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6/2011 June

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Chemical Distribution

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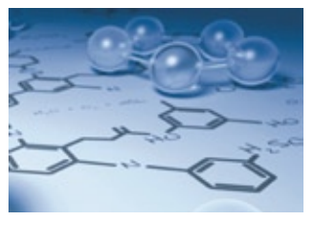

A Dynamic Network

Fecc Director General Uta Jensen-Korte on Promoting Chemical Distribution in Europe

The Right Mix – When Uta Jensen-Korte took over as director general of The European Association of Chemical Distributors (Fecc) in November, she may have been new to the job, but definitely not new to the industry. She began her career at Bayer, later moving on to Cefic, and afterwards as a temporary agent with the European Commission. It's the mix of experience with both the public and private sector that Jensen-Korte brings to the table in her new role. Brandi Schuster caught up with her to discuss the current challenges facing the Fecc and her views on the role of women in the chemical industry.

CHEManager Europe: Ms. Jensen-Korte, what do you consider to be the main objectives of the Fecc?

U. Jensen-Korte: A key objective is the achievement of unity within our membership, as this is a precondition for the stakeholders to take our position into account. It's important for us to monitor legislative developments and to make sure the interests of the European chemical distribution industry are heard in Brussels. Representing the distribution industry is very important, and it is our job to make the institutions aware of the specifics in our sector. To achieve this, it is crucial that we become the opinion maker and the natural partner within our industry.

Is there a challenge in Brussels to make the EU legislators aware of the specific issues related to chemical distribution?

U. Jensen-Korte: In any case, it is definitely useful to have a viable network. During my time in Brussels, I have been able to build relationships with industry, regulators and other stakeholders, which is now a tremendous advantage for my work within the Fecc. In Brussels, everyone knows each other – it's a close network – and this makes it easier to exchange ideas and cooperate together on projects.

What are some of the challenges facing the Fecc right now?

U. Jensen-Korte: One of our main priorities is to continue to find practical workable solutions for the next implementation phase of Reach, as well as to learn from the lessons of the first registration. I expect the next registration deadlines in 2013 and 2018 to involve more distributors in their roles as importers, of which an increase number will be small and mid-sized enterprises. These companies are sometimes more difficult to reach. Also, these deadlines apply to substances manufactured or imported in lower volumes, which means that data generation and data access costs will become a much larger issue than it was in 2010.

Another issue is the development in the co-decision for the Seveso Directive, which is aimed at improving the safety of sites containing large quantities of dangerous substances. The EU Commission set out to amend this 1996 Directive in 2010 with the objective of aligning it with the new classification, labeling and packaging Regulation, also known as CLP. The initial Commission goal was to keep the scope as close as possible to the 1996 Directive to avoid unnecessarily widening or lowering the current safety levels. However, the current draft does not correspond to that intention. While the Fecc welcomes the effort to introduce corrective mechanisms to improve the flexibility by allowing for the exclusion of certain substances from the scope of the Directive if they do not present a major accident hazard, there are other provisions that are cause for concern, such as the extension of the rules for inspections and for information to the public.

What are you working on in terms of sustainability?

U. Jensen-Korte: We are very active in promoting Responsible Care, or RC; improving health, safety and environmental standards within our member companies is one of our top priorities. In fact, the Fecc has developed its own European Responsible Care program to accelerate the progress of Responsible Care at a European level. The program has been specifically designed for companies operating in European countries where no national association exists; for national associations that wish support with the implementation of RC in their country or are currently applying only the manufacturers' RC program; and for pan-European companies operating in more than one country that are authorized by the respective national associations to apply the program. Also, the European Responsible Care program includes mandatory third-party audits.

Is there a push within the Fecc to get more members from Eastern Europe?

U. Jensen-Korte: We are currently analyzing the market there, particularly regarding the situation with regard to distributors and the distribution sector. While we have just started this analysis, our preliminary findings are that the situation differs from country to country. For example, many Western European Fecc members have set up subsidiaries in Eastern Europe, meaning that the local distributors are most likely very small or mid-sized companies, with a main focus on the local market.

Would those small companies be candidates for membership?

U. Jensen-Korte: Certainly; this is also a possibility we are currently exploring. In countries without any national distribution associations, Fecc membership could be attractive particularly for mid-sized companies. For the very small companies, however, language tends to be a major barrier. Also, we presume that these small companies that are active on the local market – and perhaps only in a specific area of the country – are more wrapped up in their national legislation rather than legislation on an EU-wide scale.

Do you see a lot of consolidation going on in the market, particularly in these small markets in Eastern Europe?

U. Jensen-Korte: Industry consolidation is continuing all over, especially now that the market is recovering. And manufacturers are also looking for distributors who can provide access to a broader market – not just pan-European, but global. Nevertheless, I presume there will be still the possibility for smaller distributors to consolidate and supply in specific regional areas and be specialized in niche applications.

As a woman at the head of a chemical distribution association, what is your take on the role gender plays in what is traditionally seen as a male-dominated industry?

U. Jensen-Korte: In principle, the entire discussion is old. This was already a hot topic at the beginning of my career, and when I started at Bayer, they already had programs in place to promote women. In fact, I was one of the first female plant managers at Bayer. But back then, I was usually the only woman. Later, when I came to Brussels, the dynamics had completely changed, and there were just as many women as men. Now when I look around at meetings, I sometimes get the impression that there are more women than men. And in our Fecc office, we only have women – gender discrimination in the opposite direction, I suppose.

In your home country Germany, there is currently a debate going about whether or not the government should mandate quotas that would require companies to place women in management positions.

U. Jensen-Korte: I think it is important that women are given the chance to be in management positions. But while I'm a strong believer in this, I don't think a quota is needed. Personally, I never wanted to be the token woman. What's more important is that society does its part to promote opportunities for working mothers; it's not just about companies coming up with internal plans on how to get more women into management positions. It's about providing adequate child care, adequate school systems that ensure that children are being taken care of. Furthermore, in some countries, being a working mother comes with the stigma of being an uncaring parent. This is also where society needs to change its views if more women are to join the ranks of management in companies.

What role does gender play in the management of the FECC member companies?

U. Jensen-Korte: Take Fecc President Edgar Nordmann's company, Nordmann Rassmann, for example: Their managing director is a woman, Gabriele Henke. Some of the members have told me that they already have some units where there are more women than men. And that is the natural basis needed in order to move women up into management positions. My impression from our member companies is that they are all in favor of promoting women. But in the end, they want to choose the best candidate for the job, regardless of gender.

► www.fecc.org

See also our interviews with the leaders of several Fecc member companies on pages 10–11.

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CONTENT

Saudi Aramco, Air Liquide in Nitrogen Deal

French industrial gases group Air Liquide has signed a long-term agreement to supply nitrogen to state oil giant Saudi Aramco. Under the 20-year deal, the French firm will supply at least 5 million standard cubic feet per day of nitrogen to support sea water injection in Aramco's oilfields, officials from Aramco and Air Liquide said during a signing ceremony. It would also supply liquid nitrogen to Saudi Aramco facilities. The value of the agreement was not disclosed and no details were provided as to which oilfields would be targeted. Air Liquide would also build an interface inside sea water injection facilities as well as an air separation plant in Qurayyah, south of the eastern city of Khobar. Construction work would take 18 months to be completed. ■

EU Court Upholds €59 Million Fine on Arkema, Elf

Europe's second-highest court upheld European Union antitrust fines totaling €59 million ($84 million) on French groups Elf Aquitaine and Arkema for participating in a cartel in a paper-bleaching chemical.

The General Court upheld a 2008 ruling they had fixed prices for sodium chlorate, divided up market volumes and shared sensitive information in a cartel with several other firms from 1995-2000.

Elf Aquitaine later merged with French oil major Total and spun off chemicals group Arkema France.

The cartel also included Finnish Chemicals, Erikem of Luxembourg, Spanish firm Aragonesas/Uralita, Swedish group EKA Chemicals and Dutch company AkzoNobel. Sodium chlorate is mainly used to produce chlorine dioxide used in the pulp and paper industry to bleach wood pulp. ■

Sinochem's DSM JV Stake Cleared

Chinese state-owned oil and chemicals company Sinochem received EU regulatory approval for its purchase of a 50% stake in Dutch chemicals firm DSM's anti-infectives business. Located in Hong Kong, the joint venture will reinforce Sinochem's presence in the biochemical industry.

The European Commission, the EU antitrust watchdog, said it had examined whether the Chinese authorities coordinate the market behavior of different state-owned firms, among other concerns.

"The (European) Commission concluded that even if all Chinese state-owned firms acted as one, there would still be a sufficient level of competition in the markets concerned," the EU executive said in a statement. ■

Momentive to Sell Formaldehyde Unit

Momentive Performance Materials Holdings has put its formaldehyde and resins unit on the block and the unit could be valued at between $800 million to $1 billion, several sources familiar with the matter said.

Momentive, owned by Apollo Global Management, is trying to shed the business before an IPO, those sources said. It is likely to attract interest from private equity firms, one of the sources said.

In the first quarter, the company's formaldehyde and forest products resins unit had earnings before interest, taxes, depreciation and amortization of around $45 million.

Morgan Stanley and Goldman Sachs are representing Momentive in the sale, the sources said.

Momentive filed in April to raise up to $862.5 million in its IPO. The company was formed last year when private equity company Apollo merged its two specialty chemicals companies — Hexion Specialty Chemicals and Momentive. Apollo, Morgan Stanley and Goldman Sachs declined to comment. ■

Merck Xirallic Production Online

Merck KGaA resumed normal operations at the Onahama production site in Japan in May. Among other products, the Onahama site manufactures Xirallic effect pigments, which are widely used in high-quality automotive coatings by companies such as Chrysler Group, Toyota Motor, General Motors and Ford Motor. The damage to the production units and infrastructure caused by the catastrophic earthquake in northeastern Japan on March 11 resulted in the stoppage of pigment production in Onahama. The recovery and repair work, which began on April 4, has been completed ahead of schedule. Merck said it expects the plant will achieve its regular production output in June.

The Onahama site (southern part of Iwaki City) is located 57 km south of the damaged Fukushima Daiichi nuclear power plant, and outside the evacuation zone. Merck is continually monitoring all public directives regarding radiation levels in order to ensure the safety of its employees. The company is also testing the products being shipped from Merck Japan to ensure that they comply fully with all regulations and safety standards.

Apart from Onahama, Merck will establish an alternative production site for Xirallic effect pigments. It is planned to have additional capacity for Xirallic pigments in Germany by the end of 2011. This will considerably boost future supply reliability of Xirallic products as of 2012. ■

Trio of Rivals Line Up For 3i's Azelis

The world's top chemicals distributors, including Germany's Brenntag, are circling Belgium-based Azelis, three people familiar with the matter said. Rival chemicals distributors Univar and Nexeo Solutions, the former distribution arm of Ashland, are also interested in buying Azelis, which is owned by British private equity firm 3i Group, the people said.

Reuters reported in March that London-listed 3i had hired Bank of America Merrill Lynch to sell Azelis, which handles sales and development of the Mirasil cosmetics line and distributes food and beverage flavorings, such as a recently launched vegetarian bacon flavoring.

3i is aiming to run a tight auction process, in which a small number of potential trade buyers will soon be selected to bid for the business, one of the people familiar with the sales process said on Tuesday.

The private equity group, which bought Azelis in 2007 in a €315 million ($447 million) deal, values its businesses conservatively and often sells at a big premium to asset value. It held the Azelis equity at £193 million pounds ($314 million) at the end of September, which with debt of about €300 million taken out in 2007, could give Azelis an enterprise value in excess of €500 million.

"This valuation is not out of this world," a source close to the seller said.

While there are no bidders from the private equity sector, the three bidders have buyout firms as their main shareholders.

Germany's Brenntag, which says it is the world's biggest chemical distributor, was floated by BC Partners a year ago. The private equity firm retains a 36% stake.

Ashland's distribution business was bought by TPG last year for $930 million and renamed Nexeo last month. Univar is co-owned by Clayton, Dubilier & Rice, and CVC.

Based on Brenntag data, Univar and Nexeo (then Ashland) are the world's No.2 and 3 distributors respectively — while Azelis is No.3 in Europe.

Azelis operates in 26 markets across Europe and has offices in Shanghai and Mumbai, serving more than 50,000 customers with chemicals for paints and polymers for plastics manufacture. It had sales of €987 million in 2009 and earnings before interest, tax, depreciation and amortization of €44 million, according to the company's website. ■

Albemarle Acquires Catilin

Albemarle said it has expanded its presence in the biofuels market with the acquisition of Catilin Inc.

Based in Ames, Iowa, Catilin is a technology leader in the development and application of heterogeneous biodiesel catalysis. Catilin's technology and products will further strengthen Albemarle's offerings for the renewable fuels market. Albemarle will also benefit from a number of R&D and distribution synergies resulting from the acquisition.

Terms of the agreement were not disclosed. ■

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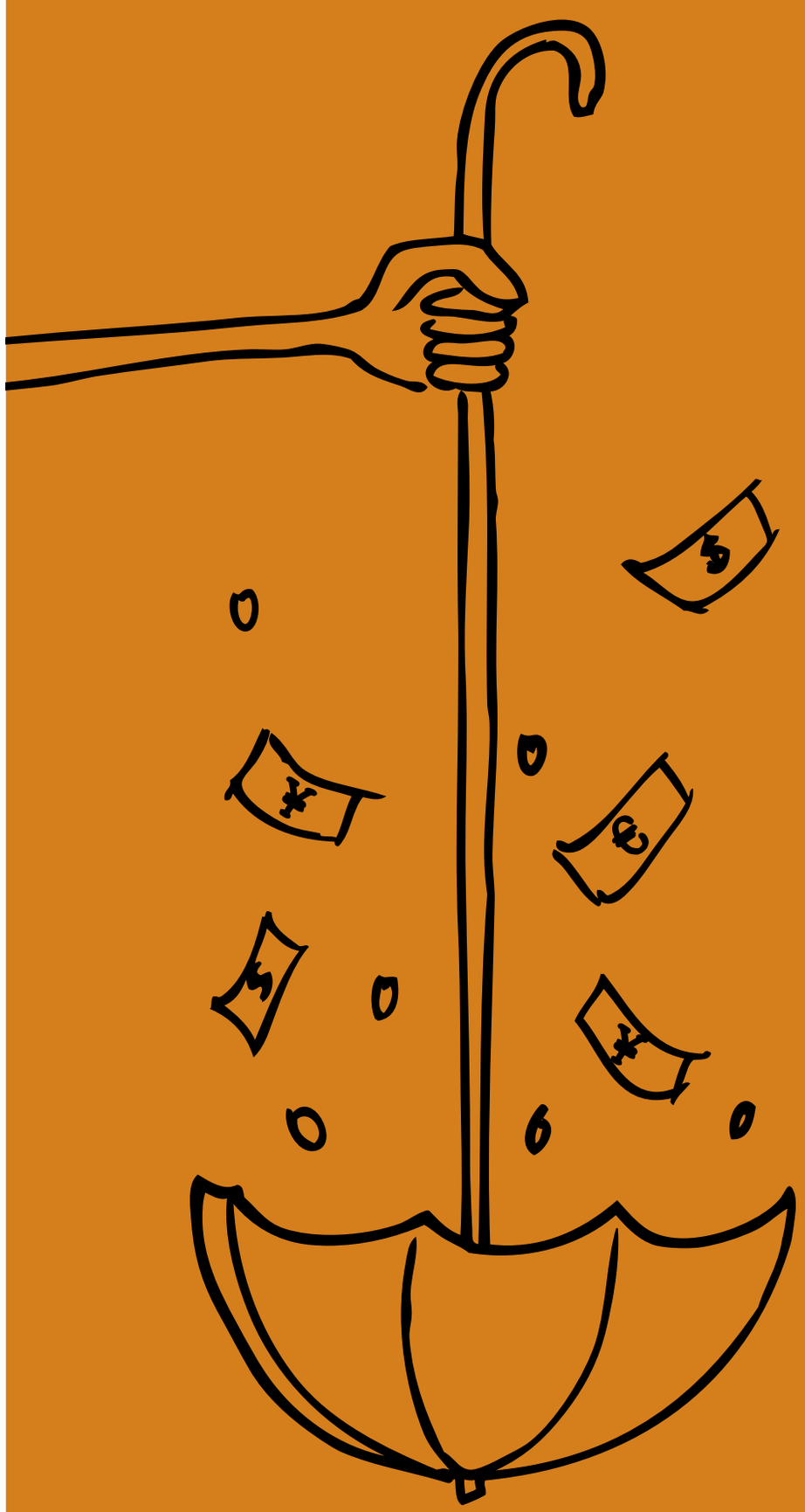

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An Underutilized Opportunity

R&D Cooperation In China

Working Together – Carrying out research and development (R&D) in China is now widely established among chemical multinational companies. Dr. Kai Pflug of Management Consulting – Chemicals and Dr. Bernhard Hartmann of A.T. Kearney China will highlight the preconditions for R&D cooperations between multinational companies (MNCs) and domestic chemical companies in China.

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

Dr. Kai Pflug
CEO, Management
Consulting – Chemicals

In 2010 alone, more than 10 Western companies opened or extended their R&D capacity (tab. 1) in China. On the other hand, there is a strong interest of Chinese institutions and chemical producers in cooperating with Western companies, something that is frequently stated at chemical conferences. This means that some basic preconditions for R&D cooperation between MNCs and domestic chemical companies are met. However, what is the actual status of such cooperations, and how can they be classified?

