideal. The French regulation allows emission evaluations via a chamber method (ISO 16000-9) or the Field and Laboratory Emission Cell method (ISO16000-10).

To Meet the Regulations, What Are the Options?

Manufacturers of architectural coatings in Europe are being driven by the aforementioned regulatory directives, retailer requirements and consumer preferences to deliver products with reduced volatile organic compounds and lower emissions. This must be accomplished while maintaining optimum paint performance in scrub resistance, block resistance, low temperature film formation, and other parameters.

Formulating with coalescent-free alternative binders to meet VOC or emission regulations can lead to issues. Adding polymers with low glass-transition temperatures (Tg) or self-crosslinking polymers are techniques that binder formulators have developed to reduce or eliminate the need for coalescents. However, low Tg polymers normally produce softer, tackier coatings and the formulated paints can suffer in terms of poor blocking, dirt pick-up resistance, surface hardness and film cohesion.

The introduction of crosslinking polymers is another technique to enhance the application properties of soft, low Tg binders. However, the crosslinking technologies for water-based paints are usually expensive compared to conventional resin systems and are not suited for many product segments in this highly priced competitive market.

According to a recent independent study of coalescent versus coalescent-free architectural paints conducted by the Paint Research Association for Eastman Chemical Company, coalescent-free paints presented serious performance issues, including in the areas of scrub resistance, porosity, mud cracking, blocking, print resistance, hardness and color development. The same study showed that paints containing coalescing aids produced excellent results even when applied in the most demanding conditions.

Compliance

Most importantly, independent emission evaluations of architectural wall paints containing Eastman Texanol ester alcohol and Eastman Optifilm Enhancer 300 show that these formulations can comply with the new French mandatory emission labelling. The independent evaluations, conducted by Eurofins and using a chamber test method, actually showed that matt and satin paints containing the two coalescing aids achieved an A+ rating for both emission and the principal substances detected.

In short, paint manufacturers can meet today's strict industry regulations and performance needs by using coalescing aids in their products without the need for a complete reformulation and certification of their paint products.

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Tanning Made In Germany

New Product Offers Innovative Technology for Leather

Organic Tanning – In September 2011, Lanxess launched X-Tan, an innovative organic tanning technology based on a newly introduced tanning agent. CHEManager Europe has asked Christopher Tysoe, Director Wet End at Lanxess' Leather business unit, to explain some of the most prominent characteristics and advantages of this new system.

Chris Tysoe
Director Wet End, Business Unit Leather, Lanxess

CHEManager Europe: What are the key features of the new tanning process?

C. Tysoe: X-Tan is a metal- and organic chlorine-free, innovative tanning technology developed and marketed by Lanxess. It is based on the active ingredient polycarbamoyl sulfonate (PCMS), a bifunctional, non-toxic cross-linking agent. During tannage, which takes place in moderately alkaline media above pH 8, PCMS permanently and irreversibly links to amino groups from lysine residues of the collagen fibers. This fast reaction ensures excellent tanning results in a highly robust process and a very stable and transportable wet white with an excellent property profile.

In short, X-Tan addresses many of the existing issues of wet white production at once without creating any new obstacles from an environmental or operating point of view.

Which is the main difference in comparison with other wet white processes available in the market?

C. Tysoe: Compared with conventional systems for organic tannage, X-Tan offers substantial advantages for the wet white production. This is equally true in terms of quality and ecological aspects. One of the key features of the new X-Tan technology is the virtual whiteness of the leather. Due to a complete absence of a strong color of the intermediate wet white and a good dyeability brilliant and uniform colors can be achieved in the final product. This opens up a whole spectrum of application opportunities which have hitherto not been in reach for wet whites.

At the same time, the resulting leather has very good physical properties: For example, X-Tan-processed leather has shown a very high stability at climate change tests and offers a particularly good tear resistance.

What about the environmental advantages?

