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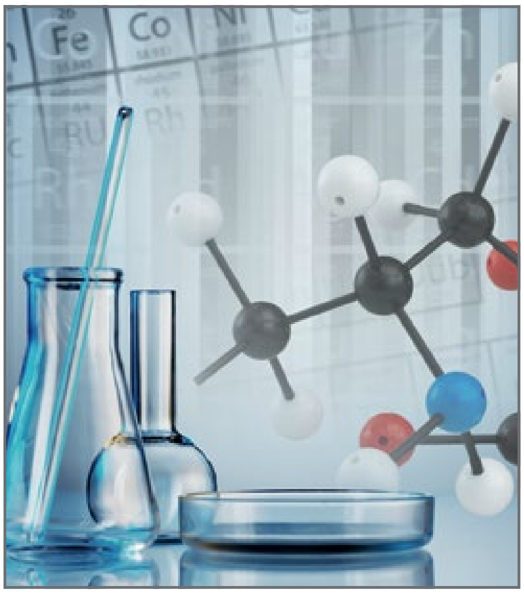

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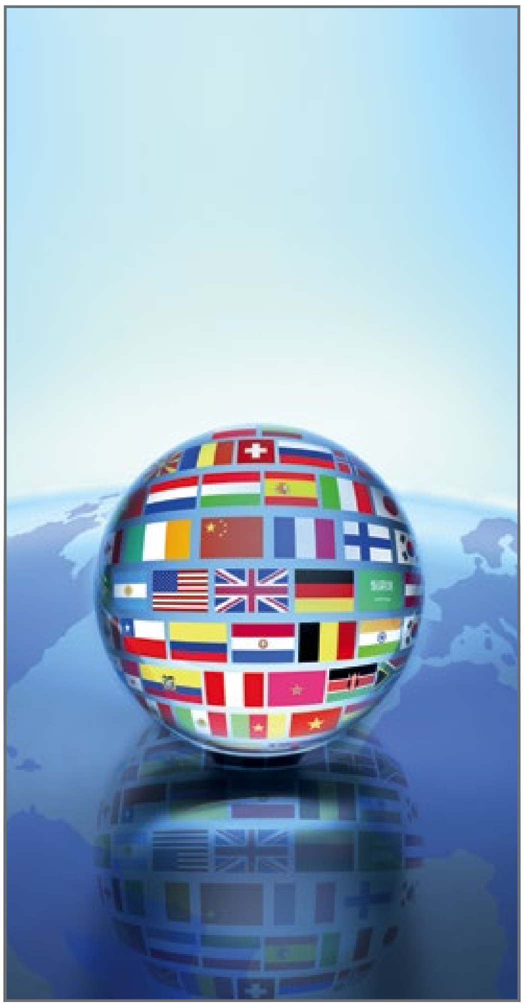

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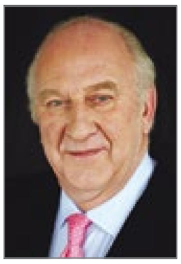
Grow as a Stronger Industry

Times Ahead Represent an Unprecedented Opportunity for Chemical Distributors

Powering the Supply Chain — *Chemical distributors play a significant role in shaping the future of the chemical industry. FECC's priority of the European Association of Chemical Distributors (FECC) is to encourage the industry to speak with one voice. This has been true for the past six decades, and it will be no different throughout 2014, when the Brussels-based association celebrates its 60th anniversary.*

"FECC sees a positive outlook for the chemical distribution industry."

Dr. Uta Jensen-Korte, director general, FECC



"Working together is now more important than ever."

Edgar E. Nordmann, president, FECC

"I feel very privileged to serve as president for this strong association. Working together is now more important than ever in order to grow as a stronger industry and overcome the challenges we face," said Edgar E. Nordmann, FECC's president.

Sustainable Business Environment

FECC's efforts focus on providing services that enable its members to take advantage of growth opportunities. These opportunities will arise from the necessity to reduce the complexity of chemical trading, placing chemical distributors in a unique position to profit from this growth opportunity.

To become the driving force in the chemical industry, distributors must take advantage of the innate diversity of the business, by offering tailored services for manufacturers and downstream users alike. This requires distributors to build a business structure able to perform while rapidly adapting to a dynamic environment. The profitability of individual companies will depend on an efficient distribution system that allows them to react rapidly amidst changing market conditions.

Working closely with a distributor brings nothing but advantages to producers and downstream users. For manufacturers, partnering with a distributor may help them penetrate a new market and increase market share and reach. Distributors' local knowledge of the market and accessibility allow them to offer outstanding service to the end user. The proximity to their customer base also ensures timely recognition of user requirements.

The downstream users, on the other hand, can benefit extensively from the specialized knowledge distributors have on substances useful to specific industries. FECC believes it is crucial for the industry to promote how distributors' services can assist the supply chain with sales, marketing and procurement efforts. By fostering this cooperation, FECC supports the development of a sustainable business environment.

Chemical distributors have been an example of positive adaptation; companies increasingly invest in partnerships in businesses, development of new products and services, research and development, marketing activities, and employee training. To match these efforts, FECC works to offer its members tools besides publications, guidance documents and regular regulatory updates.

Information is Critical

To help its members excel and stay up to date on the latest industry trends and growth possibilities, FECC is taking a more practical approach by organizing even more specialized workshops. Covering topics such as distribution and competition law, chlorinated solvents, exposure scenarios, and social media, these events allow every department from the member companies to benefit from taking part in FECC. The current year will bring an even broader offer of seminars and workshops on biocides, international trade, classification of mixtures, crisis communication, food hygiene, and good trade and quality standards related to pharmaceuticals, food, feed and cosmetics ingredients.

People are the main asset of the chemical distribution industry; FECC hopes its specialized workshops support the training and personal development programs already implemented by individual companies. Making these programs stronger is key to attracting and retaining skilled young talent, a known challenge faced by the chemical distribution industry.

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Globalization and Expansion

The work carried out by the association's committees goes beyond monitoring, reporting and advising on industry-related affairs. The industry has seen trends like globalization and expansion to emerging markets take a starring role in recent years, and they

will become even more important in the next decade. Although globalization provides increased capacity, and increased availability of suppliers in the chain, global competition is something chemical distribution companies cannot afford to ignore.

FECC is committed to providing members with regular updates on free trade agreements (FTAs), and the opportunities, advantages and disadvantages these may bring to the industry. The association and its members are aware of the requirements companies must meet before venturing into a new market. Preparation is the key to success, and FECC recognizes that detailed information on possible new markets is of great use for its members.

By providing up-to-date information on emerging markets, including issues specific to the local distribution of chemicals, local regulations, economic development, and export and import matters, FECC helps its members properly prepare to enter these markets. Based on a growing interest, FECC will further inform its members on the chemical market in various regions, in particular the Middle East, South Africa and Southeast Asia.

Sustainability remains at the top of the global agenda. The industry sees even more frequent inquiries by consumers about products that are sustainably produced, prompting many chemical distributors to focus on adopting sustainability principles in their operations. FECC continues to promote Responsible Care, the chemical industry initiative that helps

the industry to operate safely, environmentally responsibly and with care for future generations.

The past year has seen FECC become a stronger association; the objectives achieved by the working committees show great progress toward the goal of becoming a more efficient and effective organization. Developing membership is a priority and absolutely imperative to strengthen the association's position as the European voice of the chemical distribution industry. Welcoming new members opens a door to opportunities for collaboration and business growth.

Positive Outlook despite Concerns

"FECC sees a positive outlook for the chemical distribution industry, however we cannot ignore certain concerns that it is faced with. Increased regulatory pressure, sustainability, safety, health and environment, and increase in the raw material costs across the globe are certainly aspects that need to be taken into account when preparing any business model," said FECC Director General Dr. Uta Jensen-Korte.

Distributors have and will become an ever more important link in the supply chain. But with this comes great responsibility. The many factors to be taken into account oblige chemical distributors to be pioneers in order to be able to offer the services their clients need. Only those who can manage to work without losing sight of the many elements that make up the complex chemical supply chain will succeed.

To learn more about the FECC's activities, achievements and plans for 2014, download the Business Plan at www.fecc.org/fecc/publications.

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Formidable Winning Teams

How Chemical Distributors and their Principals can Capitalize on Future Business Opportunities

Fascinating times ahead for distribution – *The chemical industry is expected to play a major role in the next industrial revolution, which will be the "sustainable" one. Rafael Cayuela, global product and marketing director at Styron (part of Dow Chemical until 2010) and book author describes in his book "The Future of the Chemical Industry by 2050" what opportunities lie ahead for chemical manufacturers. For CHEManager Distribution and Logistics, Michael Reubold asked him about the impact this will have on the chemical distribution industry.*

Rafael Cayuela Valencia, global product and marketing director, Styron Europe, Horgen, Switzerland

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CHEManager: In your book "The Future of the Chemical Industry by 2050," you explain what challenges and opportunities lie ahead of the chemical industry. In brief, what will the future for our industry look like?

R. Cayuela: The chemical industry — as our world — is in the midst of one of the most important transformations in modern times. Already large "tectonic shifts," such as the shale gas revolution in North America, the emergence of China as the largest chemical market in the world, or the consolidation of the Middle East as the single largest petrochemical hub, might appear minor compared with what is currently unfolding.

„The third industrial revolution will be the 'sustainable' one.“

The imperative need for our world to reduce CO2 emissions drastically will create massive technological challenges. It will also create the single largest business opportunity in human history of up to $80 trillion — at $10 per ton of CO2. At the same time the chemical industry will have the potential to triple or quadruple during the next decades, from $3 trillion in 2010 to $14 trillion by 2050. During this transition new companies and industries will flourish, while others will disappear. But certainly the chemical industry is expected to play a major role in the next industrial revolution, the "sustainable" one.

What will be the major factors influencing the future direction our industry is taking?

R. Cayuela: From a "quantitative" point, massive growth in population, economics and urbanization rates, as

> „The chemical industry has become more complacent with itself."

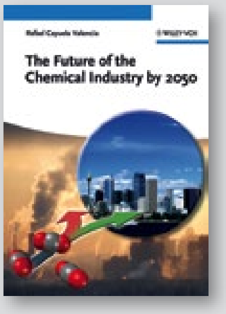
well as changing demographics around the world would play a critical role. From a "qualitative" and margin point of view, the large impact of climate change and energy and feedstock change are expected to become crucial for our industry. We already experienced the large impacts of some of these transformations with the recent discovery of shale gas in the U.S., while more transformations will come very soon. Finally, computational progress and technological convergence are expected to accelerate all other trends, creating even bigger opportunities and challenges for our industry.

Do you think the industry — or most industry players — are prepared for this future?

R. Cayuela: The chemical industry is extremely well-positioned to capitalize on the upcoming challenges and business opportunities. Europe is especially well-positioned here, with high levels of integration, long-standing focus on innovation and very powerful technology/industry clusters.

However, some parts of our industry as well as many players will need to be transformed. The winners and losers of the future will be determined by their capacity to think strategically, master change and remain flexible, and ultimately by their ability to capitalize on the upcoming challenges and opportunities. Chemical producers able to provide superior solutions, while enabling energy and emissions reductions, will be the winners of the future.