Different Types of R&D Cooperation

There currently are three R&D cooperation types (fig. 1) dominating the chemical sector:

1. Cooperations between Western companies and Chinese universities
2. Cooperations between Western companies bringing in the technology and Chinese companies acting as the local provider of raw materials, production capacity or related assets
3. Cooperations between Western and Chinese companies, both of which provide core expertise in complementary areas.

Cooperations Between Western Companies and Chinese Universities

Of these three, the first type is the one most frequent. The MNC provides the materials and/or technology, while the domestic university provides the link to a customer industry and the research capacity to test the materials in this industry. For example:

- Evonik has a technological cooperation agreement with Luoyang Ship Material Research Institute. In this cooperation, Evonik provides polyimide foam, which is tested and applied as insulation material for ship cabins.
- Linde works with Shanghai University to develop thin-film encapsulation material and packaging for electronic displays. The research is done at the university, with Linde providing funding for experimental materials and participation of Linde engineers.
- Bayer cooperates with Tongji University Automotive College, sharing expertise on new technologies and collaborating on interior and exterior car design.
- Rhodia works with East China Normal University to strengthen scientific collaboration in renewable materials and sustainable development.

This type of cooperation between MNC and Chinese universities is well-established and professionalized, with the university administration being involved in the contract management. It is relatively uncontroversial. For one thing, the investment tends to be relatively small (for example, 800,000 RMB in the Linde example). Secondly, the MNCs do work with non-commercial partners in these partnerships, thus limiting any potential damage via loss of intellectual property (though university professors in turn may work with domestic companies). Finally, even if these cooperations fail to yield any quantifiable research results, they still have promotional benefits, increasing the visibility of a MNC and helping the company to recruit promising young professionals.

Company	Chemical Area	Research Center Activity
Air Products	Performance materials	Extension of Asia Technology center in Shanghai
BASF	Epoxy resins	Expansion of technical center in Shanghai
Bayer	Plastics for automotive	Opening of AutoCreative center in Shanghai
Borouge	Plastics	Opening of plastics application Centre in Shanghai
Chemtura	Specialty chemicals	Opening of application development center in Nanjing
Dow Corning	Silicon materials	Launch of development center in Shanghai
DSM	Composites	Opening of research center in Shanghai
Dupont	Circuit & packaging mat.	Opening of new laboratory in Shanghai
Dupont	PV, auto, biomaterials	Doubling of R&D staff in Shanghai until 2012
Evonik	Silicons	Opening of R&D center for radiation-curing silicons
PPG	Aerospace coatings	Opening of aerospace application center in Tianjin
Solutia	Automotive film	Opening of service center in Suzhou

Tab. 1: 2010 R&D center openings/extensions of chemical MNCs in China

Company/University	Chemical Area	Research Activity
East China University	2,3-Butanediol	Progress in biological production
Hebi Baoma	DME	Pilot plant for DME from coal-based syngas
PetroChina	Polyesters	Development of environmentally friendly new types
Shanghai Chlor-Alkali	Epichlorohydrin	Pilot plant for preparation from glycerin
Sinopec	Polyester	Development of novel Titanium catalyst
Sinopec	Oil processing	Processing of highly acidic oil
Sinopec YCF	p-Aramid	Start of pilot production plant
Sinorgchem	Rubber Chemicals	Establishment of R&D center in Shanghai
Suntec	Photovoltaic	Cooperation with other firms to improve solar cells
Weifang Jinsida	Dye production	Zero emission waste water treatment
Xiamen Finehope	Fiberglass	Development of PU fiberglass
Yingli Green	Photovoltaic	Cooperation with other firms to improve solar cells
Yip	Acetate Solvents	Establishment of R&D center in Shanghai

Tab. 2: Examples of recent R&D work in Chinese chemical companies

Cooperations Between Western Companies (Technology) and Chinese (Raw Materials, etc.)

The second type of cooperation is between MNCs and Chinese companies in different production segments. The benefit from these cooperations comes from the MNC providing a technology or material, while the Chinese company offers a platform to test and use this material. For example:

- Novozymes works with the Chinese starch processing group Dacheng, providing enzymes and knowledge to convert biomass such as straw into sugar. Dacheng provides the raw materials, the facilities and the expertise to convert the sugar into glycols. Similarly, Novozymes cooperates with Sinopec and COFCO, a Chinese producer of processed agricultural products, in building a cellulosic ethanol plant.
- Total and China Power Investment are cooperating to study a coal-to-olefins project in Inner Mongolia. Total contributes experience in processes such as methanol to olefins conversion and olefin cracking while China Power provides the coal.

This type of cooperation is still acceptable to Western companies, as the contribution provided by the two partners can be clearly separated, which reduces the risk of knowledge loss. For example, Novozymes does not need to share its knowledge of how to produce enzymes with Dacheng or Sinopec.

Cooperations Between Western and Chinese Companies (Both Core Expertise)

Finally, there is R&D cooperation between chemical companies each having deep expertise in complementary technologies. This type is the most successful between different Western companies. However, the number of such cooperations between MNCs and Chinese companies so far is limited:

- Yingli Green Energy collaborates with Innovalight on research to raise the efficiency of multicrystalline solar cells produced by Yingli. Innovalight is the owner of nanotechnology-based technology to improve solar cell production while Yingli is a leading integrated photovoltaic manufacturer.
- Suntech, another Chinese leading solar energy company, works with Silex Solar, an Australian solar company, to improve the power conversion efficiencies of crystalline silicon solar cells. This collaboration is particularly interesting as there is a clear overlap in the portfolio of both companies as both are deeply involved in the production of solar cells.

Why is the third type of collaboration so relatively rare, and how can this be changed to leverage the full potential of such collaborations?

The examples already give some clear indications about the requirements for successful cooperation between MNCs and domestic companies. Both Yingli Green and Suntech are listed in the U.S. and thus meet Western transparency standards. Both companies are strong in their markets and have substantial R&D programs. And both companies work in a segment in which China is strong.

Lessons To Be Learned

What are the lessons that can be drawn from this for MNCs wanting to collaborate with domestic chemical Chinese companies? R&D cooperation only works if it is a win-win situation. It is not realistic for a chemical company to give away research knowledge for free. As a consequence, to be an interesting partner for R&D cooperation, a company needs to have own strong areas, either in research or with regard to other relevant aspects such as global market access.

On a practical level, the following issues need to be observed:

- Put together a strong rationale for your value as an R&D partner. This selling point should focus on the benefit of such cooperation for your partner, not on your own needs.
- Focus on benefits specific to your partner. While Chinese companies are interested in a clean environment, they will not put substantial effort into cooperation if it only improves the Chinese environment and not their overall market position.
- Be realistic about which companies will be interested to collaborate with you. If your own company is mid-size, searching for a mid-size Chinese partner is more promising than for a state-owned chemical giant.
- Be realistic about the contributions of the Chinese partner. They are more likely to be in application and development than in basic research, in line with as the focus of R&D work in Chinese companies (see tab. 2)
- If you cannot find a good reason for a Chinese company to collaborate with you, stop your search for a partner as it is unlikely to be successful.
- Internally, clarify and summarize your own goals of R&D cooperation. This will allow you to prioritize any potential opportunities.
- Create clear responsibilities for cooperation within your company. Who drives the partner search – is it the head of R&D, the company chairman, or somebody else?
- Continue to have clear responsibilities once the cooperation has started. Consider creating a liaison officer inside your company, and urge your partner to create an inter-company R&D team.
- Be visible to potential Chinese partners, e.g., via participation in conferences, publishing of articles, etc.
- During the partner search, do not limit yourself too early.
- Identify small areas of cooperation that can be used for trust-building. Be prepared to share some of your knowledge in these initial cooperations.
- Be upfront about potential issues regarding intellectual property, and prepare possible solutions for these issues in advance.

In summary, R&D cooperation is very similar to a business transaction – it is an exchange from which each partner needs to benefit. As a consequence, research cooperation cannot substitute own research, but it can strengthen it.

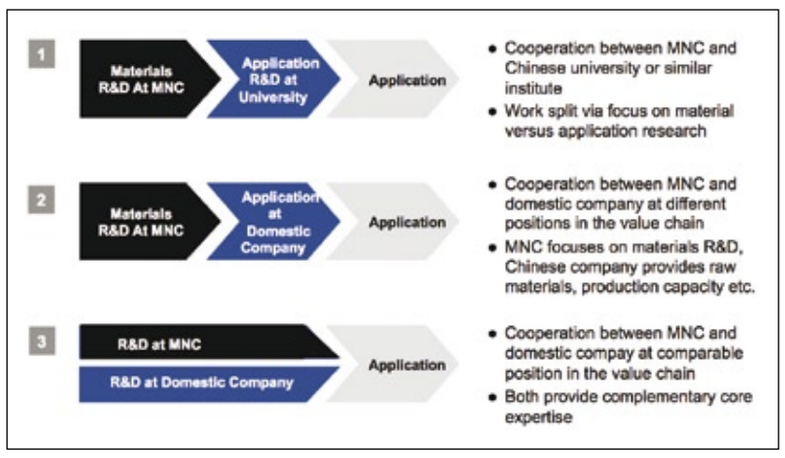

Fig. 1: Current types of chemical R&D cooperation between Chinese organizations and multinational companies

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Playing By Different Rules

Chemicals' Changing Competitive Landscape

New Players – A major shift in the competitive landscape of the worldwide chemical industry is under way as new players from oil- and gas-producing countries and the high-growth developing markets of China and India join the industry's top ranks in sales. The new players focus on resource monetization and economic development, in contrast to the classic shareholder value-creating goals that have historically informed the strategies of top players. Not only are these newcomers playing by different rules, but they are also better placed to benefit from two of the key dynamics driving the industry's future: control of advantaged feedstocks in a high-oil-price world, and privileged access to the most attractive consumer-growth markets.

Dr. Florian Budde
Global Chair Chemicals Practice, McKinsey

The shift in the competitive landscape of the worldwide chemical industry has pitted established companies up against new up and comers from emerging areas.

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While newcomers may be better placed than incumbent chemical companies in Europe, North America, and Japan, the shift creates challenges for both groups. If the newcomers want to establish themselves as industry leaders in the coming decades and fully realize the industry's wealth-creating and society-supporting potential, they must evolve rapidly. They should move beyond simply monetizing their cost-and market-advantaged positions to build capabilities that will put them on more equal footing with incumbents when it comes to management, innovation and marketing performance. At the same time, to assure continuing success in this new landscape, incumbents must reconsider their position in the industry and adapt their strategies and priorities accordingly.

A Changed Industry

Coming out of the financial crisis and economic slowdown of the past two years, the global chemical industry is seeing major changes. The first relates to energy-price dynamics. The chemical industry is confronting unprecedented hydrocarbon price volatility. In addition, energy prices are significantly higher than they have been for the past two decades – and they are higher than they were coming out of previous recessions. While there is little progress on climate-change regulation, which could add carbon tax-related costs for chemical companies in certain regions, the industry is nevertheless seeing increasingly pronounced divergences in gas and electric power prices among regions. Overall, the degrees of cost advantage and disadvantage among regions have increased.

Second, the economic downturn has highlighted the accelerating shift in the growth of global chemical demand from developed economies to the developing world. While demand in Europe and the U.S. has not returned to pre-crisis levels and seems unlikely to do so until 2012, China's chemical demand increased by 6.4% in 2009 and by over 15% in 2010. Meanwhile, new petrochemical capacity in the Middle East continues to expand, while plant-closure announcements have multiplied in Europe, Japan, and the U.S.

Closely related to this is the third major change – the arrival among the chemical industry's leadership ranks of companies based in hydrocarbon-producing countries and in large, high-growth developing markets such as China and India. The simpler value propositions of the new players are in some ways on a collision course with the value propositions of the traditional players, and the disruptive potential of this development is only gradually coming into view.

The industry's leading incumbents have operated for the past two decades with similar goals: striving to increase shareholder value based on their technology portfolio and asset base, and making opportunistic excursions from traditional home markets to tap emerging-market growth. Whether the companies were based in Europe, North America, Japan, or South Korea has only added nuance to this common approach.

In contrast, for governments and their production subsidiaries from hydrocarbon-rich countries, chemical manufacturing represents an opportunity to monetize advantaged feedstock resources and build industries that will provide jobs for their rapidly expanding populations – even if it will have a detrimental effect on industry structure and profitability.

For leading companies based in fast-growing major emerging markets, chemical production is seen as a necessity to provide the products needed for continued economic expansion. Lower labor costs in these countries translate into competitive capital-investment and operating costs for these companies, many of which are owned by the state or by families that have close ties to the government. These companies can establish production to capture local market growth, and they are little concerned about any resulting global supply-demand imbalances for the chemicals in question.

Importantly, both groups of newcomers include many government-backed companies. As a result, these companies can invest on a scale that is much greater than even the largest traditional chemical-industry players. These changes have been building for years, but their importance is hard to overstate. In summary, incumbents that have ridden growth in developed and developing markets are now undercut by powerful new rivals with access to cheap feedstocks and the most attractive growth markets. The new competitive dynamics pose important questions for both newcomers and incumbents about the steps they must take to assure their continued success. For the newcomers, the choices are arguably more straightforward than for the incumbents, which have large legacy businesses to reposition.

Develop World-Class Capabilities

For new producers – whether based in feedstock- rich countries or high-growth emerging-market countries with low labor costs – market entry has been built on production, taking advantage of their lower cost base to establish a presence based on price in their export markets. This is a logical approach and a natural entry point. But it tends to result in the commoditization of the market and a strict focus on the lowest price, and it therefore risks destroying a lot of the value that exists in the market for the new entrants as well as for existing players. There have been numerous examples of competition from new low-cost producers that have reduced prices well below the level that would assure them a foothold in developed markets, in products as varied as polyethylene terephthalate and fluorochemicals.

Similarly, Chinese specialty-chemical products are often sold in developed markets in North America and Europe on a specification basis through third parties, which means that the Chinese producers are cut off from customers and have limited insights into market dynamics. As new players build their presence in the industry, they must develop capabilities to sustain their growth and look more ambitiously at the kind of profile they want to create. As a first step, they must establish their own R&D and innovation capabilities, which will enable them to offer differentiated products and make them less dependent on incumbents for technology.

Second, new producers must start to build marketing capabilities that will enable them to move beyond selling simply on low price and reap the full economic benefits from their products. They must develop expertise in approaches such as differentiated marketing, transactional pricing and value pricing, and sales-force management. This is a need shared by all new producers, whether they are manufacturing for export or meeting surging demand in home markets. Developing these capabilities will help new producers get better returns from their current product range and avoid leaving money on the table from selling at unnecessarily low prices.

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The Top 10

A Look at the Movers and Shakers in Fine Chemicals

Analysis – When comparing the fine chemicals market of today to that of 2001, a few clear differences can be seen. Fine chemicals expert Jan Ramakers takes an in-depth look at the top players today.

Jan Ramakers
Jan Ramakers Fine Chemical Consulting Group

Back in 2001, the three largest producers, DSM, Degussa, and BASF were very close to each other, each of them having fine chemical sales in the $1.8–2.0 billion range. Also in that year, the top five companies had a combined market share of 12.3%; the combined market share of the top 10 was 16.7%.

Looking at the current situation, the first impression is that the industry is more concentrated than it was 10 years ago. However, a closer look shows that this is not the case. In 2010, the market share of the leading company was 2.8%, whereas in 2001 the market share of the leading company was 3.5%.

The top five had a combined market share of 10.8%, which is less than the 12.3% they had in 2001. Also, the combined market share of the top 10 in 2010 was 13.5%, down from 16.7% in 2001 and only slightly higher than the top five 10 years ago.

So, the net result of all the mergers, acquisitions, spin-offs and divestments of the last 10 years has not increased the degree of concentration of the fine chemical industry at all. On the contrary, instead of being more concentrated, the fine chemical industry is more fragmented now than it a decade ago.

A Closer Look at the Top 10 in 2010

1. BASF

As the leading fine chemical producer in 2010, Germany's BASF also happens to be the largest chemical company in the world with production sites in 41 countries and some 109,000 employees. The product portfolio of the company includes chemicals, plastics, performance products, agricultural products and fine chemicals, as well as crude oil and natural gas. Following the acquisition of Ciba in 2009, the company acquired Cognis in 2010. Neither of those acquisitions have a direct impact on the fine chemicals business of the company.

2. Evonik

Evonik's fine chemicals business is part of its Chemicals business area, which formerly traded as Degussa. Its fine chemical operation mainly revolves around the custom manufacturing business. In the course of 2011, Evonik started divesting its non-chemical businesses (Real Estate and Energy). According to the company, its Real Estate business will be "placed on a more independent basis in the medium term." In the first quarter of 2011, the company sold 51% of the shares of its Energy business to a consortium of municipal utilities in Gernany's Rhine-Ruhr region. The remaining stake is to be sold within five years.

3. Lonza

Lonza has always viewed fine chemicals as its core business. At the end of 2006, the company divested its polymer intermediates business, and since then almost all of its revenues have been generated from fine chemicals. In recent years, Lonza has invested heavily in strengthening its position in the biotechnology area.

Biotech manufacturing facilities were built and/or expanded at the Visp, Switzerland, and Slough, UK, sites in 2004 and 2005, followed by a large number of acquisitions and investments in the biotech area, including: UCB Bioproducts, Cambrex's Bioproducts and Biopharma segments; Genentech's mid-scale mammalian biopharmaceutical production plant in Spain; large-scale commercial mammalian cell culture manufacturing facilities in Singapore; a large scale production plant for antibody drug conjugates; and some others. With that, Lonza has positioned itself as a leading player in the biotech/biologicals area.