C. Tysoe: No chemicals with critical toxicological properties are employed in the X-Tan process. Additionally, only toxicologically uncritical substances are generated in the course of the tanning process. In the end, neither the leather nor shavings and effluent contain reactive tanning materials. This is the case because any excess of tanning agent in the float that is not consumed during the cross-linking step will – in the absence of readily available amino groups – slowly react with water to yield only toxicologically uncritical products such as amines and urea derivatives. All these hydrolysis products are also easily biodegradable.

X-Tan is the the next generation of wet white tanning.

As a further advantage of the X-Tan process, no pickling step is required because of the good penetration of X-Tan at neutral pH. This simplification of the overall process gives rise to a significant reduction of the salt load in the effluent. This is partly the case because only minor neutralization is required later on. X-Tan thus makes an important contribution to preserve the natural resource water and extensively reduces the environmental contamination caused by the wet white process. Not the least, the overall tanning process becomes significantly less time-consuming without pickling.

Due to all these advantages, the new X-Tan technology is fully in line with the aims of Lanxess' initiative "Sustainable Leather Management." This initiative has recently been designed to extend and enhance the company's product portfolio for sustainable leather production. Even more, we consider X-Tan being one of the cornerstones of our initiative as it immediately leads to increased sustainability in leather manufacture.

For which kind of leather is it recommended?

C. Tysoe: The X-Tan process allows for manufacturing a wide range of leathers, allows to tan unsplitted, thus being able to replace almost any other wet white process without compromising product quality or overall process performance and productivity. Leathers for all kinds of applications have been produced on a small scale as well as in bulk loads. We are therefore convinced that our new process will not only prove its competitiveness in all areas of wet white production, but will be superior to many other methods of organic tannage in many, if not all respects.

▶ www.lanxess.com

chemanager-online.com/en/tags/leather

CPhI Organizers Call Attendance 'Record Breaking'

UBM has announced that this year's CPhI attendance numbers are "record breaking." The event, which took place in Frankfurt at the end of October, had 2,200 global exhibitors onsite. While the official attendance numbers are still pending audit through the Audit Bureau of Circulations (ABC), the organizers said their projections "smash all records set in more than 20 years of the events:"

The CPhI hosted several several industry-specific sub-shows, including the ICSE for contract and outsourcing services; P-MEC Europe for equipment, machinery and technology; and the InnoPack for innovative packaging solutions. P-MEC Europe grew more than 44% over 2010, and despite exhibitors moving over to the new InnoPack event, ICSE still had a strong showing with over 220 exhibitors. The new InnoPack event was met with positive feedback and attendance with over 100 global exhibitors hosting attendees from more than 140 countries.

"The scale of the events has grown exceptionally over the years," said Greg Kerwin, UBM's portfolio director Pharma. "It is important to us that the size does not change the opportunity for each visitor to have a unique and personal experience and we invest a large amount of time and money to ensure this."

Innovation Awards

The CPhI Innovation Awards returned for their eighth year to recognize companies and organizations that are breaking new ground in the pharmaceutical, packaging, contract services and biopharmaceutical sectors. The gold winner of the CPhI Innovation Award was Glycotope for their GlycoExpress platform that optimizes the glycosylation of antibodies and other glycosylated biotherapeutics. The Silver medal went to Acuros for their disposable drug delivery device designed to deliver microliters or milliliters per hour. Finally, bronze was awarded to Johnson Matthey Catalysts for their Color-Tag-Protein technology that works as a marker for protein expression. The awards were handed out during an exhibitor party that also took a moment to recognize UBM's shift towards celebrating and supporting sustainability in the events which included awarding Solvias with the Exhibitor Sustainability Award.

2012 In Madrid

CPhI Worldwide, ICSE, P-MEC Europe and InnoPack will all return Oct. 9–11 at the Feria de Madrid in Madrid, Spain. Further information about CPhI Worldwide, ICSE, P-MEC Europe and InnoPack can be found online at www.cphi.com, www.icsexpo.com, www.p-mec.com, and www.innopack-pharma.com. ■

chemanager-online.com/en/tags/cphi

Ashland Unveils Comprehensive Excipients Business at CPhI 2011

Ashland Specialty Ingredients presented its expanded excipient portfolio and global R&D capabilities that support the formulation development goals of pharmaceutical companies at the CPhI in Frankfurt. Ashland outlined how it plans to support formulators of pharmaceuticals with expertise in a larger range of formulation approaches and manufacturing techniques, as well as with a larger portfolio of proven excipients to address today's drug formulation challenges.

