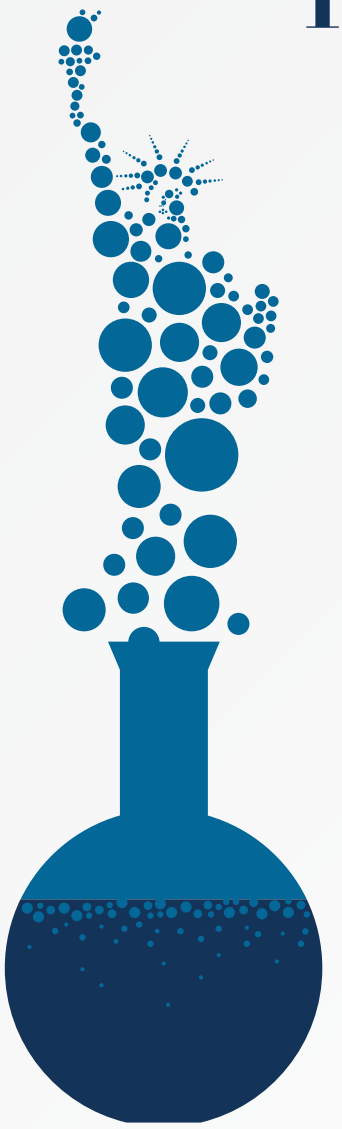
GLOBAL BUSINESS REPORTS

INDUSTRY EXPLORATIONS



USA Specialty Chemicals 2012

-East Coast-

Economy • Market • Pharmaceuticals • Innovation • Challenges • Services

Cal Dooley
President & CEO,
American Chemistry Council

Though the challenging economic landscape is likely to continue into 2013, there is a bright spot: American chemistry. We are one of the nation's most significant manufacturing industries and we play a critical role as an economic growth engine.

American chemistry is essential to the US economy. It:

- is a $760 billion enterprise;
- supports nearly 25 percent of the US GDP;
- has products present in nearly every facet of the American economy;
- accounts for more than 12 percent of the nation's exports; and
- generates 1 in 5 US patents.

As the cornerstone of our economic future, it is vitally important that we have sound policies that encourage solutions to our nation's biggest challenges through innovation that drives economic growth, protects US jobs, and enhances the safety, health and quality of life in our communities.

One of our country's biggest challenges and highest priorities today is achieving greater energy security. In one of the most exciting developments for our industry in decades, we have seen incredible increases in supplies of natural gas from previously untapped shale deposits. These supplies help provide energy security but also create a competitive advantage for US petrochemical manufacturers, leading to greater US investment and growth.

It is estimated that a modest increase in natural gas supply from shale deposits would generate more than 400,000 new jobs in the United States, more than $132 billion in US economic output and $4.4 billion in new annual tax revenues.

The business of chemistry is at the heart of US manufacturing, and access to shale gas has the potential to dramatically boost America's competitiveness and help meet our nation's goals for increased exports and new jobs. Right now the business of chemistry accounts for 12% of all US exports, making it the largest exporting sector in the US.

As we look toward the future, we must continue to develop common sense policies and regulations that support our ability to create the groundbreaking products that are improving the world all around us. •

INDUSTRY INTERVIEWS

The American Chemistry Council talk about TSCA reform and the future of the industry, Beveridge & Diamond discuss the current regulatory framework, and DSM explains the importance of having a US presence.

ANALYSIS

GBR's own researchers provide their insights into the market, with analysis of TSCA reform, the potential of shale gas, and the implications of the Patient Protection and Affordable Care act for the pharmaceutical industry.

EXPERT OPINIONS

Exclusive articles from industry insiders, as SOCMA writes about the progress of the Chemical Facility Anti-Terrorism Standards program and Chemical Search International addresses the issue of recruitment.

This research has been conducted by Angela Harmantas, Amelia Salutz, Chloe Dusser and Katya Koryakovtseva | Edited by Barnaby Fletcher
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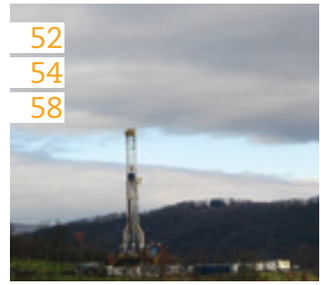
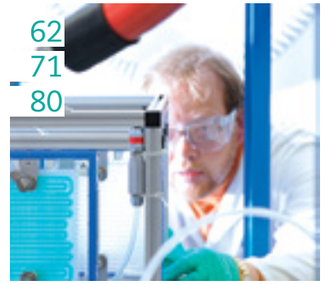
SPECIAL REPORT



The shale gas boom promises to be a boon to the East Coast specialty chemicals sector. We look at the actual potential, with reference to two case studies of Pennsylvania and New Jersey.

INNOVATION



The US specialty chemical industry leads the world in research and development. New trends such as CMOs and CROs, and the increasing importance in green chemistry, signal an interesting future.

FINAL THOUGHTS

Thoughts on the future potential of the US chemical industry, the challenges it faces, and the path it must take to overcome these, from leading businessmen.

A Traditional Power in a New World

An Introduction to the USA's Economy and Chemical Industry

"US chemical manufacturing is and can continue to be globally competitive … It is way too soon to write off the US as a place where manufacturing cannot thrive. It can and it is.".

- Madeleine Jacobs, Executive Director & CEO, American Chemical Society

An Introduction to the USA

A brief introduction to the economy and chemical industry of the United States of America

The world's economic uncertainty is perhaps nowhere better expressed that in its largest economy, the United States of America. While the situation has not reached the extremes of Greece or some parts of the Eurozone, the effects have nonetheless been felt; a recession saw GDP drop by 3.5% in 2009, recovering to 3% in 2010 and 1.7% in 2011. With growth predictions for 2012 and 2013 a small but respectable 2.1% and 2.2% respectively, it feels from an objective standpoint as if the ship has steadied. Yet as the recent presidential race made clear, it does not always seem that way from inside the country.

Despite these troubles, and insecurity derived from the continued challenge to the USA's long-standing economic hegemony from a surging China, the USA remains comfortably the world's strongest market. GDP is almost double that of second-ranked China in terms of real exchange rate, and almost $4 trillion more in terms of purchasing power parity.

GDP-per-capita, at $49,000, is the eleventh highest in the world, the labor force is the fourth biggest in the world, and foreign direct investment into the country was an impressive $227,865,000,000 in 2011.

American scientists and companies still remain at the forefront of development, both in an abstract pure science sense and in tangible technological development for industry. While the 2012 Nobel Prizes for physics (shared with an America), economic sciences (won by two Americans) and, fittingly for this "Industry Explorations" book, chemistry (won by two Americans) aptly demonstrates the nation's continued scientific credentials, it is the predominant position of its companies in the global marketplace that best illustrates its almost unique ability to transfer that knowledge from laboratories to commercial use. The American universities that continue to sit at the top of the world rankings strength these links; providing both the research and the future business leaders.

The pervasive nature of the chemical industry has usually ensured its reliability as an indicator of the wider economy. Inextricably linked to almost 97% of manufactured products and supporting nearly 25% of the American economy, it has accurately reflected both the turbulence and uncertainty in the USA and, given that it produces a fifth of the globe's chemicals, that of the wider world. The number of bankruptcy filings amongst US chemical companies reached 55 in 2009, up from 27 in 2007 and just 12 in 2006; employment waned and chemical shipments fell dramatically.

While the worst of the global recession may possibly be over, continued uncertainty in the Eurozone plus tenuous recovery at home is putting immense pressure on the US chemical industry. To add insult to injury, China recently overtook the United States as the world's largest chemical producer. As Asian countries transform their economies to become more sophisticated manufacturers, the US market is being flooded with cheaper product equivalents from China and India; the value of inorganic imports in Q3 2011 was $4.8 billion, the highest in three years.

The beloved American writer Mark Twain once famously quipped, "the reports of my death are greatly exaggerated", and the same could be said for his country's

States at a Glance

Source: United States Census Bureau

Massachusetts at a Glance

Population: 6,587,536 (2011 est)
Capital: Boston
Head of Government: Governor Deval Patrick (D)
Gross State Product: $348.6 billion (2011)
GSP per Capita: $50,735 (2008)
Economic Sector Breakdown: Education, biotechnology, finance, healthcare, tourism
Nickname: The Bay State
Motto: Ense petit placidam sub libertate quietem (She seeks with the sword a quiet peace under liberty)

Connecticut at a Glance

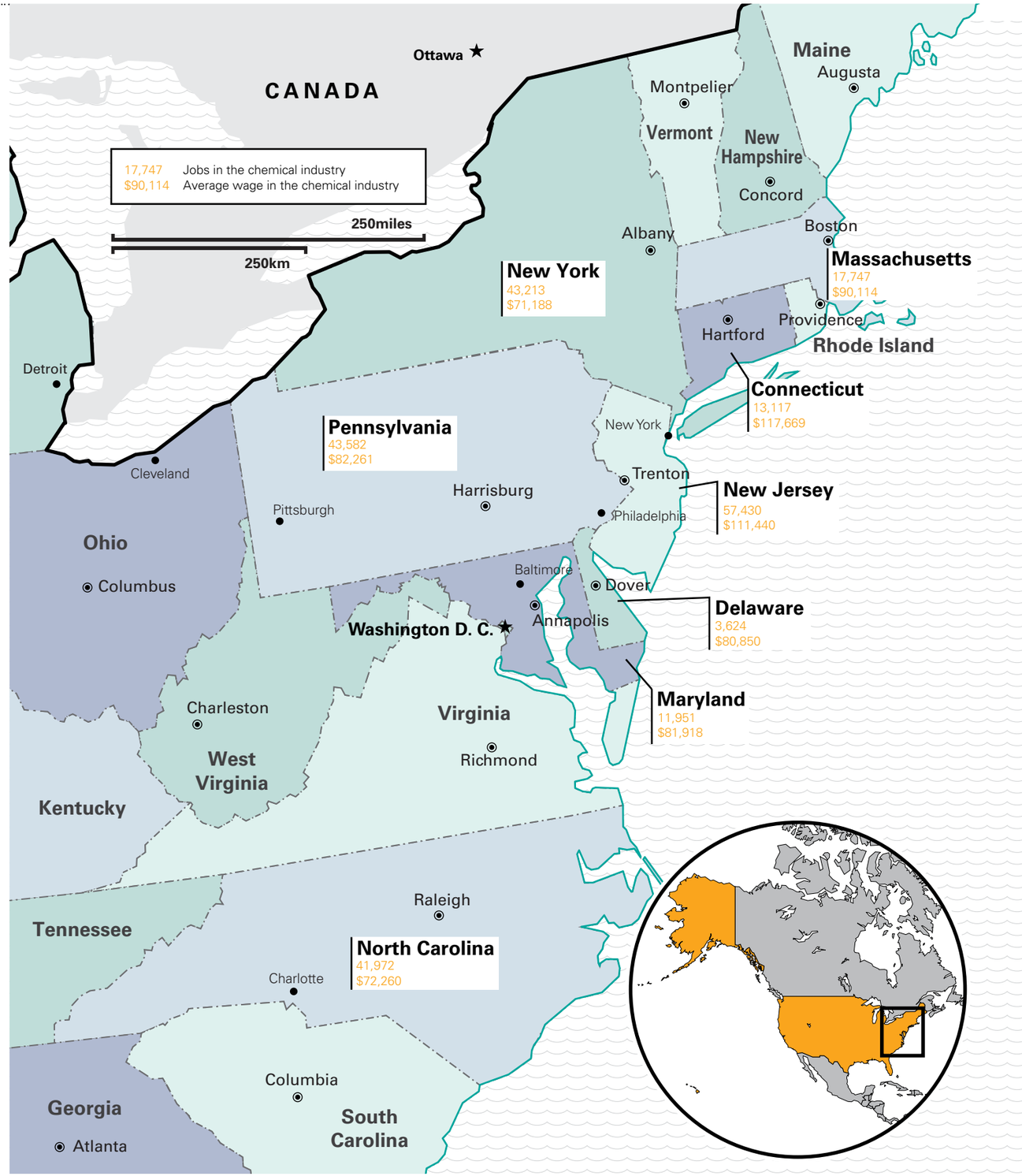
Population: 3,580,709 (2011 est)
Capital: Hartford
Head of Government: Governor Dannel Malloy (D)
Gross State Product: $201.4 billion (2011)
GSP per Capita: $64,833 (2007)
Economic Sector Breakdown: Machinery, electrical equipment, insurance, finance, agriculture
Nickname: The Constitution State
Motto: Qui Transtulit Sustinet (He Who Transplanted Sustains)

New York at a Glance

Population: 19,465,197 (2011 est)
Capital: Albany
Head of Government: Governor Andrew Cuomo (D)
Gross State Product: $1,016.4 billion (2010)
GSP per Capita: $46,364 (2007)
Economic Sector Breakdown: Finance, publishing, scientific instruments, electrical equipment, machinery, chemicals, tourism
Nickname: The Empire State
Motto: Excelsior (Ever Upward)

Pennsylvania at a Glance

Population: 6,587,536 (2011 est)
Capital: Harrisburg
Head of Government: Governor Tom Corbett (R)
Gross State Product: $500.4 billion (2011)
GSP per Capita: $39,830 (2010)
Economic Sector Breakdown: Chemicals, finance, insurance, mining, agriculture
Nickname: The Keystone State
Motto: Virtue, Liberty and Independence



chemicals sector. For while the seemingly perilous position of the industry was indicative of America's uncertainty, its slow but certain recovery is a clear sign that it is still a major global player.

Although American chemical companies have been forced to adapt to a post-recession market place and plenty of pitfalls still remain, underpinning the industry is a slow but steady growth over the past few years and a cautious optimism that pervades among the sector's insiders.

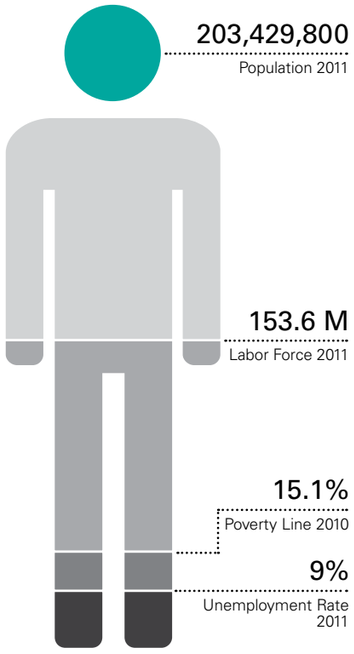
In order to provide a more focused analysis, GBR has elected to focus on regional markets, starting with the East Coast, which for the purposes of this report is defined as including the states of New Jersey, New York, Connecticut, Massachusetts, Pennsylvania, Delaware, Maryland and North Carolina.

The East Coast exemplifies the general trends discussed above particularly well. Chemical production growth for the Northeast region (the above-mentioned states excluding Delaware, Maryland and North Caroline) in 2012 has fallen in the latter part of the year, bringing down the year-on-year growth from 1.8% in June to 0.4% in August (the second highest after the Ohio Valley region). In the Mid-Atlantic region, which includes Delaware, Maryland, and North Carolina, pharmaceuticals are dominant. Pharmaceuticals, although facing significant competition as patents expire and generics flood the market, had a strong year in 2011; 3.5% growth was well above general industry growth, or wider economy growth. Nonetheless, and perhaps due to this strong 2011 showing, 2012 was a bit tougher, with the Mid-Atlantic region seeing a 0.5% drop year-on-year in August.

Nonetheless, the chemical industry here, less dominated by petrochemicals than those of the southern regions, displays a diversity and focus on high value-added specialty chemicals that contributes to a cautious optimism. Other factors, such as the strategic position of the region (poised to benefit from declining European production and less challenged by the Asian markets), and its traditional status as a chemical producer, also make it an interesting case study of the challenges facing American chemical companies as a whole. •

Domestic Market: Population and Poverty

Source: World Bank - CIA World Factbook



203,429,800
Population 2011

153.6 M
Labor Force 2011

15.1%
Poverty Line 2010

9%
Unemployment Rate 2011

World Largest Economies

Source: CIA World Factbook

	(trillion dollars)
United States	$15.07
China	$7.29
Japan	$5.86
Germany	$3.60
France	$2.77
United Kingdom	$2.49
Brazil	$2.41
Italy	$2.19
Russia	$1.85
India	$1.82
Canada	$1.73
Australia	$1.48
Spain	$1.47

New Jersey at a Glance

Population: 8,821,155 (2008 est)
Capital: Trenton
Head of Government: Governor Chris Christie (R)
Gross State Product: $426.8 billion (2011)
GSP per Capita: $46,588 (2010)
Economic Sector Breakdown: Pharmaceuticals, chemicals, finance, telecommunications, food processing, electrical equipment, publishing, tourism.
Nickname: The Garden State
Motto: Liberty and Prosperity

Delaware at a Glance

Population: 907,135 (2011 est)
Capital: Dover
Head of Government: Governor Jack Markell (D)
Gross State Product: $57.3 billion (2011)
GSP per Capita: $34,199 (2010)
Economic Sector Breakdown: Chemicals, pharmaceuticals, finance, healthcare, automobile manufacturing
Nickname: The First State
Motto: Liberty and Independence

Maryland at a Glance

Population: 5,828,289 (2011 est)
Capital: Annapolis
Head of Government: Governor Barbara Mikulski (D)
Gross State Product: $264.3 billion (2011)
GSP per Capita: $43,500 (2006)
Economic Sector Breakdown: Chemicals, electronics, fishing, agriculture
Nickname: Old Line State
Motto: Fatti maschii, parole femine (Strong deeds, gentle words)

North Carolina at a Glance

Population: 9,656,401 (2011 est)
Capital: Raleigh
Head of Government: Governor Bev Perdue (D)
Gross State Product: $385.1 billion (2011)
GSP per Capita: $33,735 (2007)
Economic Sector Breakdown: Finance, agriculture, chemicals, electronics
Nickname: Tar Heel State
Motto: Esse quam videri (To be, rather than to seem to be)

1.7%

GDP Growth Rate 2011

Source: World Bank, CIA World Factbook

Budget Deficit 2011

-8.6%

of GDP

Source: CIA World Factbook

3.1%

Inflation Rate Average Consumer Prices 2011

Source: International Monetary Foundation, CIA World Factbook

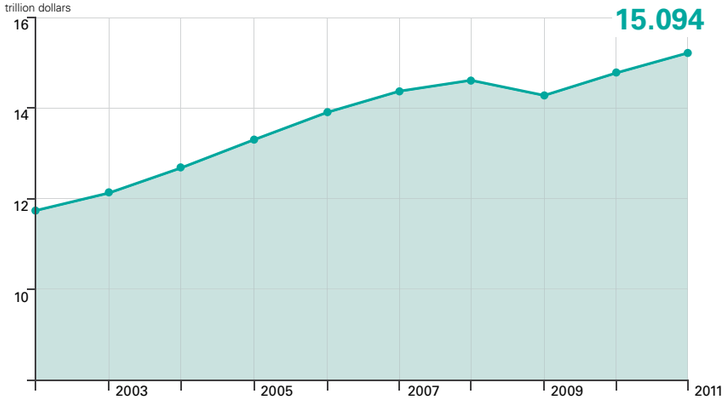
-$178,377 MILLION

Foreign Direct Investment Balance of Payments (current US dollars) 2011

Source: World Bank

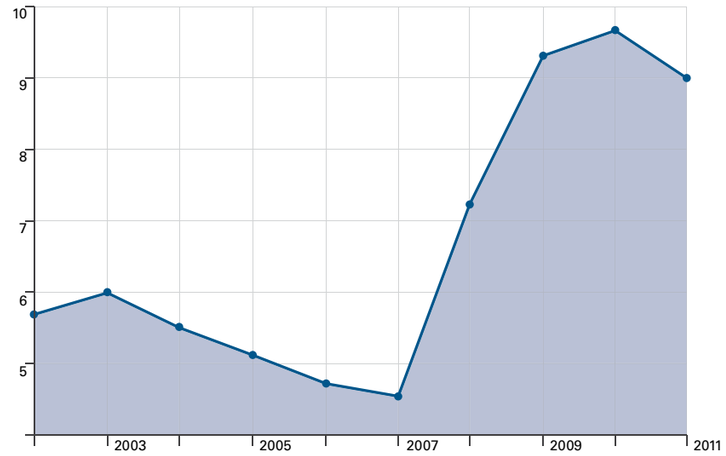
GDP (current US dollars)

Source: World Bank, CIA World Factbook



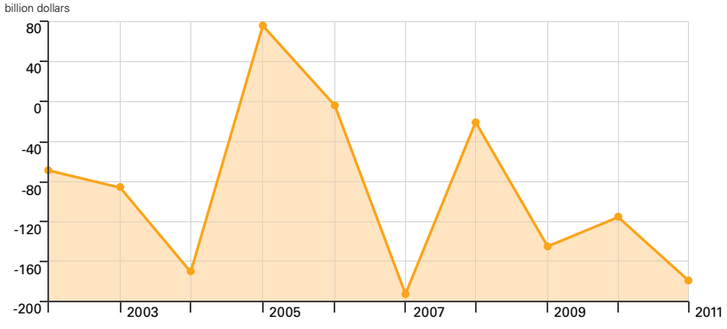
Unemployment Rate (%)

Source: CIA World Factbook



Net Foreign Direct Investment (current US dollars)

Source: World Bank



Interview with **Calvin Dooley**

PRESIDENT AND CEO, AMERICAN CHEMISTRY COUNCIL

Could you provide us with a brief introduction to ACC?