Want more? Check out the book.
The Future of the Chemical Industry by 2050
Discussing the technological supremacy of the chemical industry and how it will adopt a leading position to solve some of the largest global challenges humans have even seen, this book by Rafael Cayuela details how the industry will address climate change, aging populations, resource scarcity, globality, networks speed, pandemics, and massive growth and demand.



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What do you see as the biggest challenges that lie ahead and will have to be mastered by the chemical industry?

R. Cayuela: To some extent, the largest challenge for the chemical industry has become the industry itself. The chemical industry, after decades

> „The role of distributors will become still more critical than today."

of enormous growth and success, has become more complacent with itself and more inwardly focused, especially when addressing technology and stakeholders' relationships.

After the Second World War and most recently with China's entrance into the world economy in 1990, the chemical industry experienced a period of massive growth. Indeed the chemical industry more than quadrupled between 1970 and 2010, while China's industry quadrupled from 2000 to 2012.

This remarkable growth in chemical demand has triggered massive changes in the chemical industry, such as the reshuffle of the leading chemical markets and trade flows — with China already the largest chemical market in the world. Perhaps even more important: it changed the whole focus of the industry.

From a technology point of view, the industry has become more focused on incremental technologies and operational efficiencies, rather than on pure technology and innovation.

From a stakeholder's perspective, the industry has become more inwardly focused. The industry has a reactive stand toward society and legislators rather than a proactive one; after all, the industry has been growing significantly in the last decades.

However, the imperative need of our world to address massive growth, emissions and energy reductions will stretch the industry to levels never observed before. The fact that one single product, technology or even industry could not solve some of the upcoming challenges will require producers to work, collaborate and innovate across the value chain, including governments and regulators. In other words, the industry will be forced to change its perspective from an inward to an outward one; putting innovation and technology back at the forefront of the industry and technological collaboration at the core of the industry.

In terms of the supply chain, what role will chemical distributors play or have to play in the future?

R. Cayuela: As chemical companies stretch themselves — addressing simultaneously "quantitative" and "qualitative" growth — the role of distributors will become still more critical than today.

Massive growth into emerging economies will create huge distribution opportunities, supporting the already stretched chemical companies in the advanced economies to succeed in the growing areas. However, distributors from the advanced economies need to rush and work decisively in this area, as local contenders are becoming not only more experienced and professional but also much bigger.

On the other hand, the imperative need to reduce energy and emissions around the world, especially in the advanced economies, will force chemical producers to refocus themselves on innovation and technology. Distributors, as a key part of the industry with direct access to a large part of the customer base, will play a critical role in understanding and communicating the customers' needs and aspirations.

Distributors will be forced to become even more technologically knowledgeable and to work even more closely across the value chain. In a world oriented more and more toward sustainable solutions, technology understanding will become critical, collaboration and flexibility invaluable. Additionally, the clear need of the industry to focus on both massive growth and pure innovation will open the door to distributors for more vertical and horizontal integration. More and more, the joint distribution of monomers and polymers will present higher opportunities, while the mastering of global arbitrages will become vital. Vertical and horizontal integration also implies and requires larger sizes and even stronger financial health but also larger opportunities. Fascinating times ahead for distribution!

How will the chemical distribution industry have to adapt in order to participate in the future growth opportunities of their principals?

R. Cayuela: Long-term strategic alignment with their principals and markets will remain essential. Vertical and horizontal integration present enormous business opportunities and huge synergies, too. That is why, in a world full of opportunities, the clear understanding of where to focus would be as essential as possessing the right set of skills.

The upcoming decades will present an enormous array of business opportunities but also enormous risks. That is why rigorous and regular strategic and long-term assessments would become more and more critical, especially as principals will embark on dramatic and long-term strategic changes.

On the other hand, emissions and energy reductions would also present a large opportunity and challenge for the distribution industry. As an industry fully exposed to massive movements of chemicals, the emissions related to the transportation and handling of goods might present large opportunities for differentiation. Indeed, distribution should become fully informed and aware of all the upcoming legislative and market trends but also should be keen and strong to let its voice be heard.

Is there one chemical distributor business model that will guarantee success or will the markets call for various or flexible distribution models?

R. Cayuela: Fortunately, I don't think there is a universal business model to guarantee success, as that will make the whole industry and its players very vulnerable. Different areas, markets and products will require different business models, however some special attributes and competencies could be observed in the winners of the future.

Chemical companies — principals — able to support emissions and energy reductions will be the winners of the future. Distributors able to choose the right partners, but also to think strategically and act accordingly, collaborate globally but closely across the whole value chain, will be the winners in the next decades. Together, principals and distributors could create formidable winning teams, outperforming competition while delivering sustainable business models for an industry in need of the best technologies and products. In a world expected to grow massively in commodities and specialties, the most strategic and flexible players will enjoy the rewards of the largest business opportunity in human history.

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Fit For The Future?

Key Drivers of Industry Dynamics and Their Influence on Specialty Chemicals Distribution

Beyond This Year's Growth — *Major chemical markets are heading for further improvement this year, according to the latest global business update from the German chemical industry association (Verband der Chemischen Industrie, VCI). So despite some headwinds from the Ukraine crisis and the "macro risk" from an unexpected shock in China, it may be a good time to look at what this means for chemical distributors in Europe.*

"It's a People Business, After All!"

Günther Eberhard, managing director, DistriConsult

Short term, the flow of good news seems to continue and the bull markets seem to prevail, but what about the longer-term outlook, say in the next four to six years, into 2020 and beyond?

"Re-shaled" Supply Patterns

The shale gas boom and the resulting revival of the chemical industry in the US will have a profound influence on the chemical industry and product supply patterns globally.

Europe will not be exempt from these developments. Driven by a declining cost-competitiveness, products that have so far been produced in and exported from Europe may experience a reversal of product streams and supply chains. Plants that are no longer commercially viable may be shut down, and the respective products may be imported instead.

While the focus will be mostly on large volume petrochemicals, specialty chemicals will see some effects as well. This might benefit distributors, which have the infrastructure and the knowledge to manage sales processes and supply chains on behalf of smaller exporters from the US and to channel these imports into Europe.

Will We Have the Energy to Continue?

Closely related to the product supply pattern is the question of affordable energy at reasonable cost. Particularly in Germany, changes to the legislative framework might result in even higher energy prices that make the chemical industry increasingly uncompetitive. But other industries are under pressure as well. Europe is running a significant risk of losing out when it comes to major reinvestments. The long-term viability of complex value chains, going beyond the chemical industry as such, may be endangered.

If no corrective action is taken, industrial activity in Europe may decline in many sectors served by specialty chemical distributors, among others. This could limit the distributors' business base and threaten their long-term commercial viability. So distributors are well advised to make themselves heard at the local, regional and national level in order to educate politicians and governments on the importance of having a sound industrial base in Europe.

Cash Is King

Financing has always been a key aspect of any long-term company strategy. Basel III and other regulatory initiatives that followed the 2008-09 financial crisis put increasing pressure on banks, when it came to their equity and underlying capital. That in turn has made the banks look at their credit books more carefully. Many small and medium-sized companies have found it more difficult than before to obtain debt financing for growth initiatives and investments.

Distributors are not exempt from this trend. Alternative sources of financing have been tapped by some companies to fill the gap. But of course, since distribution can be highly cash-generative, many companies are to a large extent still "self-financing," even when they make sizeable acquisitions or grow otherwise in large increments.

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The Next Round of REACH

After a big sigh of relief, when the last round of registrations under REACH (Registration, Evaluation, Authorization and Restriction of Chemicals) was completed by June 2013, many companies are now looking at their lower-volume products. The next deadline in June 2018 may seem to be still quite some time in the future. But in practice it may show some effects before the deadline.

A number of mainly non-European producers, which have only limited exports to Europe, may start to prune their products before the 2018 deadline. Or if they decide to continue production, they may seek to market their products at home or in other geographies, free of the restrictions imposed by REACH. A registration is out of the question to them, as its cost may be prohibitively high for a product with less than 100 t/a volume and only low to moderate margins.

As the low-volume business quite often goes through distributors in Europe, these companies will see their business shrinking. If the producer cannot afford the registration, it's unlikely that the distributor can. Customers will also feel negative effects, as they will be limited in their technical and commercial options, when products are taken from the market. This effect will be felt more strongly by smaller distribution companies, which tend to be associated with smaller producers, imported from abroad. But in the end nobody is able to escape this development.

Structure Must Follow Strategy

After all, size matters, in the sense of critical mass. But it's not only the size of a chemical distributor that must be big enough to help carry the increased fixed-cost burden that results from regulatory complexity and the need to amortize investments in infrastructure, such as application laboratories and technical expertise.

A number of medium-sized distributors have the profitability and the financial strength to support the investments required. The question for some of them is "Do we have the right structure to support growth?" In the last 10 to 15 years, a number of companies have grown from a strong home base — in German the "Stammhaus" — adding representation offices and subsidiaries, mostly in neighboring countries but sometimes also in more distant countries.

Small teams around the owner or CEO at the head office developed strategies, and the local subsidiaries were then simply told how to implement them. That worked reasonably well, as long as the subsidiaries were small and the newly developing economies, for example in Central and Eastern Europe (CEE), were relatively immature and such a "generic" approach did the job.

Increasingly, however, some of those economies have become very important in terms of certain user industries, and more sophisticated business clusters — with the need to offer differentiated products and services — have developed. That brings with it a level of complexity and requires a degree of sophistication that can less and less be understood and provided from a faraway — geographically and often also mentally — ivory-tower-like head office.

The winners in this game will be the companies that develop a sort of "distributed intelligence" by locating key personnel closer to customers (and sometimes also suppliers), while at the same time maintaining the "unité de doctrine" needed to run a larger group of companies successfully.

It's a People Business, After All

The increasing complexity of both the supplier and customer markets and the continued volatility of the business also require distributors to upgrade and develop their management capabilities. Cohesion should be fostered by a set of clearly communicated and understandable values that form a sort of guardrail for the work done by the sales force in the field.

Support and back-office structures must be kept as simple and resilient as possible, IT systems designed as closely as possible to the standard templates of the program developers, to make maintenance easy and less prone to disruptions during the upgrades that will inevitably be required in the future. Uniformity of processes must be a key consideration here, to leverage supply-chain capabilities across the organization and to facilitate companywide analysis and just-in-time reporting.

This is not an argument for a one-size-fits-all approach, but rather a plea to seek differentiation in areas where it adds value to the customers, the suppliers and the distribution company. This is mainly at the customer (or supplier) interface and through the service provided around the product, whether it's technical advice or specific laboratory and/or logistics tasks that the distributor performs.

Strategies must be developed iteratively in a combined "bottom-up/top-down" approach. Details of the implementation should be delegated to local staff, based on their understanding of specific customer needs but guided by well-communicated corporate policies.

All this requires polyvalent employees that can translate customer needs on one hand and parent company guidelines and objectives on the other into coherent business strategies and workable action plans. Education and training concepts for new hires as well as attractive career paths for more experienced employees, typically in their 30s and 40s, will become the key to attracting the right staff. Well-structured management development programs must be used to disseminate company philosophy and identify suitable talent at the same time. Remuneration packages must be competitive to attract qualified staff.