In 2008, it entered into a partnership with Novartis for the development and manufacture of its biological pipeline, and into a joint venture with Teva, one of the largest generics companies for the manufacture of biosimilars.

In the course of 2010, the company streamlined its organization. It also signed co-operation agreements with Dalton Pharma Services (Canada) and California Peptide Research (U.S.). In early 2011, it announced investments to further expand its biopharmaceutical capacity as well as its capacity to produce high potency APIs (HPAPIs).

4. DSM

DSM, the leading fine chemical company in 2001, has streamlined its fine chemical portfolio over the past few years, which included some divestments and site closures in the pharma area in 2004–2006. One of the major reasons for this was the extremely competitive situation that developed in the market for semi-synthetic antibiotics, mainly from Asian producers, which had a heavy impact on DSM's business in that segment.

In 2007, the company decided to focus more on life and material sciences; it has since divested several of its commodity chemicals businesses and closed down or divested some smaller fine chemical manufacturing operations. The divestment of its elastomers business in early May 2011 completed the transformation of the company. To mark this milestone the company redesigned its house style, including a new logo.

5. Sumitomo Fine Chemicals

The Sumitomo Chemical Group includes around 100 companies around the world, with activities in fine chemicals, basic chemicals, petrochemicals, plastics, agrochemicals, pharmaceuticals and IT-related chemicals.

Sumitomo Fine Chemicals, the highest ranking Japanese producer of fine chemicals, merged with the fully owned Sumitomo subsidiary Sumika Fine Chemicals in 2003. After that no other major acquisitions were made.

Sumitomo also has a majority share in Koei Chemical, another Japanese producer of fine chemicals.

6. SAFC

SAFC, the fine chemicals business of Sigma-Aldrich, has a clear focus on the pharmaceutical market. The company has shown a rapid growth to its current sales level over the past few years, largely as a result of a large number of acquisitions, mainly in the biotech and high potency area.

In late 2010, the company completed the expansion of its Jerusalem, Israel, facility. The additional capacity expands SAFC's contract manufacturing capabilities in large molecule recombinant proteins and small molecule APIs through fermentation, including HPAPIs and secondary metabolites.

7. Saltigo

Saltigo, formerly the fine chemical business of Bayer, has certainly benefitted from its independence, as well as the subsequent realignments.

In May 2010, Saltigo entered into a cooperation agreement with Syngenta, a leading agrochemical company. Syngenta is investing some €50 million in expanding several Saltigo facilities in Leverkusen, Germany, to significantly enhance its capacity for manufacturing active agrochemical ingredients. Saltigo supplies the active ingredients and intermediates produced in those facilities exclusively to Syngenta.

8. Albermarle

Albemarle showed good growth in the first few years after 2001, partly fuelled by the acquisition of DSM Pharmaceutical Products' generic API business that was operated out of South Haven, U.S., in 2006. After that, growth stalled for a while but recently Albemarle's fine chemicals business is showing signs of improvement.

9. WeylChem

WeylChem was formed in 2005, when International Chemical Investors Group (ICIG) of Germany acquired part of Rütgers. The deal included the pharma fine chemicals business of Mannheim-based Rütgers Organics and its U.S. affiliate, which specialised mainly in agrochemicals. Since its formation, the company acquired a number of other businesses, including Albemarle's Thann, France, facility; the Cork, Ireland, and Landen, Belgium facilities of Cambrex; Clariant's custom manufacturing business; and Miteni.

In 2010, the company acquired DyStar's production site in Brunsbüttel, Germany from Chemie Bitterfeld Wolfen. WeyChem and CBW are planning to use the site in the future as a mutual production platform. With the new facilities, WeylChem intends to add phosgenations to its technology portfolio. For that, the phosgenation capacity in Brunsbüttel will be expanded.

10. Groupe Novasep

Last but not least, the number 10 on the list is Groupe Novasep. The company is organized in two strategic business units: Novasep Process (focused on purification engineering) and Novasep Synthesis (focused on chemical and biochemical synthesis) Novasep uses the combined strength of the business units to manufacture advanced intermediates and APIs for custom manufacturing services to the pharma industry and other fine chemical industries. Séripharm, part of Novasep Synthesis, is involved in the manufacture of highly potent compounds. In 2009, the company acquired Henogen (Brussels, Belgium), a contract manufacturing organization offering bioprocess development and manufacturing services ranging from cell bank to supply of clinical products.

Trends In The Market

Fine chemicals are used in a wide variety of applications, and it is not too difficult to make a list of 40–50 market segments. The products are used as active ingredients in biocides, cosmetics and toiletries, as additives for plastics and coatings, etc. Larger markets for fine chemicals include agrochemicals, flavors and fragrances, and dyes.

The pharmaceutical industry has been the main market for fine chemicals for many years. As a result of the fact that the average annual growth of pharma has always been significantly higher than the average annual growth of any other fine chemical market, the relative importance of pharma for fine chemicals has increased. In 2010, the pharma segment was responsible for 68% of the fine chemical market, up from 54% in 1999. Given the current growth rates of the various fine chemical market segments it is anticipated that pharma will be some 71% of the market in 2015.

Because of the dominance of pharma in fine chemicals, the main drivers for the fine chemical market are the trends and developments in the pharma market, including

- The markets for HPAPIs and biopharmaceuticals are growing at rates above the average pharma growth rate, and it is anticipated that between them these markets will be responsible for some 30% of the pharma market in 2015
- The market for biopharmaceuticals is growing at rates above the average pharma growth rate
- Increasing market share of generics
- Increasing cost and regulatory pressure
- Increase in pharma outsourcing

Profitability

Although R&D-related pharma business was affected the overall pharma market continued to grow during the global economic downturn and in spite of adverse market conditions in many other fine chemical market segments the total market for fine chemicals continued to grow. Profitability levels dropped off significantly though. In 2009 close to 50% of the top 40 fine chemical producers had an operating profit of less than 5% of fine chemical sales, or suffered an operating loss; more than two thirds of the top 40 had an operating profit of less than 10% of sales.

In 2010 profitability levels improved, with 37% of the top 40 generating an operating result of 5% of sales or less, and 59% generating an operating result of 10% or less. Going forward it is expected that profitability levels will gradually return to more normal levels.

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Playing By Different Rules

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Doing so will become even more pressing as new producers expand their portfolios to include more sophisticated and higher-value-added products, from which they will want to extract maximum value.

Becoming worldwide suppliers will require new producers to establish marketing and sales capabilities in developed markets that are sophisticated enough to support this type of product. Many of these products will require a completely different type of sales approach – one that is capable of dealing with product-approval registrations, gaining intimacy with customers' product-development programs, and getting products specified for these programs.

"Building a worldwide market presence will require that newcomers take steps to establish international operations and build up the management skills to run those operations successfully."

Third, all of the above moves related to building a worldwide market presence will require that newcomers take steps to establish international operations and – most important – build up the management skills to run those operations successfully. Whether such operations are established through acquisitions or built from scratch, creating and running subsidiaries in overseas locations will be a new challenge for these players' senior-management teams.

Incumbents Must Reappraise Their Opportunities and Adapt

Established producers in Europe, Japan, South Korea, and to an extent North America will have to take steps to adapt to lower overall demand-growth rates for chemicals in their home markets. Clearly, there are segments of the industry in mature, developed markets that continue to enjoy good prospects and that are relatively safe in the new competitive landscape. These divide into two main areas, upmarket and downmarket, where there will be niches that are relatively impregnable.

The first area is chemical-industry segments in markets that require customer intimacy and a high level of service support. Examples include flavors and fragrances companies that have developed superior customer insights and exclusive manufacturing know-how to support customer demands; coating companies that manage the painting of automobiles within the production line; leather chemicals, where the producer works closely with luxury-goods makers; and water-treatment and construction chemicals. In all these cases, customer intimacy makes them less vulnerable to inroads from low-cost offshore competitors.

The second area is a group of basic chemicals where the low prices mean that importation is not viable; this includes such products as sulfuric acid, hydrogen peroxide, industrial gases, and, to an extent, caustic soda. These are, and will continue to be, regional markets.

Where incumbents must look especially carefully is at the many market segments between the two poles. In many of these segments, lower demand growth is likely to translate into the consolidation of players in certain sectors and capacity closures. Producers in Europe, North America, Japan and South Korea have historically been net exporters of chemicals, but for many product areas, their export cost position will become less and less competitive. They already face cost disadvantages on raw materials and must confront disadvantages on two other scores: Incumbents' domestic plants are not only in the wrong place to serve emerging growth markets such as China, but they also tend to be older installations that have intrinsically higher costs than the new world-scale production capacity that is being installed in the new growth markets.

Successfully managing the transition to this lower-growth mode will require that incumbents evaluate their product portfolios and manufacturing footprints. They must also decide in which sectors they want to be consolidators, with an eye to becoming the "last man standing," and in which sectors it would make more sense for them to be among the companies being consolidated.

Companies must bear in mind that as the industry landscape shifts, the relative attractiveness of products will change, with some more vulnerable to the trends in the industry than others. They must look at their portfolios accordingly. Established markets are becoming net importers of a growing range of chemicals, as new feedstock- advantaged producers can profitably serve these markets. While imports frequently lead to lower prices and reduced margins in the short term, this is not always the case in the long run, particularly if incumbents are willing to shut part of their capacity. Imports are rarely able to cover all domestic demand volumes, and for the surviving incumbents that can manufacture domestically at below the cost of imports, this evolution can be positive if it results in a more clearly structured and disciplined market with pricing based on import-price parity.

It is also important to emphasize that across all of their businesses, incumbents must work hard for functional excellence with regard to low-cost operations and lean and effective marketing and sales. In the face of the growing competition from newcomers, incumbents cannot afford any slack in their businesses and must make sure they are top-class operators in all areas.

Riding the New Market-Growth Waves

Next, incumbent companies must look beyond their home markets and consider how they can ride the dynamics that are transforming the industry – the rise of chemical production in feedstock-advantaged countries and the shift in demand growth to emerging markets. Incumbents must ask themselves how they can join up with the new players, whether by establishing a presence in a resource-rich country or by building capacity in China and other high- growth markets – or by doing both.

They must then consider what they can do to enhance and maintain their attractiveness as a partner. Many incumbents operate broad portfolios of businesses; these companies must think about how they can clarify and best articulate the value proposition that they bring to their potential partners. High on any list will be innovation – creating new technologies and products – which has always been a route to profitable growth in the chemical industry and remains an area of strength for incumbent chemical companies. Companies that have technology that is needed by oil-producing countries to use in their new petrochemical plants will be best placed in any contest to participate in joint ventures. And companies with know-how that is much in demand in rapidly growing emerging markets will be of greater interest to those countries' governments; they are thus better placed to gain access to such markets.

Incumbents must also think about how the market access that they could provide in their home market could be valuable to new producers. They should consider the best way to make this available. One possibility is to act as a joint-venture partner with a new producer in a way that would enable the incumbent to gradually ramp down its own production.

Finally, incumbents must recognize the strategic choices that they face. What kind of bargaining chips does the company have, and what types of chips might it want to develop? Is it strong enough to stay independent? Should it consider partnerships or alliances? Does a focus on the Middle East make more sense than a focus on China? And if a company decides to focus on China, should it try to ally with a Chinese player or to establish a greater direct presence in China? Companies must think carefully about how to play their bargaining chips for maximum value creation – these chips cannot be used multiple times. The global chemical industry has entered a new phase in its evolution, as players from oil- producing countries and high-growth developing markets take their places among the industry's leaders. These new players are focused on resource monetization and economic development – and job creation in particular, in a number of countries – rather than on traditional shareholder value, and they thus play by a different set of rules than do the industry's traditional leaders. As a result, the competitive landscape is changing. Incumbents must recognize the shift under way and adapt, while newcomers should build new capabilities to more fully deploy their strengths in the market.

As the world economy picks up speed after the crisis, senior managers are understandably preoccupied with navigating back to "business as usual." However, the shifts in the chemical- industry landscape we have described above have arguably been accelerated by the crisis, as the major emerging economies have recovered faster than the developed ones. As a consequence, the window of opportunity for incumbents to engage with newcomers could close sooner than they might expect. The number of exceptionally resource-advantaged countries is finite, and major emerging markets such as China may pursue a policy of favoring domestic champions. Incumbents should use any momentum gained from recovery in their traditional businesses to advance their positions in the new industry landscape.

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chemanager-online.com/en/markets-and-companies

Paving the Way for Growth

The Next C3X Top Management Survey

Managing The Future – Over the last months, chemical companies across all regions reported increasing production volumes and sales. Even though in many cases pre-recession levels have not yet been reached, it is largely agreed that the industry is now heading for growth again. Yet, which growth paths are promising? Which technologies and geographies bear potential and which do not? What hurdles need to be cleared?

Dr. Tobias Lewe
Partner in the Chemicals and Oil Practice at A.T. Kearney

These questions will be raised in this year's top management panel Chemical Customer Connectivity Index (C3X) of A.T. Kearney, CHEManager Europe and Westfälische Wilhelms-Universität Münster with a special section dedicated to the topic of growth. The survey is available at www.chemanager-europe.com/C3X.

After it recovered well in 2010, the European chemical industry is now gaining steam again and is looking optimistically ahead.

"Even though further economic recovery will most likely slow down a little compared to 2010, the European chemical industry is clearly on target for growth. This is also backed by a recent increase in larger-scale M&A activity such as Clariant's acquisition of Süd Chemie or BASF's takeover of Cognis," said Dr. Tobias Lewe, Partner in the Chemicals and Oil Practice at A.T. Kearney. "In the mid-term, companies will increasingly look beyond the boundaries of their current businesses and into new market opportunities. We will see companies enter new geographies and new product segments and tap into entirely new value chains. However, these activities will only be crowned with success if they are based upon a sound understanding of what the chemical customers actually need."

Starting on June 1, top management panel Chemical Customer Connectivity Index (C3X) is going to the next round and will once again look at the issues that are leading the agenda of European chemical companies and their customers. Next to the recurring questions on customer interface priorities, innovation and sustainability, this issue will contain a special section devoted to the topic of growth. It will deal with the critical success factors for the European chemical industry as well as with the factors that can put growth at risk, ranging from an increasing lack of qualified workforce in mature Western markets to expected higher electricity cost as a result of the planned nuclear phase-out in leading European economies such as Germany. Furthermore, the survey will address aspects such as: What is the impact of expected increases in raw material costs on growth and profitability of Europe's chemical industry? In which geographies will European companies add capacity and for what kind of products? How important will emerging technologies e.g. in the field of energy efficiency and bio-refining be for European chemical companies and what is the right strategy to address them? And how will regulation impact growth?

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C3X
Chemical **Customer Connectivity** Index

Joining The Panel

Until June 30th, executives of chemical companies as well as executives of customer industries such as automotive, consumer goods, pharma and pulp and paper, can register as members of the C3X top management panel at www.chemanager-europe.com/C3X and take part in the survey. Therewith they can make a vital contribution to improve both parties' understanding of the issues that are crucial at the interface to the customer in the European chemical industry.

Answering the questions on our portal will not take longer than 10–15 minutes. All information will be treated in strict confidence and only anonymous data will be included in the overall evaluation.

As an incentive, participants will receive the survey results in an exclusively edited form. The results of the survey will be published in the September issue of CHEManager Europe.

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The World Of Biosimilars

Disruptive Challenge or Unmissable Opportunity?

Doubled-Edged Sword – The emergence of biosimilars has caused very large ripples in the biopharma pond, and has recently been called the most "disruptive technology" of the decade. True to a point, but dynamic change for some is usually accompanied by significant opportunity for others. This is the "double-edged sword" paradox of the biosimilars market.

In simple terms, biosimilars are the biotech industry's version of chemical generics. However, due to challenges of proving equivalence, biosimilars are considered only therapeutically similar to the originator product.

The Size of the Biosimilar Prize

According to Datamonitor analysis, the global biologics market (excluding vaccines) reached $116 billion in 2010, and is predicted to reach $145 billion by 2016. A strong driver of this growth has been the continued, robust uptake of monoclonal antibodies (mAbs). However, over the next five years, a wave of patent expiries in the biologics market will expose approximately $65 billion worth of biologics sales to biosimilar competition.

While this represents a significant opportunity for biosimilar players, success is not guaranteed. Commercial success of biosimilars has, and will, vary by product and therapy area. Attitudes and perceptions of physicians and nurses, how influential the payer is, the influence of manufacturing capacity, and the importance of a device to the delivery of the product are all potential key influences on biosimilar success.

Biosimilar Approvals (and Failures!) to Date

Across the EU, Japan, Canada and Australia, there have been 18 biosimilar approvals across three classes of biologic products; human growth hormone, epoetin (EPO) and filgrastim (fig. 1). In addition to the approvals, there have been three notable failures:

Alpheon: In June 2006, Biopartners failed to receive EMA approval for biosimilar interferon-alfa-2a (Alpheon), due to quality, stability and lack of adequate biosimilarity to the reference product, Roche's Roferon-A.

Marvel Insulin: In Dec 2007, Marvel Lifesciences of India withdrew its EMA biosimilar marketing authorization (MAA) application for three biosimilar human insulin products (a basal, bolus and mix version). Despite the withdrawal, the EMA clearly states in a Q&A document that approval would not have been given due to concerns of biosimilarity and product quality.

Epostim: In April 2011, Reliance GeneMedix withdrew a MAA for Epostim (EOP-alfa) due to the company's inability to provide additional data.

Interestingly, the commercial success of biosimilars has varied significantly. For example, after nearly five years on the market, Omnitrope, a biosimilar human growth hormone marketed by Sandoz, has struggled to get more than 5% volume market share in Germany (as of August 2010). In contrast, uptake of biosimilar EPO and filgrastim in Germany has been strong, with biosimilar EPO capturing about 30% volume market share of the class, and over 60% volume market share of the reference product.