ACC's mission is to deliver business value through exceptional advocacy, and our priority is to advocate for sound government policies that preserve and promote competition and innovation. We're America's oldest trade association of its kind, representing more than 160 companies engaged in the business of chemistry – an innovative, $760 billion enterprise that is helping solve the biggest challenges facing our nation and the world.

Our members are the leading companies engaged in all aspects of the business of chemistry, from the largest corporations to the smallest, and everything in between. For more than 140 years, companies have joined ACC because we provide, access, expertise; information and opportunities. Our offerings are extensive and diverse. They include everything from first-in-class advocacy; business opportunities and networking; economic and industry intelligence; research and benchmarking; specific product and market sector support; professional and technical conferences; and CHEMTREC®; the industry's foremost emergency response initiative.

How has ACC's membership evolved in recent years in accordance with industry trends?

Representing more than 85% of U.S. chemical manufacturing capacity, ACC has three categories of membership: regular, affiliate, and associate. We also continue to grow our base of small and medium-sized enterprises. In these uncertain times, companies of all sizes want to know that membership delivers results and value. Our continued growth is proof of our effectiveness when it comes to strategic advocacy, product and market sector defense, compliance assistance and business networking opportunities.

It's critical that today's policymakers understand the scale and scope of the economic and societal contributions our industry makes – both directly and indirectly, so the addition of our value chain partners to our membership continues to strengthen our ability to provide exceptional advocacy at all levels of government.

ACC's mid-year 2012 Market Situation and Outlook reported slow growth and softer demand for U.S. exports in 2012. What expectations do you have for 2013?

We are anticipating sub-par economic growth into 2013 as the economy continues to face strong headwinds and concerns around the fiscal cliff crystalize. We are also seeing this year's economy repeat the pattern of 2010 and 2011. At ACC, we have compared this situation to the old Charlie Brown comic strip where Lucy holds the football for Charlie but at the last moment as he goes to kick it, she removes it. Just as the first quarter discussion about economic recovery is finally gaining traction, the proverbial football – the recovery – disappears, hence the 'Charlie Brown' effect. If this trend continues, it is likely that job creation, income growth, growth of sales and growth of production will continue, but at a very slow rate.

Given ACC's high prioritization of regulatory reform, please elaborate on your efforts to represent the industry's interests regarding TSCA reform on Capitol Hill?

ACC strongly supports legislation and regulatory action on TSCA that further enhances the safety and health of people and the environment, new approaches must be based on reliable scientific data without creating burdens that stifle innovation and reduce global competitiveness. Although the partisan divide in Congress this year prevented a sound bi-partisan bill for TSCA modernization from advancing, we will continue to work with Congress to craft a new proposal that will attract bipartisan support and create a world-class regulatory system that provides for the safe use of chemicals, protects American jobs and maintains U.S. global leadership in innovation. A strong foundation has been laid for bi-partisan chemical management reform in 2013.

The boom in U.S. shale gas development has spurred renewed investment in the chemicals sector. What activities has ACC undertaken to foster this growth?

Energy demand continues to increase, and regulatory policies are creating uncertainty about future supplies. Yet after years of debate, America lacks a national energy strategy. In order for our economy to grow, U.S. industries to innovate and compete globally, and businesses to create new jobs, our nation must have a truly comprehensive energy policy.

In early 2012, ACC launched a campaign to promote and advance specific policy outcomes that support, among other things, the production and utilization of shale gas.

How do you expect the U.S. chemical industry to perform in comparison to its Chinese and Indian counterparts in the medium-term?

Output of chemicals in emerging markets will continue to outpace production in developed countries. China, the world's largest chemical sector, will continue to grow strongly, but at a slower pace that in the previous decade. India and other emerging markets in the Asia-Pacific region will continue to expand. Over the next several years, chemical output in the dynamic economies of China and India are expected to grow 9% to 10% per year. By comparison, U.S. chemistry is expected to grow by 2% to 3%, slightly ahead of GDP growth as the renewed chemical competitiveness boosts exports. From a product standpoint, the strongest growth will continue to be in specialties, consumer products and agricultural chemicals. •

Courtesy of Aptuit

A Changing Market

The turbulence and dynamism of the US chemical industry

The period that America's chemical industry, and specifically its specialty chemical industry, is now entering is one that is in equal parts turbulent and dynamic. Geological developments at home and global economic circumstances have combined to create a new business environment, with specialty chemicals companies especially being forced to drastically rethink their business models.

"The chemical industry in the United States has an interesting future that will be full of growth. Companies are starting to focus more on innovation and technology as opposed to low cost," said Alexander Wessels, president and CEO of DSM Pharmaceutical Products, and chairman of DSM North America.

Not all this forced adaptation is a result of bad news; a variety of factors, both challenging and promising, have served to re-sculpt the landscape. Much of the optimism surrounding the US chemical industry's recovery is due to the excitement over the Marcellus Basin shale, a geological outcrop containing untapped natural gas reserves that blankets the sediment beneath the Eastern United States.

"Given the relative inexpensiveness of natural gas and the closeness of the Marcellus shale field in Pennsylvania, there is a very good chance investment will come back to the region," said Hal Bozarth, executive director of the Chemistry Council of New Jersey. "Natural gas is the lifeblood of the chemical industry, whether the gas is used to heat or run the facilities or its wet stream materials are used as raw materials for specialty chemical manufacturing."

These developments have helped drive the price of natural gas to its lowest in a decade in early 2012. At the time of writing, gas had risen from that low of $2/MMBtu to a little over $3/MMBtu, but remained a far cry from the almost $5/MMBtu of mid-2011.

Although hydrocarbons of whatever form arguably have a more direct effect on the petrochemical industry than specialty chemical manufacturers, the downstream advantages are undeniably there. According to the American Chemistry Council, specialty chemical production in the United States is expected to grow 5.1% in 2012, with a 3% growth rate forecast for 2013, thanks partly to lowered natural gas prices for specialty chemical companies being translated to lower costs for the end user, stimulating demand in markets such as agricultural chemicals and consumer products.

The demand, however, is not driven entirely by the domestic market. American housing and construction industries are only beginning to recover from the 2008 crash, and while the automotive industry is regaining its footing, the US economic outlook as a whole remains weak. In light of these domestic challenges, new growth markets become ever more important for chemical companies to survive and thrive.

The specialty chemicals sector has historically been the bastion of North American and Western European countries, yet this shift towards outward growth represents a significant change in business models and strategies, and chemical companies are taking heed; the value of US chemical exports reached a record $86.9 billion in 2011, according to census data. This is not simply a case of companies embracing an opportunity overseas; emerging from the most widespread recession to hit the US since the Great Depression of the 1930s, chemical companies have learned that when navigating the waters of a volatile marketplace it is best to spread the sails as wide as possible.

The importance of financial responsibility in companies has also been emphasized by the global financial crisis; something many governments around the world could do well with learning.

"The global financial crisis affected every business," said Wessels of DSM. "DSM has been more affected in performance materials than in pharmaceuticals or nutrition, although the company is resilient and our financial stability has provided the company with many opportunities."

In order to maintain this financial stability, US chemical companies were forced to examine their cost structure in a more innovative manner.

"During the recovery of the recession we invested our resources in a way that has allowed us to manage our products, which has given us more of an insight into how our costs really work," said Kate Donahue, president of Hampford Research Inc., a custom chemical manufacturer in Stratford, Connecticut. The company put systems and infrastructure in place for data management that enabled them to react quicker to other market opportunities, such as dental and cosmetic product manufacturing.

The financial crisis certainly forced companies to tighten their cost structure, but some companies, such as Edison and New Jersey-based specialty chemical manufacturer Croda Inc., remained focused on long-term objectives. "During the crisis, we were careful about costs, but we were also sure not to do anything we would regret later when the economy improved. We did not change our long-term investment in R&D, marketing or promotional work," said Kevin Gallagher, President of Croda Inc.

As demand from end-user markets has now begun to increase, so too have the fortunes of US chemical companies; various indices such as the Dow Jones are showing a sustained trend of strong and increasing growth. •

Global Chemical Industry Predicted Growth

Source: UNEP

Percent change, 2012-2020	
North America	**24%**
United States	**25%**
Canada	27%
Mexico	28%
Latin America	**33%**
Brazil	35%
Other	31%
Western Europe	**24%**
Emerging Europe	**35%**
Russia	34%
Other	36%
Africa & Middle East	**40%**
Asia-Pacific	**46%**
Japan	22%
China	66%
India	59%
Australia	23%
Korea	35%
Singapore	35%
Taiwan	39%
Other	44%

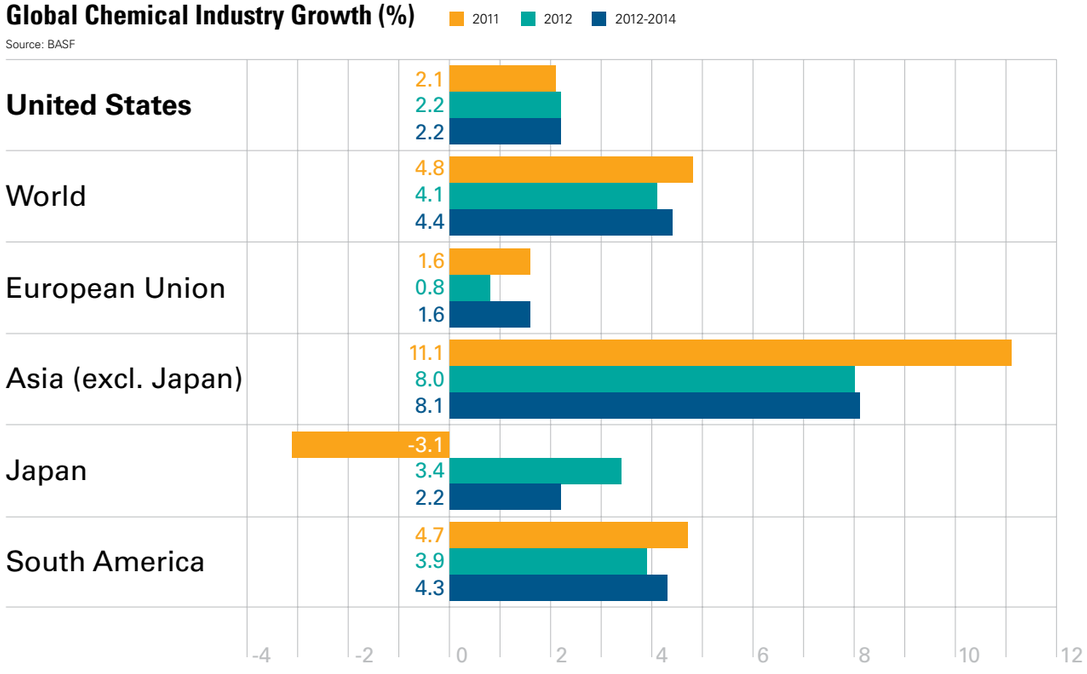
Top Global Chemical Companies

Source: ICIS

1. BASF (Germany)
2. Dow Chemical
3. ExxonMobil
4. Sinopec (China)
5. LyondellBasell Industries
6. SABIC (Saudi Arabia)
7. Shell (Holland-UK)
8. Mitsubishi Chemical (Japan)
9. INEOS (UK)
10. DuPont

Global Chemical Industry Growth (%)

Source: BASF



The business of chemistry provides
788,000
American jobs
Source: American Chemistry Council

The business of chemistry supports nearly
25%
of the U.S. GDP
Source: American Chemistry Council

The business of chemistry is a
$760
billion enterprise
Source: American Chemistry Council

Global Chemistry Industry Output (billions of dollars)

Source: American Chemistry Council

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Global Trade in Chemicals	602.0	658.2	785.7	962.7	1,087.6	1,222.9	1,444.6	1,635.7	1,412.5	1,663.7	1,887.1
Shipments by Region:											
United States	438.4	462.5	487.7	540.9	610.9	657.7	716.2	738.7	624.4	701.2	759.3
Other NAFTA	64.7	63.6	67.7	79.9	91.4	99.0	104.1	106.9	83.9	98.0	114.7
Latin America	108.0	103.3	117.4	135.0	157.5	176.1	201.5	234.0	213.7	260.1	315.3
Western Europe	488.1	523.7	626.5	711.1	749.4	805.6	930.1	1,027.1	862.6	941.6	1,106.9
Central & Eastern Europe	49.7	52.5	61.0	73.2	81.9	99.0	119.0	146.9	109.1	145.7	188.9
Africa & Middle East	54.8	55.5	70.6	84.8	93.7	96.5	110.2	137.5	117.2	143.0	175.5
Asia-Pacific	492.1	512.0	607.6	736.5	852.9	972.1	1,165.9	1,408.7	1,415.9	1,829.1	2,337.9
Total Chemistry Shipments	**1,695.8**	**1,773.2**	**2,038.4**	**2,361.5**	**2,637.7**	**2,906.0**	**2,906.0**	**2,906.0**	**3,426.7**	**4,118.7**	**4,998.4**

Interview with **Thomas Tritton**

PRESIDENT, CHEMICAL HERITAGE FOUNDATION

Can you explain the mission of the Chemical Heritage Foundation and the services that you provide?

The Chemical Heritage Foundation is an independent non-profit organization dedicated to fostering an understanding of chemistry's impact on society. We like to say that we do everything there is to do about chemistry except chemistry. The first part of the organization is our library. CHF collects everything there is to do with chemistry and related sciences, from books to instruments, art and manuscripts. We even collect every stamp every country has ever produced with a chemical theme. We have the only collection in the world of this magnitude and our building houses 5.5 miles of shelves of artefacts dating back to the fifth century or earlier.

The second part of CHF is our museum. We are an educational institution that aims to reach a broad public and the museum is one way that we can make our collections available to the public. CHF holds many public events and sponsors activities doing anything we can think of to interest people in science. Our third piece is our centre for scholars. We are also an independent research organization that functions in many ways like a university. We have what amounts to a faculty who do research on the history and impacts of chemistry and we also have a fellowship program that brings in 20 scholars from around the world every year to stay in residence.

In what ways do you partner with the chemical industry?

We are not principally partners with industry, but CHF will do everything we can to be supportive of the industry. We take a wide view of chemistry and the audience for our industry-related events ranges from small specialty companies to big pharma. We are also partners with government agencies that want to regulate the industry, and we are partners with academic institutions that do chemistry and create new ways for the industry to do what they do.

Many members of the industry are also members of our Heritage Council, including SOCMA and ACS. In total, we have about 40 organizations, three-quarters of which are based in the United States. Twice a year, they meet to advise us on how we can best meet this mission of collecting, preserving and making available the history of chemistry.

Can you give us some examples of industry-related programming and services that you offer?

We organize the Joseph Priestly Society, a monthly series of lectures and symposiums centred around industry and innovation. We also hold Innovation Day every September, an event aimed the industry that brings together mostly younger and early-career working scientists and engineers to share ideas about contemporary topics facing the industry.

CHF also works with companies to produce case studies. We have had a long series called Innovation Case Studies, where we worked with a company on a product that maybe failed or was a success to understand what it was that made it a success or what made it harder. CHF is known for being experts in oral history and we have the largest science-based collection of oral histories anywhere. As an example of how we work with companies, we are in discussion with a large chemical enterprise to do their oral history for them and turn those scholarly documents into a set of documents that they can use to preserve their history and make it known to others.

Is CHF looking to create international partnerships to expand the reach of your activities outside of US borders?

One of CHF's growth goals is to have more global relevance and impact. We are the only organization in the world that does that we do, and we need to do it for more than just the United States. CHF has several international partners now, such as the Royal Society of Chemistry in London, La Fondation de la Maison de la Chimie in Paris, IUPAC and JAIMA, the Japan Analytical Instruments Manufacturers Association. In order to represent a country's role in the history of chemistry, we are looking at franchising. We have had preliminary discussions about how to do that in a couple places, but we are in the early stages.

Many industry members have expressed concern that the US chemical sector will face a shortage of qualified personnel in the coming years. Do you think this is a likely outcome?

We have heard from companies that they cannot find the scientists that they need. The paradox is that if you look at the manpower that is produced by the government or independent agencies there is no shortage. They are either not in the right paces or the opportunities do not match the skills and aspirations of the people. Although it is not our purpose to get people to go into scientific careers, we do it by accident because we try to inspire people about chemistry. However, it is equally important to CHF to reach people who are not going into chemistry, because they need to be informed citizens.

In a rapidly advancing industry, what can be gained from focusing on the history of chemistry?

Chemistry has contributed a lot to society, both good and bad and it is important for CHF to remain independent so that we can chronicle both the achievements and challenges that chemistry presents for our society. A lot of people have a very negative reaction to chemistry, but we make it accessible. A focus on history makes chemistry a personal thing. It is not abstract; it is about the people who created it. History also makes chemistry about its practical ramifications, highlighting the achievements that chemistry has made possible. •

Interview with **Madeleine Jacobs**

EXECUTIVE DIRECTOR & CEO, AMERICAN CHEMICAL SOCIETY

Can you give us an introduction to ACS and your mission?

The American Chemical Society was founded in 1876 by a handful of chemists, and we have since grown to become the world's largest scientific society with more than 164,000 members. In 1937, the U.S. Congress granted ACS a national charter of incorporation that was signed into law by President Franklin Roosevelt. Fundamentally our over-arching goals have not changed in all these years. Our whole reason for being is for the public good. Our mission is about increasing the diffusion of chemical knowledge, aiding the country's industries, helping chemical practitioners become more valuable, educating the public and ensuring the prosperity and "happiness of our people."

Today we have more than 40 scientific journals in chemistry and related fields, in addition to our Chemical Abstracts Service. Two-thirds of our members work in the chemical industry and we have many programs that are aimed at the industry. Many of our career and continuing education programs are aimed at meeting the needs of the industry and we work in tandem with companies to determine the kinds of courses that they need for the continuing education and professional development of their employees. We then work backwards with the universities to ensure that they are producing graduates with the education and skills that industry and other employers are looking for. We seek collaborative ways to engage with organizations like SOCMA and ACC to work on issues that we all agree are important: educating the workforce, advocating in areas of R&D and celebrating achievements in the field of chemistry. While we do not get involved in joint lobbying, we do work with common purpose to present to Capitol Hill our views on things like regulatory reform and alternative energy.

What is the situation like today for US chemical manufacturing?

US chemical manufacturing is and can continue to be globally competitive. People worry about quality issues and counterfeiting outside of the US, not just for pharmaceuticals, but for other chemical products where the purity and specifications are very important. In the US, we normally have excellent quality control standards (although there are sometimes very visible and unfortunate exceptions) and a stable regulatory framework. People are also worried about their intellectual property and we have the best IP protection in the world. It is way too soon to write off the US as a place where manufacturing cannot thrive. It can and it is.

How important is the area of specialty chemicals to the growth of US chemical manufacturing?

Among the healthiest areas of the industry is specialty chemicals. Specialty chemical manufacturers play such a critical role in terms of the overall health of the chemical industry. Many specialty chemical companies started out as small, entrepreneurial startups that either grew or were sold to a bigger company. Entrepreneurship plays a very critical role in the specialty chemical area. Most of the growth in new jobs comes from small companies. We need more of these types of companies because they employ people and make innovative products that other companies and sectors need.

How has the passing of the America Invents Act, signed into law in September 2011, impacted your members?

AIA was the first time in 50 years that the US updated its patent law. The act brings US law into sync with other countries and will hopefully eliminate fighting with the first to file rule. This was a modernization that was long overdue. One of the biggest hang-ups occurring at the US Patent and Trademark Office is a bottleneck of hundreds of thousands of patent applications. When you ask yourself, what is the fuel that drives innovation? The answer is these patent applications, and they have been sitting there without the adequate examiners to process them. The passage of AIA has enabled the office to hire people and clear out this backlog.

One of the big problems for startups is when they hold a patent and someone else gets issued a patent that infringes on it. Then they must spend a lot of time and energy to defend their patent. In a start-up, where money is tight, patent litigation can wipe out profits and take away funds. Having better trained patent examiners will reduce the issuance of patents that are not robust and get rid of this backlog. There are 1.2 million in progress and 700,000 in backlog. You cannot run a successful innovation enterprise when you have all this IP bottled up.

How is the current US political climate impacting the industry's growth plans?

Because this is a Presidential Election Year in the U.S., nothing that should get passed to stimulate the US economy is getting passed in Congress. Companies are understandably not sure about what is going to happen, and when they are not sure, they do not take action. They do not invest, they do not build new plants and they do not hire more people, and that is what is going on right now.

How do you expect the chemical industry to perform in the medium term?