Do Your Homework!

The future for specialty chemicals distributors is not without challenges. To address these appropriately requires a dual effort. Firstly, optimizing the set-up within the individual company as well as a coherent approach to strategy development and implementation. Secondly, close cooperation with suppliers, downstream users of chemicals and other stakeholders, in order to address the issues that the chemical (distribution) industry as a whole is facing in view of macroeconomic trends and political plans and initiatives. Distribution companies that do their homework and continuously hone their skills will prevail.

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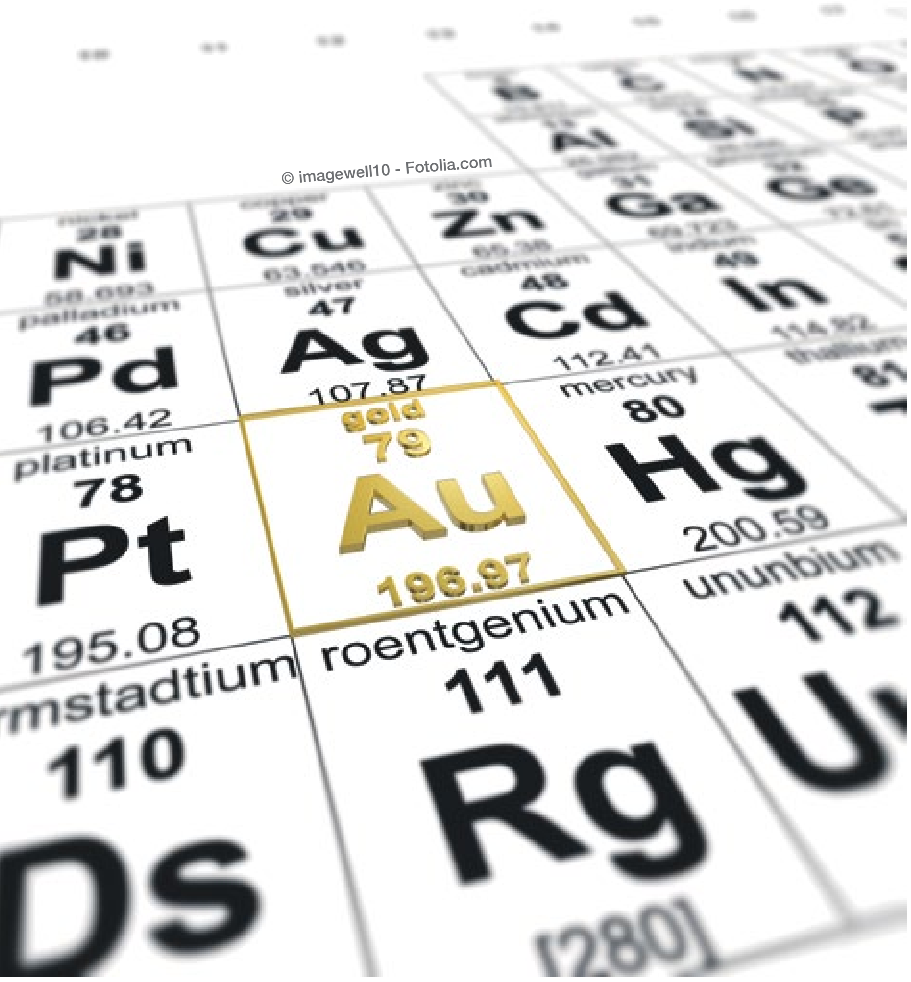
Adding Value

Growing Market Opportunities and Strategic Options for Chemical Distributors

Robust Expansion — *From 2008 through 2013, the worldwide chemical distribution market grew approximately 6.5 % per year (corrected for exchange rate effects) to roughly €168 billion, according to a new report by The Boston Consulting Group. That rate exceeds the concurrent nominal annual 4.4 % expansion in worldwide chemical consumption. We expect growth in the chemical distribution market to slow to 5.6 % in the coming five years (fig. 1a).*

Increased chemical consumption and outsourcing were the main growth drivers through 2013. Over that timespan, chemical consumption in Western Europe and North America (excluding Mexico) grew slowly but steadily — 1.6 % and 2.6 %, respectively. In emerging markets, growth rates were highest in the Asia-Pacific region, Middle East and Africa, and Central and Eastern Europe, which all averaged around 10 %. Latin America (including Mexico) was next at 8.6 %. Within Asia-Pacific, China's growth exceeded 10 %, compared with approximately 6 % in the rest of the region.



Developments Among Distributors

Today, the distribution market remains fragmented, with top companies dominating specific markets but few global powerhouses. As of 2012, the three largest global distributors, Brenntag, Univar and Nexeo Solutions, held a combined market share of 12.7 %.

Fragmentation is most pronounced in emerging markets: In Asia-Pacific and the Middle East and Africa, the top three players collectively hold 6 % to 10 % of the market. In North America and Europe, the top three players hold 30 % to 40 % and 15 % to 20 %, respectively (fig. 1b). The global top ten include two specialty distributors and five mixed-model distributors.

Over time, we expect producers to favor medium-sized local champions and large international players. Three main factors are driving consolidation. The first is that producers are reducing the number of their dealer relationships. The second is increasing regulation. New rules governing documentation, safety and environmental protection are being implemented in Europe, and are likely coming in the US and large developing markets. The third major force spurring consolidation among distributors is M&A. Large international distributors have been active acquirers in recent years, particularly in emerging markets.

Best Practice For Distributors

Specific success factors for distributors vary by company size. Small and medium-sized distributors need to ensure their financial stability and comply with local regulations — particularly in emerging markets. If they lack critical mass and sufficient volume, they will have to partner with competitors or seek an acquisition or merger. Once their viability is assured, they can differentiate themselves through specialization.

Large international distributors will continue to use M&A to increase their reach and industry expertise in fast-growing sectors such as oil and gas or water treatment. In emerging markets, where buyout candidates are becoming scarce, distributors must identify the right targets, such as medium-sized companies struggling with evolving regulations.

When expansion into local markets is not possible through M&A, large distributors need to extend their reach organically. They should focus on building strong regional positions to enhance their standing as preferred partners in promising markets such as Asia.


Christian Hoffmann, principal, The Boston Consulting Group, Hamburg


Adam Rothman, principal, The Boston Consulting Group, Chicago


Stefan Scholz, project leader, The Boston Consulting Group, Berlin

Best Practice for Chemical Companies

Chemical companies considering whether to work with distributors have three major imperatives:

- ☐ Define a robust business rationale for employing third-party distributors, setting out each party's roles and obligations
- ☐ Select a distributor willing and eager to realize the supplier's business case

□ Govern the relationship over time to maintain high performance

The business rationale for using third-party distribution often entails two considerations, coverage and efficiency. Can the supplier leverage the distributor's commercial and logistics networks to improve its market expertise and access? This concern is especially relevant for suppliers seeking growth in new geographies or market segments. And can the distributor reduce costs and complexity for the supplier through services such as packaging, mixing, formulating and inventory management?

When developing its go-to-market strategy, a supplier must ask if in-house or third-party distribution is more cost-effective. In typical cases, this analysis entails estimating the system cost and total profit pool of a region or business line. Does working with a distributor enlarge the total profit pool either by decreasing system costs or increasing price realization? With higher sales territory density and more multiproduct line delivery routes than individual chemical suppliers, distributors can often reduce total system costs. The key is local scale — even though distributors are typically smaller than chemical suppliers, they can be much larger in specific geographies or end markets.

In addition, distributors may realize higher prices by bundling products and services to add value for the customer, or by focusing on customers considered non-core to large suppliers. In other cases, distributors simply have stronger capabilities in pricing execution than do suppliers.

Distributor Selection

Assuming that this process culminates in the decision to outsource distribution, the supplier should select a distributor based on its ability to realize the supplier's business rationale. In addition to general considerations such as a distributor's financial strength, creditworthiness, reputation, and ethics, the distributor's capabilities should map to the business rationale. For example, if the supplier seeks increased coverage, its selection of distributor should involve metrics such as the size of each distributor's sales force, its square meters of warehouse space and its roster of active customers. Conversely, if efficiency is the main consideration, the supplier should evaluate each distributor's cost structure and ability to reduce the supplier's costs.

Once a distributor is selected, the supplier should use tough love to manage the relationship. The distributor is both a key customer and a vendor and must be managed accordingly. The key is to align incentives to motivate the distributor to work for the supplier's commercial benefit. Suppliers can choose among several different levers, ranging from mutual exclusivity to market-based steering, depending on such considerations as geography, product line, and available alternatives.

In a mutually exclusive relationship, contractual agreements covering topics such as information transparency and revenue targets and penalties can solidify the supplier-distributor partnership, as can shared activities and assets such as warehouses. This approach works best with distributors handling a highly specialized product closely identified with the supplier's brand, or when the supplier wants to protect its price point and the distributor can offer differentiating cost advantages. Conversely, in market-based models, suppliers reward distributors that deliver the most volume or enhance margins. This model works well for commodity products that require a less technical sale.

Summary

Distributors can capitalize on increased shipments and suppliers' cost-cutting needs by establishing preferred partnerships and focusing on differentiating, value-added services. International distributors can differentiate themselves by improving reach and segment-specific expertise, while small companies should broaden their networks to become local champions. Suppliers should clearly define their distribution objectives, carefully choose their distributors, and actively manage the distributor relationship.