Challenge Vs. Opportunity … or Both?

In the context of the wider biologics market, there are a number of companies that are directly or indirectly affected by biosimilars, and for a range of different reasons:

Innovative biopharma currently market biologics products and are at risk of losing market share to biosimilars, and are interested understanding how they can effectively (and ethically) compete and manage their portfolios.

Opportunity seekers include biosimilar/generics players seeking to develop and commercialize biosimilars, or interested investors seeking to leverage internal capabilities and reputation to get a foothold in the biologics market, realize that the biosimilars market is a low-risk strategy for gaining entry into the biologics market.

Hybrids, formed of biopharma companies with at risk portfolios, but also interested in using internal capabilities to develop biosimilars, potentially for emerging markets, hybrid companies are emerging. A good example of this business model is Merck & Co, which has invested $1.5 billion in establishing Merck BioVentures, its biosimilars business unit.

Just like no two zebras are exactly alike, biosimilars cannot be automatically substituted for branded biologics.

In the face of a new threat within the biologics market, various innovator companies have reacted very differently to biosimilars. Some reactions have been based on sound commercial logic, while others have attempted to call into question the safety and efficacy of biosimilars. This speculation has attempted to give physicians and other key stakeholders pause for thought before using biosimilars, but backfired in May 2008 when the European Commission was forced to put out a statement defending the its position on biosimilars, calling all stakeholders to stick to the facts and not question the EC's integrity. Other responses include litigation to keep biosimilars off substitution lists in Europe.

Based on the fact that biosimilars cannot be automatically substituted for branded biologics, particularly in Europe where several countries have actually banned it (e.g. France and Spain), biosimilar companies have needed to create compelling marketing messages and imagery for their products. For example, Hospira's marketing campaign for Retacrit (EPO-zeta), a biosimilar version of J&J's Epogen, uses the image of a zebra. The perceived logic is that no two zebras are identical, with each animal having a unique stripe pattern that other zebras are able to differentiate between. Additionally, due to the INN that Retacrit was given (i.e. EPO-zeta), it is believed that a zebra could be associated with zeta, thereby creating a verbal and graphic link between the two.

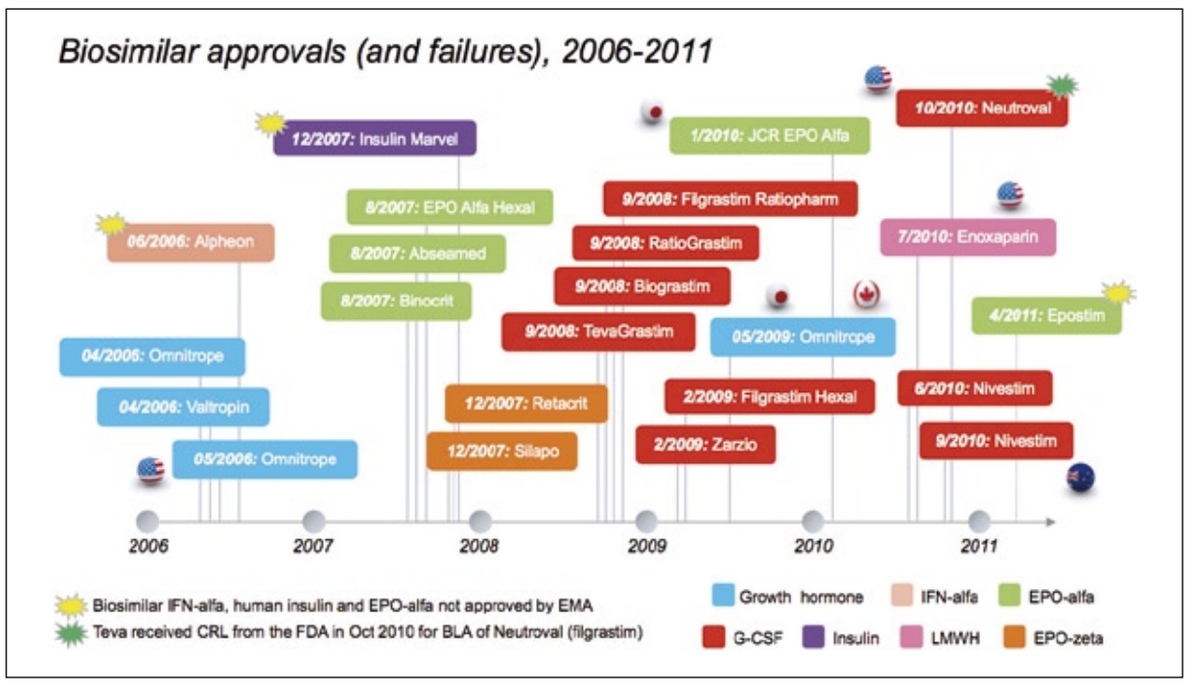
From a "hybrid" business model perspective, many more innovator companies are expected to employ a similar strategy to Merck and invest in the biosimilars market. Companies that have already mentioned that gaining access to the biosimilars market would be favorable to the business include AstraZeneca, Amgen, Biogen Idec and Pfizer. Pfizer's recent biosimilar insulin deal with India's Biocon provides proof that Pfizer are serious about exploiting opportunities within the market.

What About The Future?

Despite much progress being made in the biosimilars market, much is left to learn and understand about this rapidly evolving sector. There will be legislative developments and refinements. In the U.S., the FDA has yet to release clear biosimilar development guidance, with the first guidance documents expected to emerge during late 2011. In Europe, draft legislation related to the development of mAbs has been published, and refinements and amendments to current legislation are planned.

Off the back of this legislative activity, more biosimilar approvals are expected, both in classes where there biosimilar products are currently approved, and in other classes. Biosimilar versions of leading mAbs are in clinical development in Europe, including rituximab (Rituxan; Roche) and adalimumab (Humira; Abbott). Additionally, biosimilar versions of human and modern insulin are also expected to be launched in Europe.

Finally, there will be increased deal activity. As companies seek to gain access to the biosimilars market, an increase in the number of partnerships, collaborations, joint ventures and acquisitions are likely to be seen. These deals will enable companies to leverage pipelines, reputations and geographical reach, thereby driving overall commercial success of biosimilars in the future.



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Teva Buys 57% of Taiyo for $460 Million

Teva Pharmaceutical Industries will acquire 57% of privately held Taiyo Pharmaceutical Industry for $460 million in cash and will make an offer to buy the remaining shares of the Japanese company. The deal gives Taiyo an enterprise value of $1.3 billion and is expected to be accretive to GAAP earnings within four quarters after closing, Teva said.

Taiyo is the third largest generic pharmaceutical company in Japan with sales of $530 million in 2010. It has over 550 generic drugs in a variety of therapeutic areas.

"This acquisition will enable Teva to deliver on our strategic objective of becoming a leading player in the fast-growing Japanese generics market," Teva President and Chief Executive Shlomo Yanai said.

The transaction will be funded through cash on hand and bank debt. Teva expects to complete the transaction by the end of the third quarter. ■

Takeda in $13 Billion Nycomed Deal

Takeda Pharmaceutical, Japan's largest drugmaker, has announced its 1 trillion yen ($13 billion) purchase of closely held Swiss rival Nycomed as it seeks to expand in Europe and emerging markets, Japanese business daily Nikkei reported.

The purchase would also give Takeda, known for its top-selling diabetes drug Actos, access to lung-disease drug Daxas, just approved in the U.S., and a portfolio of over-the-counter consumer products.

Takeda, which has around 874 billion yen in cash and marketable securities at hand, has previously said it would be willing to take on debt for future deals.

Nycomed is majority owned by four private equity firms, led by Nordic Capital with 41%. Credit Suisse's DLJ Merchant Banking has 25.6%, Coller International Partners 9.7% and Avista 8.9%.

The Swiss drugmaker is well-placed to tap emerging markets, which made up nearly two-fifths of its revenue in 2010 and should make up 60% of sales by 2015. Emerging markets sales leapt 30% last year.

Nycomed chief Hakan Bjorklund has since 2008 talked of a possible IPO and in 2009 the Wall Street Journal reported that Goldman Sachs was hired to explore a sale of the company.

The group, which is now being advised by Goldman and Credit Suisse, also fielded approaches from several other suitors, one person familiar with the matter said.Takeda may be able to reap synergies which could run to hundreds of millions of euros a year.

Takeda is financing the €9.6 billion acquisition with cash on its balance sheet and the loan, which is expected to be completed in the next few months.A loan term sheet has been already been circulated to Japanese and some international lenders, including Citigroup, and comments on a cheaper Japanese-style club loan have been invited, a senior banker told Reuters.

Japanese banks can fund themselves more cheaply due to high deposit ratios and are able to offer margins as low as 25–30 basis points on a guaranteed loan for a company with a high AA credit rating such as Takeda. ■

Near Infra Red Cameras

PRODUCT Photonfocus introduces two cameras, based on the newly developed CMOS imager A1312IE. The MV1-D1312IE cameras provides a high dynamic range of up to 120dB with LinLog technology. The camera delivers up to 108fps at full resolution. A major benefit is the possibility to further increase the speed to thousands of frames/s by reducing the ROI through horizontal and vertical windowing.

The resolution is 1,312 x 1082 pixels, with 8µm x 8µm square pixels and over 60% fill factor with an excellent image quality. The camera has an extended spectral range covering 350nm to over 1,100nm.

An extended set of features including MROI, the possibility to use two different LUTs over different regions, advanced trigger and strobe functions make this camera the ideal tool for your application.

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A Positive Outlook

But What About those Clouds on the Chemical Distribution Horizon?

A Decent Start – When reading press releases of chemical distributors these days or when talking with their senior management, one can get the impression the economic crisis of 2008-09 is definitely a thing of the past. Sales volumes, turnover and profit figures for 2010 are across the board very satisfying and even in record territory for some companies. Also, companies in private ownership or controlled by financial investors that do typically not publish results will confirm in personal discussions that business was "very good indeed in 2010" and that 2011 has been off to a "very, very decent start."

In the next breath, however, many people will state that it is not easy to ensure the supply of products at the level that customers demand and when they want it. It appears that over the last 12–18 months, many marginal production plants were mothballed or decommissioned and scraped altogether. Sudden plant outages and unplanned maintenance shut-downs have led to availability problems every so often, so that a number of producers had to declare force majeure and go on allocation for certain products. This begs the questions as to whether the often-significant reductions of maintenance spending during the downturn – that may have helped profitability short term – were made at the detriment of the longer term outlook and viability of plants and their steady performance.

A Few Stumbling Blocks

For chemical distributors, this often results in the need to hold higher inventories than desirable under normal circumstances, in order to guarantee product availability at the customer level. This ties up additional working capital, on top of the higher raw material and product prices, which make replenishing stock more costly. The dramatic increase of crude oil price levels from about $65/barrel in the trough to more than $120/barrel in late April is to be felt with full effect here.

Cash flow calculations in quarterly or annual reports that show the cash consumption over the last year, talk a clear language here, despite all the efforts to optimize management of working capital, which were made at many companies. This is no easy task, as customers still keep ordering on short notice and/or in rather small lot sizes and deliveries. This is caused by their customers ordering late in the first place, but also by the fact that many small and mid-size customers find it hard to obtain financing in the run up to new and increased orders. The increase in cost of capital – that can be expected once central banks raise interest rates to keep inflation check – doesn't bode too well here.

So it's not all bright and shiny, despite the fact that particularly the industrial activity in Germany (and other "northern" countries in Europe) is "humming along nicely" as the Swiss daily "Tages-Anzeiger" wrote recently. During Q1 2011, Germany's annual gross domestic product rose by 5.2%, an increase not seen since reunification 20 years ago. On the other hand,

Günther Eberhard
Managing Director,
DistriConsult

the numbers don't look that good in other parts of Europe, and many economists warn of reduced growth, be it due to a continued rise in commodity prices or a general decline of the dynamics of the global economy.

Growth: Why Not Seek It Externally?

Besides internal growth driven by continued economic expansion, more and more distributors are considering external growth options. The larger M&A transactions reported in Q1 2011, however, were the closings of acquisitions that had already been published in 2010. Transactions that fall in that category are the MBO of the distribution activities of Ashland, which has been trading under the name Nexeo Solutions since the beginning of April; and Univar's acquisition of BCS and Quaron in Belgium and the Netherlands.

Nevertheless, there were also some "new" deals, such as the purchase of Quaron France by Kem (a 50/50 joint venture established for this purpose by German privately held distributors Overlack and Stockmeier); Univar's purchase of Eral-Protek in Turkey; UK-based Melrob's takeover of Japan's Chemiplus; the asset deal that Brenntag did with niche distributor Luwatec in southern Germany; and Azelis' acquisitions of Serbia's Finkochem and part of the S&D Group (Europe as well as Canada and India).

The last three transactions in particular show that the larger groups like Brenntag, Univar, Azelis and IMCD are more or less constrained to "bolt-on acquisitions" of comparatively small companies in Europe. Larger transactions would possibly lead to difficulties when trying to get clearance from EU or national competition authorities. It is therefore to be expected that these companies will increasingly focus on geographies like Asia Pacific or Latin America for their next M&A projects, a move that has also been confirmed by senior representatives of these firms in recent interviews.

M&A In Europe

This doesn't mean that nothing will happen in Europe regarding M&A. More and more privately held companies are considering acquisitions. Their shareholders, often families that have successfully managed generation changes and succession issues over the last few years, follow a long-term strategy that calls for reinforcement of core business activities and broadening their geographic footprint. These companies have reached a size bracket that, on one hand, allows them to manage mid-size transactions without undue financial strain; and, on the other hand, they are not yet too big, so that approval by competition authorities should not be an issue. What needs to be kept in mind, however, is that these companies are very circumspect, if not cautious, so that valuations will possibly be on the conservative side of the spectrum seen lately.

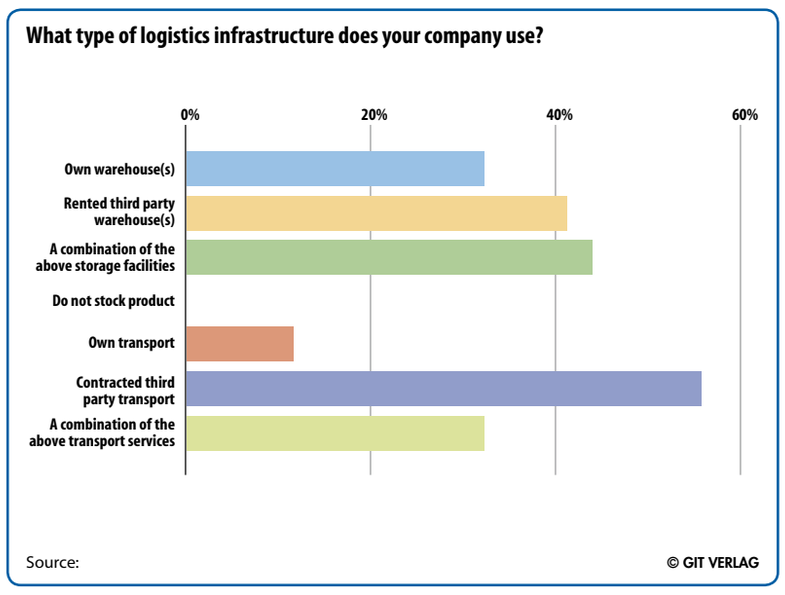
Distributors controlled by private equity investors are also good for flashy headlines at times.

One example is Azelis, where several media outlets recently reported that the owners, 3i, had commissioned an investment bank to explore "strategy options." Some industry watchers even suggested that a sale was imminent. This could very well be the case, or it could not! The only thing that can be said about private equity sponsors in chemical distribution (as opposed to other categories of shareholders) is the fact that there will ultimately be a sale. An exit is the only way to realize the value of the investment. When that exit will be in a particular case, however, is very difficult to predict from the outside, as there are many factors that influence such a decision. Not all of these are to be found on the level of the investment, i.e. the distribution company. Much more often, considerations regarding the portfolio of the investor and the funds that were used to make the investment in the first place play a significant role here.

Service Offering as the Main Differentiator?

While industrial chemicals distributors had to invest into storage tanks as well as blending and filling equipment all along, the case has been different in specialty chemicals. There it has been quite possible to run the business from a leased office, having just a third-party warehouse for packed goods to manage the supply-chain. The actual "investment" according to this business model was predominantly in human assets, hiring technically competent employees who had detailed product knowledge and an in-depth understanding of the target applications and/or industry segments.

Now there might be changes on the horizon as more and more customers are looking for enhanced services from their suppliers, which a distributor can only provide with an in-house laboratory infrastructure. Examples can be found in the cosmetics and the food industry,



Warehouse and Transport Logistics in Specialty Chemicals
© DistriConsult – Survey April 2011 (33 answers = 40% return rate; multiple answers possible)

where new trends and developments need to be made accessible via an on-the-spot feel, smell or taste of a formulated product in front of the purchaser or the developer in order to generate sufficient interest for new additives and ingredients. But this also applies to certain technical applications. Add to that the fact that the application labs of the typical non-European producers are just too far away for a speedy turnaround of customers' technical problems and one can easily appreciate the fact that distributors must step in here. A number of companies are considering an investment in this area, as DistriConsult recently found out during a survey of specialty chemical distributors.