The chemistry industry's health in general is going to depend a lot on what happens not just in the US but elsewhere. The Eurozone is a huge producer and consumer of chemicals and the outcome of the debt crisis is going to be critical to what is going on in the United States. Overall, we are predicting modest optimism. There are still many hurdles in this country with regards to manufacturing, but we have some very good positives, such as lower natural gas prices. The chemical industry is going to be innovative and start new companies and there will be growth. •

Courtesy of DKSH

The Regulatory Framework: **Rules and Reforms for an Uncertain Chemical Sector**

"We can make comparisons with China, where Kureha also manufactures. People sometimes say that in China the law changes frequently; subsidies are given and then taken away. The US is not subject to these frequent changes. Also, it is a single marketplace and business friendly."

- Koji Hagino President & CEO, Kureha America

Rules and Regulations

A simple overview of a complex environment

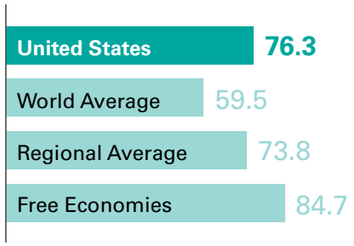
United State's economic freedom (2012)

76.3

Source: Heritage Institute 2012 Institute of Economic Freedom

Country comparisons

Source: Heritage Institute 2012 Institute of Economic Freedom



Ease of Doing Business

Source: Doing Business database

1. Hong Kong	89.9
2. Singapore	87.5
3. Australia	83.1
4. New Zealand	82.1
5. Switzerland	81.1
6. Canada	79.9
7. Chile	78.3
8. Mauritus	77.0
9. Ireland	76.9
10. United States	**76.3**

Investors in the USA are not free from worry, and neither should they be expected to be; in this uncertain global economy no investment plans, no matter how well laid or in what country, are foolproof. Yet in the US chemical industry this uncertainty is compounded. The distinct lack of regulatory modernization places the sector in an uncomfortable position.

In the wake of Europe's rollout of its Registration, Evaluation, Authorization and Restriction of Chemical substances (REACH) law, which entered force in the European Union in 2007, regulations have grown notably tighter worldwide. The US is struggling to follow suit with a reformed regulatory policy that clears political divisions in government, industry approval and public concern.

This type of regulatory uncertainty is unusual for the United States. While partisan politicians may throw accusations at their rivals for being unfriendly to business (or, more recently, too friendly to big business), the truth of the matter is that clear regulations and an established rule of law has contributed to a welcoming business environment in the country, which is ranked fourth in the world for ease of doing business according to the World Bank's 2012 Doing Business report, and 10th in the world in the Heritage Foundation's 2012 Index of Economic Freedom.

The law at the center of the debate is the Toxic Substances Control Act (TSCA). Enacted in 1976, the law empowers the Environmental Protection Agency (EPA) with the authority to require reporting, record-keeping and testing requirements for new and existing chemical substances and mixtures.

Since TSCA was passed, it has not been significantly amended, and as such has been criticized by industry stakeholders and policymakers alike as inefficient and unable to provide EPA with the necessary resources and authority to adequately impose controls.

The piece of legislation to advance furthest in the way of TSCA reform, Senator Frank Lautenberg (D-NJ)'s Safe Chemicals Act, was moved to mark-up in July 2012 by the Senate Environment and Public Works Committee. The Senate committee's approval of the proposed reform was the first vote of its kind in 35 years. Historic though it may be, the question of whether Lautenberg's bill is the way forward is still a matter of debate.

The Safe Chemicals Act argues that EPA is overburdened, citing the fact that the agency has only been able to require testing for 200 out of the over 80,000 chemicals in TSCA's inventory. The bill proposes shifting the burden of proof of a chemical's safety to the chemical companies themselves and increasing EPA's authority to evaluate this safety on the basis of sound science.

Industry stakeholders have voiced concerns that the bill would deal a severe blow to the industry, imposing costly data requirements for existing chemicals and impacting their ability to bring new products to market.

While industry opposition is strong, stakeholders have been brought to the table in hopes that reform can be achieved in the near future. "It is a possibility that we will see reform in 2013, but it will be an uphill battle to see any legislation pass. There is still no consensus, but progress has been made through dialogue between legislators, NGOs, and industry representatives," said Mark Duvall, principal at the environmental law firm Beveridge & Diamond.

One thing is clear: the government's failure to reach consensus with regards to chemical regulation modernization is doing nothing to improve the confidence of the post-crisis industry. Understandably, many chemical industry players are unwilling to invest in the capital necessary for growth.

"Because this is a presidential election year in the US, Nothing that should get passed to stimulate the US economy is getting passed in Congress," explained Madeleine Jacobs, executive director and CEO of the American Chemical Society. "Companies are understandably not sure about what is going to happen, and when they are not sure, they do not take action. They do not invest, they do not build new plants and they do not hire more people and that's what is going on right now."

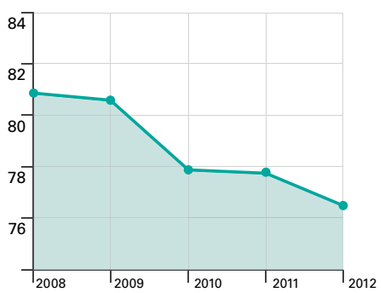
Another key regulatory issue for the chemical industry is the Department of Homeland Security's (DHS) Chemical Facility Anti-Terrorism Standards (CFATS). The program has yet to be reauthorized for the long-term, causing concern for many companies who have invested millions of dollars in meeting these security requirements.

"The CFATS program has proven to be extraordinarily successful. Implementation of CFATS has been controversial because of how DHS has carried out its responsibilities in evaluating information submitted by companies," said Duvall of Beveridge & Diamond. "Overall, the industry itself has done a good job of looking at its own vulnerabilities, and it is better at making the safety-related decisions than the government is. "

"Chemical security is a huge issue for our members," said Chris Jahn, president of the National Association of Chemical Distributors (NACD). "Although CFATS got off to a rocky start, DHS has done its best to identify issues with the program that need to be fixed. NACD believes that CFATS as a whole is fundamentally solid and the law itself needs to be extended for the long-term and fully implemented by DHS. We do not think it is necessary to start over and waste all of the work that has already been done." •

Country's score over time

Source: Heritage Institute 2012 Institute of Economic Freedom



"While regulatory response is important, it is just one facet of the suite of services that chemical companies should be addressing. The reality is that we are entering a renaissance in regulatory development worldwide: everything is moving in the direction of understanding not only your chemistries, but what they do to the environment, to people, and how you should be using them."

Rich Hubner, Senior Consultant, Cardno ENTRIX

"The EPA does a great job with its regulation and enforcement, however, sometimes the bureaucracy involved can be cumbersome, especially to a small business. Distributors play a distinct role in the supply chain. We are not manufacturers and we are not end users. Many times the regulations on our industry do not reflect our unique function. We have done some business in Europe, but frankly, REACH requirements are so complex it makes it very difficult for us to enter the European market. If more REACH-like regulations are implemented by the EPA, the result would be catastrophic for small businesses like ours."

Wendy Cleland-Hamnett,
Director of the Office of Pollution Prevention & Toxics, EPA

"Chemtura does quite a bit of advocacy to help promote sound science and a risk-based approach as a basis for regulations. This is critical for the industry. One of our objectives is academic, promoting interest in the technical sciences, but we are also committed to showing that we are good neighbors. We bring neighbors into our plants to demystify what is going on in our pipes. We also deal closely with government officials to help them understand what is important for the industry. Job creation has been a good way to get an audience in Washington in the past few years."

Craig A. Rogerson, Chariman, President and CEO, Chemtura

"Historically, the primary role that a small company played was simply to offer cost savings (as a result of lower overhead), but as the industry became more regulated, we have had to substantiate our credibility and industry certification in all that we do. As a result, today many of our customers are Fortune-100 companies."

Jessica Fegan, Vice President Business Development, Technichem, Inc.

Interview with **Lawrence D. Sloan**

PRESIDENT, SOCIETY OF CHEMICAL MANUFACTURERS AND AFFILIATES

Can you provide us with some background information about SOCMA?

We were founded in 1921 as the Synthetic Organic Chemical Manufacturers Association; in 2009 we became the Society of Chemical Manufacturers and Affiliates. SOCMA has three platforms: helping businesses become more productive and efficient, instilling greater public confidence in the chemical industry, and advocating smart regulations and laws. An integral side business, Association Management Services (AMS), is a portal for us to run the affairs of smaller trade associations. When the EPA requests information on particular chemicals, we will often take the initiative to form consortia, banding companies together to fund research. In 1984, we founded and later sold a trade show called Informex, one of the first of its kind for the speciality chemicals industry. It has grown from 50 or 60 exhibitors to around 450, and attracts anywhere from 3,500 to 4,000 attendees.

The other facet of the chemical industry that we have embraced is biotechnology. This brings a very different breed from the traditional organic or inorganic chemical company. We created a new affiliates group called The Society for the Commercial Development of Industrial Biotechnology. It focuses on the business side of biotech, helping companies connect with commercialized partners, and helping with funding and the ability to scale up.

Why is there a stalemate over TSCA reform?

A bill has been introduced in the Senate that would mandate an inconceivably high bar regarding the definition of no-risk. You have to look at it in terms of permissible risk, based on the hazardous nature of a chemical, plus its exposure potential. Many of our members make raw materials that are used in a very contained environment as additives and intermediaries in other products which do not end up in the final product used by the consumer

The legislation, which was amended by a Senate committee along party lines, has many other specific criteria. They want states to be able to do their own thing; we are concerned about state pre-emption, because of the growing patchwork of regulations. There has been an emphasis on every single chemical being proven to be completely safe and harmless before it can be entered into commerce. Another issue is the Confidential Business Information; our companies have to rely upon trade secrets, and if you release the name of the specific chemical identity it could be picked up by competitors like China. We understand the need to provide an identity as part of a health and safety study, but we are saying make it a structurally descriptive generic name, not the specific name, which can sometimes give away valuable intellectual property. Otherwise, we will see more and more products imported from overseas, where the regulations are sometimes more lax And, as we have learned from the drug industry, imported products subject to less stringent health and safety regulations can result in unintended consequences for American consumers.

Does the debate speak to the larger issue of a lack of understanding about the chemicals industry, and how do you go about changing perceptions of it?

We have a long way to go in educating lawmakers, and unfortunately there is a lot of misinformation about visible chemicals. We ask our members to consider inviting their respective congressman out to their plants since many do not know how this complicated legislation builds upon and often conflicts with itself. The last two administrations have promulgated a lot of regulatory changes, creating confusion and uncertainty, and making our members fearful of expanding their businesses or pursuing new product lines when they do not know what is coming down the pike.

Are there any other issues SOCMA deals with that we have not touched upon?

EPA's Chemical Manufacturing Areas Sources rule seeks to control hazardous air pollutants from the smaller, "area" sources. There are now proposed changes which could force some of our members to acquire a Title V Permit, which is very expensive and takes a long time to obtain; they could potentially have to stop making certain products either for a period of time or permanently. This is troubling, because we could lose our role as a global industry and innovation leader, transferring business and its risks to other countries.

Chemical Facility Anti-Terrorism Standards (CFATS) is the plant site security regulation. Industry and government worked really well together to develop the program in 2007. We have put hundreds of millions of dollars into the program, and feel it has been very successful; however, we are concerned that it needs to be renewed for a block of time, rather than on an annual basis to provide stability to the Department of Homeland Security's implementation activities. Similarly, R&D tax credits have been re-authorized annually for the last 20 years; most of our members like it, but it breeds concern in the industry when people cannot plan. Our R&D tax credit is probably one of the least competitive of OECD nations.

FDA reform is another focus area. One of our affiliates under AMS is called The Bulk Pharmaceuticals Task Force; last summer it negotiated a deal with the FDA that would grant the agency $300 million per year to strengthen the FDA's oversight of foreign drug facilities and streamline applications for new drugs. The FDA Reform Act was introduced in Congress and signed into law by President Obama in July. •

Interview with **Miles Hutchings**

HEAD OF BUSINESS DEVELOPMENT NORTH AMERICA CHEMICALS AND PHARMACEUTICALS, INTERTEK

Can you provide a brief overview of Intertek in the US?

The Americas account for about 30% of Intertek's global revenue and are therefore strategically extremely important. The specialty chemicals industry is increasingly facing margin pressures and the gradual commoditization of products. Being a global company, Intertek is very well positioned to assist North American companies looking towards global expansion in all major regions, through services such as product notifications or local laboratory support in the countries of interest; we can help meet their business objectives from a standpoint of quality, safety and sustainability. Much of this work is done in the US. Our services range from the commercial end of the supply chain; inspecting cargo before it is released into a country; as well as analytical R&D for specialty chemicals companies developing new products, and ensuring that clients are compliant with regulations in new markets. We are heavily involved with global product regulations such as REACH, TSCA and China notifications. To serve the specialty chemicals industry, we have labs in Allentown that have advanced analytical capabilities and Pittsfield that concentrates on polymer and composite materials testing. On the west coast, as well as in New Jersey, we have pharmaceutical labs; and in San Antonio we have an engine test facility that does performance testing on lubricants and fuels as well as emissions testing. A pilot plant facility in Pittsburgh can evaluate catalysts used in the specialty chemicals industry for their efficiency in catalyzing chemical manufacturing processes. These facilities are all very unique in their capabilities and work together to provide solutions to our specialty chemical customers.

Why do companies not regard analytical testing as a core business component?

As specialty chemicals companies look diligently at costs they have to determine which activities are core, and some are deciding that analytical testing is non-core t. They regard the innovation of new products to be core, but what they need are test results to interpret. Companies do not necessarily need the scientists to generate the lab results; their resources can then be focused on core activities such as innovation and product development. Of course, some companies do want to keep everything under their own control; Intertek has a strong track record of laboratory outsourcing in Europe and this is now being developed in the US.

How has companies investing more in specialty products changed Intertek's business model?

The movement towards specialty chemicals provides Intertek with the opportunity to offer our customers advanced solutions. The more complex the new chemistry and regulations become, the more knowledge and is required to characterize products and to ensure they are safe. Intertek has extensive toxicological consulting expertise that can assess the health and safety implications for new specialty chemicals. Specialty chemicals generally require more sophisticated analytics, which our clients often don't possess. Introducing these new products to market also requires the regulatory support that we can supply.

How can Intertek help their clients to navigate the changing regulatory framework?

The biggest challenge is keeping up with regulations, because they are moving quite quickly; however, Intertek's representatives involved in the consortia for REACH in Europe keep us well updated, and we have regulatory experts sitting on panels looking at specific product types, so we can articulate what is going on to US clients. It is not only knowledge of regulations that is important, but also relationships and credibility with authorities in those countries; for example, Intertek can approach the FDA about a specific product notification and get feedback on our suggested approach. More companies are outsourcing this sort of activity due to its regulatory complexity coupled with globalization and the need to control costs. Intertek's reputation is extremely important; if the company does not meet timelines, or fails to come across as subject matter experts, credibility obviously takes a big hit. Intertek ensures that its experts are up to date and projects are well defined to avoid a mismatch of expectations with our clients.

Do you see Intertek diversifying through organic growth or acquisitions?

Intertek will diversify through both organic growth and acquisitions. We have grown significantly through acquisitions such as Moody International, and our organic growth at constant currency was also close to 10% for the first half of this year. The specialty chemicals supply chain is very diverse and complex; although we participate across many part of the supply chain there are still gaps in our portfolio that we would look to fill through acquisitions or building internal capabilities.

Where would you like to see your division of Intertek in five years' time?

Our chemicals and pharmaceuticals division will remain extremely important, especially as Intertek's various divisions help each other by providing joined up solutions. In five years' time, we will be fully leveraging our complete portfolio of services to serve our customers in industries, such as specialty chemicals, thus becoming a trusted partner integral to our customers' success. Intertek is a unique company in the full breadth of global expert services it offers. As the world becomes more global, we can really help our clients ensure they can deliver safe, quality products. •

The Importance of US Chemical Reform

As the USA elects its next president, a game-changing reform for the country's chemicals industry hangs in the balance. A reshuffling of Congress could determine the future of the Toxic Substance Control Act (TSCA) reform, ending a period of uncertainty that is stymieing growth and innovation at a crucial time of recovery.

After turbulent years in the wake of the global financial crisis, the US chemicals industry is on its way to recovery with a modest growth rate of 2%. Yet as the industry moves to recoup, many challenges lie ahead. Not only do US chemicals face heightened competition from emerging markets, but the lack of regulatory modernization places the sector in the uncomfortable position. Regulations are growing tighter worldwide, and the United States is struggling to follow suit with a reformed policy that clears political divisions, industry approval and public concern.

Decisive action on regulatory reform is crucial in the wake of the crisis and in the face of rising international competition. However, with the upcoming elections and the eventuality of a "lame duck" Congress, the prospects of imminent action are slim, effectively tabling any legislative action until well into 2013. As a result, industry players are unwilling to invest the necessary capital for growth.

"Nothing that should get passed to stimulate the US economy is getting passed in Congress," explained Madeleine Jacobs, executive director and CEO of the American Chemical Society. "Companies are understandably not sure about what is going to happen, and when they are not sure, they do not take action. They do not invest, they do not build new plants and they do not hire more people and that is what is going on right now."

The law that regulates the US chemicals industry, the TSCA, was enacted in 1976 and has not been significantly amended since. TSCA grants the US Environmental Protection Agency (EPA) the authority to require reporting, record keeping and testing requirements for new and existing chemical substances and mixtures.

Over three decades old, TSCA is not up to date with advances in science and technology. It has been criticized as inefficient and unable to provide EPA with the necessary resources and authority to adequately impose controls. A main issue of concern is the lack of safety rulings made on existing chemicals that were grandfathered in at the start of the program.

Of the many regulatory reform bills that have recently been introduced in Congress, one of the most notable is Senator Frank Lautenberg (D-NJ)'s Safe Chemicals Act. EPA is overburdened, the bill argues, citing the fact that the agency has only been able to require testing for 200 of the over 80,000 chemicals in TSCA's inventory. The Safe Chemicals Act proposes shifting the burden of proof of a chemical's safety to the chemical companies themselves and increasing EPA's authority to evaluate this safety on the basis of sound science. The suggested actions would include requirements such as minimum data sets for every chemical a company produces and a system of chemical prioritization based on risk, in addition to less controversial measures such as the promotion of green chemistry, a trend which has been wholly embraced by the industry.

Lawrence Sloan, president of SOCMA, the leading trade association representing the batch, custom, and specialty chemical industry, described the draft bills promulgated by the Democrats in the Senate as nonstarters. "What they mandate is an inconceivably high bar in terms of the definition of risk," said Sloan. "You have to calculate permissible risk from the context of the hazardous nature of the chemical, plus the exposure potential of the chemical."

Lautenberg's Safe Chemicals Act would allow states to enact their own regulatory laws, which would generate duplicity and further complicate a company's ability to meet regulatory standards. The high implementation costs of the proposed reform would further jeopardize job creation and innovation in the sector.

These reforms would disproportionately impact small- to medium-sized companies, which are a key driver of the specialty chemicals segment of the industry. Out of SOCMA's over 230 members, 70% are small- and medium-sized businesses. Innovation is crucial to the sector's competitiveness and regulatory uncertainty compromises the US's strength in this area.

"These regulations are so complicated that they are actually forcing SOCMA's members to reconsider product lines, allocations of resources and markets to serve," said Sloan. "This is scary for the industry, because we could lose our role as an innovation leader in the world. When this business goes to another country, we are just transferring the risk elsewhere and creating new concerns about the quality of these products coming from abroad."

The current wait for reform is further aggravated by the imposition of stricter regulation schemes worldwide. Rich Hubner, a senior consultant at Cardno ENTRIX, a global environmental and natural resource management consultancy, described the era as a renaissance in worldwide regulatory development.

"We are coming to a globally more nuanced understanding between regulating on hazard and regulating on risk. Systems are coalescing around the recognition that the data we are collecting can do a lot more. We are able to understand not just the chemistries of substances, but also what they do in the environment and how they affect people."

The EU adopted in 2006 the most stringent regulatory system for industrial chemicals to date, and is in the process of rolling out its regulations to be in full force by 2015. The legislation, called REACH, establishes a comprehensive system for EU member states to register and provide information on over 30,000 chemicals. REACH is in part a reaction to the failures of TSCA, and its enactment provides further impetus for the United States to bring their framework up to a new global standard. The expected rollout of a comparably strict Chinese regulatory framework only adds to the necessity for US reform.

What all sides can agree on is that the sooner they reach a consensus, the better. Once the fall elections take their toll on partisan dynamics in the political system, the industry is hoping that 2013 will be a year of action. •

Interview with Mark Duvall

PRINCIPAL, BEVERIDGE & DIAMOND

Can you give us an introduction to Beveridge & Diamond?

Beveridge & Diamond is the largest law firm in the United States that focuses on environmental law, land use, and related litigation. Among other practices, we look at all aspects of chemicals, particularly in respect to litigation and regulation. We have clients that are specialty chemical manufacturers, basic chemical manufacturers, distributors of chemicals, and trade associations for chemical companies. We have offices in the US but provide advice to clients on environmental requirements in many foreign countries and at the international level. We also have a network of attorneys in other countries with whom we correspond, and they are able to provide supplemental services to our clients regarding foreign laws.

What are typical issues that a chemical industry client would bring to the firm?