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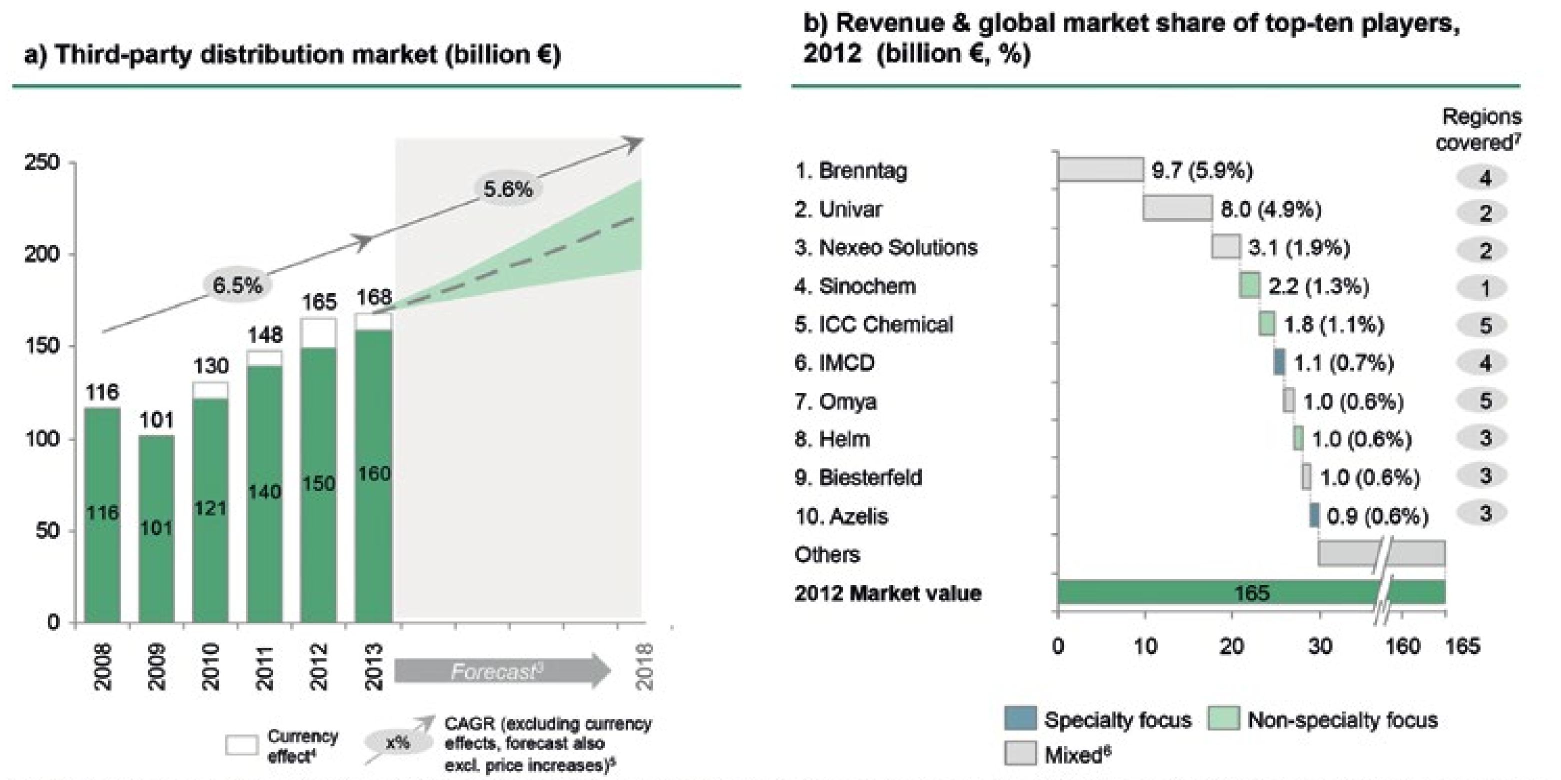
Fig. 1: Distribution market development (a) and market players (b)



Sources: Chemdata International; Verband der Chemischen Industrie; American Chemistry Council; national statistics; European Chemical Industry Council; Oxford Economics; Economist Intelligence Unit; BCG market model, 2014; BCG reports; companies' annual reports and websites; ICIS; interviews with market participants
Notes: Values for 2012 and 2013 were extrapolated on the basis of an Oxford Economics forecast for industrial growth and price increases; growth for third-party share is based on interviews.
[1]Outsourcing share, determined separately for each region (as of 2013), is based on interviews with industry participants [3]Assumes stable exchange rates, no price increases
[4]Currency effect is calculated as the nominal market value minus the market value at 2008 exchange rates [5]In comparison to our former studies we applied growth rates excluding currency effects to give an even better understanding of market dynamics (chemical distribution market growth incl. currency effects is 7.6% p.a. (2008-2013) [6]Significant commodity and specialty-distribution business
[7]Based on revenue estimates by region (North America, Latin America, Asia-Pacific, Middle East and Africa, and Europe); includes regions with revenues greater than €10 million.

Chemical Distributors and their Fight for Growth

How are Small and Medium-Sized Enterprises Dealing with the Issue of Growth and the Pressure to Consolidate?

Fewer And Bigger Companies — *For a long time, until far into the second half of the 20th century, chemical distribution was a local business with local or regional players. National distribution units were rare and international ones even more so. This landscape has changed drastically in the past 25 years, with the chemical trade moving further and further away from a configuration based on small-scale organizations. The number of market players is ever decreasing while the relative size of the remaining companies keeps growing.*

What are the reasons behind the persistent consolidation of the market and the trend toward concentration? They can essentially be attributed to altered market conditions that lead to larger entities enjoying comparative advantages over smaller ones and gaining more and more weight as they do so. The various reasons for this are given in detail below.

Challenge 1: Storage and Transport Conditions

Since the mid-'80s, legislators have been intervening more strongly in the storage and transport of dangerous goods and have brought about ongoing tightening of the relevant conditions nationally and, later, at the EU level, because of several chemical accidents. This led to mechanization of storage facilities and to the considerable expenditure associated with environmentally sound equipping of warehouse and handling facilities, as well as the mechanical devices that are used in them.

While it used to be possible to operate storage plants economically at 10,000 or 20,000 t/a of handling, the considerable expenditure required now to set up and operate a storage facility of this kind leads to a constant increase in the volume threshold required. In the commodities-handling segment, at least, including tank storage and filling, we can assume that the 100,000 t/a threshold has now been reached. Very few small and medium-sized enterprises (SMEs) can achieve and handle this kind of quantity through their head offices and warehouses. Most of them are just too small.

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Challenge 2: Bureaucratization of the Processes

The official requirements for handling chemicals lead to red tape, not just in terms of the physical movement of goods but also in the trading operation. The expense of generating the correct processes has to be dealt with and requires staff, as well as the necessary knowledge and experience. This is much easier for entities with larger handling volumes. For them, employing the skilled workers required is worth it. They are also the most likely to be able to develop and run IT systems that guarantee the necessary high level of automation for these processes. This reduces manual input to a manageable level, which is not possible for smaller distribution units.

Challenge 3: Paring Down Distribution Channels

Manufacturers are confronted with the necessity of making sure that their distribution channels are slim and efficient. Gone is the previously accepted method of taking care of a large number of different chemical distributors, using in-house distribution staff, and intensively penetrating this "channel to market" with a regional structure based on small-scale organizations. Large producers are scaling back their staff and, for this reason, prefer trading partners who purchase and distribute large quantities, preferably nationally or even multinationally. This reduces communication, consultation and support expenditure to a sensible level.

Obstacles To Growth

Considerable adjustment problems arise for a distribution structure characterized by SMEs, but these companies need to recognize that their original, region-based focus is increasingly being squeezed out of the competitive landscape. Chemical distribution has become an expensive business that is capital-intensive and complex. Running and developing these businesses requires increased staff input and more know-how and financial strength. Developing and expanding

Peter Overlack,
CEO,
Overlack

enough chemical distribution centers of sufficient size costs millions. A three-tier, fully equipped chemical distribution center, for example, can easily cost €50 million.

Against this background, the biggest obstacles preventing SMEs from being active in this field become clear:

- Psychological reasons: People are not willing to look closely and to recognize that the market structures are changing or to realize that waiting much longer means that their company loses its appeal.
- Know-how reasons: Companies realize that very good, skilled workers are necessary for running the business and that they are not easy to find. Skilled workers are expensive and discerning when it comes to choosing an employer. They want a motivating working environment, and they may not adapt easily to patriarchal structures and to companies that are perceived to be old-fashioned with years-old vested rights and hierarchies that are not considered to perform adequately.
- Capital: This is probably where the main problem lies. The monetary requirements for a company to develop and expand its own distribution activities and, for all the right reasons, to acquire competitors are usually limited by the financial strength of the equity investors. These equity investors who, in small and medium-sized enterprises, are normally family members, are only very rarely able to invest further hundreds of millions or even billions into their own company to facilitate and promote the necessary growth in volume and area.

The Power Of Capital

Let's take another look at capital. Nowadays, banks are reluctant to work with borrowers whose equity capital is considerably below 30 %. They also apply key-figure frameworks when evaluating the borrowers that give information about the performance and stability of the chemical distributor. Whether a loan is made depends on the equity capital invested and on the earnings of the company and its ability to make a profit (still measured by the size of the EBITDA today, which is not always favorable). Scope here is limited. Companies that are already below the optimum size — or at least a tenable size in keeping with the market — and whose proceeds are suffering are not normally able to generate the necessary funds for expansion from equity and loan capital. They are simply not able to join the game of "who can grow faster?" These circumstances are difficult to change retroactively if a company expands to an adequate size too late.

Buy Or Be Bought

So what alternatives are available to chemical distributors like Overlack AG — a distribution company that has been run by the same family for several generations — who realize that they are too big to die and too small to prosper in this market in the long term?

In my opinion, there are only two possible paths in this case: The best possible sale of the company to a prospective buyer who is represented on the market or, alternatively, to become a buyer. Overlack also chose this path. It means leaving in the company any equity capital that can be generated in the course of the profit retention. For the shareholders, this means tightening their belts for 20 or 30 years, with the next-but-one generation in mind, doing without proceeds from the company as much as possible and, last but not least, supporting management as risks are taken. A growth trajectory does not have to lead straight to paradise. The retention of equity capital will be bolstered by adequate support from loan capital. The indebtedness of a company that is set up in this way increases significantly. Against the backdrop of market turbulence or unexpected obstacles, there is a risk of failure.

No Time To Waste

However, resulting positive development of the company is not to be equated with achieving the final goal: It would not be wise for a company to rest on its laurels. The large competitors, the nationally and internationally active market players who have developed in the meantime or who have always occupied a leading position in the sector, have grown at a comparable rate during the same period. And new market participants have joined in through a build-and-buy strategy with the help of private equity. Both of these groups, the old multinationals and the reconfigured groups that are active all over Europe now dominate the much older family firms, some of whom have been on the market for over 100 years. We have to look at that and accept it, even if it hurts — and then we need to act.

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Growth Opportunities in Distribution

Growth is the dominant topic in this edition of “CHEManager Distribution & Logistics”. On the previous pages, our authors discussed the market situation, challenges and opportunities for the chemical distribution industry. Now it is time to ask the distributors themselves. Our expert Dr. Birgit Megges, editor Distribution, asked industry specialists and company spokespersons about their opinion. These are the questions we put up for discussion:

- What kind of growth do you aspire to in the next few years?
- In which sectors, markets or regions do you see significant growth opportunities?
- How do you intend to implement these plans and seize these opportunities?

On this double page you can read excerpts of the answers we received. You will find the complete statements online on www.chemanager.com/en/tags/cdl-opinions.

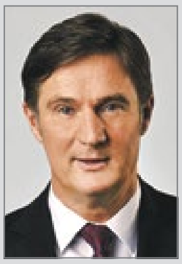
Statements

Close to Our Customers

Pavel Kratochvil, executive vice president, Barentz

Our strategic plan shows a focus on our traditional core activities, like food and nutrition, pharmaceuticals, personal care and animal nutrition. On average, we strive for double-digit growth, but I have to add to that that we differentiate our ambitions region-by-region and market-by-market. In our strategy, we have a focus on three regions — Europe, Southeast Asia and the Americas — to expand our business. We have a well-developed strategic planning process and we are lucky to have been in business for more than 60 years, so we have a very good network all over the world. We have a small team in charge of new business development and these people have a keen eye for market developments and good people. Our implementation plan is always to have local people on the ground in every country we operate in, so we immediately can leverage their knowledge and network. Another important element of our strategy in new markets is that we want to be supported and backed by our principals in these markets, so we can go to our customers with a complete product portfolio.