To build these often application-specific laboratories is a considerable investment, which makes significant demands on the financial capacity of a distribution company. Amortizing the investment within a reasonable pay-back time requires in turn a sufficiently big business volume. This can easily be generated by medium to large-sized companies, with activities across several countries. Small companies often only have the option to focus on a selected core industry sector or to abstain from providing this type of service altogether.

The survey mentioned above also yielded the result that when it comes to warehouses, the two models of in-house and third party facilities are equally used. Hybrid forms are also possible. The transport logistics, however, are outsourced almost completely to third-party logistics providers. The few cases where own trucks are used can be attributed to companies that have a significant activity in industrial chemicals, where often customized tank trucks are needed and are not easily contracted in from logistics companies in the open market.

Will The Consolidation Continue?

The general economic outlook can be considered as rather good, apart from the possibility of a sudden deterioration of the political situation in North Africa or the Middle East and any resulting dislocations in the global economy. However, further price increases for raw materials and petrochemicals and an accelerating inflation could increasingly cause problems, as there would be a dampening effect on demand. Product availability constraints and short-termism seen in customers' order patterns place high demands on distributors' infrastructure.

As an industry, chemical distribution will experience continued growth, since outsourcing of non-core activities by producers is likely to continue, a trend that opens further opportunities. It appears that also for specialty chemicals, additional services will be required by customers, be it the support through application development laboratories or customer specific blends and formulations, beyond what is already common in industrial chemicals. Reasons for that are that customers do not want to (re-)invest in the associated facilities or that producers continue outsourcing of small volumes handling and customised products, which are often blends of standard grades.

All this in turn requires distributors to show a willingness to invest in infrastructure. Not every company owner can or wants to do this. It is to be expected that a further round of consolidation will be triggered. It remains to be seen what type of distribution company will drive this. We expect the larger and more capable companies from the "Mittelstand" (SMEs) to eagerly seize the resulting opportunities across Europe.

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chemanager-online.com/en/tags/chemical-distribution

Energy and Healthy Ambitions

Europe's Chemical Distributors on the

Challenges And Chances – With the chemical industry posting phenomenal Q1 numbers, it's clear that the worst of the economic crisis is over. The same goes for chemical distributors in Europe, who will be gathering in Vienna June 6–8 for the annual European Association of Chemical Distributors (Fecc) congress. This year's motto, "Turning challenges into opportunity" sums up the strategy many Fecc-member companies employed when the going got rough. Brandi Schuster asked the leaders of several Fecc member companies about the lessons they learned from the downturn; their take on continuing consolidation within chemical distribution; and the trends that will shape the market over the next 12 months.

The economic downturn didn't really change the rules of the game.

Mikko Teittinen, CEO, Bang & Bonsomer Group

Markets should be treated with respect, and caution is imperative.

Christian Westphal, Managing Director, TER Group

Energy and healthy ambitions … have served as a catalyst for dynamic growth.

Alexander Ivlev, General Manager, Ruskhimset

It's not absolutely essential to be number one!

Carl Hugo Erbslöh, President, C.H. Erbslöh

While we have certain advantages as a larger distributor, we also firmly recognize this is a local business.

Steve Holland, COO, Brenntag

CHEManager Europe: What have been the most significant developments/changes within the chemical distribution industry since the economic downturn? What lessons have been learned and adapted for your business?

Mikko Teittinen (Bang & Bonsomer Group): The economic downturn didn't really change the rules of the game. Many companies made losses but still had a good cash flow during the downturn. Now companies are enjoying of increasing profit and growth, but are struggling to finance the growth. But, the business is the same.

Pavel Kratochvil (Barentz): The most significant changes within the chemical distribution have been the exact following or copying of all changes in the chemical industry, as well as changes in consumer behavior. Consumer behavior has been dominated by uncertainty with regard to the future and future economic developments. Therefore, slow down of consumption has been followed by slow down of production, followed by cost reduction – or at least cost awareness. At least this point was very positive, and we have learned a lot from this. It forced us to look in the mirror and see where and what we can do much more efficiently and practically. In many cases, we came back to the original roots – to make business simple. This goes for production companies, distributors and even for our private lives.

Steve Holland (Brenntag): The single biggest impact on the chemical distribution industry during this difficult economic climate was the drop in demand, which is only now starting to recover in many industries to pre 2008/09 levels. Chemical distribution was not as heavily affected in terms of volume, which demonstrates the resilient characteristics and need for products and services provided by the chemical distribution industry.

Since then, we see moderately improving macro-economic conditions in advanced markets and a stronger economic performance in emerging markets. We expect an increasing global demand for products and distribution provided by the large chemical distributors as customers demand even more complex value-added services. We do not depend on single procurement channels, allowing us greater diversity and leverage in the marketplace. This model has allowed Brenntag to help our suppliers and customers to offset the negative effects of the economy by creating a more efficient distribution system.

Carl Hugo Erbslöh (C.H. Erbslöh): What the economic crisis has taught us is that a relatively small event such as the collapse of a bank in America can trigger around the world. This phenomenon will not change in future. We have to be prepared at all costs to have sufficient reserves of our own to tide us over such crises in future, even those of longer duration.

José António Magalhães (Quimitécnica.com): The economic downturn had increased the need for flexibility and for sharing risks both at the customers and at the producer levels. In that sense, the role of the chemical distributor has been enhanced as an active partner for both customers and suppliers. Chemical producers increased their interest in partnering with distributors for all the non-strategic accounts to optimize their marketing costs and credit risk. Also, end users are more interested having services tailored to their needs concerning time, quantity, quality and commercial terms. We are always learning in our business, so instead of talking about lessons learned, I prefer to point out two recommendations: maintain a strong balance sheet and operate with a diverse portfolio and in the widest geography economically viable.

Peter Skou (R2 Group): It is clear that the financial crisis had a severe impact on the chemical industry. We at R2 Group have of course also felt this impact, however, fortunately, our business is divided into four key areas: chemicals, agro, consumer and pharmaceuticals, and most of our ingredients go into daily life products.

The major impact for us was the fact that clients requested just-in-time deliveries; purchased smaller volumes more frequently; and were very demanding on payment terms. What we have learned from the crisis is the importance of cash flow management and the balance between orders and stocks.

Christian Westphal (TER Group): The most significant development since the downturn was the surprisingly strong business activity, which cranked the upturn. The dimension of raw material price increase after the crisis of 2009 was unforeseen by most market participants. In most cases, demand is still high and in excess of supply. In contrast to conditions of previous generation's worldwide economies, asset categories and risk exposures are interlinked nowadays. In this context, isolated markets are a thing of the past.

Globalization will continue. We expect that a continuation of price and currency fluctuations will take place. In the future we furthermore expect the soft curves of accustomed standard-business cycles to be interrupted by a repetition of harsh turbulences. Markets should be treated with respect, and caution is imperative. Close relation and intense dialog with manufacturers and suppliers is key to consulting our customers on their purchasing strategies. The importance of companies active in the trading and distribution of chemical products has increased as a consequence of the changed market conditions.

François Minec (Velox): The downturn has not affected all companies the same way. Sectors particularly affected were construction and automotive, but pharma, medical, cosmetics and food were barely affected. During the downturn, most companies have increased their controls on costs and stocks in order to limit cash usage. However, most companies have chosen to keep investing in their core assets and most of all in finding and retaining well-qualified staff. Thanks to this, in our view, the rebound is particularly favorable for most of the chemical distribution industry.

Birger Kuck (Biesterfeld): The economic downturn in 2009 forced European chemical distributors to focus on their strengths in order to be cost conscious, to optimize their cost structure and, above all, to do their day-to-day business with a long-term focus. This means that it has been right to further improve the quality of the employees in spite of the crisis and to provide a sufficient workforce to be ready for the time after the economic recovery. Our company expanded its activities in niche markets further with a strong focus on specialty products and their applications. An improvement of the service is a strong support for customers and suppliers, especially in difficult times. Furthermore, we learned that "cash is king" in times of crisis. It is important for the financial policy of the distributor to act accordingly – not only during crisis, but especially in times of prosperity, too.

Alexander Ivlev (Ruskhimset): The chemical industry is conservative and new trends have been forming over the years. Chemical distribution is a reflection and continuation of these trends, but in our opinion, distribution is leading. The healthy shake-up of the economic downturn generated an updated system of relationships between the chemical industry and the chemical distribution.

For our young company, the crisis has opened many doors that were previously closed to us. Energy and healthy ambitions, together with already accumulated experience, have served as a catalyst for dynamic growth. We cannot say that we did not recognize the challenges for the development of new areas before the crisis, but their real effective realization became possible thanks to the crisis. A lot of chemical manufacturers have revised their approaches to the supply chain in favor of new small and vigorous distributors.

Peter Manshausen (Caldic): The economic downturn in the end of 2008 came suddenly, hitting small- to medium-sized companies hardest. General industries such as construction, chemicals, steel, automobiles, tires producers, etc. found themselves in a situation of almost collapsing demand and rapidly dropping prices. Thus chemicals distributors specialized on these "suffering" industries – particularly those who had quite substantial quantities of raw materials on stock – were severely hit. In contrast, consumer industries such as food, feed, health care and cosmetics weren't affected at all or even faced higher demands. All players servicing these industries were in a more favorable situation during that period. Consequently, focusing on working capital reduction – particularly in times of "rough seas" – and strengthening specialty chemicals business with added-value services were the first goals in and after the downturn phase. Furthermore, it is necessary to reconsider the traditional business models in order to further grow in line with megatrends such as water, food and convenience products.

The gap between the three largest players and everyone else within chemical distribution is quite significant; how significant are mergers and acquisition and alliances among the small to mid-sized players on the field? What role do you see private equity companies playing?

Mikko Teittinen (Bang & Bonsomer Group): In the chemical distribution business, there is still space for the technically skilled, small family companies who are specialized to work in some specific customer segment or product area. Many specialty raw materials manufacturers don't want to work with large multinational companies. There is also room for the companies who have strong local presence in some geographical area. Consolidation will continue in the chemical distribution industry, and we will see many acquisitions and mergers also in the future.

Pavel Kratochvil (Barentz): The gap between the three largest players and everyone else within chemical distribution is indeed significant. It is significant in the size of the business, in the revenue, global coverage and other parameters, but one can question if we are not comparing apples with oranges. In the current worldwide economic recovery, we can see increased appetite of the huge chemical companies for investments, and owners of the three biggest distributors striving for further acquisition. This is driven by pure financial criteria, meaning showing either growth of shares on the stock exchange or showing expected return on invested capital.

Medium-sized distributors, often still family owned, have different roles and ambitions, such as being a long term global partner for their principals and strengthening their position while making a profit out of it. We haven't seen a lot of mergers, acquisitions or other alliances among these medium-sized distributors yet, but some of them shall step out and will become visible very soon. The real smallest ones, particularly real local ones, will hardly survive and stay alone, unless they are very specialized or even niche in the certain segments or region.

Steve Holland (Brenntag): An estimate of our current market share is just under of 7% globally, and the market remains highly fragmented. While we have certain advantages as a larger distributor, we also firmly recognize this is a local business. We believe that the ongoing consolidation process will continue through more and more mergers and acquisitions. Also, Brenntag will continue to grow both organically and through acquisitions. We want to get access to more countries, offer additional products, increase our knowledge and decrease costs. In addition we continue to actively realize the potential offered by the trend for chemical producers to outsource activities.

The chemical distribution market is obviously an attractive field for private equity investors, if we take into consideration the recent developments at Ashland Distribution, which was bought by TPG Capital, or Univar, which is held by funds managed by CVC Capital Partners and Clayton, Dubilier, & Rice.

Or take Brenntag, which received its second private equity investor in 2006, BC Partners, after Bain Capital. Brenntag's history and market presence show that its strong business model developed very well under the ownership of financial investors. Another measure of Brenntag's success under financial investors is the successful IPO in March 2011, with an outstanding share price development since then and a free float of almost 64% today.

Carl Hugo Erbslöh (C.H. Erbslöh): Of course the gap between the three giants and the rest of the chemicals distributors is widening. This is no different from the picture in any other industry. This trend will continue, and the gap will increase. There is still enough room for middle-sized companies; if we analyze the markets accurately and position ourselves well, we will grow. It's not absolutely essential to be number one!

José António Magalhães (Quimitécnica.com): Chemical distribution is low-value added, has low-capital intensity and a highly flexible industry – so it is a low-risk sector, but also one where size does really matter. The fast and successful consolidation performed by the big three or four players in the last decade has proved it. In the past, M&A moves were fueled by a financial market situation that is not anymore available – especially to SMEs. This means that transactions at this end have to be very carefully considered, and the motivation should be to increase the geographic coverage or portfolio diversity and strong synergies as enablers of the deal. The private equity owners are still pursuing buy and build strategies, however with a sharper focus and selectivity in the acquisition side and, despite one success exit by IPO, with secondary and tertiary transactions as the exit rule.

Peter Skou (R2 Group): There is no doubt that private equity companies are here to stay. From a medium-sized distributor/producer's point of view, they are welcomed in the distribution market. The three or four largest players have a factor of power that is very significant, but we are quite confident that there is also room for medium sized players like ourselves, and in some areas maybe we can act a little quicker to changes than the big multinationals. We have deep respect for our colleagues in the business, but I must also say quite happy with our own performance in the different geographic and segmented areas that we are in.

Christian Westphal (TER Group): We will see both a rising level of mergers and acquisitions among the small to mid-sized players, as well as a higher level of alliances to cooperate internationally. Private-equity financed distributors will continue to play the role of the geographically widespread player for the chemical commodity industry. We expect investments in Asia, in particular China, to be a focal point for private-equity driven growth.

François Minec (Velox): Medium-sized and smaller companies are less active in mergers and acquisitions. They typically focus on organic growth,

as Catalysts for Healthy Growth

Lessons Learned from the Global Recession

Consumer behavior has been dominated by uncertainty with regard to the future and future economic developments.

Pavel Kratochvil, Executive Vice President & Board Member, Barentz

The role of the chemical distributor has been enhanced as an active partner for both customers and suppliers.

José António Magalhães, Director, Quimitécnica.com

There is a common understanding that the market is currently over-fragmented and that some consolidation is needed.

François Minec, General Manager, Velox

It should go without saying that the quality and service level of a distributor is not governed by its size.

Birger Kuck, CEO, Biesterfeld

It is necessary to reconsider the traditional business models in order to further grow in line with megatrends.

Dr. Peter Manshausen, Managing Director, Caldic

There is no doubt that private equity companies are here to stay.

Peter Skou, Part Owner, R2 Group

which allows them to develop a strong company culture and retain full control over how and where they grow. So typically, larger companies with more than €250 million in sales are active in M&A. However, today there is a common understanding that the European chemicals market currently over-fragmented and that some consolidation is needed to face the challenges of the chemical distribution industry here.

Birger Kuck (Biesterfeld): With a turnover of €835 million, Biesterfeld is not one of the three largest players but ranks among the top 10. It should go without saying that the quality and service level of a distributor is not governed by its size. Nearly all large chemical distributors have a strong focus on the industrial chemical market segment, but not Biesterfeld. We concentrate our activities on specialty and niche markets. When pursuing this strategy, acquisitions are a tool to complement the product portfolio and to buy know-how for new market segments. Private equity companies are usually interested in buying larger companies to follow their own buy and build strategy. All other targets are subordinated. For mid-sized companies, acquisitions are a vehicle for diversification, for complementing their activities and for expanding their geographic presence. By doing so the distributor improves his value and service quality for customers and principals.

Alexander Ivlev (Ruskhimset): In addition to industrial giants, there are a number of sufficiently large universal chemical distributors in Europe and the U.S. This is the second tier that has rather good prospects for further expansion. We find it difficult to judge the potential of mergers and alliances among small distributors in Europe because there are differences in attitudes, business culture and personal ambition. Nevertheless, we believe the emergence of one or two large companies to be logical.

The time of alliances and acquisitions has not come yet to Russia. Within 10 years, the leading players will be indentified, and they will determine the further development of the industry and will actively absorb "niche" companies. At this stage, private equity companies could play an important role in formation of the one to three largest distributors in Russia and the Commonwealth of Independent States.

Peter Manshausen (Caldic): The chemical distribution industry is very diversified. There are numerous financially healthy, privately owned medium-sized players locally distributing chemicals and specializing in niche markets. All of them are facing increasing competition from the few large players, who – because of economy of scale and geographic extension – are covering an almost complete area of products and regions.

Alliances between the players in the chemicals distribution industry are quite difficult because of antitrust laws and therefore mostly limited to procurement processes. Thus all players, even the big ones, are facing an increasing need to grow through acquisitions in order to defend themselves from low-cost suppliers in emerging markets and in order to get closer to customers. Private equity companies who noticed the fragmentation of the chemicals distribution market are keen on looking for chemicals distributors to acquire and grow, which all in all results in higher multiples for the few companies left for sale.

What do you think the top three trends will be in chemical distribution over the next 12 months?

Mikko Teittinen (Bang & Bonsomer Group): Companies will begin to focus more on strategies; will devise business concepts for competitiveness; and will continue to improve effectiveness.

Pavel Kratochvil (Barentz): Mergers among the biggest chemical producers will create big and strong groups, affecting the way they select their distributors. They will require pan-European and non conflicting distributors.

The organic growth of top distributors certainly has its own limits, following stronger or weaker economic growth. Therefore the biggest growth model needs to come through acquisitions. This will, however, create at the same time more and more conflicts of interests for the principals.

Barentz strongly believes in a non-conflict of interests and consequently foresees a lot of new opportunities due to this dangerous growth policy of the top big three to five players.

Medium-sized distributors will grow by smaller acquisitions, alliances and or joint ventures. Consequently the smallest ones, without any perspective and plans, will disappear.