There are a variety of circumstances in which clients approach us. Sometimes people have questions about the meaning of current requirements, so we help them through the guidance documents or bring their questions to the relevant agencies. Sometimes we have clients who want to advocate a position on a regulatory requirement, often because there is a proposed rule out there, or because they would like to see a proposed rule out there. Beveridge & Diamond also does a certain amount of lobbying in Congress with respect to the legislation related to the chemicals industry, and we also help companies resolve enforcement situations that they may find themselves in.

How would you define the state of TSCA legislation at the moment, can we expect to see reform in 2013?

It is a possibility that we will see reform in 2013, but it will be an uphill battle to see any legislation pass. The composition of the next Congress and who is elected president will significantly influence the likelihood of TSCA legislation being passed. Bills have been introduced in 2005, 2008, 2010, and 2011, but they have all been too extreme, even when amended. There is still no consensus, but progress has been made through dialogue between legislators, NGOs, and industry representatives. An important factor will be if the Republicans remain as hostile to EPA regulation as they are now. Ironically, EPA may have undermined its own efforts for TSCA reform; it has stepped up the implementation of the existing statute in the past four years, so if people think the existing framework is doing an adequate job, they may be complacent about not updating it.

EPA has pushed to use its authority under the Clean Air Act to improve security standards at chemical plant sites. Do you think this is a positive step or a misguided action?

The Department of Homeland Security has regulatory authority over chemical plant security, and the CFATS (Chemical Facility Anti-Terrorism Standards) program has proven to be extraordinarily successful. There does not appear to be the need for EPA to expand the application of its regulatory powers under Section 112(r) of the Clean Air Act, as the legislation was designed to address accidental releases, as opposed to security-related releases. It is important for the industry to be aware of what the actual requirements are. Implementation of CFATS has been controversial because of how DHS has carried out its responsibilities in evaluating information submitted by companies. Overall, the industry itself has done a good job of looking at its own vulnerabilities, and it is better at making the safety-related decisions than the government is.

In the absence of federal regulatory reform, many states have come out with their own initiatives for chemical regulation; have these made it harder for your clients to do business?

There are three kinds of state restrictions. One is chemical-specific restrictions, such as bans on specific chemicals and specific applications. The second type is generally called green chemical requirements, which are based of lists of chemicals that are considered problematic; these are mainly public disclosure requirements. The third category is California's proposed green chemistry requirements, which are so aggressive and ambitious with respect to the obligations they create for producers of consumer products that they merit their own category. An impact of all state restrictions is that they create a confusing web of differing restrictions for nation-wide companies. This impact is compounded by California and other large-state restrictions because they can become, in effect, national standards as companies must satisfy them or choose to create an entirely different product just for the California market. One reason the industry broadly supports TSCA reform is that it would create a single set of national standards that would replace differing state-to-state restrictions, such as California's. A national standard would also benefit companies in that they would only have to be aware of one set of requirements, instead of having to keep track of 50 different standards.

What are Beveridge & Diamond's strengths as a law firm serving the chemical industry?

Beveridge & Diamond has an excellent reputation with EPA and other agencies. We have a breadth and depth of experience that is not usually seen in other law firms. We have specialized groups for air, water, waste, chemicals, and the international components of these areas. Air, water, and waste are the traditional environmental issues, but we have one of the leading practices that is specifically related to chemicals. Beveridge & Diamond works at the intersections of state, federal, foreign, and international requirements, so that our clients are fully aware of requirements. •

Interview with George Misko

ATTORNEY AT LAW, KELLER & HECKMAN

Can you give us an introduction to the firm?

Keller & Heckman is a Washington DC-based law firm that is celebrating its 50th anniversary this year. We are a global firm, with additional offices in San Francisco, Brussels, Shanghai and Indianapolis. The firm has two components to it: we started off as a telecommunications firm, but we have developed a practice in the FDA area that has expanded over time to engulf the environmental area and chemical regulations. What makes us unique is that we have had scientists on staff at the firm since the 1970s to help us apply a practical angle to our problem-solving. We are able to resolve a client's issue by doing a synthesis of the law and the science, which is a very unique way of practicing law.

What is the significance of chemical industry to the firm?

We deal with all aspects of the chemical industry—not only smaller, specialty chemical companies but also some of the big petrochemical companies. Our practices break down into the Food and Drug Administration (FDA) area, the Occupational Safety and Health Administration (OSHA) area, the environmental area and Consumer Product Safety Commission (CPSC). While we deal with some other industries as well, most of that work emanates from the chemicals and plastics industry. We also deal with most of the products used in packaging, which are heavily regulated throughout the world.

How has your client base been evolving in terms of industry trends—Are you seeing a lot of growth coming from biotechs, for example?

Companies need to develop their biotech and nanotechnology capabilities and we certainly help them out in this area. Nanotechnology is something that has really been developing over the past few years now, not only in Europe but also in the United States. Established companies like DuPont, which are on the cutting edge of innovation, have to stay on top of these issues. Start-ups as well need assistance in this area when it comes to understanding regulatory barriers to entry into the market. We not only counsel on regulatory issues but we also help our clients actually put together the submission and applications necessary to clear these products through EPA and FDA.

When it comes to TSCA reform, do you think Senator Lautenberg's proposed Safe Chemicals Act is a positive step forward?

There are a number of big issues with Lautenberg's bill, most notably the proposed standard of reasonable certainty of no harm. The current standard we use is unreasonable risk of harm, which in other words means you need to have a cost-benefit balance when evaluating risk. Reasonable certainty of no harm is essentially the standard that FDA uses when assessing what is going to be added to a food. For the reasonable certainty of no harm standard to apply to any type of chemical product would be very extreme. It is going to be virtually impossible to find chemicals that would be able to actually meet that standard –a lot of drugs would not even meet the standard.

The bill also would impose an aggregate exposure standard that means you would have to determine a reasonable certainty of no harm from all types of exposures. Even if you could meet the standard, it would be almost impossible to get the data together to prove that you have actually met the standard. It is a huge obstacle to the industry overall in order to be able to develop new products or even establish the safety of products that have been on the market for years. The data requirements are overboard, especially as far as new chemicals are concerned. The current new chemical program at EPA has been in effect since 1976, and it has been effective at stopping things and requiring additional data when needed. Requiring a minimum data set for the agency when it does not seem to be called for will increase cost and make things more difficult, but will probably not provide any human health or environmental benefit.

How difficult is it for clients to bring new products to market when they face overlapping regulations from the different regulatory agencies?

When you have to deal with more than one regulatory agency—not just in the United States but abroad as well—you need to have a strategy of how you are going to put the data together to meet all the agencies' requirements in an efficient way that does not duplicate studies. As an example, antimicrobial products are regulated by both FDA under some applications and by EPA under FIFRA for pesticide applications. It is understood why you have different agencies regulating the different applications for a product. However, you need a basic understanding of which agency you will likely to be more quickly successful with. From a business perspective, this will allow you to target this agency first, bring the product to market for that specific application and then be able to support the rest of the regulatory process with the profits from this initial market.

How is Keller & Heckman the law firm of choice for chemical clients in navigating these complex regulatory issues?

We have the ability to digest the science and the technology behind chemical products and then present that to a regulatory agency to demonstrate that a product has the data or the applications that are necessary to show that it is safe. We are able to do that on a practical basis as opposed to just a legal basis. If a company has to go to court to fight a regulatory agency just to get their product on the market, that is a losing product for them. The more we are able to take our clients and keep them out of court, the better off we are. •

Permanent Reauthorization of CFATS a High Priority for DHS, Chemical Industry

By Lawrence D. Sloan, SOCMA President & CEO

Despite recent challenges the U.S. Department of Homeland Security (DHS) has endured with implementation of its Chemical Facility Anti-Terrorism Standards (CFATS) program, a high-ranking agency official says it is a top priority to work toward permanent reauthorization. Speaking at the 2012 Chemical Sector Summit in Baltimore, MD, last summer, National Programs and Protection Directorate (NPPD) Under Secretary Rand Beers said DHS has made a lot of progress over the years and built up the CFATS framework in a short period of time. However, an internal DHS assessment in December 2011 identified significant shortfalls in the progress of reaching compliance. The report detailed serious administrative and personnel problems as well as a lack of proper staff training programs and inadequate spending controls.

Beers says his department is learning from its mistakes and moving forward to make substantive improvements. And while it is difficult to project the level of funding that will ultimately be approved by Congress for the next fiscal year, Beers said DHS will work toward permanent reauthorization of CFATS.

The Society of Chemical Manufacturers and Affiliates (SOCMA), a trade association representing batch, custom and specialty chemical manufacturers, commends DHS for conducting the internal review to identify and subsequently remedy problems with the CFATS program. The association continues to voice its support for the program's continuation and urges Congress to differentiate between the administrative challenges plaguing CFATS and the appropriateness of the standards themselves. Moving forward, Congress needs to enact a long-term reauthorization of CFATS to eliminate the uncertainty of one-year reauthorizations which do little to help the chemical sector allocate proper resources and plan more effectively.

Biggest CFATS Challenges

The biggest challenges facing CFATS involves the site security plan (SSP) process, according to David Wulf, Director of DHS's Infrastructure Security Compliance Division (ISCD), which oversees the program. At the Baltimore Summit, Wulf said the agency was "not as far along in the process as we had hoped." But DHS has taken steps to address the issues. Case in point – ISCD has developed an action plan to monitor the SSP inspection and authorization process. The action plan contains 95 items, and DHS has completed a large majority of these to help advance the program, Wulf said.

***SOCMA**, the Society of Chemical Manufacturers and Affiliates, Inc., is the only U.S. based trade association dedicated solely to the batch, custom and specialty chemical industry. From its office in Washington, DC, SOCMA advocates for U.S. laws and regulations that affect our members' competitiveness and bottom line. SOCMA member companies encompass every segment of the industry and manufacture tens of thousands products annually that are valued at $24 billion. The industry's impact on U.S. GDP is upwards of $2.9 trillion.*

***Larry Sloan** is currently President and CEO of SOCMA. He focuses SOCMA's efforts on increasing public confidence in this industry sector, championing the passage of rational laws and regulations, and maximizing business opportunities for all SOCMA member companies. Prior to joining SOCMA, Larry served as President of the Adhesive and Sealant Council from January 2005 to February 2010. Larry graduated magna cum laude from the University of Pennsylvania with a Bachelor of Science in Chemical Engineering.*

Major action items in the plan include development of standard operating procedures for inspections and an inspector handbook. DHS has also incorporated deliverables from an inspector tools work group into its training.

In November, Wulf reported to SOCMA members that the agency authorized 120 SSPs, including some Tier 2 sites, and conducted 30 to 40 inspections of regulated facilities.

"We are pleased with progress on the action plan," Wulf said. The department is also looking to ramp up the pace of inspections in 2013. Beginning in January, DHS expects to conduct 40 inspections and 40 authorizations each month.

"By November, we would like to have 400 SSPs approved," Wulf told SOCMA.

DHS is looking to form industry focus groups to assess what the agency needs to do differently with the SSP tool in order to avoid data entry errors. Wulf said the agency hopes to develop a more intuitive system that will assist with authorizations and approvals and avoid the back and forth to clarify information.

Next year, DHS is expected to issue an Advanced Notice of Proposed Rulemaking to solicit public comment on how to improve CFATS. We expect this will also include possible changes to the list of chemicals regulated under the program, known as Appendix A. SOCMA is planning to comment and will closely watch any major changes made to the program.

Congressional Reauthorization

The internal audit of CFATS, which was widely publicized upon its release by the media, was a game changer in terms of long-term or permanent reauthorization of the program, according to Congressional staff working on the issue.

As a result of the problems hindering DHS's implementation of CFATS, Congress will likely maintain close oversight of the program by extending it on a year-by-year basis, according to congressional staffers. They also stress that CFATS needs to be operating in a way that Congress can feel more confident about, and continuity in the program and its leadership is critical.

Beers and other DHS leaders, including Deputy Under Secretary Suzanne Spaulding, are also focusing on the positive aspects of the CFATS program. Spaulding says that CFATS has already taken measurable steps toward a safer America. More than 2,700 facilities have already reduced their risk profile sufficiently enough that they no longer warrant regulation under the program.

DHS advocates that CFATS is clearly driving facilities to proactively reduce inherent hazards, thereby avoiding transfer of risk to some other point in the supply chain, which also makes good economic sense.

For CFATS to work effectively, Congress needs to adequately fund it. It is implausible to expect DHS to make progress in meeting the Congressional intent of CFATS if Congress undermines it with severe cuts to the program. Such a scenario would set the Department up for failure.

Personnel Surety

In July 2012, DHS withdrew from the Office of Management and Budget (OMB) its Information Collection Request (ICR) for a proposed employee vetting program. DHS previously recommended a personnel surety program to obtain facility-based information on personnel accessing sites regulated under CFATS. The original proposal had undergone a number of revisions following months of negotiations with industry and was likely far too amended to be approved by the OMB, which vets all federal regulatory changes before they are finalized.

DHS officials said they withdrew the program in order to have open dialogue with industry. DHS's goal is to develop a program – a requirement under Risk Based Performance Standard 12 of CFATS – that will not hinder industry's ability to work, yet still meet national security standards. Officials hope to move quickly through the analysis process and resubmit the program as soon as possible as the agency cannot proceed with final facility compliance approvals without addressing risk-based performance standards under CFATS, which deals with personnel surety.

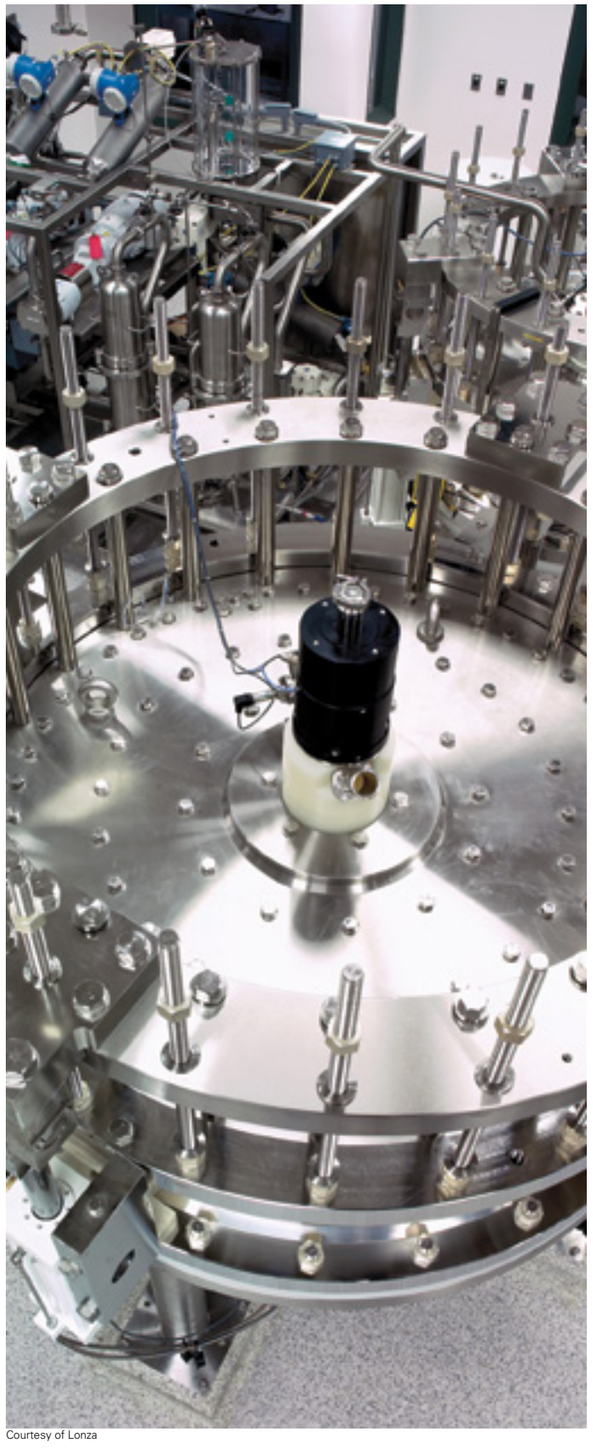
Additionally, during a Congressional hearing on September 11, 2012, DHS mentioned that it was open to the idea of allowing facilities to use Transportation Worker Identification Credential (TWIC) cards, issued under the Maritime Transportation Safety Act (MTSA) that regulates some portside chemical facilities, to satisfy the screening requirements under CFATS if cards are scanned through an electronic reader.

CFATS Funding

Repercussions of DHS's internal assessment could also impact funding for CFATS. Authorization for the program was extended by a continuing resolution through March 27, 2013 and funded at fiscal year 2012 levels. However, the U.S. House of Representatives-passed Homeland Security appropriations bill for 2013 provides only $45.4 million for CFATS, $29.1 million below the amount requested by the administration and $47.9 million below the previous year's level of $93.3 million. In an accompanying report to the bill, the Appropriations Committee said the reduction in funding is due to "significant managerial problems, program delays and poor budget execution."

The U.S. Senate Appropriations Committee approved its own Homeland Security appropriations bill in May 2012, which preserves almost $87 million for the CFATS program – nearly double the amount of funding in the House bill. However, the full U.S. Senate has not voted on the bill.

DHS is hopeful there won't be a funding cut and the program will have a budget it can work with, Wulf said. However, if the House budget were to be approved, DHS would have to make difficult decisions about priorities for the program. Wulf said it would be difficult to sustain much of an operation, and it could mean barebones inspections and jeopardize SSP review activities. "But I am confident we will get a budget that works," he said.


Courtesy of Lonza

Renewed push for EPA Regulation of CFATS

In recent months, environmental groups have been calling on the Environmental Protection Agency (EPA) to use its authority under the Clean Air Act to regulate chemical security and require the use of inherently safer technology (IST) as a security measure. Several comprehensive government regulations, such as OSHA's Process Safety Management standards, already address the safe management of chemical production, use, and storage, making this effort pointless. Furthermore, chemical manufacturers, as part of their process culture, most often consider safer alternatives before they begin a manufacturing process. In cases where it is feasible for the facility or the requirements of the specific process, facilities often do use alternatives.

This renewed push for EPA regulation came on the heels of the internal audit that found significant administrative challenges to DHS's implementation of the standards. With the increased scrutiny on DHS's management of CFATS, proponents of prescriptive mandates on industry have asked current EPA Administrator Lisa Jackson to look into her agency's ability to regulate chemical security under the vague Section 112(r) General Duty Clause (GDC) of the Clean Air Act and subsequently require facilities to implement IST.

The agency has yet to issue any proposed rule detailing enforcement or compliance. Furthermore, EPA, as well as the Justice Department, has already said the agency doesn't have the authority under the Clean Air Act General Duty Clause to require covered chemical facilities to make process or security changes to address the threat of terrorism, and the Labor Department has expressed a similar view regarding the authority on which that General Duty Clause was modeled.

In August 2012, Congressman Mike Pompeo (R-KS) introduced legislation requiring the EPA to clarify key terms of the GDC before the agency can continue using it to cite facilities for perceived violations, as fines have been issued disproportionately under the clause across EPA's 10 administrative regions.

In addition to clarifying the GDC's terms, the SOCMA-supported bill reaffirms that the EPA's mission is environmental protection, not homeland security.

The Road Ahead

CFATS is the most robust and comprehensive chemical security regulatory program to date. The regulation protects facilities against attack without impairing the industry's ability to remain innovative and to maintain some of the nation's highest paying manufacturing jobs. Further, the secretary of DHS has the authority to levy significant fines on a facility for non-compliance, and can even shut down a facility. If Congress were to end the program, it would immediately throw the security efforts of thousands of facilities into limbo, creating a major setback to the public's justifiable expectations that industry and government can work together to secure chemicals produced or stored by CFATS facilities. Moving forward, DHS must do more to engage the chemical sector and be held ultimately accountable for its success. David Wulf and Deputy Under Secretary Spaulding are working diligently to ensure as large an outreach to the industry as possible, which is a step in the right direction. Conversely, Congress must continue to conduct regular diligent oversight, with the intent to ensure regulatory certainty for the program without jeopardizing it through budget cuts. •

Courtesy of CMC

Changing Strategies: **How the USA is adapting to a new global economy**

"We must continue to be in touch with the market fluctuations, and be flexible in working within it. This is especially critical in the specialty chemical industry: taking advantage of any given situation and moving quickly to adapt."

- Len Glass, President, Morre-Tec Industries Inc.

Domestic Manufacturing

Returning chemicals to American soil

The US chemical industry is beginning to see a resurgence in domestic manufacturing; after industrial production fell by significantly over 10% during 2008 and 2009, it has since grown every year, almost equaling pre-crisis levels.

This growth is partly due to a simple recovery of demand, but it would be a mistake to attribute it to such simplistic analysis. The advent of shale gas has attracted manufacturers tempted by future guaranteed low-cost feedstock, and in an age when protectionist measures and economic nationalism appear to be on the rise around the world, domestic manufacturing allows chemical companies to offer their domestic US clients a surety of supply that they would otherwise have to source from abroad, which would leave customers open to increased tariffs and other cost pressures outside of their control.

"Croda has learned from our customers that they want supply chain surety and part of surety comes from being able to source near where you are going to use the product. We have a large manufacturing footprint in North America because this is what our customers want from us," said Kevin Gallagher, President of Croda Inc.