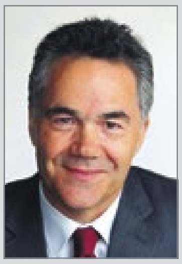
Strengthening Partnerships; Exploring New Markets



Thomas Arnold, managing director, Biesterfeld Spezialchemie

After a dynamic business year of 2013, we aim at further growth by tapping into new markets, intensifying existing partnerships, by acquiring new suppliers, as well as through expansion of our product portfolios and service activities, both across Europe, and in the international market.
Furthermore, Eastern and Central Europe provide interesting markets for us, with strong growth, and they will remain attractive for the future. We will grow further in Western and Northern Europe, and we see significant opportunities for growth in emerging global markets like the BRIC countries and Southeast Asia.
Already in January 2014 we have started our activities within Biesterfeld Petroplas in the U.K. and Ireland. We plan further strategic alliances. We see a significant boost through continuous expansion and optimization of the challenging product portfolio. Permanent adjustments to the changing market demands are a must. The expansion of our service offering and the communication — both with suppliers and customers — is top priority for us.

Looking to Capture Strong Growth in Emerging Markets



Steven Holland, CEO, Brenntag

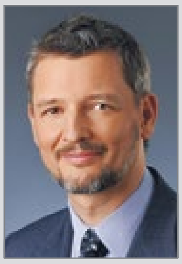
Our focus is on expanding our presence in emerging markets to capture the expected strong growth in demand for chemicals in these regions. Today, we already generate almost 30% of our total sales in these emerging markets. In the established markets of Europe and North America, we continue to further develop our product and service portfolio as well as to optimize our national and international distribution networks, also through acquisitions.
The systematic implementation of our strategy is based on global and regional initiatives. We seek to effectively leverage our capabilities through accelerated and targeted growth in the particularly attractive industries: water treatment, personal care, pharmaceuticals, food and beverages, oil and gas, as well as adhesives, coatings, elastomers and sealants. We focus on expanding business with regional, pan-regional and global key accounts, sectors where our broad product offering and far-reaching geographic network provide unrivaled service capabilities.

Good People, Innovative Ideas and an Excellent Service

Dr. Neville Prior, chairman and CEO, Cornelius Group

Cornelius will continue to focus on its core sectors of industrial, personal care, health and food, and medical devices, and we certainly see further opportunity in those sectors. We continue to see exciting opportunities in Europe for market penetration, particularly as the region looks toward a general improvement in economies. The revitalization of the industry in the USA, on the back of cheap energy and a global economy that is in recovery mode, will make it an exciting region over the coming period, whilst the emerging markets in Asia, Africa and South America will continue to fuel a growing world market.
Success in this industry relies on having good people, innovative ideas and an excellent service, all things that Cornelius has, and will continue to build upon. Customers look more and more to their top suppliers to bolster their own innovation, and we do and will continue to look at how our portfolio can help our customers to enhance their own business, and alongside that, ours.

Building the Know-How to Meet the New Requirements



Robert Späth, CEO, CSC Jäklechemie

If you succeed in building the know-how to meet the new requirements, then there are plenty of opportunities to grow the business. By offering a better and broader service to both suppliers and customers, it is possible to gain more business.
For us this means to grow continuously to further regions, like the Benelux or Scandinavia with our coatings division, as well as to increase the abilities to meet the requirements, for example, of the food, feed or cosmetic industry.
On the one hand, we are looking for new young talents to increase the specific know-how of our specialty divisions, like lacquer and coating, surface and parts cleaning, life science and water treatment. On the other hand, we develop our abilities to sell and source on an international basis. We gained the status of a full AEO (authorized economic operator) as well as a “known shipper” to ease airfreight, for example. Another important task to work on is to improve our networking. Sustainable growth is always a matter of continuous improvements of our abilities.

Strategy for Sustainable, Profitable Growth

Thomas Sul, co-head of Performance Materials business unit and member of group management, DKSH

Regionally we are focused on Western Europe, and the outlook for this region has definitely improved since last year. We aim to continue outgrowing the market in our key industries based on our strategy for sustainable, profitable growth. Its execution is supported by investments done during the last years into technical sales, formulation services and regulatory support.
Many applications we developed with our customers will be commercialized in the next years. The environment continues to become more challenging in terms of regulatory needs, while our customers dedicate their R&D capabilities on value-added and innovative products. We are confident that our strategy to focus on these areas was, is and will be the most promising one. We will continue to invest in dedicated specialists for our global sourcing organization that today covers all major regions in order to add innovative and cost-efficient suppliers to our product portfolio.

Statements

Sustainable Growth in the 'Old' Market

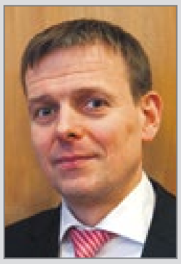
Horst Ludwig,
CEO,
GB-Chemie

Actually, first of all I would like to point out that I do not see a significant growth in any market in the world. Nevertheless, our company aspires to a sustainable growth of sales in the "old" market of Central Europe, especially in the German-speaking area. Global players sometimes forget the regional markets; this is our chance to act.

On the other side, one of the most important instruments to grow is global sourcing. Of course, everybody is engaged in the BRIC countries and, for sure, successful. For our targets I see a great opportunity in developing business with the USA based on, for example, much better energy policy there.

Our ambition must be to combine these modern advantages with our traditional market in spite of political and economic barriers. To implement these plans — by not forgetting all activities in BRIC — an investment and special training in personnel is necessary.

People, Infrastructure and Processes that Differ Remarkably from Competitors



Dr. Rolf Kuropka,
managing director,
Krahn Chemie

Krahn Chemie will consequently follow its growth strategy: regional expansion to countries attractive for distributors and strengthening of the product portfolio of the segments Krahn Chemie is active in, i.e., coatings and construction chemicals, plastics, rubber, technical ceramics, adhesives, and lubricants. We still believe that even in a quite mature market like the EU, a company can gain additional market share by offering people, infrastructure and processes that differ remarkably from competitors.

With the acquisition of the ICH Benelux Group in 2013 and more recently Pietro Carini in Italy, Krahn Chemie took two major steps to expand its market position in Europe and to strengthen its portfolio and competencies. We will continue to follow this path, and we also go on winning attractive distributions rights of the tier 1 suppliers of the world.

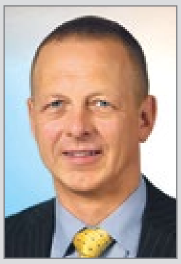
Prospects in Eastern Europe

Thorsten Harke,
president,
Harke Group

Despite the Ukrainian crisis, we see continued growth opportunities in Russia, Ukraine, as well as basically all other Eastern European markets. These opportunities relate to all different areas of chemical distribution with special focus on certain industries depending on the country. We also see further growth potential in Turkey and partly in the Middle East.

We intend to participate in these growth opportunities through our subsidiaries and sales offices in these countries and regions, whereas we are currently serving the Middle East from our subsidiary in Turkey as bridgehead.

Cooperation Creates Broad Portfolio at Best Market Price



Dr. Bernd Soyke,
CEO,
Penta

We expect organic growth through expansion of our customer and product portfolio as well as offering new services to our customers. Generally, we see opportunities in all sectors where we are active. As a cooperation network with focus on the European chemical distribution segment, we have growth opportunities in many different regions, markets and sectors.

Penta takes its chances out of the cooperation. Our shareholding companies as well as our cooperation partners form a strong alliance in order to offer our customers a broad product and service portfolio in virtually every place in Europe at the best market price possible. This has been our success factor for almost 50 years.

Finding a 'Win-Win-Win Situation'

Dr. Holger Franke,
head of Technical
Department,
Klaus F. Meyer

Klaus F. Meyer aspires to an organic growth in the next years. We are focusing in the European markets as well as emerging markets, especially China, India and Russia.

Our main target markets are pharma and agro chemicals. Especially in the latter one, we expect rising demands for our products because of strong needs for agricultural chemicals in the world.

Together with our costumers we are running projects for new products and new developments. Having good relationships with our main costumers as well as our main producers, we see ourselves as an interface for both of them.

We have already identified some new possibilities, which we discuss with both sides to get a powerful win-win-win situation for all three participating partners.

Sustainability in Chemical Supply Chains

A Close Look at the Current State and Ways Forward

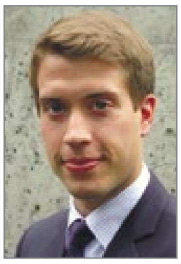
Growing Green — *The ongoing sustainability movement has become a hot topic in the business world and within broader society. Issues such as renewable resources, waste management and working conditions have become omnipresent in the media. As a result, chemical companies feel the growing concern of customers, non-governmental organizations and regulators to ensure sustainable operations beyond the boundaries of the corporate entity.*

In response to continuously growing stakeholder pressures, leading chemical firms have increasingly taken individual and joint measures to augment the status quo of ecologic and social sustainability in their supply chains. Yet the agendas of prominent industry conferences indicate that chemical companies are particularly concerned with economic aspects, namely the minimization of costs. We take this opportunity to assess the current state of sustainability in chemical supply chains and to suggest auspicious roads into the future.

Sustainability in Chemical Supply Chains Today

Chemical companies operate in a business-to-business context. On the supply side, the bulk of raw materials is provided by few large-scale suppliers from the oil and gas industry equipped with relatively high bargaining power. For example, Germany-based Bayer reports a sourcing volume of more than €18 billion, of which nearly 60% is spread over suppliers from Germany, the United States and Japan.

On the sales side, a wide range of industries demand basic and specialty compounds. The European Chemical Industry Council asserts that chemical products are processed at manufacturing plants of all sectors of the economy with health care, agriculture and automotive holding major shares. Industrial customers rely on chemicals as a nonsubstitutable input in their production processes but take advantage of their commoditized nature — particularly with regard to the basic types.



Prof. Dr. Wolfgang Stölzle, managing director, chair of Logistics Management, University of St. Gallen, Switzerland

Marc Müller, research associate, chair of Logistics Management, University of St. Gallen, Switzerland

Chemical companies started to address sustainability by concentrating on the environmental dimension at the individual-firm level before extending it to suppliers' facilities and the logistics in between. This was largely aimed at differentiating themselves from competitors in order to augment economic performance through the reduction of production inputs and byproducts (e.g., water consumption, energy use, carbon emissions), the utilization of alternative raw materials (e.g., renewable resources) and the extension of the product range (e.g., eco-friendly products).

DuPont serves as a good example, placing a distinct focus on the environmental footprint of its supply chain activities.

Over time, chemical companies' endeavors on sustainability have advanced by including social concerns, joining forces in industry initiatives, and intensifying collaboration with suppliers and customers. In this sense, managing sustainability in chemical supply chains has become a mainstream approach primarily focused on minimizing reputation risks.

For example, AkzoNobel operates a risk-management system to continuously assess suppliers' performance against social and environmental criteria, and recently joined the "Together for Sustainability Initiative," which seeks to enhance the status quo of sustainability in chemical supply chains through shared audits. Moreover, life-cycle approaches are on the rise to address ecologic issues from cradle to cradle or cradle to grave. For this purpose, Dow Chemical teams up with its suppliers and customers.

In sum, the scope of sustainability in the chemical industry has evolved

from a firm-level construct with a strong focus on green aspects to a chain-level approach attempting to address the triple bottom line of economic, social and environmental elements. Chemical companies from separate parts of the world seem to follow different philosophies on sustainability in supply chains. European firms (e.g., BASF, Bayer, AkzoNobel) are quite transparent about social and environmental issues in their supply chains, whereas U.S.-based businesses (e.g., Dow Chemical, DuPont) appear more restrictive on sharing such information.