Steve Holland (Brenntag): The role of the global distributor will continue to grow. As the world shrinks and we gain greater insight to the markets worldwide; chemical producers are looking outside of their current markets more and more. These producers need a link between their products and customers abroad. Brenntag offers this link by being able to think global, but act local with their employees' extensive knowledge of who to target, and how; as well as possessing the infrastructure and logistics required for distribution.

Market consolidation and outsourcing will continue, as it is more economical not only for the producers, but also the consumers. Chemical manufacturers will continue to optimize their distribution and marketing cost and outsource small accounts to third party channel providers, or less-than-truckload distributors like ourselves; a process which means less complexity and cost savings for both sides.

Carl Hugo Erbslöh (C.H. Erbslöh): Deliver on time. Keep your promises. Give service.

José António Magalhães (Quimitécnica.com): Cash management; focus on the more resilient sectors; and geographic and portfolio expansion both by organic and inorganic activities.

Peter Skou (R2 Group): A major issue in the coming months will be the continuous rise in the cost of raw materials. Supply and demand in both the chemical, food and agro industry are not in balance, and there is a sincere need for more material. We predict that we will have a very volatile market situation the next 12 months, but also an increase in business; not only in turnover, but also in volumes.

Christian Westphal (TER Group): Ongoing product shortages, acquisitions, productivity increase by improving processes.

François Minec (Velox): Consolidation of European players; creation of European networks and strategic alliances between those medium and smaller players who manage to remain independent; all European players seeking more actively to access the Eastern European markets.

Birger Kuck (Biesterfeld): The increasing importance of mega trend markets like nanotechnology, solar, biotechnology and electronics.

We also expect to see a drifting apart of the distribution of industrial chemicals on one hand and from the specialty chemical distribution on the other. Quality requirements for sales and technical service people and the market know-how of the distributor will become a further differentiation of the specialty chemical distributor from the industrial chemical one, who is more logistic and product handling oriented. The globalization of the chemical trade will continue so that far away product sources and suppliers will be of even stronger importance for European customers than today.

Alexander Ivlev (Ruskhimset): We believe that year 2011 will be calmer than the stormy years of 2008–2010. We expect to see significant changes in the European chemical industry: The production capacity will be concentrated at few giants and they will tend to establish their own distribution divisions. The producers from the Asia-Pacific region will increase their activity. And the prices for chemical raw materials will grow rapidly as will the currency imbalances.

Peter Manshausen (Caldic): In a competitive environment such as chemicals distribution, it will become more and more essential to generate competitive advantages, creating USPs and thus differentiating from others. We expect to see more marketing efforts and stronger focus on customers' needs in order to identify and focus on market segments that will deliver most profit; change from chemical distribution to customer value generating services in order to offer customers added value; and integration of sustainability into core strategies by focusing on green chemistry and improved energy and materials efficiency, thus reducing carbon footprint in all processes.

The interviews can be read in their entirety here:

chemanager-online.com/en/tags/chemicals-distribution

The Pros and Cons of Dissemination

Registrants of Hazardous Substances to be Named by ECHA

Viewpoint – On May 11, the European Chemicals Agency (ECHA) announced that it will publish company names and registration numbers for substances registered as hazardous following a commission services ruling. Up until now there has been no public way of linking a company to a particular substance that has been registered, unless the company freely advertises the fact on its company website or in a suppliers' database.

This new information is undoubtedly linked to ClientEarth and Chemsec's recent initiation of a legal case against ECHA for non-disclosure of the companies linked to the registration of 356 of the most hazardous substances. The Reach legal text did not provide a route for the release of company names being linked to particular substances.

As ReachReady, we spend a great deal of time helping companies of all sizes, from all parts of the world and all parts of the supply chain meet their Reach obligations and through those discussions we can see many pros and cons of this new information being disseminated publicly.

Firstly, it will even out the playing field in the substance information exchange forums (SIEFs), as currently only lead registrants know who has registered through their role in providing access to the joint submission. In most SIEFs, joint registrants have no idea who else has registered and so wouldn't know if a competitor was compliant or not. The releasing of this information will also be a huge benefit to downstream users who will be able to use the tool to reassure themselves that their supplier has registered, that they are trading legally and that there will be continuity of supply. It will also aid self enforcement within the supply chain and help eliminate free riders. However, as companies can also claim confidentiality by paying a fee, this will be an option many registrants will undoubtedly take.


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Claiming confidentiality, however, will be yet another cost to add to the ever increasing cost of Reach compliance, added to which we assume that there will also be criteria around the confidentiality claim that will have to be satisfied for the claim to be secure. The disclosure will also cover all hazardous substances, not just those which are substances of very high concern (which currently captures some which are carcinogens, mutagens and reprotoxins or those that are persistent, bioaccumulative and/or toxic). The term hazardous will also capture substance that are flammable, explosive, oxidizing, sensitizing, irritant, taking the disclosure to many thousands of substances, some of which will be found in many everyday products. The dissemination of company information is also unprecedented, as it does not happen in the regulation of pesticides or biocidal products. The disclosure of this information will also set alarm bells ringing for distributors who may well see their customers go direct to their supplier and freeze them out of the supply chain.

Overall, this is just one more thing for those who are already wrestling with Reach registration, updating safety data sheets with new data and exposure scenarios to manage. Gone are the days of spontaneous supply.

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Don't Gamble With Compliance

The Importance of Reach Document Delivery

Important Considerations – Even though the first phase of Reach registration has come and gone, this is no time to relax says Malcolm Carroll of Reach Delivery. The delivery of safety data sheets (SDSs) is an importance part of compliance, Carroll explains.

In December last year, EU chemical manufacturers breathed a collective sigh of relief that the first phase of Reach compliance was completed successfully. In this phase, high volume and hazardous chemicals were registered with the European Chemicals Agency (ECHA).

There is little doubt that while manufacturers, distributors and downstream users of chemicals may recognize the importance of the Reach regulation in promoting and ensuring the safe use of chemicals, many would agree that it is one of the most complex pieces of legislation to impact importers of chemicals to and within the EU. Therefore, achieving registration successfully would not just have been a major milestone, but also the accumulation of many months of hard work.

However, even with registration over, there is no time to relax. There are other important considerations and changes under Reach that will impact these companies and that need to be addressed now. One major consideration is the new rules and changes involving the delivery of SDSs to customers in Europe.

Achieving Compliance

The big change is that under Reach, any company involved in importing and distributing chemicals to and within the EU will need to ensure the direct delivery of SDS and associated documentation to their customers. They will also be responsible for keeping these documents and their customers up to date in the event of any changes or clarifications. Companies need to ensure they know these changes are required and that they adhere to them; failure to act upon them may place their business at risk of non compliance.

Achieving compliance in this area is a major administrative challenge and could also prove incredibly costly and because SDSs are needed at every stage of the supply chain, this issue will impact thousand.

It is clear that new methods of delivering SDSs and associated documents will be required, as traditional methods will prove unacceptable, expensive and will not be robust enough to meet the Reach compliance requirements. Reach compliance insists SDSs must be supplied directly to the customer so there are some obvious problems with current working practices in this areas. If we look at each of in turn, there are some very real challenges.

- Email does not guarantee or record proof of delivery without significant time, effort and cost and obviously does not physically replace old, out of date versions of an SDS.
- Post has the same problems as emails, adding further costs and time with stationary, postage and administration.
- Placing documents onto a website simply will not suffice as it provides no proactive delivery and is already rejected by the Reach legislation.

Easy and Consistent Access Difficult

Nor will existing methods help with the intent of Reach, as customers will not be alerted to any changes in the SDSs, multiple recipients are not easily managed and there are no standards in terms of the media on which the SDS is held, making easy and consistent access difficult. All of this results in either significant additional costs for suppliers or the possibility of errors leading to non-compliance with the regulations.

So the issues facing companies are many and companies should be asking themselves a series of questions. How do they fully comply with the legislation in respect of the delivery and receipt of SDSs? How do they maintain their operations and ensure only the use of current information, and provide consistency across all operational areas? How do they effectively audit, internally and externally, and prove the delivery, receipt and access of critical information by customers? And, how do they address possible legal action should it arise?

It has become clear recently that many companies now need to look at this aspect of Reach legislation. This year is starting to see a high number of revised SDSs entering the supply chain and keeping track of what has been sent to which customer and ensuring "delivery" is bringing new challenges. Companies are seeking ways to establish both a method of complying with legislation in communicating with their customers and an effective approach to their internal operations in respect of SDSs.

Alleviating Headaches

Reach Delivery is a new industry-wide SDS delivery service aimed at alleviating the headaches around Reach compliance concerning the delivery of SDSs and other documents. As a secure online service, it facilitates the electronic delivery, receipt, control, update, audit and tracking of SDSs in line with the regulations.

Reach Delivery automates the entire delivery process, monitoring, tracking and reporting on all documents sent to customers. It retains a delivery status for documents sent, alerting users only when they need to follow up. Any document updates are automatically identified and the new SDSs replace any versions previously sent, alerting customers and staff to it.

Documents from all of a company's suppliers are all stored in an electronic database, allowing users a single consistent point of access for the latest version of a SDS. Any documents that a user chooses to store locally on his PC are also automatically kept up to date, so that it is possible to work online or offline.

Reach Delivery is free to use, with an optional "pay as you send" area for users wanting to send documents externally, who will then pay a per document fee. All that is required is a set-up and registration process, and then users can send securely the latest SDSs and other documents to their customer's desktops and receive proof of delivery. Recipients always use the service completely free of charge and users can also send documents free of charge internally to ensure that the latest SDSs are being used across an organization.

The service operates on a many-to many basis, allowing companies, no matter where they are located, to be able to manage and automate the sending and receiving of SDS, and other documents and messages, within a fully secure and audited environment. It is international and multi-lingual as well as being easy to use.

In addition to the fact that Reach affects companies throughout the world, similar legislation is now being considered in other countries, most significantly in the U.S. Reach Delivery has been designed to meet the requirements of new international legislation as and when it is required.

An International Basis

The system already functions on an international basis. Non-EU firms can use it to comply with Reach by securely delivering SDS to their customers in Europe. They can also use it outside of Europe and in their own countries, as it supports the delivery and receipt of SDS and any other documents worldwide, or to distribute SDSs free of charge throughout their company.

There is no doubt that Reach compliance is a hugely complex issue for companies around the world but automating and guaranteeing the safe delivery of SDSs will ease the complexity and ensure one key element of compliance is addressed. At the end of the day, after all the hard work that has gone into registration, it doesn't make sense for companies to gamble with their compliance.


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A Holistic Approach

Efficient Production in the Chemical and Pharmaceutical Industry

A Comprehensive Approach

– The development of future chemical processes requires a truly holistic approach that employs standardized methodologies allowing for fast implementation of both innovative synthesis procedures and innovative process equipment. Figure 1 depicts the necessary broadness of this approach comprising the analysis and optimization of the whole value added chain from novel products over the evaluation and implementation of innovative process equipment to the market developments.

The following common needs can be identified:

- Shorter time to process/market
- Reduction of product and process development costs
- Reduction of both capital and operational expenditures

Sigurd Buchholz
Bayer Technology Services

- Move risk of process development to early phases
- Engineer modular and standardized processing units

Flow Chemistry and Process Intensification

Flow chemistry approaches integrating process intensification and modular engineering aim to solve these tasks. Flow chemistry is here understood as the systematic combination of chemical characterization, innovative hardware and unit operations, process development, design and reaction engineering employing especially the benefits of continuous flow systems but not restricting to the latter.

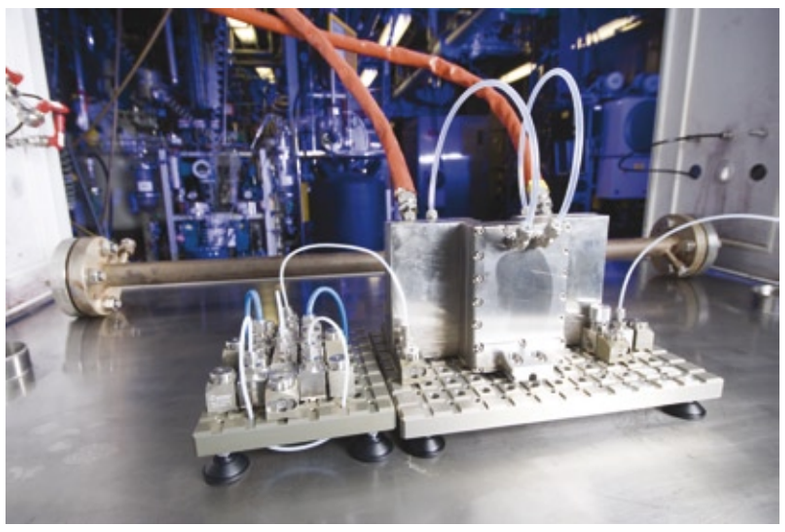

Figure 2: Ehrfeld Modular Microreactor Setup during a synthesis campaign for a challenging intermediate in a BTS pilot plan facility

- Maintain and/or improve robustness and quality simultaneously increasing manufacturing flexibility

Thus tasks for future chemical manufacturing can be derived:

- Introduce efficiency and scalability to multi-purpose, multi-product facilities

Introduction of a batch-to-conti transfer chemical was first successful for critical reaction conditions, sometimes even being the only safe access to the target molecule and for opening up new process windows. A typical production size micro reactor set-up for the synthesis of an intermediate requiring a very high heat transfer capacity and excellent mixing capability is shown in figure 2. Though a number of different reaction classes have been successfully demonstrated and operated up to production scale in the last decade, the continuous instead of batch manufacturing is still not established as a standard in chemical manufacturing. Reasons for this can be development workflows; usage of existing (batch) assets; and high implementation effort for innovative approaches at comparatively low total sales volumes of a single product.

Very often, the selection of synthesis procedures of organic chemists focus on availability of starting material and yield/quality of the product, but the detailed knowledge of the reaction pathway is not considered to be as important as in the development of a heterogeneously catalyzed petrochemical process. In the flow chemistry approach, the time- and space-dependency of the process steps are investigated at an early stage of development, allowing for the design of processes exactly according to the requirements of the chemical transformation and pushing the reaction "to its limits." The overall process design does not restrict to classical equipment but includes also process intensified equipment and technologies for novel reaction pathways employing e.g. innovative solvents. Sustainable processes with superior performance and less consumption of starting materials and auxiliaries can be designed by this approach.

Standardization And Modularization

A systematic process design requires robust and fully scalable equipment and process design; engineering and equipment cost must not exceed the limits of an economic and sustainable process. A truly modular approach employing standardized, robust equipment that is easily fully scalable will significantly decrease the expenditures related to design, engineering and construction. Thus, the implementation effort mentioned above can be decreased, which will enable integration of innovative process technology.

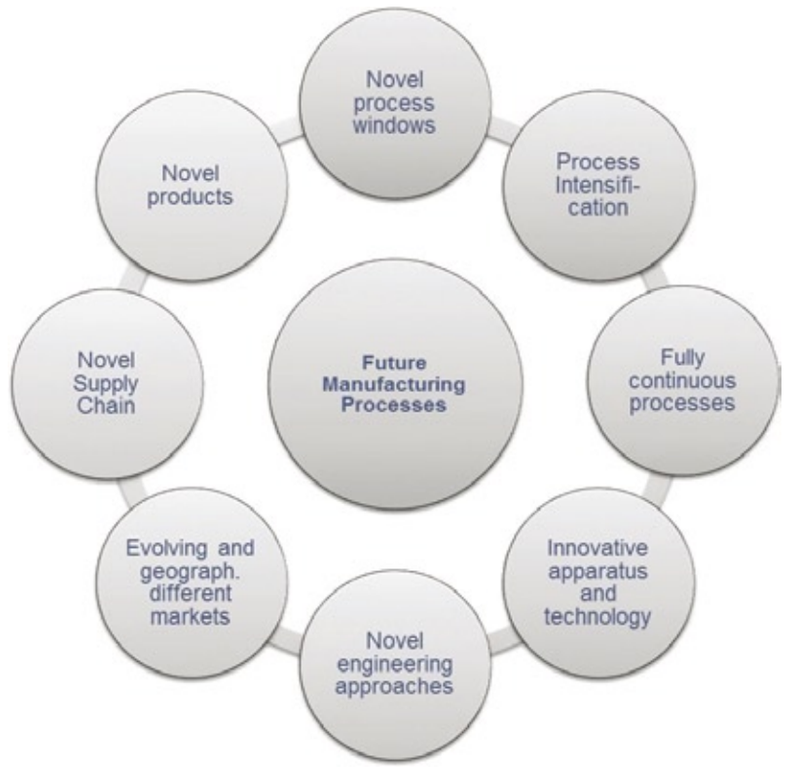

Figure 1: Dimensions of holistic process design required for future chemical processes

But not only manufacturers of small- to medium-sized projects experience increasing pressure resulting from shorter innovation cycles, markets evolving and decreasing in geographically different locations, global competition and increasing process for resources. This is also valid for large, world-scale plants that are designed for high-process efficiency rather than flexibility. Here, standardized small units can decrease initial investment risks, allow for rapid market entry also in remote locations and enable novel flexible and decentralized production concepts with optimized supply chains.

In order to realize this step change in the chemical and pharmaceutical process industries, a joined and interdisciplinary approach is necessary comprising academia, chemical industry, equipment manufacturers and engineering companies. In order to achieve technical standardization rather than technical differentiation, company borders have to be overcome and joint developments in non-competitive areas are important to develop this approach. Prominent examples for this open innovation approach are current projects of the 7th European Frame Work program such as Copiride and F³ Factory aiming at novel process equipment, a standardized infrastructure and demonstrating a number of example processes. The development of highly integrated and thus flexible catalytic continuous-flow processes is part of the project Synflow.