J. Christopher York, North American president of Bluestar Silicones, echoed the importance for their company. "For silicones, the cost is in capital equipment and raw materials such as methanol, silicon, copper and platinum. Our strategy is to be close to our customer base in order to be responsive to the evolving needs of our markets."

In addition to supply chain surety, US chemical manufacturers are able to relieve some of the uncertainty surrounding intellectual property security in emerging chemical manufacturing destinations. Kate Donohue, Hampford Research's president, explained that "in the United States customers are guaranteed intellectual property protection and American manufacturers can ensure that their customers will not be out of production, which limits any negative impacts on the supply chain."

Indeed, chemical companies such as DSM often have multiple bases; manufacturing their more established or less specialized products in low-cost jurisdictions, yet reserving their more advanced chemicals for production in the USA. "Our more intellectual property-sensitive manufacturing is carried out in the United States, as a lot of the company's sales are driven by our rich intellectual property portfolio," said Alexander Wessels, president and CEO of DSM Pharmaceutical Products, and chairman of DSM North America.

According to Dave Mazzarell, president of Lab Express International Inc., a manufacturer of niche materials for the pharmaceutical and specialty chemicals industries, many customers have had "nightmare experiences" with Chinese and Indian manufacturers. "Pricing has gone up in these countries, but quality has not. It is approaching the point where it just no longer pays to source from them. Regulations are tightening in overseas manufacturing; the FDA has a bigger presence, and will shut down those who are not complying with US regulatory measures."

Yet while these reasons of surety of supply, ability to cater to the client's supply chain concerns and protecting intellectual property have combined to make the USA more attractive as a manufacturing destination, it is also true that other locations have become less attractive. Labour costs, arguably the primary factor contributing to the general exodus of manufacturing companies in all economic sectors from the USA, Western Europe, and other developed jurisdictions such as Singapore, are no longer as disparate as they once were. Wages in the Pearl River Delta in China, for example, have increased 10% this year, and, coupled with rising land prices and tightening environmental and safety regulations, China's cost advantages are not what they used to be.

"China used to offer savings of five to 10 times over suppliers from other countries

continued on page 34

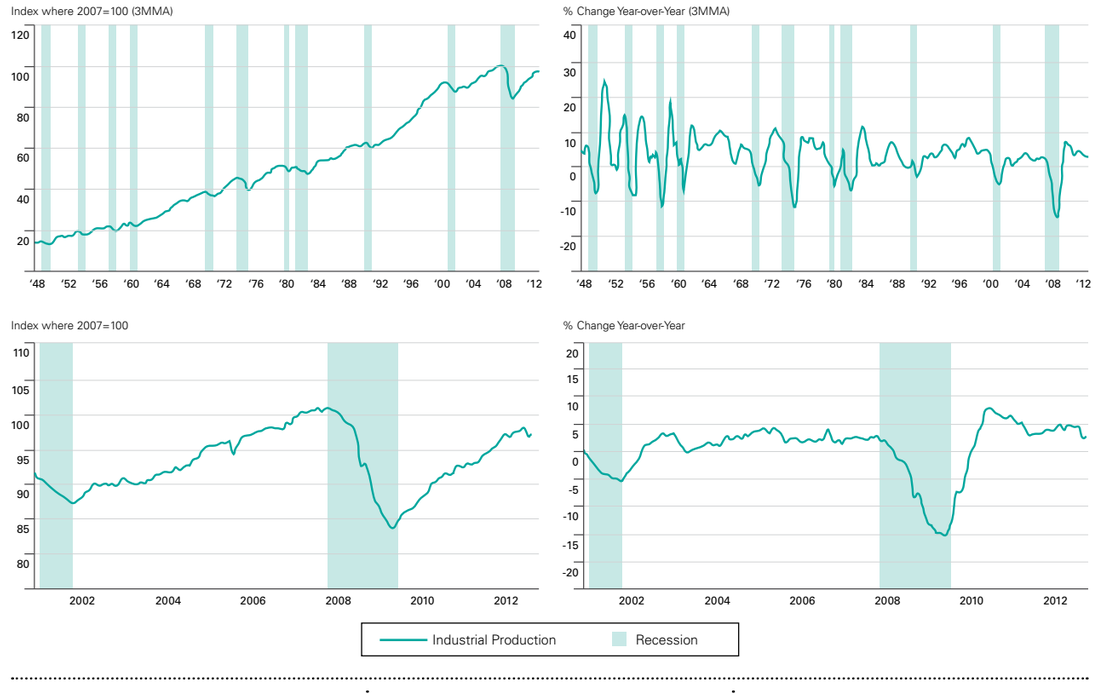
Largest Specialty Chemical Segments

Source: IHS

1. Specialty polymers
(engineering thermoplastics, specialty films, high-performance thermoplastics)
2. Industrial and institutional cleaners
3. Electronic chemicals
(IC process chemicals, PCB/packaging chemicals)
4. Construction chemicals
5. Surfactants

USA Chemical Production

Source: ACC



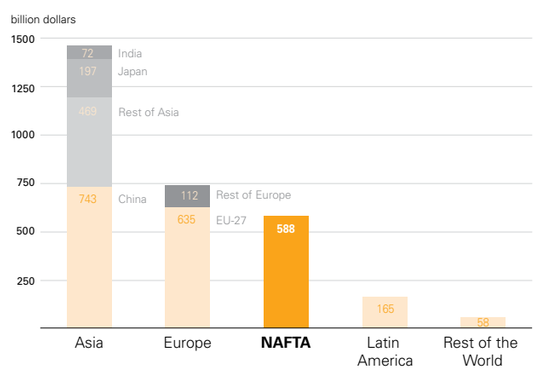
Worldwide Market for Chemicals (2011)
$5.5 trillion
Source: Global Industry Analysts

Worldwide Market for Specialty Chemicals (2011)
$483.7 billion
Source: Research and Markets

Worldwide Market for Specialty Chemicals (2012)
$513.0 billion
Source: Research and Markets

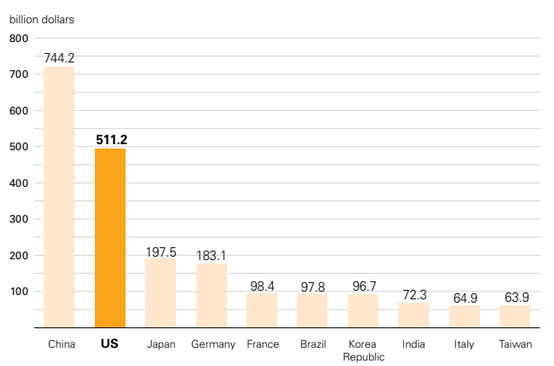
Global Chemical Sales

Source: CEFIC



Global Chemical Sales by Country

Source: CEFIC



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competing on the same material. Labour costs in China are increasing quickly, partly because of the high demand for chemists generally, and also for more highly trained chemists with an American or European background. The Chinese education system has been opened up to allow a lot more students in each classroom, while the number of expert teachers has not increased at the same rate. So the level of training is not quite as good as it once was," said Charlie Lewis, president of AcceleDev Chemical LLC, a custom synthesis organization with R&D and manufacturing sites in both the United States and China, and a perfect example of a growing trend.

"Over time, it made sense for AcceleDev to also integrate R&D back into the United States as the reduction of real estate prices and the cost of hiring chemists became much more cost effective, and began closing the gap with China. This US site now fits well within our overall low cast business model, while adding additional capability and team expertise for our customers."

What is often overlooked when discussing the regulations, market size, feedstock, or other factors contributing to the attractiveness of a manufacturing destination is the particulars of the clients. The USA is a market of over 300 million people, but arguably more important is the concerns that these potential customers have; and it is not only American companies who can recognize this.

Kureha America, a Japan-headquartered global specialty products company, is experiencing growth in emerging markets, particularly China, yet the US continues to be a very important market. To solidify its presence, in 1992 Kureha established a joint venture with Ticona, the engineering polymer division of Celanese to manufacture, market and sell polyphenylene sulphide resins for use in the aerospace and automotive industries. "We are the first overseas manufacturer of short carbon fibers in China, but it is important to maintain our American manufacturing base in this sector; US customers will always require short delivery times and support from local suppliers," said Jeff Zhang, executive vice president at Kureha America. •

Interview with **Alexander Wessels**

PRESIDENT AND CEO, DSM PHARMACEUTICAL PRODUCTS, AND CHAIRMAN OF DSM NORTH AMERICA

Can you provide us with a brief overview of DSM's presence in the United States and what importance the region has for the company's global strategy?

DSM`s global headquarters are based in Europe. The company`s focus has shifted from basic and specialty chemicals towards the biotechnology sphere. DSM has been actively investing money and resources in order to diversify its portfolio into the material and life sciences arenas. In the last 18 months DSM completed three major acquisitions in the United States, in addition to a number of smaller acquisitions. The United States is a significant market for DSM and accounts for around 25% of the company's global turnover of €9 billion. The manufacturing base in the United States has expanded significantly during the last two years to increase the capacity of DSM businesses in material sciences and life sciences. (Bio)chemical manufacturing in the United States has become more competitive due to energy costs, and labor costs and practices, the regulatory environment, and intellectual property protection, making the United States an attractive destination for investors. DSM's manufacturing base is global and increasingly focused on high added value chains close to its customers.

What is the strategy behind the increased focus on specialty chemicals?

DSM focuses innovation towards global issues and developments, which are related to global shifts, energy and climate, health and wellness, and other themes that will be real challenges for the planet. Innovation is one of the company's main growth drivers; in addition to sustainability, high growth economies, and acquisitions and partnerships. For innovation, we have metrics regarding the number of sales that are generated from newly introduced products. Another important driver for the company is sustainability, which is an integral part of our business model; many of our plastics are manufactured to be more sustainable from a manufacturing and carbon footprint perspective. DSM is also focused on high growth economies and mergers, acquisitions and partnerships. The new portfolio has moved more towards intellectual property intensive industries. DSM increased market presence in North America through acquisitions such as Ocean Nutrition, which expanded our food enrichment growth platform, and Kensey Nash, which strengthened our biomedical business. Companies were acquired to expand competencies and product portfolios for DSM. In addition to pharmaceuticals, performance materials and nutrition, we have built two new emerging business areas: Biomedical and Bio-based Products and Services. DSM is working with POET, one of the largest bio-fuel producers in North America, to build the first commercial second-generation biofuel facility in the United States. We have focused our technology portfolio around the cellulosic feed stock component for biofuel. We have chosen not to be involved in first-generation biofuel feed stocks, a process that competes for the same feed stock as food.

Why is it important for DSM to maintain a manufacturing presence in the United States?

The location of our manufacturing base is related to our customer base and the importance of maintaining a close proximity with our customers, especially in regard to high technology manufacturing processes. The United States have become an extremely competitive market for the fermentation and energy intensive industries. For example, due to low energy costs (the shale gas effect) the United States has an advantage over Europe and even Asia; also in labor costs, the gaps between the continents are decreasing. The United States continue to be a sound place in which to invest because of the size of the market and the high technological environment combined with a large pool of skilled labor

What emerging markets is DSM looking at expanding its presence?

DSM has a sound base and is expanding in Brazil, China, and Russia, and identified Indonesia and Turkey as new potential emerging markets. The company has successfully expanded its presence in China, India and Brazil. The United States will remain important to DSM. Twenty years ago, Europe was the key to our turnover, today it is more evenly weighted across the globe with higher growth rates in the United States and high growth economies. DSM' growth related CAPEX investments are mainly directed toward the high growth economies and North America.

Where do you see the future sustainability of the chemical industry?

DSM has been consistently ranked as the top in its category in the field of sustainability. As sustainability has become an overall business driver for us in many ways beyond corporate social responsibility. Many products have been to be converted from traditional chemical processes to bio-chemical or pure biotechnology processes to be sustainable. We make a life cycle analysis of every development product that we manufacture; and we aim to always be better than the best product in the category from a carbon footprint perspective. Large companies want to work with DSM because we are at the forefront of making components more sustainable. Green chemistry has also become more important; DSM has taken the lead in the pharmaceutical industry in micro reactor technology, which greatly controls production volumes lowering energy consumption and waste while increasing safety. In our broadest commitment to a sustainable planet, DSM works closely with the World Food Programme to provide the organization with knowledge, and also supplies our products at cost price to help feed those in great need. •

Interview with
Koji Hagino, Elizabeth Gershon & Jeff Zhang

PRESIDENT & CEO; EXECUTIVE VICE PRESIDENT;
& EXECUTIVE VICE PRESIDENT, KUREHA AMERICA

What is the history of Kureha in the United States?

EG: Back in 1963, Kureha Corporation began to see opportunities beyond Japan and set up a New York office to begin to develop the U.S. market. Our focus, as a raw material supplier, was, and continues to be on innovation and technology development, so initially we followed our Japanese customers to the United States. But in the early '90's the Company decided to invest in manufacturing in the Unites States. Kureha had developed a unique improvement to the polymer called PPS, and went to Ticona, the Engineering Polymers Division of Celanese, as a go-to-market partner. In 1992, the two companies created a joint venture called Fortron Industries, based in Wilmington, North Carolina, to manufacture, market and sell this polymer outside Japan. This partnership has been very successful and just celebrated its 20th anniversary. In 2005, Kureha acquired a carbon fibers business, including a manufacturing site outside of Pittsburgh to complement our own Japanese product offering, and in 2009 we decided to build a plant in Belle, West Virginia to manufacture a brand new polymer called polyglycolic acid (PGA; brand-named Kuredux), using very unique technology. Part of our strategy is to diversify, not only in sales and marketing but also in our manufacturing sites around the world.

Can you describe your other products in more detail?

EG: PPS is an engineering polymer. It is a high-temperature, chemically resistant material used for transportation applications (automotive and aircraft), durable goods (appliances and electronics), as well as industrial applications (machinery and filtration). PGA had been used in absorbable sutures for decades, but Kureha realized it might also be very useful in other applications as it is biodegradable, compostable, recyclable and provides outstanding gas barrier properties. We have discovered a variety of interesting uses for this material that degrades over time, in particular in the oil and gas industry. PGA had been very difficult to manufacture, so Kureha spent almost a decade developing the technology to make it on the large scale needed for industrial applications. Kureha is the first and only company that has achieved this capability, and our patent estate is extensive. We chose the US for our manufacturing base partly because the market is clearly here, and also because DuPont manufactures the key raw material at the West Virginia site where we are co-located.

As you embark on a more global strategy, how important will the US remain?

JZ: A lot of growth has been seen in emerging markets, particularly China and parts of South East Asia; however, Kureha still regards the US as a very important market. We are the first overseas manufacturer of carbon fiber heat insulation in China, but it is important to maintain our American manufacturing base in this sector; US customers will always require short delivery times and support from local suppliers. With the automotive and other industries growing in the US, we feel the same way about Fortron® PPS.

Where are you directing your current R&D efforts?

EG: Kureha is very focused on products that are beneficial to the environment. Our scientists worked diligently to develop Kuredux® PGA grades with controlled rates of degradation for various product applications. We are also working very intently on a newer grade of carbon to be used for electric vehicles and HEVs; however, there is also a very important component of development going into our existing core products, so the goal is to find the right balance. One of our competitive advantages is our long-range thinking and the fact that our leadership understands that innovation takes time. In fact, sometimes we are ahead of the market in anticipating trends.

As a multinational, how do you characterize the financial and regulatory incentives to invest in the United States?

EG: Creating jobs is very important to all 50 states. Many of them have been very supportive in providing incentives to build plants, and we had several options for the PGA site. West Virginia was very helpful as we navigated through the regulatory requirements, which are significant in the chemicals industry. The U.S. brings energy and raw materials together easily, whereas in other parts of the world you might face difficulties in one or the other area. The fact that the US plastics industry is a net-exporter, with a trade surplus, is reflective of these capabilities.

KH: We can make comparisons with China, where Kureha also manufactures. People sometimes say that in China the law changes frequently; subsidies are given and then taken away. The US is not subject to these frequent changes. Also, it is a single marketplace and business friendly.

Where would you like to see Kureha positioned in the US in about five years' time?

EG: We work with companies who value our innovations and experience strong growth by using our specialty materials. Our challenge is to continue to find customers who will work with us in these breakthrough areas. We are looking at expansions of various plants as demand grows and our capex budget for the next five years will be significant. We have a major HR focus at the moment, because at the end of the day our success depends on our people. Kureha treasures people, and insists on our growth occurring within our environmentally focused corporate philosophy. •

Interview with
Beate Ehle

EXECUTIVE VICE PRESIDENT, BASF CORPORATION AND PRESIDENT,
MARKET AND BUSINESS DEVELOPMENT, BASF NORTH AMERICA

What is the strategic importance of the US market to BASF's global strategy, and why was New Jersey chosen as a base?

North America is the biggest chemical market by demand, so it is the place for us to be. Other chemical companies may have the philosophy to go where the raw materials are; BASF goes where the demand is. BASF's key business lines in the US are the same as in the rest of the world. We say that in a day in your life you will encounter several BASF products. It starts in the morning, as we contribute to the shampoo you use in the shower, and the clothes you wear. We are even part of your refrigerator, and make sure that your breakfast is nice and tasty. We are in many parts of your car. Agriculture, construction, personal care, food and nutrition, healthcare and the oil industry are important to us in North America. Our global oilfield activities have moved into Houston; all of BASF's global catalyst work is steered out of Iselin, New Jersey; and this year we have announced that BASF's global plant biotechnology and insect control research headquarters will move to North Carolina.

How important is it for BASF to maintain manufacturing operations in the US, and how do you manage your costs?

As you can see from our latest announcements, maintaining US manufacturing operations is very important to BASF. We have built a new methylamines plant in Geismar, Louisiana, and will be putting a new formic acid plant there as well. We have started battery activities here, with the building of a plant in Elyria, Ohio. We would not do these things if we were not convinced we could be cost-competitive, because we would not be able to survive in the market. Of course, we have activities in Asia, and there is no doubt we will increase our presence in emerging markets; however, North America enjoys very attractive energy prices right now due to the shale gas effect, as well as excellent raw material prices in certain value chains.

What are some strategic research and development investment areas for BASF?

Batteries are an example of a solution that requires interdisciplinary cooperation; to make them work, you need material scientists, chemists, physicists, and electro-experts. This is a huge number of people working together. We feel it can be important to acquire technologies, and you might have seen the long list of small acquisitions pertaining to our battery business. BASF has acquired Sion Power, the leader in next generation lithium-sulphur battery technology; Ovonic, which has leading technology in nickel metal-hydride; and Novolyte, which has electrolytes for lithium ion batteries. BASF also acquired Merck's electrolyte activities. Worldwide, we have 10,100 people in R&D, close to 10% of the total workforce; with 1,500 people spread across five big centers in North America, it makes up a similar proportion here. BASF's research team in North America works in close collaboration with our R&D headquarters in Ludwigshafen.

BASF has recently made investments and acquisitions in speciality chemicals. What is the advantage of being involved in such a niche market?

At the current rate, by the year 2050 the world will be consuming the equivalent capacity of three Earths. Chemistry and sustainability will play key roles in solving the demands for food, transportation and energy that will exist. Innovation is important; we need to do things differently, which drives us to look into niches. Big-volume, classical chemicals do not solve key issues, such as water and heat management, but more sophisticated high-tech chemistry combined with interdisciplinary activities can help to address these concerns.

BASF is a leader in sustainability. How is it leading the charge towards green chemistry?

Smart Forvision is a concept car developed by Daimler and BASF, and was showcased at the IAA motor show in Frankfurt, Germany. It is designed for driving in densely populated cities with small parking spots. Energy efficiency starts with weight reduction; the whole car is made from engineered plastics, even the wheel rim, making it the first of this type. Many of its innovations will be realized over the next five to 10 years, such as organic light-emitting diodes in the roof and a coating to regulate heat.

Another example of our sustainable approach is Green Sense™ concrete, which uses fly ash to substantially reduce the energy and water consumption, and CO2 emissions associated with its production.

BASF is the world champion of the "Verbund" concept. For us, it is not just about chemistry, but also people, know-how and energy. By the year 2020, our global goal is to improve the energy efficiency of all our process by 35% relative to 2002; we also want to reduce the consumption of drinking water in all processes by 50% between 2010 and 2020. BASF is always looking into its internal processes, and from this we can also help our customers and make them part of our Verbund.

How do you expect the US chemicals industry to perform in the medium term?

Right now, we see a picture of slow but steady growth in the US chemicals industry. Shale gas is a huge opportunity in North America; it currently addresses the upstream value chains, but it remains to be seen what it will bring to speciality chemicals. In the medium term, the American chemicals industry has quite a positive outlook. Our strategic target is to outgrow the chemical market. BASF wants to be the partner and employer of choice, and we feel confident we are on track to achieve this. •

Interview with **Michael Ott**

PRESIDENT, POLYSCIENCES INC.

Can you provide us with an introduction to Polysciences and your strategy as a specialty manufacturer?

Polysciences is a specialty chemical manufacturer that is diversified. We work in niche markets and offer a product catalogue of 3800 items that are examples of what we can make and what we hold in inventory. Polysciences is the place where you come if you are starting on a new material. We can make things exactly to your specifications and get them into the container that you want. Our products have applications in medical devices, electronics, hospital testing laboratories and diagnostic laboratories as well as many other high value added markets. There are all sorts of different applications where the little bits and pieces that we make are needed to make things work. The company's diversity is our strength and part of what makes our business so fun.