Current trends indicate that economic aspects have moved to the top of the priority list for chemical companies. This does not come as a surprise when taking into consideration that chemical firms' sourcing costs already account for up to 50% of the corporate revenue, with the International Monetary Fund projecting a doubling of the cost for the industry's most important raw material — oil — for the 10-year period ending in 2021.

Given these underlying conditions, the question remains: What is the way forward for truly sustainable chemical supply chains based on the joint consideration of economic, social and environmental aspects?

Ways Forward for Sustainability

The output of chemical companies is utilized in almost all sectors. Accordingly, the manufacturing, utilization and recycling or disposal of chemical compounds is of concern beyond the chemical industry. The creation of truly sustainable chemical supply chains requires a joint effort beyond individual businesses — involving chemical companies, suppliers, customers and consumers. In consequence, an adaption of the primarily green-focused life-cycle approach enriched with social elements is a promising way to go.

With regard to supplies, chemical corporations may be increasingly tempted to switch raw-material sourcing regions to low-cost countries. Yet U.S.-based Exxon Mobil — the world's largest oil firm — has not defined mandatory social and green requirements for its suppliers (i.e., chemical businesses' sub-suppliers). Hence, one can hardly assume that raw-material suppliers from emerging markets (e.g., Brazil, China, Russia) currently ask their suppliers to eliminate environmental pollution and to uphold adequate working conditions. This allows the inference that the implementation of sustainable operations at suppliers' and sub-suppliers' facilities demands unceasing efforts from chemical companies.

Joining forces in industry initiatives to counterbalance to the large-scale oil and gas multinationals could be one way of advocating for chemical firms' economic, social and environmental interests in the short term. Intensifying research on alternative production inputs for chemical products may yield valuable options in the longer run.

Pursuing cross-industry sales — particularly basic types in developing nations — entails chemical companies' responsibility to provide at least elementary education on the handling and recycling or disposal of such compounds. Environmental pollution and exposure of workers to hazardous substances constitute persistent problems in the global textile industry with production hot spots in Asia's low-cost countries.

Recently, the chemical and pharmaceuticals company Merck and the Deutsche Gesellschaft für Internationale Zusammenarbeit have completed a project instructing workers and consumers in Indonesia, the Philippines and Thailand on the safe, environmentally friendly disposal of chemical waste. This is certainly a start, but more of such leadership is inevitably required.

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Planning Processes

LEAN SCM: a Paradigm Shift in Supply-Chain Management in the Chemical Industry

Volatility Calls For Flexibility – *Supply-chain management (SCM) requirements have changed significantly over the past few years. The buzzword when managing global supply chains is adaptation to increasing global complexity and volatility.*

Dr. Josef Packowski,
co-founder and CEO,
Camelot Consulting Group

Growing pressure from financial markets and the difficulty of increasing operating margins and working capital in this environment require efficient planning and execution of global value-added processes. More and more companies are therefore relying on LEAN supply-chain planning. This approach not only greatly simplifies existing planning processes, but it also improves the synchronization and variability management of global supply chains.

A recent survey among supply-chain managers impressively demonstrates the urgent need to adapt existing SCM concepts to the new reality: Three-quarters of top managers consider market volatility the biggest challenge to their supply chains, followed by supply-chain complexity. Most companies have chosen adapting to the VUCA world — an acronym for volatility, uncertainty, complexity and ambiguity — as a major strategic target. In this context, global SCM can play a key role.

Traditional Planning Fails in VUCA World

Particularly for companies in process industries, increasingly frequent market fluctuations, associated with the high level of complexity involved in global value-creation processes, bring with them hitherto unknown challenges.

Production processes in the chemical industry are generally characterized by long production times. Production of chemical materials often takes months. If the chemical supply chain cannot respond quickly to fluctuations, supply bottlenecks will very quickly threaten many downstream industries. Particularly in the pharmaceutical industry, the reliability of supply is the highest principle: It is simply unacceptable to allow poor supply-chain planning to threaten the supply of essential drugs.

To ensure optimal responsiveness and efficiency in supply-chain processes, almost all companies in process industries have in recent decades established global planning departments and invested heavily in their planning systems. The challenges of today's VUCA world show more and more the major flaw of advanced planning and scheduling (APS) and enterprise resource planning (ERP) systems that form the planning backbone of the global value chain: They work effectively only when extremely reliable forecasts, especially regarding market trends and customer demand, are available.

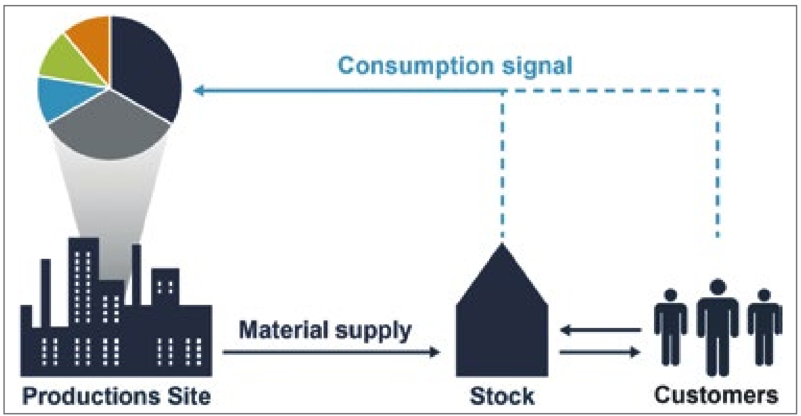

Figure 1: Real consumption should trigger pull-production.

Key Elements of LEAN Supply-Chain Planning

Three planning and management concepts are particularly emphasized in order to effectively align planning in process industries with the requirements of the VUCA world. They also form the key elements of LEAN SCM.

☐ Cyclic Planning with Rhythm Wheels:

Many companies have achieved great success incorporating lean manufacturing principles when designing their manufacturing operations to achieve greater efficiency. With cyclic planning and control of entire supply chains, it is now possible to transfer these ideas to global end-to-end value-added processes. In process industries, it is especially important to devote attention to the optimal design of set-up procedures and campaign sizes, as well as to orient them in accordance with rapidly changing market demand. Without optimal set-up sequences — e.g., shifting from bright to dark colors or from high to low concentrations — companies risk substantial production losses and cost increases.

To reduce inventory and increase the utilization of capital-intensive equipment, more and more companies rely on rhythm wheels. These planning models make it possible to efficiently plan a variety of products while at the same time smoothing capacity load to avoid costly production peaks.

The nature of a rhythm wheel (fig. 1): It continuously repeats a given production sequence. Each wheel

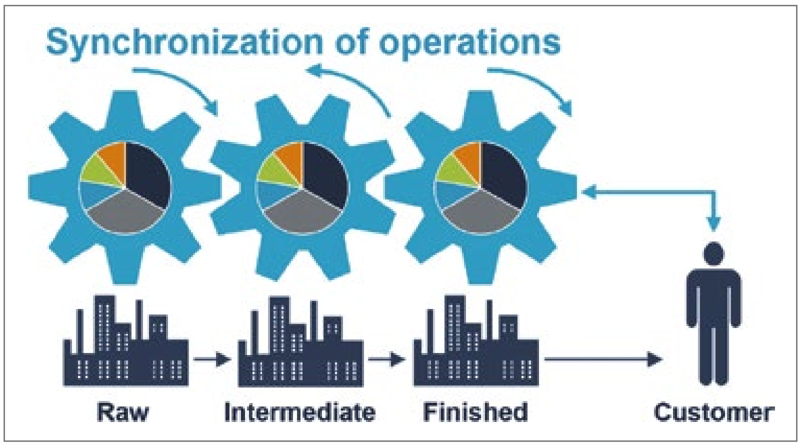

Figure 2: Operations are synchronized by the synchronization of supply-chain parameters.

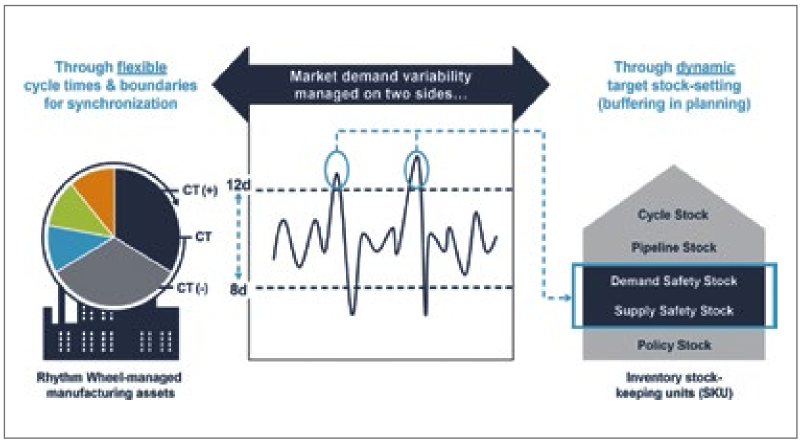

Figure 3: Market demand variability is managed on two sides.

spoke symbolizes the production of a certain product. It arranges the products in an optimal order to utilize assets and operate more cost effectively. When planned according to rhythm wheels, production processes can even be perfectly aligned with fluctuating market demand. The lengths of the wheel's spokes — and thus production volumes — are continuously synchronized based on a pull-logic according to existing stocks and customer orders.

□ End-to-end synchronization along the supply chain:
Value chains in the chemical industry are typically extended across a variety of production stages and are often spread over several plants around the world. In order to ensure cost effectiveness and alignment with markets, supply-chain synchronization is of utmost importance. Only effective synchronization can relegate production delays or even failures to the past. In this context, rhythm wheels can achieve significant improvement; they not only optimize processes in order to determine the load on a production machine, they also help to achieve effective global timing mechanisms for production processes along all parts of an international supply chain.

All steps along the supply chain should be closely coordinated with one another — and, ideally, mesh like gears (fig. 2). Traditional planning concepts, however, have always failed in this respect. Unless production orders are adapted to local conditions, effective synchronization of upstream and downstream production stages is nearly impossible. By establishing a stable production rhythm, complex production networks in the chemical industry can be successfully synchronized, thereby reducing lead times and increasing responsiveness.

□ Variability management on the capacity and inventory side:
In many companies in process industries, it has been common practice to counteract demand fluctuation primarily through adjustments of production plans. However, (safety) stocks — although the name suggests they are meant to absorb the impact of market volatility— were previously thought of only for planning a red line such that tapping into such (safety) stocks would spread panic through planning departments. The consequences of such one-sided variability management, however, are no longer acceptable in the VUCA world. While stocks and thus capital costs continue to rise, production peaks can be met only by maintaining costly excess capacity and incurring overtime costs in the workforce.

LEAN supply-chain planning helps companies to manage variability efficiently. By adjusting cycle times in production, capacity can be utilized consistently to actively counteract production peaks — in capital-intensive companies in process industries this is a key competitive advantage. If actual demand is significantly above expectations, stocks are actively used in planning. Indeed, it is among the great advantages of LEAN supply-chain planning that planning cyclically with rhythm wheels makes it possible to match production capacity with stocks more efficiently (fig. 3).