A modular platform approach will enable the scale up of innovative processes over a broad range of capacities at beneficial manufacturing costs. Standardized processes and their interfaces have to be developed in close exchange by project partners from all stake holders employing and developing methodologies for whole modular process and plant design.

INVITE Joint Research Center

Bayer Technology Services and the TU Dortmund University just recently announced the foundation of a new joint research center – INVITE – for innovative and modular production concepts and their demonstration. INVITE is a nonprofit research organization and a true public-private partnership. It will act as an open innovation platform allowing different partners to work together on this challenging target. The INVITE research center will host lecturer rooms, a chemical laboratory and a technical hall for the development, test and operation of container-based fully modular process units and process management systems. This standardized "backbone" plant located at the Chempark site in Leverkusen will also serve for demonstration purposes of the projects F³ Factory and Synflow. In order to assess the capabilities of the novel modular approach, case studies on products of the key industrial project partners ranging from APIs over intermediates, polymers towards renewable feedstock will be demonstrated here. The research center will have own R&D staff as well as extensive capabilities for development and demonstration of modularized processes and equipment.

Implementation of resource efficient chemical routes and processes will be a joint effort for chemists, engineers, equipment suppliers and supply chain experts. Commercialization will however only be possible if processes are robust and both ecologically and economically superior. In order to achieve this, a flow chemistry approach must integrate process innovation, modularization and equipment standardization in a comprehensive way. Projects such as e.g. F³ Factory will foster and widespread implementation of continuous cost beneficial equipment and manufacturing platforms.

Sigurd Buchholz and Tobias Grömping, Bayer Technology Services; and Michael Lorenz, INVITE Research Center

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Flow Chemistry for Hazardous Reactions

Does Converting from Batch Processing Make Sense?

Magic Pill? – The kick to expand flow chemistry into new application areas is a hot topic in chemistry and pharma. Driven by the vision of highly efficient processing, reputable players put enormous efforts into converting existing and new processes from batch to flow. Indisputably, the flow process has a potential but is it the pill to cure all headaches?

Chemistry Between Flow and Batch

Continuous processes are work horses in the production of commodities such as petro and industrial bulk chemicals. These industries developed and fine-tuned highly efficient processes on continuous equipment to fulfill the steady and high demand for their products. Production facilities are often dedicated mono plants, optimized for high throughput based on full automation and high plant utilization. In contrast, fine chemical companies are using batch processes because of their customized and complex products, smaller and fluctuating volumes and specialized applications. For CMOs, flexibility is the key in manufacture a large variety of sophisticated, often exclusive products on existing batch equipment.

Günter Weingärtner (l.) and Ivo Hubacek, Dottikon Exclusive Synthesis

Flow Chemistry Is 'En Vogue'

Past years have shown trends towards continuous processing in fine chemical and even pharmaceutical industries. The continuous approach becomes more attractive as a concept to overcome the lag of R&D productivity and to address price pressure in the pharmaceutical industry. Hence, many pharmaceutical companies have recently established their own flow chemistry research groups to gain more knowledge and investigate cost-effective production of intermediates up to active pharmaceutical ingredients (APIs) under Good Manufacturing Practice (GMP) requirements.

Fit For Flow

Flow reactors are preferably used for reactions with fast kinetics and hazardous reactions in order to keep the critical volumes small. Fast reactions are often highly exothermic due to the use of highly reactive and toxic reagents or the formation of unstable compounds. The continuous mode is a superior approach for the safe performance of hazardous reactions. Additionally, reactions with selectivity issues are candidates for flow chemistry due to the accurate control of the more narrow temperature profile in a flow system.

Size Matters

Micro-reaction technology featuring high heat and mass transfer characteristics appears to be the tool to meet the "fit for flow" requirements. Many companies invested in this new technology, developed new equipment and run various types of chemistry with such devices. Today, the micro-reaction technology is well established, predominantly in research and development as a convenient lab tool for screening different reaction conditions and producing first quantities of product within short time. In the meantime, the dimensions of the micro reactors were increased to millimeter scale to avoid clogging and some other disadvantages of the micro reactors.

Although there are few examples of micro-reactor applications for industrial manufacture of products, the micro-reaction technology still has to demonstrate its relevance next to the tubular flow reactors in an industrial environment.

Different Development Approach

Development of continuous processes requires a different mindset of the development chemists. Traditionally trained in running batch processes, a change to a more chemical engineer's view is needed. The chemical process is normally adjusted to fit the technical plant requirements.

Continues Page 14

Interfacing Science And Business

The CESIO Congress Looks to Sustainability

"Sustainability of the surfactant industry in a highly regulated world" – The motto of the upcoming CESIO World Surfactant Congress reflects the hurdles facing the industry nowadays. The congress, which is organized by the European Association of Surfactant Producers (CESIO), is usually dedicated to the scientific and technical exchange between surfactant manufacturers and companies along the surfactant value chain. New this year is the business convention element, which the organizers say will enable visitors to meet with suppliers and customers on site. Dr. Birgit Megges asked CESIO President Dr. Thomas Greindl about this new orientation of the congress and issues that are currently being discussed among the surfactant manufacturers.

Dr. Thomas Greindl
CESIO President and Vice President Regional Business Management Home Care for BASF's Care Chemical division

CHEManager Europe: Dr. Greindl, in the past, the CESIO congress has been oriented into a scientific/technical direction. What is the specific target of the new business convention element?

T. Greindl: At the end of the 7th CESIO World Surfactant Congress 2008 in Paris, many companies approached us and asked us to create a European platform that would enable companies along the surfactant value chain to meet and to organize mid-year business review meetings. The CESIO World Surfactant Congress in general offered the necessary conditions for this new orientation, but has been focused more on scientific/technical topics and did not consider to the required extend the wishes and requests of the business people in the companies.

According to their needs, the adjusted focus of the event will be shifted to the interface of science and business. We assume that this adjusted positioning will encourage further target groups to participate at the congress. It is not our aim to establish a new competition to existing events in the field of detergents or cosmetics. In fact, we would like to establish a unique profile that focuses on surfactants as an ingredient for a multitude of applications along the whole value chain. We therefore invite and encourage all stakeholders, to meet with the surfactant industry June 6–8 in Vienna.

What expectations do the organizers link to the review of the congress? Will the profile of the participants change significantly?

T. Greindl: Considering some 80 presentations in parallel sessions under the headlines market trends; applications; technical; and regulatory and safety affairs, we expect to attract a high number of industry delegates. With the business convention and the session on market trends, we expect a significant number of participants representing the business of the companies. The profile of the participants will most probably be broader and more diverse than in the previous congresses. In addition to that, we want to motivate and encourage more representatives from emerging regions like Eastern Europe and Middle East to participate at the congress. Selecting Vienna as the first location for our new orientation reflects a corresponding symbolism, as the location provides easy accessibility for delegates from these emerging regions.

Modern detergents don't just get clothes clean – they also help reduce the water and energy consumption of washing machines. BASF is constantly working to optimize the various ingredients it produces for the detergent industry and make them even more eco-efficient. (© BASF)

Why did you choose sustainability for the motto of the congress?

T. Greindl: The industry has been working on sustainability aspects in all dimensions related to surfactants for a long time, and we have seen innovative products come out of this. With the motto of the congress: "Sustainability of the surfactant industry in a highly regulated world," we would like to focus on the key question of today's markets: How can sustainability aspects in an ever more regulated world be further developed?

It is uncontested that regulation can be conducive to sustainable development, or that a regulation can even be a trigger for enhanced sustainability. For many decades, the surfactant industry has had to implement more and more pieces of legislation that limited our scope for action and, consequently, our flexibility. One of the central messages of the congress will be that sustainability should be the key driver for any new development.

Is there any good news for humans and the environment in this area?

T. Greindl: Sustainability does not only mean the protection of human and of the environment; it also has the goal to offer market solutions for our customers – needed to best fulfill technical, ecological and economic requirements. Considering the three dimensions of sustainability, activities will focus on further improvements in surfactant performance. Efforts give more and more emphasis on sustainability through improved efficacy and specific applications. Surfactants help improve processes and applications, making them more effective and saving resources and energy and thus contribute to sustainability.

Challenges for the surfactant manufacturers belong to the following four categories: availability of raw materials; production capacities; performance; and costs. Options for product-related developments could be structural variations of known surfactant building blocks, the development of new manufacturing technologies and the broader use of new petro- based or renewable-based raw materials with specific and selected properties.

There are first ideas of a synthesis of surfactant alcohols from CO_2 and sunlight through algae. Biotechnology will certainly contribute to the further development of surfactants as well. Novel structure types can be the result of modified proteins or oligopeptides that find their specific fields of application. All these examples are of course in different stages of their development and it remains to be seen which of those will have commercial relevance.

Are there other issues that will be highlighted?

T. Greindl: The key issue of our congress will focus on the performance of systems where interaction between the surfactant and other product components is a crucial topic. These interactions are prerequisite e.g. for laundry and dishwashing processes at reduced temperatures. Surfactants can help to increase sustainability in these fields – for example, through savings in water and energy consumption. With this regard, systems containing surfactants are more interesting for the life cycle assessment than the surfactants in an isolated assessment of materials and substances.

Formulations and combinations of substances may be subject to a specific assessment, if, for instance, the interaction of substances within a formulation may lead to a different assessment taking into account the interactions of the single components. A new European legislation is on the horizon that bases the risk assessment on systems or formulations of substances. On Monday afternoon of the congress, we will offer a panel discussion that will adequately inform and sensitize the participants on that matter.

The increasing demand for renewable-based raw materials will continue to be an important topic. The question of sustainability cannot be simply answered for a given product, e.g. in that sense, that the higher the share of renewable-based raw materials in a product, the more sustainable the product is. Ecoefficiency and life cycle analyses for products and applications take the entire life cycle of a product into consideration – this includes the environmental impact of the raw materials used, the use of the product by customers and end consumers as well as options for recycling and disposal.

What fields of applications do you consider as the focus of research and development?

T. Greindl: Regarding the production and processing of new materials, the use of surfactants is indispensable in the production process. For example, polymers with a special microfiber structure, bio-mimetic materials and composites require surfactants that make the various components more compatible with each other. In these cases, the typical intrinsic property of a surfactant is the key: The effect on the bounding surface of compounds, which would never bond without the help of surfactants.

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Flow Chemistry for Hazardous Reactions

Continued Page 13

In contrast, a continuous process needs dedicated equipment that is specifically designed for optimal chemical conditions. More drastic reaction conditions (e.g. higher reaction temperature, solvent-free processes etc.) can be realized even for hazardous reactions and run safely in continuous equipment due to the precise process control.

The intensive interaction of development chemists and engineers from the beginning is the key success factor in designing effective flow processes. Initial tests are needed first to generate fundamental process data on kinetic and thermodynamics for basic equipment design. Here, micro reactors offer support as lab tools. In special cases, laboratory scale continuous stirred tank reactors (CSTR) deliver the basis for further optimization and calculations towards the final flow equipment. For fast and highly exothermic (hazardous) reactions "one shot" experiments can give relevant results on the feasibility of process transfer to flow reactors.

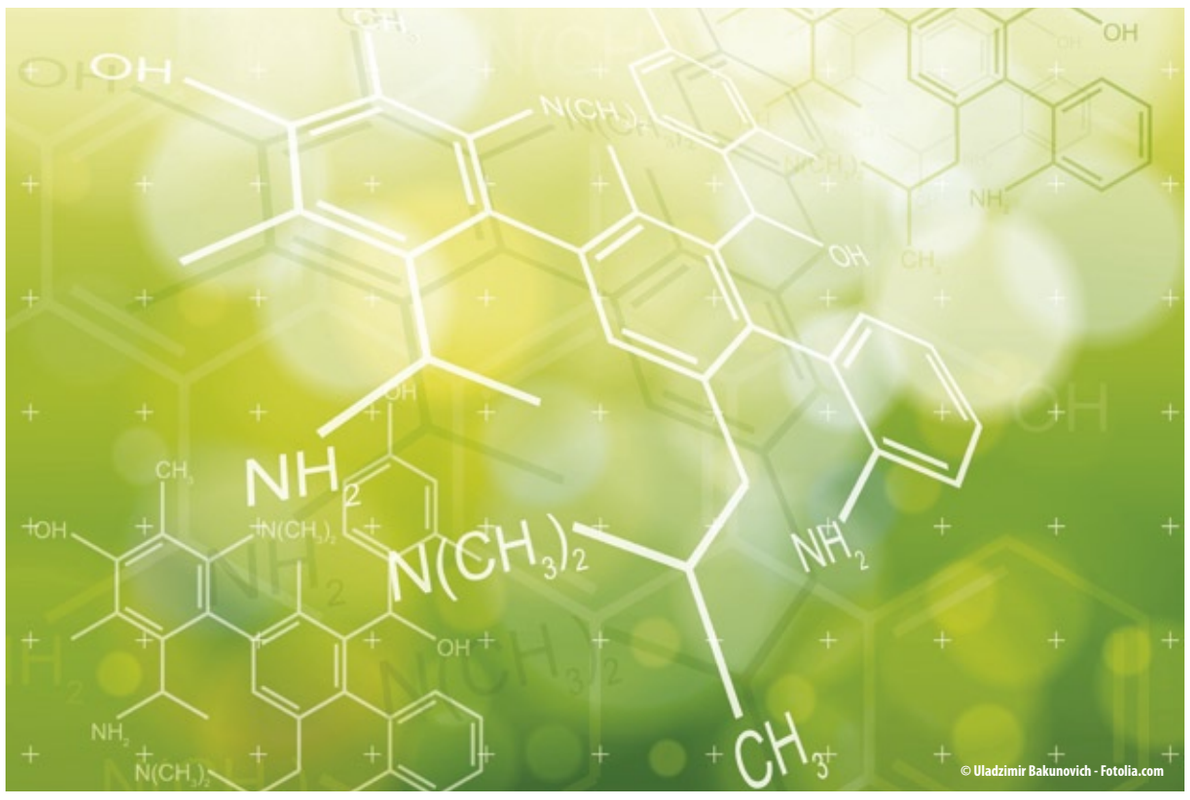
Fig. 1: Tubular flow reactors

Fig. 2: Residence time unit

Batch Vs. Continuous

In principle, many reactions can be run continuously. The key question is if there is any economic benefit. Time and effort needed to establish a continuous process is often underestimated. In many cases, it is the reaction part that is developed to be run under continuous conditions. In order to get an economic benefit at the end, continuous processes must also take the option into account to continuously quench, work-up, extract and isolate the product.

The initial efforts for design, engineering and realization of a process in continuous equipment are high, and an investment in appropriate equipment and manpower is significant. For economic reasons, many processes remain batch processes, although they fulfill all other criteria for continuous manufacture. As long as the quantities are reasonably manageable and the process can be run safely and without quality issues, the realization as a traditional batch process is still a competitive more cost-effective alternative. However, in case of a significant increase of demand, the situation has to be reviewed again and a continuous solution may be preferable despite additional investment costs.



Equipment requirements for continuous manufacturing are high. A significant number of supporting equipment like feed or receiving tanks, heating/cooling units as well as pumps and control systems are needed. With a modular approach, most parts of the equipment can be used in different configurations. There are concepts for multiple usage of continuous equipment to reduce the initial hurdles. Nevertheless a combination of a basic modular tool box of equipment with well experienced people in R&D and engineering is an essential prerequisite for a fast and reliable realization of continuous processes as services for third parties, such as Dottikon ES offers.

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Organic Solid State Lighting

The Lighting Solution for the Future

Viewpoint – Grand challenges lie ahead in Europe's future: The continent is working to become more energy efficient and greener. Dr. Geoff Williams, leader of the UK's Technology Strategy Board's Project Topdrawer polymer organic solid state lighting technology program, reflects on his own childhood to offer advice for lawmakers.

Dr. Geoff Williams
Project Topdrawer

There are, in principal, two competing technologies: organic light emitting diodes – OLEDs – and polymer light emitting diodes – PLEDs.

OLEDs are, in principle, based on complex multiple layer device structures of thermally evaporated low molecular weight molecules. Whereas PLEDs are solution-processable structures based on a single white-light emitting polymer, deposited by printing on to charge transport layers; typically PLEDs are three or four layers thick. Both devices represent extended emissive surfaces with areas up to one-fifth m2 already being demonstrated from the laboratory. However, in general, lab-made devices are much smaller, generally tenths of square centimeters in area. The main research effort continues within the materials, striving for improved quality of white light, lifetimes and efficacy.

Presently, OLEDs outperform PLED technology on laboratory test samples, but due to the complexity of manufacturing multiple layer structures, it is widely believed that solution-processable PLED technology will be first to demonstrate high direct yield manufacturing levels, due to their less complicated device structures and atmospheric pressure deposition printing processes, which also will yield very high material utilization (>90%).

Going 'Topless'

A collaborative program to take PLEDs closer to the lighting market was created during 2006, resulting in funding for Project Topless (Thin Organic Polymeric Light Emitting Semiconductor Surfaces) in early 2007. Topless, headed by Thorn Lighting, was the UK's only industrial-led PLED program of work, involving Cambridge Display Technology (CDT) and the University of Durham. Topless submitted its final reports in early 2010, achieving with the best devices greater than 20 lumens per watt (lm/W) with half life of about 30,000 hours at 500 candela per square meter (cd/m^2). However, is expected by 2015 PLED devices will exhibit greater than 60lm/W with 70% life being greater than 20,000 hours. Topless devices were typically driven at 4V DC (voltage in a direct current), were tunable over a wide range of brightnesses (1cd/m^2 to 1 million cd/m^2, although devices don't last long at these elevated levels).