How does Polysciences use synergies between your different service arms to strengthen your overall business model?

Our catalogue accounts for the most important percentage of our revenues because it brings business to the company that we then keep through forming long-term custom manufacturing relationships. What tends to happen with our catalogue is that we supply materials for graduate students in their research who will remember us at later stages in their careers when they need commercial volumes of materials made especially for them. Our custom synthesis and particles businesses account for most of our activities. Polysciences makes over 400 particle products that are used for diagnostic tests, size comparison evaluations, and many other imaginative applications. Our particles business is very dynamic and a growing area for us. Our contract manufacturing is also an important arm for the business. We are an FDA-registered facility, we operate under GMPs, we are ISO 9000 compliant and we are going to be ISO 13485 compliant in another few weeks, which applies to the design and manufacture of medical devices.

What markets are offering the most opportunities for growth for Polysciences?

Growth markets for Polysciences tend to be the electronics and medically related segments, which range from medical devices, medical materials and pharmaceuticals to biotech companies. We also work in cosmetics and personal care, particularly when it comes to products that are relatively complex to make, or are somewhat dangerous to handle.

How are you looking to expand your international presence to penetrate faster-growing markets in other regions?

Polysciences has had a global presence for many years and we are trying to grow further internationally. We have had a facility in Germany, which is a warehouse and sales organization, for over 25 years. We have historically sold the most products outside of the United States in Germany and the office is a central location from which we can effectively administer to our customers and distributors throughout the rest of Europe. Our work in Europe tends to be with subsidiaries of US companies, where they need products customized for their European markets.
We are trying to duplicate this in Taiwan with the Asia-Pacific office that we opened last year. The electronics market in Taiwan is a main focus for Polysciences, and we are also looking for more opportunities in mainland China. We have several projects underway in the region and we are certain it is going to be a growth area for us. The place where we are looking to expand next is Brazil, where there is a large medical device market.

What is inherent in the Polysciences business model that makes your company the preferred manufacturer for your clients?

Polysciences' strength is the people that we have and the customer service that we can provide. We are willing to adjust to whatever the customer wants. Customer service really counts in this kind of a business. What matters is whether you can make a product and when you can make it. Price is the third or even fourth consideration.

It is common for contract manufacturers to use facilities abroad in lower cost jurisdictions. How important is it to Polysciences to maintain your manufacturing presence in the United States?

At Polysciences, we need to have absolute control over everything and therefore we have no plans to take a plant and relocate it to another country in order to lower costs. We have found that the cost of manufacturing and raw materials is not as important as the intellectual part of the material that we are making. We have three buildings here in Pennsylvania, in addition to our manufacturing facility in Indianapolis, Indiana. It is important to our customers that we have more than one manufacturing site to provide supply chain surety. From these locations, we can make all our products.

What can we expect to see from Polysciences in the next five years?

At Polysciences we have been growing and we plan to continue growing at rates of 10% to 15% a year, not to put too much strain on the organization but enough to make reasonable progress. We will eventually have manufacturing in Germany at our facility and our operation in Asia will be a sales organization for the foreseeable future. We also plan to develop a sales organization in South America, most likely in Brazil. •

Courtesy of DKSH

The Export Market

Global competition, global solutions

While chemical manufacturers are optimistic about their North American production footprints, the lure of emerging markets remains as strong as ever. Total specialty chemical potential revenues from China, Russia, Brazil, India and Mexico in 2010 reached $127 billion, when it accounted for 34% of global market share, and by 2015 it is expected to account for 42% of global market share. While global growth for the chemical industry was a mere 2.1% in 2011, in South America and Asia (excluding Japan) chemical industry growth was 4.7% and 11.1% respectively.
Faced with flat demand from a mature home market, capitalizing on these external markets has become the key to growth for many US manufacturers. Though having a global presence has traditionally been the mandate more of basic chemical manufacturers, with the demand dynamic shifting from mature to emerging markets US specialty chemical companies are looking for creative ways in which to penetrate competitive emerging markets, whether through greenfield investments or acquisitions.

Reichhold Inc., a North Carolina-based supplier of resins for coatings and composites, recognized the importance of global integration and made significant investments in building greenfield plants in India and China, which came online in 2009 and 2011 respectively. Owned by Japanese company Dainippon Ink and Chemicals from 1987 to 2005, Reichhold saw a need to develop their own presence in Asia after they became independent.

"At that time, the US and European economies had started to flat line, so it was very important for Reichhold to grow through our Indian and Chinese business," said John Gaither, chairman, president and CEO of the company. "Our overall growth in recent years has been through our global customers who have needed the same Reichhold products in other parts of the world."

Boston, Massachusetts-based Cabot Corporation, a global specialty chemicals manufacturer with expertise in carbon blacks, has concentrated most of their efforts and investments on emerging markets in the last few years. "We have continued to grow in China, Southeast Asia, South America and the Middle East, perhaps at the expense of Europe where we significantly restructured through the financial crisis," said Patrick Prevost, Cabot's president and CEO. "China is now worth 17% of Cabot's revenues and assets; we are currently building our fourth plant there and have just expanded one of our silica facilities."

For AkzoNobel N.V., the largest global paints and coatings company, development in Asia has been a mixture of organic growth and acquisition. "Historically, AkzoNobel has had very good organic growth in mature markets, but to outgrow them we needed to improve our positions in emerging countries. A major part of our Asian strategy was the investment of more than €300 million in a grassroots chemicals facility in Ningbo, China, and we gained a leading position in specialty surfactants across Asia from our acquisition of Boxing. Elsewhere, we are building a new industrial coatings plant in Bangalore and have expanded capacity in Brazil," said Bob Margevich, global business unit leader for surface chemistry at AkzoNobel.

Specialty chemicals do more than simply cater to the whims of emerging middle classes around the world; there is an important role to play in addressing global issues such as food security. Philadelphia-based chemical manufacturer FMC Corporation, for example, has made substantial investments in emerging economies. "Many of our businesses, in agriculture, food and pharmaceuticals are strongly driven by the rise in middle class wealth in rapidly developing economies and the insatiable need for more calories and protein," said Andrew Sandifer, vice president of strategy and development and investor relations at FMC Corporation.

International expansion is not just a strategy for the well-known giants of the specialty chemical world. Polysciences Inc., a manufacturer of custom fine and specialty chemical materials headquartered in Warrington, Pennsylvania, has had a global presence for over two decades. "We have had a facility in Germany, which is a warehouse and sales organization, for over 25 years. Now we are trying to duplicate this in Taiwan with the Asia-Pacific office that we opened last year," said Michael Ott, president, CEO and owner of Polysciences Inc. "We have several projects underway in Asia and we are certain it is going to be a growth area for us. The place where we are looking to expand next is Brazil, where there is a large medical device market."

Other companies have taken an entirely different step in their global expansion strategies, such as Stamford, Connecticut-based Tronox Ltd., a global producer of titanium ore and titanium dioxide used in the paper industry. In June 2005, the company purchased the mineral sands business of Exxaro, making them the third-largest titanium feedstock producer in the world. "Tronox has shifted a lot of the demand for feedstock at our pigment plants toward our own mineral sands business; we are therefore much more self-sufficient in feedstock than before. Now that Tronox owns 100% of our feedstock and pigment suppliers, we can absorb the variations in profit margins across the supply chain," said Tom Casey, Tronox's chairman and CEO. •

Specialty Chemical Growth Markets
(average annual growth rates to 2016)

China
8.5%

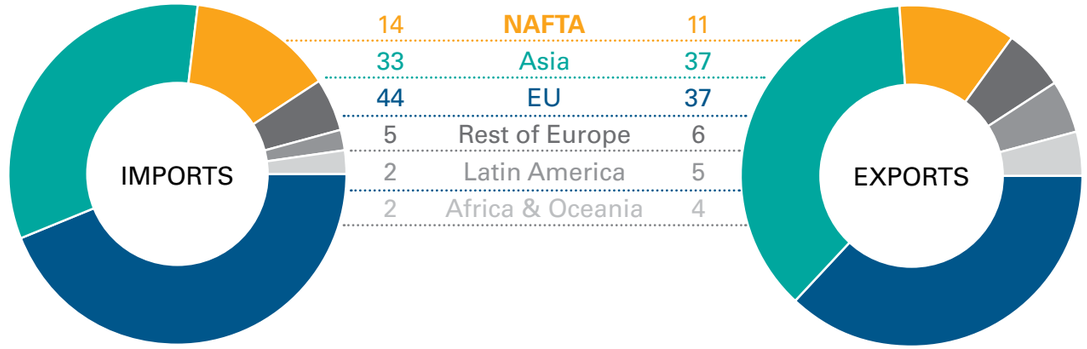
Asia (excluding China & Japan)
4.9%

Central & South America
4.6%

Source: HIS

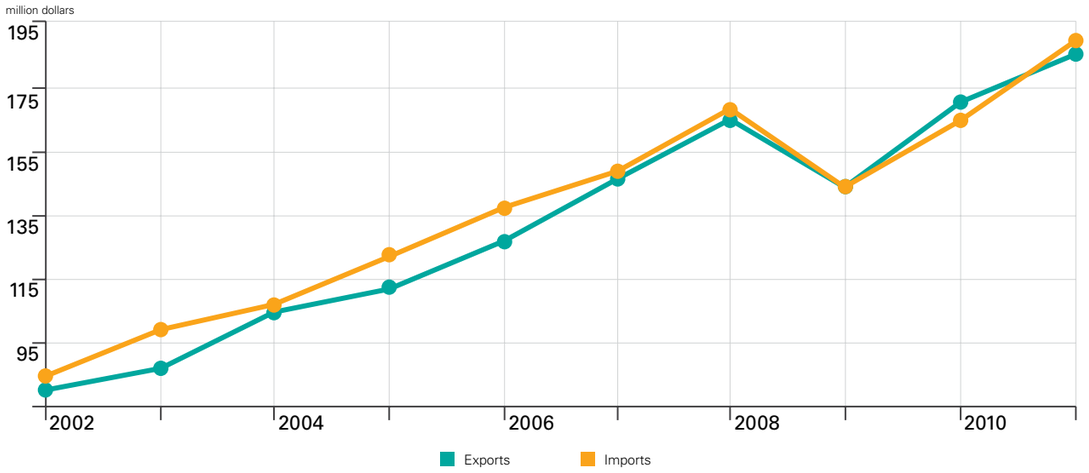
Global Chemical Imports and Exports

Source: CEFIC



Global Chemical Imports and Exports

Source: CEFIC

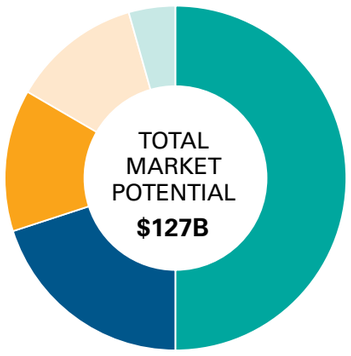


Current Emerging Market Potential (2010)

Source: Deloitte

China	63.9
Russia	25.7
Brazil	16.8
India	15.7
Mexico	5.4

(Billion Dollars)



Share of world chemicals produced in the US

15%

Source: ACC

Interview with **John Gaither**

CEO, REICHHOLD

Can you give us an introduction to Reichhold?

Reichhold is celebrating our 85th anniversary this year. Headquartered in North Carolina, we are truly a global company with integrated overseas operations. One-third of our business is in supplying coatings resins to primarily the Americas, and the other two-thirds is in composites, which is truly a global business for us. For us, it is good to be global. We do not have a lot of diversification in terms of our business, but we have the strength of our global diversification.

How have you developed your global manufacturing footprint in recent years?

So much of our growth in recent years has been through our global customers. This is what drove us into India and China; we had global customers there who were telling us that they needed the same Reichhold products in those parts of the world. From 1987 to 2005, we were owned by a Japanese company, Dainippon Ink and Chemicals (DIC). We handled the European and American markets for DIC, so when we became independent in 2005, we did not have a presence in Asia. We decided to build our presence there from zero so that we could ensure that Reichhold had plants that could meet our high quality specifications. Our Indian plant started up in 2009 and we opened our plant in China at the end of 2011. At that time, the US and European economies had started to flat line, so it was very important for Reichhold to grow through our Indian and Chinese business.

How have you addressed your concerns about liquidity?

At the beginning of this year, we had some concerns about liquidity. We went to our bond holders and they were very supportive and agreed to exchange their bonds, which were due to mature in 2014, for new bonds that are due to mature in 2017. This gives us much more time to achieve the benefits of the Chinese and Indian operations and get our more mature markets into better shape.

What do you expect growth in the US market to be like in comparison to other faster-growing regions?

In the last couple years, North America was a big part of the problem. This year it seems to be coming back. While the market in China may not be growing as fast as it has been, we are starting from zero and therefore have a lot of room to grow. We had previously been serving the market there with imports until our plant stated up last November. Our sales have tripled this year since we have put in our plant and we are projecting that they will double next year. China is still the biggest composites market in the world and the per capita consumption is still a very small fraction compared to what it is in more developed parts of the world. South America is another important market for us. Brazil, in particular, is also slowing down but is still a strong region for us.

Given the market slowdowns you are seeing, where are you looking for new business?

Reichhold is developing new products and, at the same time, we have dramatically reduced our costs by rightsizing our manufacturing footprint. This year, we have reduced our global manufacturing costs by 5%, even while starting up a brand new plant in China. The technology we are investing in is more green technology. We are very interested in the advanced composites markets and opportunities in aerospace and automotive. There are good products coming out and finding acceptance in the market. On the coatings resins side, we have developed a new waterborne alkyd latex that has been growing at about 50% a year for the last couple of years. It has performance and cost advantages over other latex products and it is bio-based, composed 30% of vegetable oil.

How do you use your global presence to your advantage from an R&D perspective?

We have three major R&D labs, one in North Carolina, Brazil and Norway. In the past there was very little coordination between these laboratories. They handled their own projects for customers and we were finding that they were often working on very similar things. We now have regular global technology meetings and we share information across all these groups. We prioritize the projects that we are working on a global basis.

What impact do you foresee the US shale gas boom having on business in your home market?

For the US chemical industry as a whole, shale gas is enormous. We will have globally competitive feedstocks. A few years ago, we were looking as a country at importing compressed natural gas and now people are trying to figure out if they can reverse those operations and maybe even export. This really can help all manufacturing, which of course helps Reichhold, since we are selling products to manufacturers. Part of the decline in the US market is that some of our customers moved offshore. We expect to see some of those customers moving back here over time.

Are you looking for partnerships or M&A to support your global growth?

Our industry is mature and in need of consolidation, which we will probably see in the near future. Reichhold would love to play a role in that. We are definitely looking for technology partners. So much of what happens in new development today does involve partnerships. Nobody has all the pieces of the puzzle by themselves so we need to form alliances. We can do it a lot faster and more cost-efficiently that way and we have access to the people that really understand all of the components of development.

Where would you like to see Reichhold positioned in the market in the next five years?

Reichhold would like to be the number one producer in composite resins on a global basis. We see ourselves being a very significant player in the Americas for coatings resins. Alkyd resin, which is the core molecule that Reichhold is built upon, has been a shrinking market at 2-4% a year. However, alkyd resins to date have been mostly solvent-borne systems. Our new waterborne alkyd chemistry can enhance the position of alkyds in the market. We plan to globalize our coatings resins through bringing this new technology to the marketplace. •

Global Business Reports
Industry Explorations

Interview with **Craig Rogerson**

PRESIDENT AND CEO, CHEMTURA

Can you give us an overview of the company's business trajectory since its restructuring in 2010?

Chemtura came out of the restructuring process in November 2010 with seven businesses in the portfolio. The seven businesses came up with their own five-year plans that were used for our valuation, and the trajectory has been significantly up. The economy has been mostly down since then, so our positive trajectory is primarily based on earnings versus revenues. Following wider trends, volumes have been challenged since the strong first half of 2011. We expected this year to be the inverse of that, but the first half of this year was stronger than we expected from an earnings perspective. A bump in the second half of the year clearly is not happening because of soft demand in electronics and the Chinese and European markets. Going forward, we are going to focus on transportation, electronics and energy, and agriculture. These markets cross a number of our businesses and account for roughly 60% of our revenues. According to our five-year plan, they should comprise around 70% by 2016. These are the markets where we think we have the experience, expertise, and technology to have the right to play and be market leaders.

What strategies are you putting in place to hold onto your market share in North America?

Our most significant investments have been in our plant in Arkansas, for our Great Lakes Solutions bromines business, where we are expanding our capability to make new products. We are also investing in facilities outside of Toronto and Charlotte to make new state-of-the-art products. The new products will start off in North America or Western Europe, then quickly move, with some fine-tuning, to meet the specific needs of the markets in Latin America or Asia, primarily India and China. Our overall philosophy is that we need to produce and perform application development in the markets we serve, so we have to move the supply chain east.

What was the strategy behind Chemtura's recent move into offering contract manufacturing and tolling?

Chemtura was put together by mergers and acquisition during the mid-1990s to 2005, so with that we have a broad footprint and many assets. In the down part of the cycle that we are in now, we have excess capacity. Many of our plants are very specific in their capability so it is difficult to consolidate them. While we have a product development pipeline that should put new products into the plants, there is a gap in time, and our plan is to utilize those assets more fully by offering to toll produce. The timing for this addition of services is good because there is a lot of consolidation in the industry and there is an increased need. Because contract and toll manufacturing is not core to any of our specific businesses, we are exploring how to best commercialize this capability.

When it comes to R&D, how has Chemtura's restructuring shifted your focus on innovation?

Chemtura's R&D is very much business by business. In aggregate, we spend about 2% of revenue on technology, application development, and technical support. There are some common themes across the businesses in terms of innovation, such as greener applications. We have done more cross-fertilization across the businesses in the technology group to make sure that there is learning across the segments. In the past, we spent slightly less dollars but the number of our programs was much greater. We now have a much more disciplined stage-gate approach, so the hit rate on projects is much higher and the time frame is much shorter to commercialization. Innovation is a large part of why we have seen improved earnings, even though volume has been soft.

As an industry leader, what activities does Chemtura engage in to advocate for the communities you work in and the wider industry?

Chemtura does quite a bit of advocacy to help promote sound science and a risk-based approach as a basis for regulations. This is critical for the industry. One of our objectives is academic, promoting interest in the technical sciences, but we are also committed to showing that we are good neighbors. We bring neighbors into our plants to demystify what is going on in our pipes. We also deal closely with government officials to help them understand what is important for the industry. Job creation has been a good way to get an audience in Washington in the past few years. The chemical industry, while it employs a large number of people in the United States, has an even greater impact when you look peripherally around the industry.

Is Chemtura on track to meet the growth goals of your five-year plan?

For our five-year plan, getting from $3 billion to $5 billion is pretty much organic. We plan to do this through investing in our new plant in China, as well as joint ventures and expansions of capabilities for new products in North America and Europe. We are on track with our margin improvement and on the innovation side, where we expect a doubling in our metric. The additional $1 billion of revenue that we have planned will come with M&A. The M&A piece is the toughest part because it's all about creating value, not driving revenue. We would rather do nothing in this area if the alternative would be the wrong thing. Chemtura is on the right track, but it is a process. We are re-establishing our reputation through innovation and the consistent delivery of results. We are going to be close to our customers both from a joint development perspective and to have a short supply line so we can get them the products they need when they need them. We are going to grow with our customers, and we are looking to continue our partnerships. •

Global Business Reports
Industry Explorations

Mergers and Acquisitions

Reshaping the specialty chemicals marketplace

Whenever any market undergoes fundamental changes, some companies adapt and thrive, some companies struggle, and larger companies look to move in to take advantage of new opportunities. These conditions pave the way for mergers and acquisitions on a scale far above that of normal market fluctuations. This is precisely the current situation of the US specialty chemicals industry.

Large chemical companies are acquiring specialty companies to enable them to move further downstream and get closer to the customer. According to Telly Zachariades, partner at The Valence Group, LLC. agrochemicals and fertilizers will have to feed more people with limited resources and there is a strong trend towards foods that are more functional. "Firms acquire companies that have synergies with their current portfolio or are focused within certain sub-sectors that have good long-term fundamentals. Personal care chemicals is a major area of focus as it relates to an ageing population and the increasing purchasing power of emerging markets for products with higher profit margins, which include high end skin creams and moisturizers," said Zachariades, who predicts the same level of billion-dollar deals in 2013.

In July 2012, Eastman Chemical Company acquired Missouri-based Solutia Inc., a global manufacturer of performance materials and specialty chemicals, for $4.8 billion, and Arkema has also made two big acquisitions in the last two years. In 2010, the French specialty chemical manufacturer acquired part of the Dow Chemical Company's US acrylics business; the following year, Arkema acquired coatings activity from former parent company Total S.A. One third of this global acquisition took place in the United States.

"The Dow and Total acquisitions are clearly related to our coatings business, and will reinforce our acrylic acid presence in the US," said Bernard Roche, CEO of Arkema Inc.