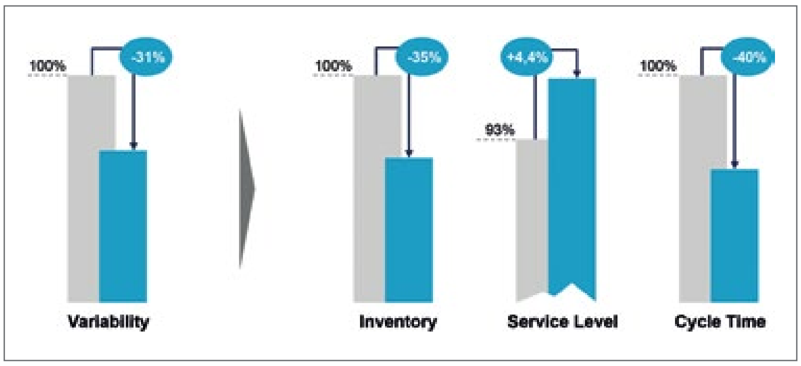

Figure 4: A step-change in variability management improves key supply-chain metrics.

Results And Industry Trends

Many companies have recognized that the more complex and challenging requirements of the business world demand new and innovative approaches in supply-chain planning and coordination. Many consider focusing on just individual elements in their planning processes, for example improving forecast accuracy or optimizing inventory, as a failed strategy. Such piecemeal efforts at most cure symptoms on a short-term basis, but they do not create the agility and robustness needed by modern supply chains in the VUCA world.

Therefore, more and more companies are relying on LEAN supply-chain planning. It greatly simplifies existing planning processes and helps in particular to improve synchronization and variability management along global supply chains.

Companies that have implemented LEAN supply-chain planning report consistently positive experiences with the new approach. Through better variability management (addressing a major challenge of the VUCA world) it is possible to improve the management of stocks, service levels and lead times. The results shown in fig. 4 are based on six industry cases. To maintain confidentiality, the results from the various cases involving leading companies such as Novartis, AstraZeneca, Eli Lilly and PCI, a BASF company, were averaged.

The experience of various consulting projects in the field of LEAN supply-chain planning and academic research and development in cooperation with leading European universities are summarized in the book "LEAN Supply Chain Planning." Such pioneers and industry leaders in the chemical industry as BASF, Dow Chemical and DuPont today all rely on cyclic scheduling with fixed production sequences. A central motivation for introducing LEAN SCM for manufacturers of both specialty and basic chemicals, in addition to generally simpler planning processes, is above all more efficient synchronization of their often highly complex global production processes.

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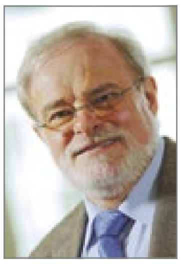
Cost Of Compliance

Global Business with Global Regulatory Challenges

From Production To Purchase — *Distribution generally refers to all processes that take place between producers and dealers, right up to the final purchaser in the sales channel, according to Gabler Dictionary of Finance. Logistics activities relate to the transportation, storage, supply, purchasing and distribution of goods, people, money, information and energy, and their management, controlling and optimization.*



Dr. Karl-Franz Torges, managing partner, KFT Chemieservice

Logistics is also defined as the integrated planning (logistics planning), organization, management, handling and controlling of the entire flow of goods and materials and the associated flows of information. The process starts with sales planning/marketing, development and production and extends via the (company's own) stages of operational value creation (e.g., stages of production or distribution), purchasing and product delivery through to waste disposal, recycling and consideration of company goals. Until a few years ago, it was still possible to define this chain based on the following equation:

Value creation/profit = sales (sales price) - purchasing (purchase price) - transport/storage (transport/storage costs) - administration (invoicing, sales, marketing)

Figure 1: The product and the regulatory environment
The example of a wood preservative shows just how complex the problem can be. This depicts the situation in Germany as an EU member state. The legal specifications may differ in other areas of the world. Only the legal regulations relating to marketability are shown. The presentation does not take into account other legal areas such as transportation, storage and import and export legislation.

Over the last few years, the cost of regulatory compliance has had to be added to these costs. This involves costs as well as the fundamental issue of whether there is any option for the marketing, transportation, storage or export/import of the goods. Regulatory compliance is a question of cost as well as involving significant time aspects. Therefore the issue of regulatory compliance needs to be addressed at the beginning of the process in addition to the financial issues.

Marketability

The first question should be the question of marketability. Can I manufacture, import, export or market a product in line with regulatory requirements?

This applies to the product itself as well as all of the product's ingredients. The correct classification of the product in terms of its use, industry or market sector presents a serious challenge. Different product groups are often subject to very different legal regulations, which may overlap or be mutually exclusive. Different legal requirements may need to be covered. A product in Europe may be subject to cosmetics legislation but in other countries may only have to meet food or commodity regulations. Products may fall simultaneously under biocide, electronics or REACH (Registration, Evaluation, Authorization and Restriction of Chemicals) legislation.

Regulations specific to the customer, industry or sector may also have to be respected. Many cosmetics and consumer goods companies have their own lists of prohibited ingredients covering mixtures or products. It is also important not to overlook issues relating to import/export regulations, dual-use goods and weapons of war. (See example in fig. 1.)

Manufacturing And Storage

Even if questions about potential global or regional marketability are answered positively, companies must clarify whether the product can be manufactured and stored at the planned site. Approval and reporting requirements may be relevant to the production or operation processes. Failure to meet these prerequisites can quickly spell the end for a production site or product.

Following these regulatory issues, technical issues relating to production feasibility may arise. Apparatus-related issues in particular need to be a priority. Questions concerning adherence to workplace threshold limit values, work safety, environmental pollution caused by the production process and waste management play a key role here. New, for some time, the extended safety data sheet and exposure scenarios serve as key tools for testing applications in line with occupational safety and environmental and consumer protection.

Transport

Distribution is often equated with "distribution and transport." Over the last few years, requirements in the transport sector have increased significantly because of new legal regulations (e.g., regulations governing the securing of high consequence dangerous goods). Additional data relating to hazardous properties of products or their ingredients (keyword: REACH) has led to an increase in the proportion of dangerous goods being transported, among other things.

The supply chain has also become increasingly globalized. While 10 years ago medium-sized companies transported goods by road only, these days many importers and manufacturers require up-to-date knowledge about the global transportation of hazardous goods. The packaging, documentation and labeling of dangerous goods must be in line with the law because errors in this sector can quickly lead to fines and costly amendments (changing labeling, repackaging) and can trigger significant delivery delays as a result.

Regulations governing different means of transport have been largely harmonized, but different technical

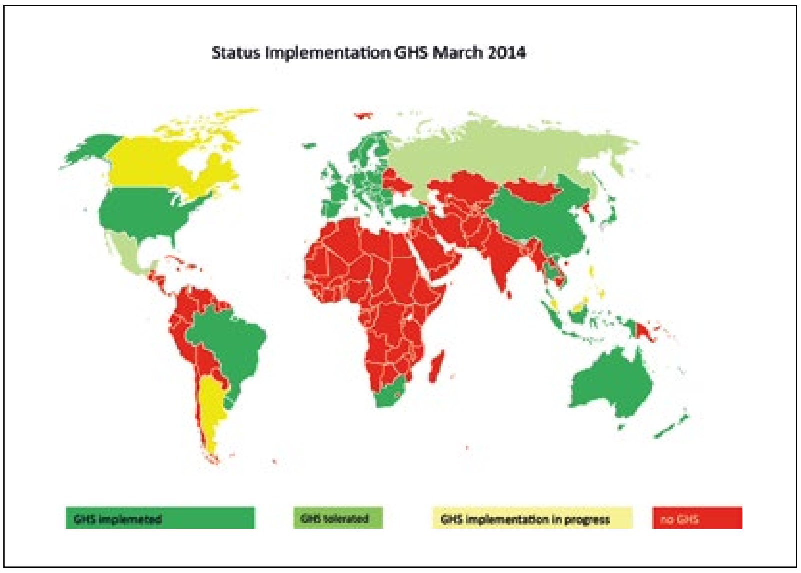


Figure 2: Updated GHS implementation in March 2014

conditions and risks mean that each means of transport needs to take account of specific issues across the supply chain. Road transport involves a tunnel directive, which regulates the transportation of specific hazard categories through tunnels. Stringent safety specifications must be adhered to in air and sea transport to avoid terror attacks, and these must be taken into account when preparing for transportation (keyword: known consignor in air transport).

Progress has been made in the form of harmonization with the hazardous substances act, via the Globally Harmonized System (GHS). The harmonization of classification criteria has led to an eradication of labeling issues, which were a frequent source of irritation.

Classification And Labeling

The regulatory specifications are generally based on the classification of products or their ingredients. As part of this process, the chemical, physical, toxicological and eco-toxicological properties are used in order to allocate substances to a specific hazard category.

The classes and categories identified determine whether specific authorizations may be required, whether and how a product must be labeled and packaged, and whether and how the dangerous good can be transported and with which means of transport. However, this classification also has a significant influence on the market success of the product.

The Globally Harmonized System (GHS) was introduced more than 20 years ago to reduce market obstacles and facilitate global free trade. The foundations for introducing the system have been laid in many countries along with a mandatory commitment to apply the system from mid-2015 (for an overview of the current situation, see fig. 2).

Introduction of the system does not automatically mean 100% harmonization. The time at which the system comes into effect or the GHS version implemented may differ. It is also possible that specifications beyond the GHS may be implemented to ensure that the existing level of protection in the country does not deteriorate.

Summary

GHS is a first step toward simplifying distribution activities. Based on experiences of introducing harmonized regulations governing dangerous goods (UN Model Regulations), it can be estimated that 90% harmonization will take 20 years. However, there is hope that this will halt uncontrolled growth in relation to the classification, labeling and packing of hazardous materials and substances. Large economies such as China and Brazil have implemented GHS rather than having their own systems, which are not based on GHS. This would not have been possible without GHS.

Overall, complexity in the regulatory compliance field will not decrease in the next few years because there will be more and more detailed specifications in terms of the required data and risk assessments. Many countries that did not have regulations in this field have formulated and implemented appropriate legal regulations in the last few years and continue to do so in order to protect the local population and environment.

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More Transparency – Less Cost

Second BVL Forum for Chemical Logistics Takes Place in Industriepark Höchst

Knowledge Is Savings — *This year's Forum for Chemical Logistics will focus on the importance of transparency in logistics processes as well as the resulting cost effects.*

Bundesvereinigung Logistik (BVL) will organize the May conference, and Infraserv Logistics will be the host of the event in the Industriepark Höchst. Dr. Sonja Andres talked to Thomas Schmidt, managing director chairman, and Jochen Schmidt, managing director of Infraserv Logistics.

CHEManager: Mr. Thomas Schmidt, what was the motivation for your company to host the event this year at your place in Frankfurt Höchst?

T. Schmidt: As the largest location for research and production of the chemical and pharmaceutical industry in Germany, the Industriepark Höchst is particularly suitable as a venue for this gathering of the industry. This is where more than 90 companies in the chemical and pharmaceutical industry undertake research and production with more than 22,000 employees, and of course many very special logistics services for the companies are also provided here.