However, the commercial challenge is one of integration in to lighting applications that deliver significant improvements and benefits over the incumbent lighting technologies; in particular electrical energy reduction (lighting accounts for 20%), and therefore CO_2 reduction. Today artificial lighting generates almost 2,000 million tons annually).

Airfix Model for a Sustainably Built Environment

When I was a young lad, I painstakingly brought Airfix model airplane kits to life. One of the quickest lessons I learned, particularly with the complicated bomber kits, was that following the assembly sheet was the quickest way to success and ensured that you didn't have your engines on back to front.

Cast forward three or four decades, and I am now consumed by a slightly more sophisticated passion – developing the lighting of the future. Using printable electronics, my team is developing solid state OLEDs that are capable of running on a 5V DC battery at a fraction of the energy usage of modern incandescent light bulbs.

The UK Technology Strategy Board awarded Project Topdrawer (Thin Organic Prototypes, Design, Applications with End-user Recognition) the single largest investment of any printable electronics R&D initiative at the end of last year – an indication of its potential once fully commercialized. Topdrawer is an extension to Topless, introducing further businesses in to the collaboration: Tridonic, Pilkington and Conductive Inkjet Technologies. One of Topdrawer's remits is, through working on the newly commissioned Large Area Coating Equipment (LACE) line in the UK's Printed Electronics Technology Centre (PETeC), to demonstrate manufacturability of 225cm^2 PLED light emitting tiles, in conjunction with novel electronic driver configurations dedicated to lighting applications.

Presentation

Geoff will be presenting on this topic at the LOPE-C in Frankfurt on Wednesday, June 29 at 2 p.m.

LOPE-C Large-area, Organic & Printed Electronics Convention

However, this technology is only one piece – albeit a highly important piece – in the carbon-reduction "Airfix kit" that the governments across Europe are developing. Significant investment in renewable energy production, emerging battery technologies, breakthroughs in new smart sensor technology, innovations in building materials such as Hempcrete (mixing hemp and lime which absorbs CO_2 from the atmosphere) and photovoltaic cells in windows are all shaping the intricate pieces that will be brought together in the buildings of the future.

But, and this is a serious but, while my fellow industrialists and I are working towards delivering sustainable, affordable and robust products that will make up these buildings, there is growing concern about the lack of an "assembly sheet" that maps out how all the technologies will work together.

Tangible Outcome

There is an excellent opportunity to get innovations out of the lab and into commercial testing but there comes a point where we need to mould these products into a tangible outcome – in this case, fully functioning, carbon neutral buildings with greatly reduced energy needs. Strategies need to be implemented and championed by the higher echelons of Europe and there after the nation states if this is to be realized by the end of 2020.

Politicians need to begin focusing on the grand challenges that currently face us and to act on the responsibilities that lie in their remit to genuinely drive change. In my sphere, this is about using technological advancements to reduce carbon emissions effectively in a manner that doesn't just throw money at potential solutions but also creates a blueprint for what this will look like in the future. By doing so, industrialists such as myself can see how our products will dovetail with others and will also set the framework for architects and other specifiers to turn the potential into reality.

This need not be arduous, over complicated or take years of consultancy to achieve. The use of focused national strategies and funding for businesses to encourage research laboratories and academics to work together will ensure the all European states meet their 2020 obligations for energy consumption and CO_2 footprint reductions.

A great deal can be learned from the aerospace industry. That sector would never set out to build an airplane based on the off-chance that the integrated technologies will work together in an optimized, safe way. So, why should we expect high technology carbon neutral/negative building constructions to emerge ad hoc?

So, I would encourage other environmental ministers across Europe to think instead about my Airfix models. We are making the parts, but we urgently need the assembly sheet to make sure that Europe leads the way in carbon-neutral, reduced energy buildings of the future.

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A Wall Of Light

Modern OLED Lighting and the LOPE-C 2011

OLEDs – Organic light emitting diodes – are capturing the creative fantasies of progressive light designers. Lightweight panels or "light tiles" composed of extremely thin functional layers on plastic or glass substrates make exclusive, futuristic looking OLED luminaires for home or office use. They are offered as commercial products by large vendors like Osram and Philips. OLEDs give off a pleasant warm-white light; they can be tuned to individual color temperatures and dimmed. And they are "instant-on:" at their full brightness right after flicking the switch.

A New Type of Light Source

With these basic properties, today's OLED lighting offers an outlook on an absolutely new type of light source: OLEDs are no spotlights; they need no reflectors or lenses to bundle and direct light beams onto the objects to be illuminated. Instead, they are large-area luminous surfaces flooding a room with diffuse, non-glare light. OLED panels are extremely thin – they will be easily embedded in walls, ceilings, windows, room dividers, car cockpits – turning them into luminous objects of their own.

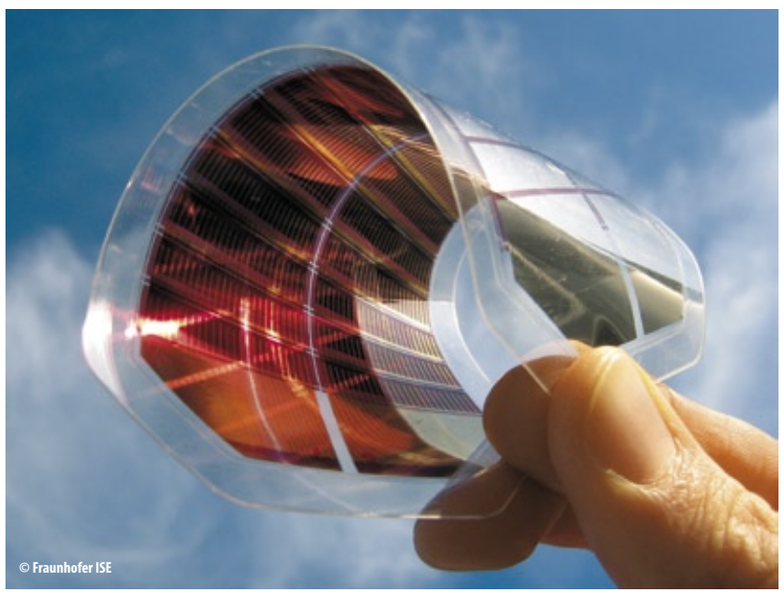
Consequently, large-area OLEDs panels made from organic functional materials are triggering a second revolution in lighting technology: After the – ecologically mandated – end of incandescent light bulbs, which radiated more heat than light, and the subsequent transition to gas discharge and energy saving fluorescent lamps, the time has come for LEDs and OLEDs to shine. They port the principles and achievements of solid-state technology and its famed learning curve of exponential innovation and cost degression to a new generation of energy-efficient and eye-friendly lighting systems.

For display purposes, OLEDs are already widely present: in millions of mobile phones they serve as bright and color intensive screens, and TV sets equipped with OLED displays or OLED backlights for LCD-screens are on their way to the markets. Next in line is OLED lighting.

Luminous Efficacy and Lifetime on the Rise

OLEDs are superbly qualified as efficient sources of light. Today, in commercially available products, they realize a luminous efficacy of 23 lumens per watt, at a development goal of 100lm/W. Lifetime is up to 5,000 hours; three years from now it will be three times as much. Large, transparent OLED modules having an active light area of 1m^2 are expected to evolve within a year though the German Federal Ministry of Education and Research public/private partnership project TOPAS 2012.

OLED light sources are manufactured without the use of mercury. Thus they fulfill the European RoHS regulation of eliminating toxic ingredients. OLED lighting needs no encasing or cooling devices. Currently they are measuring less than 2mm thick when fully encapsulated. Next step is thin flexible films, which can be formed and bent into any shape to form luminous objects of their own.



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Technology Roadmap For OLEDs

The official roadmap of OE-A (Organic and Printed Electronics Association) sees the current uses of OLED lighting primarily in the high-end segments of exclusively designed luminaries as a market entry strategy. Over the next five years according to OE-A, OLED light tiles and large-area architectural lighting panels will further develop to enter the building material and industrial markets. From 2018 onwards OE-A expects low-priced standard OLED light fixtures to be available in various configurations and specifications as a universal illumination technology.

"The first solid-state lighting products are reaching the market," said Andy Hannah, CEO of Plextronics, a U.S. vendor leading the industry in providing key materials technology, such as functional inks used as efficiency increasing hole injection layers, for the mass printing of OLEDs. "That is clearly an indication of imminent widespread commercialization. Serving this enormous market will require large-scale production, which is only attainable through solution processing. Our new materials will enable our customers to manufacture high-quality lighting devices at the lowest cost."

Osram, through its LED subsidiary Osram Opto Semiconductors will be the first large European lamp manufacturer to invest more than €50 million in an OLED pilot manufacturing line in Regensburg, Germany, and further development of commercial OLED lighting. Already in 2008, Osram showed their first designer-style OLED luminaires. "For mass market applications," said Karsten Heuser, General Manager OLED at Osram, "light designers, besides a fascinating technology, need reliability and stable specifications. Our OLED lighting product families offer exactly that." In February, Osram introduced two new OLED lighting panels, one round, the other square, mirrored or transparent, respectively, in the off-state. With these panels, OLED designers will gain further creative dimensions to realize the light of the future.

LOPE-C 2011

At LOPE-C 2011 in Frankfurt June 28–30, OLED lighting will have a prominent place, with a special conference session dedicated to discussing the latest developments and market trends. The LOPE-C covers the latest commercial and technological achievements as well as the major economic trends and technological topics in organic, inorganic and printed electronics. It represents the entire industrial value chain – academic research to R&D, to production, to commercialization, to end-user cultivation. During the LOPE-C 2011 exhibition, OLED lighting will be shown and demonstrated as commercial products as well as the other major topics lighting, organic photovoltaics, displays, electronics & components as well as integrated smart systems. More than 95 companies are exhibiting; first timers are Agfa, Konarka, printechnologics or KIMM, just to name a few.

Conference Speakers Reflect Industry Trends

The LOPE-C conference, with over 150 presentations by industry leaders and technologists, will offer insight into the latest achievements in organic and printed electronics. The conference opens on June 28 with detail-packed, hands-on short courses and a Business Conference. Leading companies, such as Sumitomo Chemical, New Venture Partners, Airbus or Plastic Logic will discuss market-entry strategies and commercial opportunities in organic and printed electronics.

For more information on LOPE-C and to register please visit: www.lope-c.com

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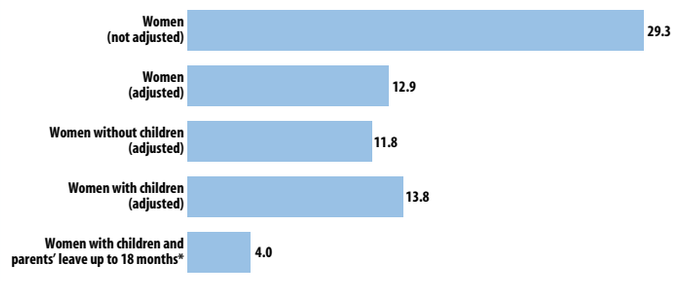
Education, Experience Prevail Over Gender

Adjusted and non-adjusted wage gap
2008, difference to the income of men (%)

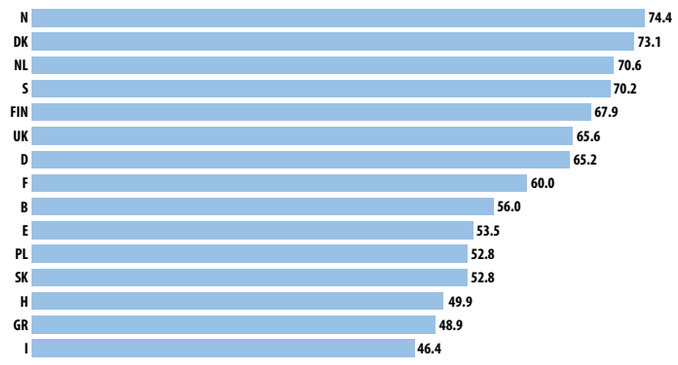


*Not significant

Source: SOEP

In 2008, the difference in gross hourly wages between employed men and women amounted to an average of 29%. The gap shrinks to 13% if factors such as education, work experience, tenure, industries, occupations and labor force participation are taken into consideration. On average, female employees who return quickly from maternity leave earn only 4% less than equally qualified male colleagues. In general, the gender pay gap is influenced more by men and women with different characteristics than by a different treatment in the wage setting process. Furthermore, the difference in hourly wages between male and female employees is larger in rural areas than in cities. This results from larger variations between men and women regarding such characteristics as education, work experience and tenure.

International Womens Employment
Employed women ages 15 – 64 years in % of women of the same age in the population 2009



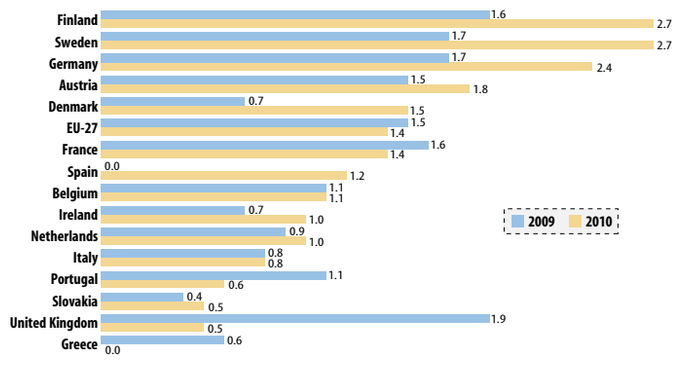
Source: OECD

Women in the International Workforce

Over 100 years after demonstrating for equality and the right to vote, women have managed to catch up to men in many areas. In fact, young women often have a better educational background than their male counterparts. Women have also made significant progress in their professional lives over the last decades. In many countries, it has become a given that the majority of women are gainfully employed. However, the percentage of women who choose to go into lucrative fields, such as engineering or mathematics, is still small. This, along with the fact that many women work part time, is one of the main reasons that women oftentimes earn less than men and are less likely to climb the career ladder. Provisions that help with the alignment of career and family- could help change this.

Stimulus Packages

Dimensions of stimulus programs in the EU
Discretionary impulse in % of GDP

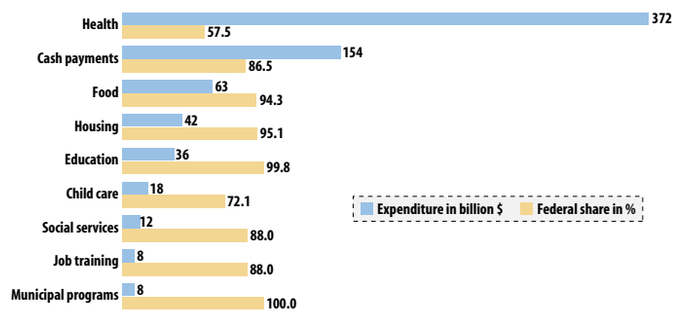


Source: European Commission, 2010

Effective But Insufficient

The global recession led most governments worldwide to pass fiscal stimulus packages in order to overcome the crisis. However, skepticism about the effectiveness of such programs was widespread. Economists were convinced that automatic stabilizers should play the main role on the way back to economic recovery. One reason for their argument was that they considered the multipliers of an expansive fiscal policy to be rather weak so that, theoretically, recovery programs would only have small effects. A second reason was that in the past fiscal stimulus packages have often not been up to the fundamental challenges they are supposed to tackle. Nevertheless, empirical evidence shows that the recent recovery programs did help in overcoming the crisis. Pursuing policies should, however, keep the limitations of this tool in mind.

Welfare expenditure in the U.S.
2008



Source: Congressional Budget Office

The American Recovery and Reinvestment Act

The financial and economic crisis has driven long-term unemployment in the U.S. to levels that had never been foreseen by the country's social safety net. When the Congress passed the Recovery and Reinvestment Act in February 2009, the bill included a host of welfare measures designed to fill some of the gaps temporarily. Since the poor receive welfare benefits even in times without crisis, the relief package – about 40% of all allotted funds – mainly benefited the middle classes. While thus providing some relief, the stimulus package has, nevertheless, failed to spur job creation.

The Hemp Chair – German designer Werner Aisslinger's monobloc chair made of natural fibers made its world debut at the Material Vision 2011 in Frankfurt. The Hemp Chair has been designed for a lightweight manufacturing process stemming from the car industry: the renewable raw materials hemp and kenaf are compressed with BASF's water-based thermoset binder Acrodur to form an eco-friendly, lightweight and yet strong composite. The water-based acrylic resin allows the use of more than 75% natural fibers for the Hemp Chair. Unlike with classic reactive resins, this method releases no organic substances such as phenol or formaldehyde during the cross-linking process. The only by-product of the curing procedure is water. Furthermore, the industrial process of compression molding accounts for low-cost mass production of three-dimensional objects with high mechanical resistance and very low specific weight. This production method is widespread in the automobile industry. Natural fiber composites are often used in lightweight components such as door linings, shelves and other interior trim parts.

Coming up in our July/August issue

Don't get the summertime blues! Here are the exciting topics we're working on for our upcoming issue:

- **Russell Gaudiana of Konarka technologies takes a look at organic photovoltaics, from research all the way to manufacturing.**
- **Our in-depth interview with Eastman's Director of Sustainability Anne Kilgore will cover company's green goals.**
- **Martin Hill of SAP talks to us about sustainability and regulations in the chemical industry.**
- **A.D. Little expert Uwe Nickel investigates the two faces of the global specialty chemicals market.**

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