The acquisition market has extended to the distribution sector as well. "We have an active acquisition candidate pipeline and a successful track record of acquisitions supporting our organic growth that puts us in a leadership position in the distributor mergers and acquisitions field," said Brenntag's Fidler. "We look to fill voids in geography, industries, skillsets and product lines. The company plans to spend an average of €250 million a year out of our free cash flow on acquisitions globally."

For pharmaceutical companies facing the patent cliff, groups are highly motivated to fill their pipelines, but the financial crisis has created a shortage of new investment funds. This shortage has created a bottleneck in merger and acquisition activity.

"We see a backlog of companies that should have been bought in 2010 or 2011. Until this backlog is worked through and those dollars are freed up, we have an environment that is keeping some capital from being invested in this sector," said Wofford of Hutchison Law Group.

While chemical companies indeed have cash in the bank, uncertainties in the current US political environment and tax policies are impeding the deployment of resources to go ahead with acquisitions, according to Mike Shannon, global and US leader, chemicals and performance technologies at KPMG LLP. "There have been very few closed deals. A combination of the US and European economic climate is holding back merger and acquisition transactions. Once the catalyst of mergers and acquisitions is realized there will be a plethora of deals." •

Interview with Michael Staff

PRESIDENT AND CEO, MINAKEM, LLC

Can you give us a brief overview of Minakem and some of the company's goals within the United States market?

Minakem is a 100% wholly owned subsidiary of the Minafin Group, which is located in Luxembourg. The company started with the acquisition of SEAC in 2005 and later acquired Chemtec Leuna from Schenectady International in 2006. The United States remains a major contributor to the overall sales of the company. In 2008 Minakem acquired Penn Specialty Chemicals, which is now known as Pennakem and is the non-regulated contract manufacturing specialty chemical business in the group. In 2009 Minakem acquired an Astra-Zeneca facility in Dunkerque, which brought the company not only into the generic space, but als and diversified Minakem's portfolio. The commercial hub for Minakem is located in the United States; roughly 60% of turnover is generated from United States based companies. Minasolve is a subsidiary that was formed to focus on cosmetics, food and fine chemistry based products that require specific technology. The nucleus of Minakem is still contract manufacturing, although we have been able to diversify our profile into specialty chemicals through acquisitions.

How has the company ensured steady growth?

Minakem has increased revenue from €25 million to over €150 million today, mainly through an equal mix of organic and acquisition growth combined with the use of technology and an understanding of our clients' needs and requirements. Minakem provides an excellent service to our clients as evidenced by being key suppliers to major pharmaceutical companies; repeat customers are vital to our success. The company is transparent and our "open book" policy and has generated several successful partnership launch durgs .

What type of markets is Minakem planning to target as part of your growth strategy?

Pharmaceuticals (API's and advanced intermediates) are the most important part of our business. We also recently added specialty pharmaceuticals and emerging pharmaceuticals that are financially stable to our growing portfolio of clients. Minakem carries out a fair amount of dual diligence when prospecting and will only approach companies that have solid proven management or management that has had previous success to minimize risk. Minakem has a screening process in place for each potential partner company.

What is Minakem's manufacturing strategy?

The R&D technical centre of Minakem is located in Beuvry where projects are piloted and matured. If the project evolves and grows, it can be transferred to any one of the Minakem sites. Pennakem is treated as a separate business unit with a different philosophy to Minakem. Minakem is still a small molecule manufacturer with monthly R&D meetings to discuss each individual project with the commercial representative that is managing and driving the program.

How much of a threat do low cost Asian manufacturers pose to companies like Minakem?

The market is very competitive; however, large pharmaceutical companies at Phase III with projects that have failed expectations for whatever reason in low cost countries have approached Minakem to help. It is important that we source some of our starting materials out of China and India, where we employ full time staff and carry out audits in order to ensure quality control. We are equally focused on keeping the company cost structure efficient and find creative ways to reduce the cost of projects through innovation and continuous improvement.

How is Minakem able to maintain a green footprint throughout the manufacturing process?

Minakem is a European company and has always been environmentally conscious; the Pennakem acquisition was made with a particular focus on "green chemistry" and environmentally conscious thinking. The segment that we operate in is highly fractured, so there will certainly be consolidation; the average revenue of contract manufacturers in the United States is under $100 million, and the trend is more and more third party manufacturing.

How do you see the contract manufacturing industry evolving over the next five years?

The industry will remain technology focused; processes that are labor dependent will continue to go offshore, although companies that have niche technology will be able to capture a fair share of the market in "local" regions. Companies need to be transparent and competitive in order to penetrate more of a market share and work closely with partners and stakeholders. As an industry, one of the biggest challenges will continue to be the peaks and valleys of the market as no program will ever advance perfectly.

Where would you like to see your operations in the United States in four years?

Minakem would like to increase the number of manufacturing sites we have in the United States and Canada. There will be an increase in the amount of manufacturing performed in the West due to the rising salary pressure and emerging middle-class in China and India. In my opinion, the United States has become as competitive as China, especially when you need a reliable, compliant supplier. Minakem will continue to grow organically and through potential acquisitions in new areas like API. We are interested in developing our generic segment and expand a product line as well. Minakem has evolved as a diversified, dynamic company and will continue along this path. •

Interview with
Eric Vogelsberg

SENIOR VP, M&A AND CORPORATE DEVELOPMENT PRACTICE, KLINE GROUP

Can you provide us with a brief overview of Kline Group and the services that you provide to chemical companies?

Kline Group was founded in 1959 as a market research company that was primarily focused on the chemical industry. Today the company has four core industries: chemicals and materials, energy, life sciences and consumer products. Kline has extensive knowledge of the chemical industry and had done much of the work to define and differentiate value added chemicals - specialty chemicals and fine chemicals for the larger volume tonnage and commodity chemicals. Our focus remains primarily on the value added sector, although we now do work in petrochemicals and commodity chemicals. Kline is uniquely positioned in the consultancy field due to a combination of deep industry understanding and experience combined with functional management consulting experience. Kline is divided into: (1) a market research division, which involves syndicated studies and custom projects for clients, and (2) a management consulting Practice, which is solutions driven and founded on industry knowledge. Kline is an extremely well known and well respected firm and has evolved from being primarily focused on data, size of markets, market share and growth. The firm has the ability to offer a large portfolio of services that enables our clients to understand critical business issues and their implications and what measures are required to improve certain aspects of their business. We offer advice to clients who want to grow their companies either through grassroots, acquisitions or joint ventures and companies who are not sure how competitive they are compared to their competitors.

The client base of Kline Group consists of companies that are strategic players in their industries. The majority of our clients are medium sized companies, although we have clients who are major chemical companies and small sized players. The majority of our financial clients are private equity firms and investment banks . The largest companies tend to have significant internal staff; so our support is more often sought by large chemical companies and equity firms who have a specific need for capacity or a unique capability that they need to access.

What is the role of the Chinese office?

The original basis for the Shanghai office was to provide research capabilities for our clients in China. Local Managing Directors have been employed in our Indian, Japanese and Chinese offices that have a deeper understanding of the local culture combined with knowledge of western business culture. The office offers a full range of services and enables our western clients to assess China as a potential business destination and answer any questions regarding aspects of the market that clients do not understand. We established an office in Delhi to help our market research business in the region and the office has been so successful that we have now opened a second office in India. Kline has a large global presence to enable our clients to take advantage of cross-border opportunities between the United States China, Brazil and Eastern Europe.

How does Kline position itself in the industry between companies like KPMG and Valence Group?

KPMG is an accounting firm that has a consulting practice and the Valence Group is a boutique investment bank that buys and sells businesses. Kline has limitations in terms of broker dealer activities, although we have informal and formal partnerships that we are able to utilize if a client requires something that is beyond our expertise or abilities.

Are more medium-sized companies looking to expand their portfolios into different industries through M&A?

All companies are looking for growth and this was reflected in the high demand for our M&A advisory, which is being driven by the increased amount of cash flow that publicly-held chemical companies have. There are $2 trillion of private equity funds that need to be re-invested to generate a return, which has made the bidding process more competitive because of the increased demand. There are a lot more properties on the market that are looking for higher multiples in North America and Latin America, and a number of external factors that could potentially affect this trend, which include oil prices and the impact of the Eurozone crisis. We have developed a more formal M&A corporate finance practice.

What would you expect the industry to become over the next five years?

Larger chemical companies will continue to increase in size, and there will be a greater Asian influence within the industry with Indian and Chinese chemical companies becoming more prominent. There will be a shift in the chemical industry towards megatrends and the industry will focus more on developing new initiatives for water sustainability and the ability to make more water. As the world's population increases, there will be more challenges in feeding the population so there will become more of a focus directed towards sub-Saharan Africa as it is the largest untapped region of arable land.

What is your final message for our readership?

Kline Group has evolved from a market research firm into management consultancy in order to meet the needs of our clients. The chemical industry will continue to thrive as it is the foundation of all consumer products. The industry has to work hard to improve its image and to create public awareness of the many functions and benefits that chemicals have and how good chemistry facilitates a better quality of life. Kline Group is optimistic for the future and our fastest growing offices are in high growth emerging markets. •

Interview with
Bernard Roche

PRESIDENT AND CEO, ARKEMA INC

Please provide us with an overview of Arkema's recent milestones in North America.

Arkema has made two big acquisitions in the last two years. In 2010, we acquired part of Dow's US acrylics business; the following year, we acquired coatings activity from our former parent company Total. This was a global acquisition, one third of which took place in the United States.

How significant is the American market to Arkema?

In terms of countries, the US is by far the largest market for Arkema and it will continue to be for a long time. Today the US accounts for 33% of Arkema's global sales. We have 26 sites in the US, compared to 44 in Europe, 10 in Asia and five in the rest of the world. Arkema's strategy is to grow in the fastest expanding emerging economies, especially China, Brazil, Mexico, India and Russia. In 2005, 57% of our sales were in Europe; this will be down to 40% in 2012. The US has grown in the same time from 25% to 34%.

How have recent changes to your business affected the company's US operations?

Arkema's recent divestiture of our vinyl business had no impact at all on the US—we had no vinyl facilities in the country, although there was very small-scale activity in Canada and Mexico. The company's new business units, high performance materials, industrial specialties and coatings solutions, are all areas where we are very strong in the United States. The Dow and Total acquisitions are clearly related to our coatings business, and will reinforce our acrylic acid presence in the US. Last year, we launched a significant investment to debottleneck and reshuffle our monomer plants in the US. Regarding the industrial specialties, Arkema will continue to be extremely strong in PMMA, fluorogases, thiochemicals and hydrogen peroxide. In high performance materials, we have a very important PVDF plant in Calvert City, which we are continuing to develop.

2011 was a very strong financial year for the company globally. What do you attribute this success to, and what are you expectations for 2012?

When you make acquisitions, you grow. Furthermore, Arkema has always worked very closely with key clients to provide solutions, which has helped us tremendously. Our work fits in with global megatrends. One billion people in the world have no access to drinking water today, and we have products which help supply it. We are also present in the field of environmental sustainability. We are on track to fulfill our commitments for 2012 toward achieving 1 billion euros of EBITDA.

How is Arkema's global push into specialties reflected in your US strategy going forward?

Arkema has seen significant turnaround in the six years since its spinoff. With double-digit growth per year, we have moved from being seen as a lackluster organization to a company in the leading pack. After the vinyl divestiture, the next stage was to announce our development in the specialty and high value-added polymers fields. In the US, we have set targets that fit with this strategy. For example, we will introduce a brand-new molecule, polyether ketone ketone (PEKK), which will compete with PEEK. This molecule is priced at the top of the plastic pyramid and we are in the process of talking with customers, developing new applications, and fine-tuning the molecules. We started work on PEKK three years ago, and are convinced we can make it a success within the next ten years.

What are Arkema's competitive advantages in specialty chemicals?

Arkema produces unique molecules. In thiochemicals there are only two key players, and barriers to entry are very high. In specialty polymers, Arkema is a clear market leader. We are the only company to have been producing bio-based polymers for 50 years, and there are tremendous advantages in being the only one with proprietary processes to produce 10-base, 11-base and 12-base polymers. We do not have a take-it-or-leave-it approach to our products; instead, we work with customers to supply what they need. In the specialty field, it is very important to tune your offerings.

What differentiates Arkema's approach to R&D in the US market?

Globally, Arkema spends roughly 150 million euros every year on R&D. Two thirds of this investment is devoted to sustainability and megatrends. We have six or seven R&D centers across our three regions, including three labs in the US—two for coatings, and one for the rest of the business units. We push breakthrough products, like PEKK, and run nanotechnology programs and some bio-processes for acrylics, for example. In the US we are tuning our projects to fit American customer requirements, which are always specific by region.

Where would you like to be positioned in the US market in five years?

In five years, we want to be a clear leader in specialties and advanced materials in the US. Clearly, shale gas will have a tremendous positive impact on the US economy. It will mean two things for Arkema: first, production will be cheaper and we may increase our exports from the US; second, our customers here will continue to grow with the economy. The US has always been very important to Arkema, and this will continue to be the case. Arkema targets a global turnover of 10 billion euros, with good profitability, by 2020. •

The Impact of Shale Gas: **A new industry paradigm**

The Marcellus Shale

Restoring vigor to East Coast chemicals

The refinement of the technique used to extract shale gas has led to what many commentators are describing as an "energy revolution" in the USA. This type of language is not mere hyperbole; shale gas and its potential role in making North America energy independent was a central issue in the recent presidential race. Estimates of the amount of recoverable shale gas in the Marcellus basin vary, but according to a 2011 report by the United States Geological Survey, the total recoverable amount is close to 85 trillion cubic feet of natural gas.

Yet the energy potential of America's new gas supplies is only part of the picture. For American chemical manufacturers who rely on ethane, a natural gas liquid that is derived from shale gas, this gives them significant cost advantages over their foreign competitors using oil-based feedstock.

The Dow Chemical Company and Royal Dutch Shell plc recently solidified the enthusiasm surrounding low-cost feedstock in the US. In March 2012, Shell announced plans to build a $2 billion ethylene cracker near Pittsburgh; the following month, Dow followed suit by investing $4 billion into a similar facility near Texas. Dow's CEO, Andrew Liveris, directly attributed the company's investment to low natural gas prices, putting the company "on the threshold of an American natural gas resurgence", according to a company statement.

Though companies operating in the less energy-intensive specialty chemicals sector may not experience direct benefits of lower energy costs, the implications for the US chemical industry as a whole can be viewed as positive.

"In addition to the downstream connections of extracting ethane, propane and butane, the chemical industry has a whole range of involvement, from developing environmentally benign additives to fracking water to providing chemicals for water treatment," said Jeffrey Peters, president of the Pennsylvania Chemical Industry Council.

Boosted by these anticipated downstream effects of the shale boom, chemical companies are going forward with their investment plans. The American Chemistry Council estimates that chemical companies across the country have allocated over $25 billion to the construction and expansion of their facilities. The East Coast in particular has become used to seeing decreasing investments as major manufacturers have exited the region. Now with the Marcellus shale play, this trend is reversing.

"Chemical manufacturing in the United States has become more competitive because of low energy prices and the cost of labour, the regulatory environment and intellectual property protection, which make the United States an attractive destination for investors," said Wessels of DSM.

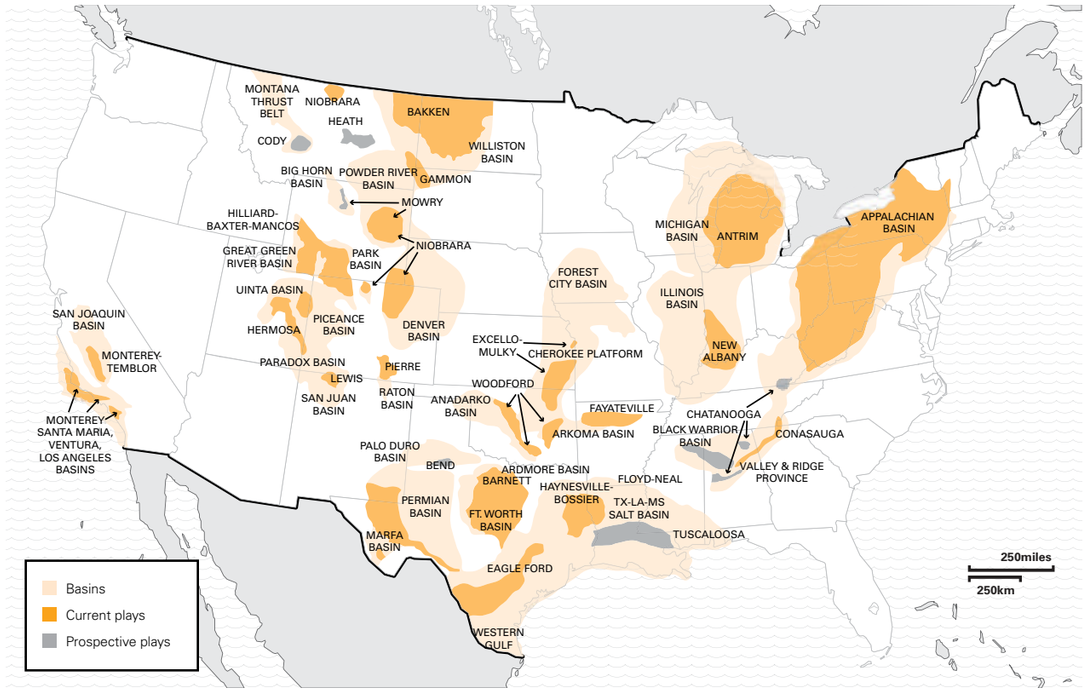
Manufacturing locally also fits within the strategy of global chemical companies with a US presence, such as Kureha America, a Japan-headquartered, New York City-based raw materials supplier with three manufacturing sites in the United States. "In 2009, we decided to build a plant in West Virginia that will make a brand new polymer called polyglycolic acid (PGA; brand-named Kuredux), using very unique technology. Part of our strategy is to diversify, not only in sales and marketing but also in our manufacturing sites," explained Liz Gershon, executive vice president of Kureha America.

Bluestar Silicones, a leading silicone manufacturer with a US base in East Brunswick, New Jersey, recently consolidated all North American manufacturing and R&D operations in a 226,000 square foot facility in York, South Carolina. "Today's environment creates the opportunity for manufacturers to regionalize production," said J. Christopher York, North American president of Bluestar Silicones.

There is a long way to go before shale gas really sparks a "golden age" of East Coast manufacturing. Environmental concerns over the hydraulic fracturing ("fracking") process used to extract the oil must be addressed and infrastructure must be put in place. Yet the potential is huge. •

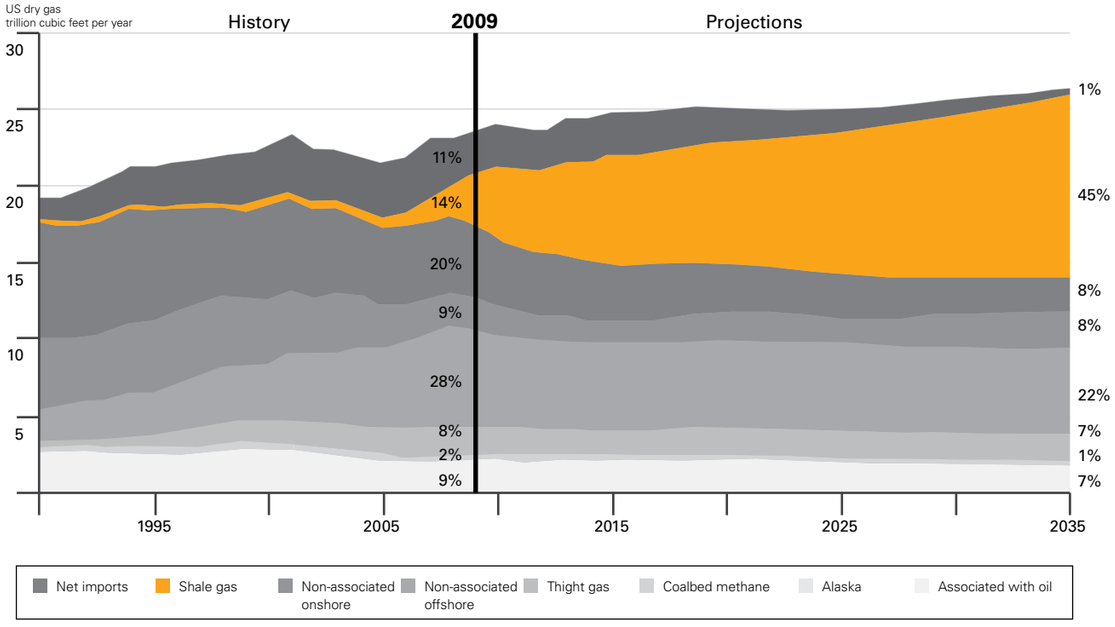
Shale Gas

Source: EIA



The Growing Importance of Shale Gas

Source: EIA



Interview with Jeffrey Peters

PRESIDENT, PENNSYLVANIA CHEMICAL INDUSTRY COUNCIL

Could you provide a quick introduction to the mission of the Pennsylvania Chemical Industry Council?