Hardly any other location can be used to illustrate in a similar way how the intensive networking of production and logistics works in practice and can lead to a sustainable increase in the competitiveness of manufacturing companies. The central location within Europe and favorable connections to all modes of transport also allow it to assume the role as a hub for chemical and pharmaceutical products.

Mr. Jochen Schmidt, the theme for the event is "More Transparency — Less Cost." Is this also the main motto of Infraserv Loistics?

Thomas Schmidt (left), managing director chairman, and Jochen Schmidt, managing director of Infraserv Logistics

J. Schmidt: Transparent cost structures are always a prerequisite to achieve lower costs sustainably. Only if you know what processes cause which costs and to what extent, is it possible to identify savings potential. As a specialized logistics service provider for the chemical and pharmaceutical industry, Infraserv Logistics has a lot of experience when it comes to operating as a part of the supply chain of the customer and to support its production processes with customized solutions. The aim is always to represent services and associated costs transparently.

We offer a very wide range of services for our various clients. Sometimes we are involved only in a part of the supply chain, for example, in storage or the organization of internal transport within the industrial park. Therefore, we are able to make the costs transparent for each individual service, and the customer can choose each module individually. This allows maximum cost transparency and the possibility to consider the respective logistics services from the point of view of costs and, if the prevailing conditions or production processes change, to make targeted adjustments, if necessary.

In terms of chemical logistics, where do you see the greatest need for companies in the chemical industry and their external logistics services providers to take action?

T. Schmidt: I see a differentiated situation here with quite different areas requiring action. Many companies have long since recognized the cost advantages of close collaboration with logistics service providers and have taken advantage of these opportunities accordingly. In the process, the understanding is growing more and more that intense cooperative partnerships offer the greatest savings potential. Whoever understands the logistics partner as part of its own value chain and integrates it into processes can gain most from this cooperation.

Logistics is much more than just the transport of goods from A to B, especially in the chemical industry. The regulatory compliance of statutory requirements, the qualification of employees who deal with sensitive products, the framework of customs and fiscal conditions surrounding the international exchange of goods — these and many other issues can have a significant impact on cost structures. Sometimes, the know-how that experienced chemical logistics specialists have is used only partly.

Supply chains within the chemical industry have become not only more international, but they also have to be assessed increasingly according to ecological and social aspects. How can this be brought into line with cost optimization?

T. Schmidt: In this case, there is also a need to pool efforts and to cooperate in partnership with a professional logistics service provider and to be prepared to relinquish those parts of processes that, up until now, you controlled yourself. At the Industriepark Höchst, we are able to shift large transport from the road to more environmentally friendly modes of transport through our trimodal port alone, which permits an optimal network of the transport modes rail, road and water to be developed accordingly. This is, of course, not available everywhere. In addition, companies can use the site as a transshipment or distribution point for breaking up or assembling large shipments. All companies, e.g., those for whom our block train connection is interesting, can also use the trimodal port. This makes ecological sense and saves on transport costs.

We just mentioned the aspect of transparency. In relation to the complex international supply chains and their wide variety of stakeholders, is it at all realistic and possible to create transparency?

J. Schmidt: Yes, this is possible. First of all, the overall processes with the individual process steps have to be analyzed and recorded also in terms of costs. That takes time and, of course, money and not everyone can do it. But the effort is worth it, because the result is a detailed taking stock of the supply chain with the individual costs, which can then also be appropriately adapted and modified. Because we operate in the industrial park and other locations for our customers at very different intensities, we have to make exactly this analysis of the processes. We tell the customer exactly at which point we can provide what services and the costs to be expected, or can be saved under optimal conditions.

The monitoring and control of complex supply chains takes place via our Internet-based system solution LEA (Logistics Excellence Anytime & Anywhere). With LEA, we are able to reproduce customized supply-chain solutions across all routes of transport, to automate and standardize processes, and create greater transparency in the supply chain. This saves our customers time and money.

How important are global standards and hence also transparency with regard to the safety of the entire supply chain?

T. Schmidt: The value of standards should not be underestimated, because they guarantee customers an appropriate level of quality. Furthermore, they encourage cost transparency, as it is possible to compare different quotations and services at the same level, furthermore they can contribute to a reduction in the complexity of the supply chain. Less complexity creates more trust and transparency and ultimately minimizes risk.

They also offer advantages for logistics companies as the processes of different customers can be harmonized, and full advantage can be taken of potential synergistic gains. Only the interaction of all those involved and the same level of understanding provide such benefits. Ultimately, however, these standards also contribute to sustainable actions. Imagine, for example, if shipping containers or pallets were not standardized, this would mean different handling, repeated repacking, differences in the necessary equipment, etc., and would result in significantly more time and effort. Uniform standards are therefore essential.

Finally: Sustainability is required in chemical logistics. How should future transparent control mechanisms be organized, and still remain affordable?

J. Schmidt: Sustainability is a many-sided issue. As a company and part of the Infraserv Höchst Group, we confront ourselves with all checks and audits that demonstrate the careful use of natural resources. The industrial park undoubtedly assumes a pioneering role on this issue. For me, sustainability means choosing the ecologically most appropriate and most cost-effective means of transportation. The industrial park offers certainly some excellent possibilities in this respect with the trimodal port and the transfer of transport capacities to both the rail and waterway options. Also, the modern hazardous goods warehouses, which meet the highest safety standards and avoid adverse effects to the environment, are part of a sustainability concept.


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As a company, we are thus in a relatively comfortable situation, however, considering the diverse regulations and statutory requirements, we should look as an industry more towards the practicality of these specifications. The number of companies that place emphasis on sustainability in all areas of the production process is growing and as a consequence causes chemical logistics service providers to keep suitable records of certification in their own interests, because in addition to the aspects of cost, quality and timeliness this provides the necessary competitive advantage.

www.infraserv-logistics.com

Complexity, Cooperation and Standardization in Logistics

The complexity of supply chains is rising continuously. Therefore, complexity management is an ongoing topic in the industry. Cooperation of logistics providers all along the supply chain could partially solve the problem of complexity. Also, the standardization of logistics processes is an imperative in certain sectors.

For this edition of "CHEManager Distribution & Logistics" our expert Dr. Sonja Andres, editor Logistics, asked industry specialists and company spokespersons about their opinion. These are the questions we put up for discussion:

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

On this page you can read excerpts of the answers we received. You will find the complete statements and some more online on www.chemanager.com/en/tags/cdl-opinions.

Statements

Avoid Information Cuts and Delays with Persistent Standards

Günter Gruber, member of the management of Fritz Group (a shareholder of Cargoline)

Because of the high complexity of supply chains, risks and vulnerability rise constantly and considerably. According to the Risk Barometer by insurance company Allianz, business and supply-chain interruptions and natural disasters are among the major risks that continue to occupy the attention of companies in 2014. In addition, they need to follow a wide variety of rules, certificates and laws. After 09/11 alone, four different black lists were developed by four different U.S. agencies. As a consequence, the USA launched 12 security initiatives in the form of laws or voluntary agreements. The European Union currently has 10 anti-terror compliance rules. This demonstrates very well how complex the issue of security in the supply chain has become. As each supply chain eventually is unique, service providers and customers jointly have to assess the particular risks. This is done by means of an extensive risk analysis, including identification and classification.

Transform Individual Value-Creation Chains into One Network

Michael Kriegel, head of Dachser Chem-Logistics, Dachser

As a system logistics provider for groupage, we face one overarching question: How should the complete supply chain be designed so that the end customers get their goods exactly when and how they need them? To do that, we go over the processes very intensively with our customers, especially when we are setting up a contract logistics project. But what we think is really vital is that we are able to control the supply chain everywhere. That's why we think we can best fulfill the requirements of our customers in the chemicals industry with single-source service by the Dachser groupage network.
To remain competitive, the major logistics service providers have invested a great deal in international networks with efficient, standardized logistics processes. Companies in the chemical industry are likewise harmonizing their logistics processes. One important step on this path is to standardize processes: It's the only way to get significant cost benefits in logistics.

All Parties Should Have Access to All Information

Heinrich Kerstgens, managing director, Contargo

The key to optimization of the supply chain is found in IT, because seamless communication between the various partners is a prerequisite for a secure, reliably functioning logistics chain. Special attention needs to be paid to the interfaces between the partners. In my view this task falls within the remit of the service provider, since we are specialists not only in the transportation of goods, but also in logistics and information.
In the chemical industry, unlike many other sectors, close cooperation between manufacturer and service provider cannot as yet be taken for granted. However, the logistics chain could be made even more efficient and effective by successful integration of the individual participants. The standardization of logistics processes is an important approach to rationalizing their complexity and thus working more efficiently. Nevertheless, logistics service providers should remain flexible enough to be able to respond to individual customer requirements and react to market fluctuations and other changes in background conditions.

Mastering the Use of Information

Carlo Novi, managing director sales, FedEx Express EMEA

It is our approach to continuously develop innovative, industry-tailored solutions to enable our customers to proactively sense and respond to the growing complexity of supply chains. To enable customers to have unparalleled visibility into their global supply chain, FedEx has recently launched and expanded two critical solutions: SenseAware, a near-real-time monitoring service that combines the power of a robust web-based platform with a state of the art multi-sensory device, and Priority Alert, a solution that provides priority handling of critical and time-sensitive shipments with additional monitoring and recovery services.
These two solutions empower customers with near-real-time visibility into location and environmental condition of their shipments.
Sensor-based logistics' combination of environmental sensors, wireless communication, and management software is the basis of a powerful new central nervous system for the global supply chain.
Supply chain leadership in the 21st century is as much about mastering the use of information and big data analytics as it is about physical control.

Logistics Service Providers Are Equal Partners

Peter Viebig, director transport, Talke

Logistics service providers, even if they cooperate among each other, can only ever provide a part of the solution. What we need is closer cooperation between shippers and logistics providers. For instance, in terms of reliability of planning: If logistics providers can plan over the long term, they can make sure the right equipment is available when it is needed and ensure consistent quality at the best possible price.
Standards make sense in many different places, for instance, when it comes to assessing the carbon footprint. Different approaches are used here, despite the fact that the VCI, CEFIC and ECTA have had the topic on their agendas. Consequently, the values obtained are not comparable. Flexibility is also expected when it comes to load securing or when booking time slots for loading. In these areas, standards would help to increase efficiency, reduce costs and create more transparency.

Production and Logistics: 'Integrated Parts of a Whole'

Uwe Willhaus, CEO, Lehnkering, member of the management of Imperial Logistics International

Ensuring the end-to-end flow of information is one of the major challenges facing logistics corporations and the chemical sector in the light of globalization and increasingly complex supply chains. The greater the number of participants involved in the supply chain, the less insight the individual partners have of the complete process. As a result, errors might occur — and this costs time and money. Logistics service providers and industry need to act as equal partners and develop joint solutions. Therefore, Lehnkering places great importance on shaping processes instead of simply handling individual orders.
In my opinion, more cooperation arrangements among logistics service providers will not lead to reduced complexity. Closer cooperation between the service providers and the industry is what is needed to shape supply chains that are more efficient and consistent. Production and logistics must be viewed as integrated parts of a whole in order to make processes stable and supply chains reliable.

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