"The former International Specialty Products (ISP) and Ashland Aqualon Functional Ingredients businesses are now combined as one business – Ashland Specialty Ingredients," said Jeffrey Wolff, group vice president, Pharmaceutical & Nutrition Specialties, Ashland Specialty Ingredients.

The company's acquisition of ISP in August significantly expanded the company's position in higher-margin, higher-growth end markets, including personal care, pharmaceutical, food and beverage and energy. Going forward, Ashland Specialty Ingredients is expected to contribute roughly half of Ashland's EBITDA. In addition, approximately half of Ashland's overall revenues will now be derived outside of North America, the company said.

In outlining Ashland's expanded offerings, Wolff cited some of the most important formulation priorities of drug makers within the past five years: Improving the efficacy of poorly soluble drugs; increasing use of controlled-release technology; orally disintegrating tablet forms for improved patient compliance; and continuous manufacturing of oral dosage forms. ■

Halocarbon Positioned For Success

Halocarbon, a worldwide producer of specialty fluorochemicals and inhalation anesthetics, announced strong 2011 results and an optimistic forecast for 2012. "We're expecting another year of double-digit growth," said Halocarbon CEO Peter Murin.

While the worldwide hexafluoroisopropanol (HFIP) supply is tight, Halocarbon has upgraded its plant to increase HFIP production to fill the void. The shortage is caused by demand for HFIP raw materials being used for other products, namely R1234yf refrigerant and fluoroelastomers.

Halocarbon has continued to grow on other fronts, as well. Advancements and recent pilot plant scale-ups have focused on electronics chemicals and its existing trifluorobased line, which remains strong worldwide.The company has also grown in the coatings area, supplying HFA monomers to the semiconductor and specialty coatings market.Halocarbon is beginning research into carrying out direct fluorination and pursuing projects involving collaborations with other companies. ■

Saltigo Strengthens Market Position in U.S., Japan

At this year's CPhI, Saltigo announced two moves in the company's strategic alignment. The company said it will build new production capacities for potent active pharmaceutical ingredients for the American pharmaceutical industry at its U.S. site in Redmond. Second, it said it is looking to strengthen its commitment in Japan. The company's Leverkusen site was recently accredited by the Japanese Pharmaceuticals and Medical Devices Agency (PMDA). "For us, its value is similar to that of a certificate from the U.S. Food and Drug Administration," said Dr. Andreas Stolle, head of the Pharma business line at Saltigo.

"It is an essential milestone for further expanding our business activity in Japan and safeguarding it on a sustainable basis." ■

Solutions For Global Megatrends

First panoramic roof made of polycarbonate for electrohydraulic convertible top (© Daimler)

Is it possible to strike a balance between megatrends like climate protection and rising global mobility? What possibilities do plastics offer for increasing the range of electric cars? When it comes to lighting, can energy efficiency, safety and modern design be combined? And how can we conserve dwindling resources if product quality is to remain at a high level? Bayer MaterialScience presented answers to all these questions at this year's Fakuma trade fair in Friedrichshafen.

"Innovations are, and always will be, an important growth driver for Bayer MaterialScience. They open up numerous, promising business opportunities in key sectors, such as the automotive and construction industries, and in electrical/electronics applications," Dr. Dennis McCullough, head of Advanced Polycarbonate Resins at Bayer MaterialScience in the Europe, Middle East, Africa and Latin America region, said during a meeting with the press at the trade fair. "To satisfy rising demand, we are investing heavily in expanding our production capacities, not only in our primary growth market Asia, but also in Europe."

An example: New drive concepts, such as electric mobility, reduce our dependence on oil and are expected to make an important contribution to climate protection. However, one challenge continues to be the low range of the vehicles. To travel a distance of just 150 kilometers, a car needs a battery weighing up to 200 kilograms. In automotive glazing and roof design, polycarbonates and polyurethanes from Bayer MaterialScience slash weight by as much as 50%, thus reducing the strain on the battery.

But plastics can do a lot more. For instance, polycarbonate glazing sheets for panoramic roofs can be tinted in a way that they filter out most of the sun's infrared radiation. The vehicle heats up significantly less on the inside, and the air-conditioning consumes less energy. As a result, the battery charge lasts longer and the vehicle's range increases.

The example of a high-quality product based entirely on recyclates from used water bottles proves that bodywork parts do not always need to originate from new material. Makroblend GR is a plastic blend made from polycarbonate and PET recyclates and it displays similar outstanding properties as new product.

"We are also developing innovative and sustainable solutions for other global megatrends, such as technology, living and health," says Klaus Dreesen, who was in charge of the Bayer MaterialScience stand at Fakuma. "Along the way, we strive both to improve processes and enhance comfort and safety."

Cost and energy efficiency, but also sustainability, play an increasingly important role in injection molding. The same applies to combining different materials. Direct Skinning or Direct Coating technology is a versatile method for coating injection-molded polycarbonate parts with polyurethane foams or coatings right in the mold. The method already is used in mass production, saving time, money and energy. The clou: This technology enables the manufacture of parts with tailor-made surface properties – from rigid to soft, from glossy to textured.

The growing global population and urbanization require improved traffic safety. Optical lenses made of Makrolon polycarbonate focus and direct the light of LEDs in automotive headlamps and streetlights. Effectively illuminating roads and walkways increases safety for pedestrians, cyclists and other traffic participants. At the same time, LED technology helps save energy.

► www.bayermaterialscience.com

Styrolution's Global and European Headquarters in Frankfurt, Germany

The world's leading supplier of styrenics will operate from its global headquarters located in Frankfurt, Germany. The new facility was inaugurated on Nov. 11 for employees from all global functions, as well as several functions from the EMEA region.

"We are looking forward to start working at our new, global and EMEA headquarters in Frankfurt," Roberto Gualdoni, chief executive officer, Styrolution said at the ribbon cutting ceremony for the new office building.

Styrolution has been operating independently since Oct. 1, 2011. The company is a 50-50 joint venture between BASF and Ineos, comprising the key styrenic business activities of both partners. Styrolution is the only company among key players on the market dedicated entirely to styrenics. Styrolution is number one worldwide in styrene monomer (SM), polystyrene (PS), styrene butadiene copolymers (SBC) and other styrene-based copolymers (SAN, AMSAN, ASA, MABS) as well as copolymer blends. In acrylonitrile butadiene styrene (ABS), the company is number two worldwide. In total, Styrolution employs approximately 3,400 employees and operates 17 production sites in 10 countries. In 2010, pro-forma combined sales totaled €6.4 billion. ■

Styrolution's CEO Roberto Gualdoni (l.) and Integration Manager Sven Grabowski at the ribbon cutting ceremony in Frankfurt, Germany

Focused on Plastics – Fakuma 2011

Celebrating its 30th anniversary, the Fakuma international trade fair for plastics processing successfully closed with 44,823 recorded expert visitors, an increase of more than 20% in comparison to 2009.

Fakuma's main focus is on machines, equipment, peripheral devices, tooling, accessories, semi-finished goods, plastic products, raw materials, auxiliary materials and associated services for the plastics processing industry.

During the opening press conference trade fair promoter Paul E. Schall announced several superlatives: 1,670 exhibitors, 915,000 square feet of exhibition floor space, exhibitors from 34 countries, 30 years of Fakuma in Friedrichshafen, and Annemarie Lipp as project manager for more than 30 years. The brief retrospective made it apparent "the trade fair has continuously evolved over all the years and is recognized as the number 2 event amongst all international plastics trade fairs throughout the world" Schall said in his presentation.

In the past 30 years, Fakuma has grown from 43,000 to 915,000 square feet of exhibition floor space, from 60 to 1,670 exhibitors, from three to 34 countries represented by manufacturers and suppliers, from roughly 4,000 to 44,823 expert visitors coming from 119 countries.

► www.schall-messen.de

EVENTS

6th Annual GPCA Forum, Dec. 13-15, Dubai The petrochemical industry continues to recover from the global recession and following on from last year's successful event, which attracted over 1,300 delegates, this year's theme will be "Moving Downstream – Creating Added Value and Sustainable Growth." Having capitalized on feedstock advantage, GPCA member companies in the coming decade will be challenged to capture further, sustainable value creating opportunities. These lie downstream and are linked to the development of industrial clusters across the region, particularly those being established to provide materials for the automotive, flexible packaging and appliances sectors. Petrochemicals provide the essential building blocks for further industrial and social development.

▶ www.gpcaforum.net

Effective R&D Controlling in the Pharmaceutical Industry, Jan. 26-27, Berlin Increasing costs for research and development while new drug approvals are stagnating are predominant in the discussion concerning the future of the pharmaceutical industry. Innovation is recognized as the cornerstone for competitive advantage and is fostered by strong investments in R&D. Rising costs of pharmaceutical R&D coupled with increasing pressure of stakeholders demanding steady growth, lead to increasing pressure on the output of the innovation pipeline. But drug development and commercialization is an expensive, lengthy and risky process.

▶ www.marcusevansde.com

CoolChain Europe, Jan. 30-Feb.1, Basel Despite pressures to reduce cost, limit risk and go green, industry professionals are pushing ahead setting up distribution partnerships, ambient transportation solutions, navigating new markets and very importantly – complying with international regulatory GDP guidelines. Find out more at the CoolChain Europe conference.

▶ www.coolchaineurope.com

InformexUSA, Feb. 14-17, New Orleans InformexUSA will offer exhibitors and attendees a direct view of what is happening in the varied chemical marketplaces. With this focus, there is exceptional vertical insight many markets, including: textiles, electronics, food and beverage, fuel and lubricants, soaps and detergents, water treatment, flavors and fragrances, adhesives and resins, paint and coatings, cosmetics and personal care, biopharmaceuticals, plastics and polymers, organic chemicals, agrochemicals, pharmaceuticals and more.

▶ www.informex.com

Green Polymer Chemistry 2012, March 20-22, Cologne Green Polymer Chemistry 2012 provides a forum for environment and sustainability managers, business development professionals, chemical engineers, plastics manufacturers, researchers, and suppliers to the industry to debate the latest developments in producing conventional polymers from sustainable sources such as plants, waste and CO_2. Conventional plastics such as polyethylene, polypropylene, PET and nylon, have a well-established performance record in protecting and preserving food and water supplies worldwide, from high pressure pipes to thin film packaging. The program includes sustainability papers from Unilever and the Ford Motor Company alongside expert presentations from majors in the chemical industry including BASF, Süd-Chemie, Braskem, Chemtex Italia, DSM and Merquinsa, alongside research institutes such as the Wageningen University, which specializes in agriculture. There will be market papers on potential sources of monomers and polymers including an economic review of the availability and competition for bio-products.

▶ www2.amiplastics.com/events

Frost & Sullivan Recognizes Merck KGaA

The 2011 Frost & Sullivan Global Product Differentiation Excellence Award in Food Colors has been presented to Merck KGaA for its Candurin range of pearl effect colors. The award is in recognition of Merck's accomplishments in the food colors sector. Frost & Sullivan's Best Practices Awards identifies exemplary achievements within a multitude of industries and functional disciplines each year.

"With its Candurin range, Merck KGaA has overcome challenges associated with pearlescent pigments, including dust in the food manufacturing center, safety and labeling data, technical support for application development and stability," wrote the Frost & Sullivan Best Practices team. "The Candurin range of mineral food grade pearl effect colors is a replacement for the ubiquitous color lake and dyes used in chocolates, confectioneries and other foods. In particular, Candurin can effectively replace insoluble artificial colors, thereby perfectly matching the growing market need for natural food ingredients," the jury concluded.

Gold, silver, bronze, blue, red and green color effects can be created with Merck's Candurin pearl effect colors. The color effects are created out of mineral components – potassium aluminum silicate (mica – E 555), titanium dioxide (E 171) and/or iron oxide (E 172). ■

Lanxess: Best Supplier of High-Performance Plastics

The Semi-Crystalline Products business unit of Lanxess has been honored as the best supplier of high-performance plastics. It was recently presented with the "2011 Global Supplier Award" from Mann+Hummel. The Ludwigsburg-based filtration specialist honors its best suppliers with the prize in recognition of their outstanding performance or achievements. "Besides our product quality and innovative capability, our delivery reliability and flexibility were also singled out for praise. Thanks in part to our production facilities throughout the world, we were able to ensure the reliable supply of material to our partners at all times, even under complex logistical conditions and tight deadlines," said Egbert von Platen, Head of Marketing and Distribution, including for the Europe region, at Semi-Crystalline Products. ■

Dr. Syuzanna R. Harutyunyan wins Solvias Ligand Contest

The jury of the annual Solvias Ligand Contest awarded the 2011 prize to Dr. Syuzanna R. Harutyunyan, Assistant Professor in Synthetic Organic Chemistry at the University of Groningen. The jury honoed Harutyunyan for her contributions in the area of asymmetric catalysis and the application of Solvias ligands with the following laudation: "In recognition of enlarging the scope of Cu-Josiphos and Cu-Taniaphos catalyzed asymmetric addition reactions. Both, the allylic substitutions with alkyl lithium reagents as well as the 1,2 addition of Grignard reagents to enones have an interesting synthetic potential."

The Solvias Ligand Contest challenges researchers all over the world to submit new and improved applications of Solvias ligands and catalysts. To pick the winner, the jury assesses the novelty, scientific rigor and originality of the work submitted, as well as its practical applicability in organic synthesis. ■

Huntsman Clinches Top Prize at IChemE Awards

Huntsman Pigments won the top prize at the IChemE 2011 Awards ceremony for its revamped site in Calais, France. Huntsman was awarded the Outstanding Achievement In Chemical And Process Engineering award after turning a site threatened with closure into a thriving new revenue stream. By turning waste filter salts into sustainable fertilizers and securing new markets, Huntsman now has plans to build a new £25 million fertilizer plant on the site. ■

PEOPLE

David N. Weidman

Albemarle Executive Chairman Mark Rohr to Take Over at Celanese

Celanese Chairman and CEO David N. Weidman will be retiring in April 2012. The company's board of directors has appointed Mark C. Rohr as his successor. Rohr is currently the executive chairman of Albemarle's board. He will step down from that position on Feb. 1.

Weidman joined Celanese in 2000. In 2002 he was named chief operating officer and was named chief executive officer in 2004 following the company's move from Germany to the United States. Weidman led the company through its initial public offering in January 2005 and was elected chairman of the board in 2007.

Michael Ceranski

New Senior VP for BASF Michael Ceranski will become senior vice president of BASF's Global Business Unit Human Nutrition, located in Lampertheim, Germany, effective Jan. 1. Ceranski is currently vice president, Business Management Crop Protection Germany, Austria, Switzerland and Benelux.

Dr. Massimo Armada, currently senior vice president, Human Nutrition, has elected to leave the company effective Dec. 31 to take over new responsibilities.

Ron Nersesian

Agilent Technologies Apponts New Executive VP and CEO

Agilent Technologies announced that Ron Nersesian has been appointed executive vice president and chief operating officer, effective immediately. Nersesian has been president of Agilent's largest business, the Electronic Measurement Group (EMG), since 2009.

Nersesian will have day-to-day responsibility for Agilent's three businesses, Electronic Measurement, Chemical Analysis and Life Sciences, with the presidents of those businesses reporting to him.

Guy Séné, who has been vice president of the Microwave and Communications Division (MCD) since 2009, will replace Nersesian as EMG president.

Merck: Joachim Christ to Lead Corporate Controlling

Merck KGaA announced that Joachim Christ will join the company on Jan. 1 as head of corporate controlling. He will report to Matthias Zachert, member of the executive board of Merck and chief financial officer. Christ has been the controller for global production at Lanxess since Dec.1, 2004.

Gregory E. Poling

Grace Announces Management Re-Alignment

W. R. Grace announced that Gregory E. Poling has been elected as the company's president and chief operating officer. Poling previously served as president of Grace Davison, Grace's largest operating segment. Fred Festa will remain chairman and chief executive officer.

Poling joined Grace in 1977.

He spent the first part of his career in Grace Construction Products eventually becoming vice president and general manager where he had global responsibility for sales, operations and technical services. He joined Grace Davison in 1999 and became its president in 2005.

Starna Scientific appoints Nathan Hulme as Director

Starna Scientific has appointed Nathan Hulme as a director to help guide the company's expansion plans. Hulme's main responsibilities will include assisting in setting out an overall business strategy for the company that will address communications with customers and dealers as well as involving leadership of the sales team.

Rick George

Suncor CEO Rick George To Retire Suncor Energy said Chief Executive Rick George will retire in May, 21 years after taking charge of the company he turned from a small, unprofitable oil sands developer into Canada's largest oil and gas producer. George will be replaced by Steve Williams, Suncor's chief operating officer, at the company's May annual meeting. Williams was also appointed the company's president and given a seat on the board of directors.

Williams is a one-time Exxon Mobil manager who came to Suncor from Octel, a British specialty chemical company. He's credited with improving the reliability of Suncor's oil sands operations following a series of fires that cut into production and disenchanted investors.

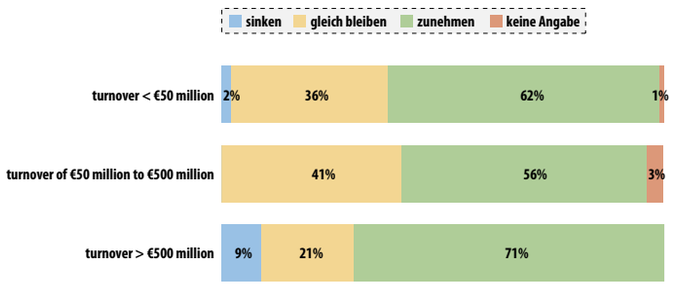
Krahn Chemie Expands Executive Board Dr. Rolf Kuropka joined Krahn Chemie as managing director sales and marketing on Dec. 1. He will succeed Dr. Jörg Schottek, who was appointed as CEO and chairman of the managing board effective Nov. 1.

Together with Axel Sebbesse, managing director finance and administration, Kuropka will be in charge for the operative management of Krahn Chemie.

Schottek is also CEO and chairman of the board of Krahn Chemie's sister company Albis Plastic.

Competitive Pressure Mounting in the Chemical Industry

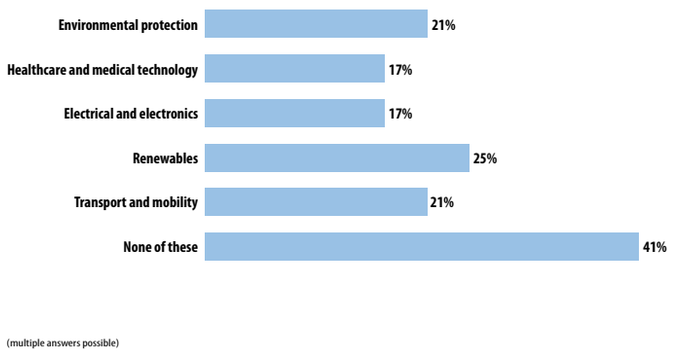
How will competitive pressure affect your products?
(next 6 - 12 months)



Source: Ceresana Industry Monitor (CIM) © CHEManager Europe

In spite of macro-economically uncertain times and the gloomy mood in different industrial sectors, the chemical and plastic industries are optimistic about the last quarter 2011. About 40 % of the participants in the Ceresana Industry Monitor (CIM) assessed their business situation in September as good. Just less than 60 % of respondents anticipate demand for their products to rise over the next months – and more than one in two expect the export share of revenue to increase. 53 % of the respondents say their current market situation is characterized by fierce competitive pressure. Yet, the current optimistic business climate can be explained by continuing high demand for chemical and plastic products.

What are the most important future markets for your company?

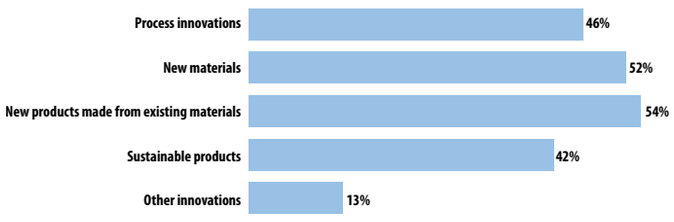


(multiple answers possible)

Source: Ceresana Industry Monitor (CIM) © CHEManager Europe

When asked about their most important future markets, almost half of all companies point to environmental protection or renewable energies. Above all specialty chemical companies see significant future potential in these two areas. While environmental protection is almost equally important for enterprises of all sizes, large companies (turnover of more than €500 million) want to focus on renewable energies. In contrast, medium-sized companies (turnover of less than €500 million) attach more importance to transport and mobility. Small companies (turnover of less than €50 million) rely on healthcare and medical technology.

Which areas offer you the greatest potential for innovations?

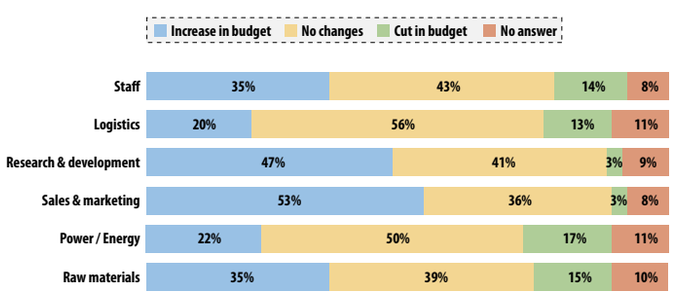


(multiple answers possible)

Source: Ceresana Industry Monitor (CIM) © CHEManager Europe

New materials and new products made from existing materials are the two sectors seen as offering the greatest potential for innovation. 42 % of the respondents think the development and use of sustainable products offer an important innovative potential (Graph A9). Especially small and medium-sized enterprises (SME) want to focus on developing new materials: More than one in two of them see their future in this field. SMEs also attach great importance to the development of products from existing materials. In contrast, large companies will rely on sustainable products. They believe that sustainable products will lead to the greatest success by far.

Graphic4: In what areas do you plan to change the budget?
(next 6-12 months)



Source: Ceresana Industry Monitor (CIM) © CHEManager Europe

About 44 % of respondents plan to increase research & development (R&D) expenditures over the next months. About 57 % plan to increase marketing budgets, which reflects the expected growing competitive pressure. Especially small enterprises (turnover of less than €50 million) plan to increase marketing expenses. The willingness of large companies to increase marketing budgets is almost 20 percentage points inferior. In order to increase future prospects even further and to react to rising demand, almost half of the respondents will rely on increases in expansion investments during the next 6 to 12 months.

Winter Wonderland – Snow and ice make a wonderful backdrop for the holidays, but it's a different story if you're stuck in an airplane that can't take off due to harsh weather conditions. Last year, many airport operators underestimated the amount of de-icer needed to make it through the winter season, resulting in canceled flights and delays. Clariant is ready for the 2011-12 season; the Swiss chemical company increased its production capacity through by new tolling agreements with partners in Sweden and Russia. Capacity increases have been made in a new facility in Udevalla, Sweden, owned and operated by Aerochem, and at two locations in Moscow. By producing Type II and Type IV thickened fluids, these additional sites will complement Clariant's main manufacturing site, at Gendorf, Germany. To serve central Europe, Clariant will use existing production and storage sites not only at Gendorf, but at major new depots and stock locations throughout Germany. Tolling and storage for the Finnish market will continue in Rauma, Finland. **(Photo by Travis Wiens/flickr)**

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