The Pennsylvania Chemical Industry Council (PCIC) is a 30 year old organization that was founded by a dedicated core group of companies. Ten years ago, we moved from a traditional trade association model to fold into an existing lobbying and full-service communications firm, Bravo Group, which now manages the organization. Traditionally, the organization has had three main activities. The first is our government-relations and advocacy work. Our board wants a defined chemical industry presence in Pennsylvania to deal with state government. To do this, we spend a lot of time on relationship-building with the government and other trade associations. Our second objective is communicating to members about what is happening in state government that will impact their business. The third component of what we do is providing industry education and seminars.

How was your membership base changed as the industry has evolved?

At one point PCIC had 75 companies, but today we have 40 members. There are three reasons for this change. By far the largest single component in membership decline is mergers and acquisitions, a process that accelerated during the downturn. The second largest reason is because of companies that no longer do business in Pennsylvania, as they close older facilities and consolidate existing plants in the US, but also globally. Pennsylvania has not seen chemical manufacturing leave the state at the level that New York has, but we have seen some leave the area. Membership has also declined because many companies that are international in scope have deemphasized their government relations function at the state level. Five years ago, there were about six or seven companies that had representatives based in Harrisburg and today there are none.

As an organization trying to provide services, this has been a challenge. However, the chemical industry is not unique in facing these challenges. Every other trade association we know is having these same problems because of corporate downsizing. It has been a long time since the industry has had a significant industry-wide threat from Pennsylvania state government. Given that the current administration and the leadership in the legislature are very positive about manufacturing, we do not foresee one in the future.

What are you hearing from your members about growth in the wake of the financial crisis?

At our November 2011 board meeting in Pittsburgh, we brought in the Republican leader and the Democratic leader of the state's House to speak to the group. We went around the table and our members uniformly had very positive things to say about the sector. Small companies are growing and looking for more opportunities. There has also been some growth and investment in Pennsylvania from some of our larger members. Eastman and BASF have made significant investments in Pennsylvania facilities. In March 2012, our meeting was similarly positive. One of the reasons our members are confident is the Marcellus play.

What downstream implications is the industry expecting to see from the shale gas boom?

The Marcellus shale play has the potential to be a game changer. The chemical industry has a whole range of involvement, from the benefits of abundant, cheap natural gas, to fracking water. We have companies that are looking at what can be put into the water that is benign environmentally and just as effective for the drilling operation. Water treatment is another big opportunity for the sector. Our industry has so many potential connections, in addition to the downstream connections of extracting ethane, propane and butane.

One of the challenges of the Marcellus story, aside from fracking, is that there is no natural gas in south-eastern Pennsylvania where most of the population lives. Advocates have been involved in bringing some awareness to this corner of the state. For our industry, the only downside that we have seen is on the hiring front. The Marcellus industry is hiring a lot and paying a lot and it has made the chemical hiring market, which has traditionally been soft, tighter.

Shell announced in March that they will evaluate a site in Pennsylvania's Beaver County as the location for their ethane cracker. How is the evaluation process progressing?

Shell has made it very clear that this is a major investment and they are handling the decision well. It is clear that they are serious about this given the fact that they have had three public meetings in Beaver County in the past month to talk to residents about the project and its impact. They are a big company, but the capital investment is still a big number.

From a regulatory perspective, what is posing the biggest challenge for the industry?

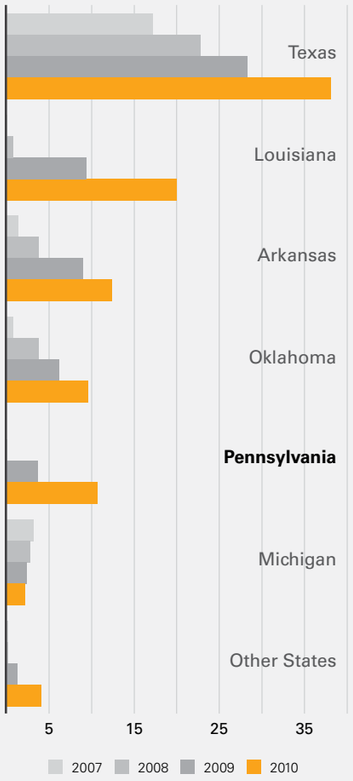
Our members have complained about the lengthy and complicated permitting process. The Corbett administration has been supportive and they have just announced a very significant new policy on permit handling. Companies want certainty about the permit process if they are going to invest, whether it is a small company with a $5 million investment or Shell's $1billion. This administration has really stepped up to address those things.

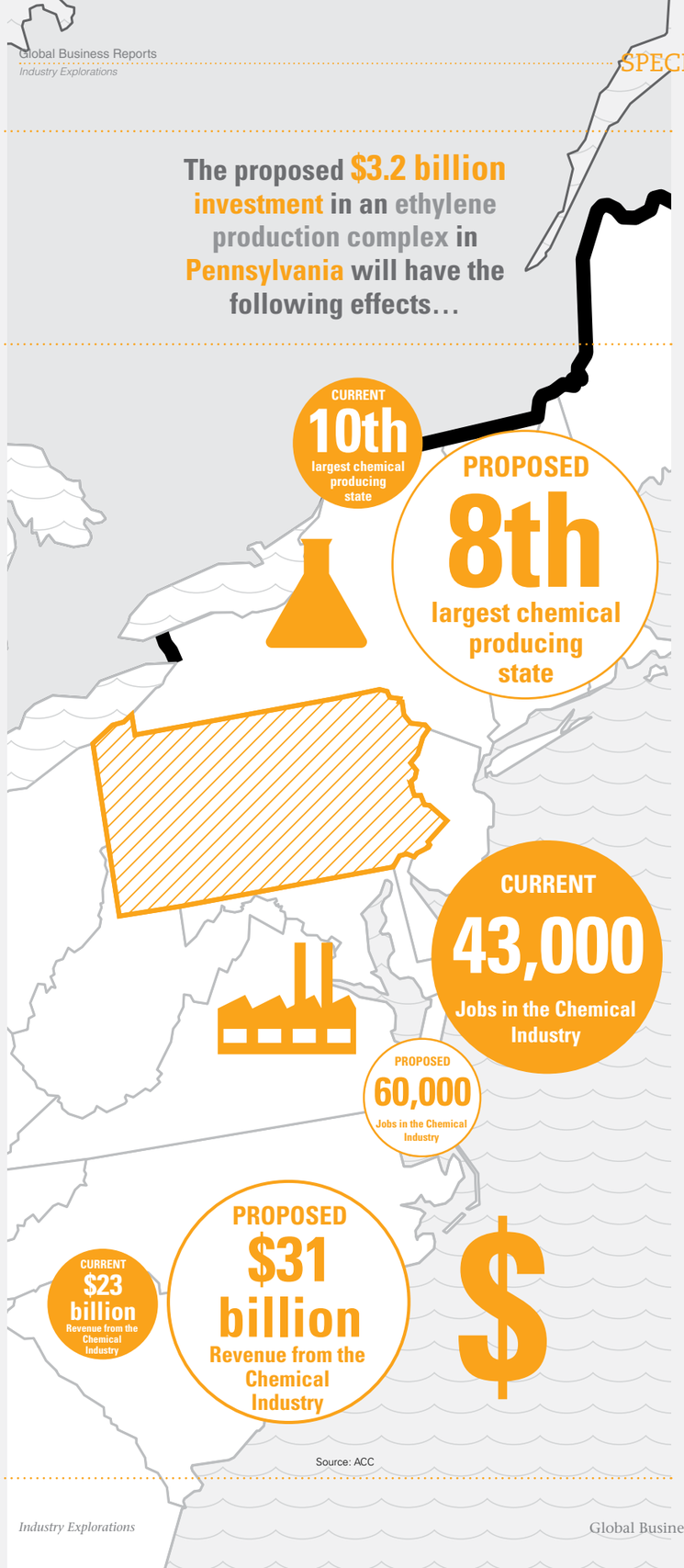
How do you expect the chemical industry to perform in Pennsylvania in the next five years?

Presuming that the Shell cracker does happen, we are going to see auxiliary plants sprout up. The economic scope of the construction of the project will be significant. Companies are now considering doing processing in state and examining who in this area might need ethane derivatives. There is a lot of activity around that right now and we expect to see more in the future. •

Shale Gas in Pennsylvania

Source: EIA





The Potential of Shale

Marcellus Shale Spells Promise for the US Northeast

The US shale gas boom is a game-changer in more ways than one. Not only has it paved the way for the country to become energy independent, but it promises a knock-on effect for related industries that are struggling to fight past a slowdown in America's economic recovery.

One such industry is the chemicals sector. With low energy prices and inexpensive feedstocks made possible by shale reserves, the outlook for the US chemicals industry is bright. Shale gas grants US producers a significant competitive advantage over global competitors and has attracted renewed investment in the industry.

Nowhere is this more present than in the US Northeast, a region that has seen manufacturing driven out by high energy costs and restrictive regulations. Home to the explosive development of the Marcellus Shale reserves, the Northeast is cautiously optimistic that they will also play host to a renaissance in chemical manufacturing.

"The Marcellus shale is very important to the business of chemistry," said Hal Bozarth, executive director of the Chemical Council of New Jersey. "Natural gas is the lifeblood of the chemical industry, whether the gas is used to heat or run the facilities or its wet stream materials are used as raw materials for specialty chemical manufacturing."

The Marcellus Shale, and the Utica Shale beneath it, are some of the largest reserves of natural gas in the country. The black shale formation runs deep underground from Ohio to West Virginia, Pennsylvania and southern New York. While geologists have known about the formations for years, exploitation did not take off until recent years because of advancements in horizontal drilling and hydraulic fracturing. In the few short years since countrywide drilling began, US natural gas reserves went up 30%.

The Marcellus Shale is an advantageous position due to its proximity to the population-heavy areas of New York, New Jersey and New England. Yet constant drilling activities have led to a surplus of gas and a deficit of buyers. The region's August bidweek prices reported the smallest regional gain of 13 cents to average $2.97. Despite record lows, Fitch Ratings has predicted Marcellus Shale production will more than double in the next five years. This growth is dependent on storage and pipeline development as the region transitions from a gas importer to a supply center.

While low gas prices have slowed drilling in the region as of late, companies are going forward with their downstream investment plans. The American Chemistry Council estimates that chemical companies across the country have allocated over $25 billion in the construction and expansion of their facilities. The Northeast in particular had seen very little investment after the majority of manufacturers left the region. Now with the shale boom, this trend is reversing.

Royal Dutch Shell is moving forward with its plans to invest in a world-class cracker in the region to convert ethane extracted from the Marcellus shale into ethylene, a hydrocarbon widely used in the chemical industry. In March 2012, Shell announced that the company had signed a land option agreement to evaluate a site in Beaver County, Pennsylvania. As Shell completes its environmental and engineering studies for the site, the state's governor, Tom Corbett, is pushing for tax incentives to solidify the deal. The processing plant has an estimated price tag of $1 billion and promises thousands of jobs.

Shell is not the only company to announce plans to invest in petrochemical plants in the region. Dow Chemical has plans to build three petrochemical facilities in the area and to restart another that idled during the recession. Bayer is considering West Virginia as a location for ethane crackers and Eastman Chemical restarted a small ethylene plant in July 2011. Other companies, such as Canada's NOVA Chemicals and US-based Caiman Energy, are signing agreements to use Marcellus-sourced ethane and other shale-based feedstocks.

While Pennsylvania has been the main attraction for drilling activity, and now the Shell cracker, other regional players are hopeful that investment will translate into good things for neighbors to the Marcellus.

"There is a very good chance investment will come back to the region and there will be some spinoff in New Jersey," said Bozarth. "The question for the future is the degree of impact that the Marcellus shale will have on the region as large facilities and subsidiaries are put in place."

Although chemical companies are eager to invest in facilities to exploit the Marcellus resources, with increased capacity will come new challenges as the industry explores more avenues for demand. Posed to produce a surplus of materials that exceeds the demand of a mature market, the industry must begin to find new markets now in order to demonstrate that a Northeast manufacturing renaissance is viable and a worthy investment.

The key to moving forward is an increased focus on supplying to emerging markets in Asia and Latin America. With a ratio of 6:1 for crude oil and gas prices, the US chemical industry is in a very competitive global position. In 2011, exports were up nearly 11% to $189 billion and are expected to exceed $230 billion in 2014. Developing export markets can be lengthy and complicated, involving business restructuring and regulatory hurdles, so it is crucial that companies start the process now.

While the shale gas boom has given the chemical industry the boost that it needed, it is now up to the sector to secure its prosperity in the future. By focusing on export markets, US manufacturers will avoid the cyclicality of the national market and ensure the industry's growth and global advantage in the long term. •

"Right now, we see a picture of slow but steady growth in the US chemicals industry. Shale gas is a huge opportunity in North America; it currently addresses the upstream value chains, but it remains to be seen what it will bring to speciality chemicals. In the medium term, the American chemicals industry has quite a positive outlook. Our strategic target is to outgrow the chemical market. BASF wants to be the partner and employer of choice, and we feel confident we are on track to achieve this."

Beate Ehle, Executive Vice President, BASF Corporation and President, Market and Business Development, BASF North America

"A couple of years ago it did not look like there would ever be another chemical plant here because of high energy costs, but today it is looking more likely because of the lower cost of feedstocks. The shale gas boom will definitely help the industry, but we do not expect it to have a significant impact on our urethanes business. However, it may help in terms of the United States being able to produce more competitively compared to other regions."

David Patten, CEO, Everchem Specialty Chemicals

"Depending upon the sector of the specialty spectrum the company represents, shale gas could be a game-changer for the US chemicals industry. The ability to have very cheap feedstock which will feed into many specialty chemicals that are carbon-derived will at some point force the US companies to develop their supply chain for their products outside US borders. With the capacity that is coming online from the ability to process shale gas for the chemicals industry, the US market is not going to be able to absorb all products. Companies are going to be forced to find and establish distribution channels for their products into overseas and emerging markets. The cost advantage of shale gas as a raw material for many of these products will allow US companies to compete overseas against the emerging markets."

Mike Shannon, Global and US Leader Chemicals and Performance Technologies, KPMG

"For the chemical sector, many of the companies based in the US can take advantage of the great infrastructure in place and the reduced risk of establishing capacity in the United States. The importance of shale gas and its potential for the economy is very compelling for the chemical sector and for BDP's future. While the US market in recent years has not been the growth market that Asia Pacific has been, now with the arrival of fracking technology, it is potentially a game changer."

Arnold Bornstein, Executive Director of Corporate Communications, BDP International

Interview with Hal Bozarth

EXECUTIVE DIRECTOR, CHEMISTRY COUNCIL OF NEW JERSEY

Can you give us a brief introduction to the Chemistry Council of New Jersey?

The Chemistry Council of New Jersey (CCNJ) was founded in 1955 by a group of executives as a way to meet and exchange information. We have since evolved into an advocacy organization that represents the interests of its members through outreach to top-level executives, government officials, regulators, the media and health and safety professionals. Our membership base today covers pharmaceuticals, chemicals, flavors and fragrances, water treatment and some refiners.

How has your membership evolved over the years as the industry has changed?

The CCNJ originally had more than 90 members, ranging from specialty to commodity and pharmaceutical chemical companies, but it has since shrunk as the industry has evolved. New Jersey was originally the cradle of the Industrial Revolution so chemicals had a natural place in the state. There were many entrepreneurs who ran small chemical companies for years, but most of these companies were bought out when the industry became more global in nature. There are still some small entrepreneurial specialty chemical operations, but not nearly as many as there were before. New Jersey's chemical sector represents 4% of U.S. chemical industrial output. The CCNJ represents an industry that employs about 55,000 to 60,000 employees in the state and total sales in the chemicals sector hover between $27 to $29 billion.

Looking at the chemicals industry in New Jersey, it is a very diverse market. What are the key products manufactured in the state?

New Jersey has a bit of everything in the way of chemicals. There are a lot of pharmaceuticals and pharmaceutical intermediates made here. There is also a contingent of plastics manufacturers concentrated close to their market in South New Jersey, where floor manufacturer Mannington Mills is located. DuPont Chambers Works, also in South New Jersey, which has developed and manufactured more than 1,200 chemicals covering cover a wide sphere. We also have producers of water treatment materials and consumer product companies like Church & Dwight and Procter & Gamble.

How has the New Jersey chemical industry been performing in the wake of the financial crisis?

By the nature of its materials and its customers, chemicals lead the economy into a recession and theoretically out of a recession. Our members can tell when the economy is about to drop off because they see requests from their customers dry up. During the last year and a half, our members were reporting that the clouds were lifting and orders were up. However now in July 2012, we are hearing that orders are slacking off and there is some concern.

What expectations do you have for the industry's health in the future?

Given the relative inexpensiveness of natural gas and the closeness of the Marcellus shale field in Pennsylvania, there is a very good chance investment will come back to the region and there will be some spinoff in New Jersey. The Marcellus shale is very important to the business of chemistry and we expect to see our members benefit. Natural gas is the lifeblood of the chemical industry, whether the gas is used to heat or run the facilities or its wet stream materials are used as raw materials for specialty chemical manufacturing.

A key problem in the US regulatory framework is the conflict between regulations on the state and federal levels. How is this duplicity impacting the industry in New Jersey?

The US chemical industry needs to be able to compete globally, and in order to do so we need to have a rational regulatory schematic. It makes little sense the extent to which there are state regulatory structures that conflict with or are additive to the federal standard in the same area. One of the things the Europeans are doing through REACH is trying to establish a one-size regulatory schematic that fits all the members of the EU. The United States is unfortunately not there yet, but this is endemic to our system. We have 120 legislators in Trenton thinking about things they can do for New Jersey that may be different from Pennsylvania or New York. In some cases we have been successful in adopting a federal stance, such as with our hazardous waste regulations, but in other areas like air and water permitting, New Jersey differs significantly from our counterpart right across the river in Pennsylvania.

New Jersey's industrial energy costs for the year to date are 59% above the natural average. What is being done to incentivize chemical companies to stay in the state?

Poor infrastructure and not enough generation capacity have led to very high energy prices. When it fell to New Jersey's big manufacturers to pay these costs, many left and drove energy rates up even further. New Jersey has now recognized, perhaps too late, that in order to spread the burden of the cost of society it needs large energy-using manufacturers to contribute in the way of property tax and the income tax of their employees. Policy leaders are trying to incentivize manufacturers to return with tactics from the sublime to the ridiculous, by issuing basic energy credits and even incentives to bring manufacturers of solar panels and wind turbines.

How do you see the chemical industry in New Jersey performing in the medium term?

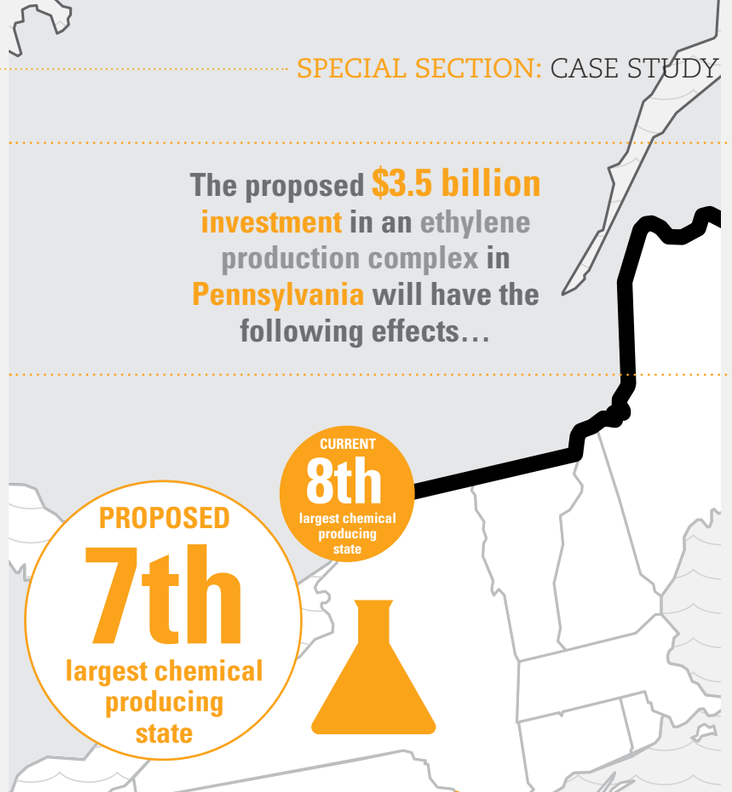
At one point, New Jersey's chemical industry had the most employees and was ranked second nationwide. We have slipped down over the years to third in the number of employees, and we are now eighth largest chemical producing state in the US. The question for the future is the degree of impact that the Marcellus shale will have on the region as large facilities and subsidiaries are put in place. We have a good infrastructure system to get materials to our customers and as long as the marketplace stays as robust as it has been historically, there will still be the need for specialty chemical manufacturers to be close to the marketplace. •

MORE THAN

16,000

permanent jobs will be created

Source: ACC



Source: ACC

Courtesy of Siegfried

Innovation Breeds Success: **Research and Development in Specialty Chemicals**

"There are predictions every year that the rate of innovation in the United States will start to decline. Although China now holds more patents than we do, US innovation has not declined. This is because we are good at it. The United States has an inventive and entrepreneurial spirit."

- Thomas Tritton, President, Chemical Heritage Foundation

The Competitive Edge

The importance of research and development

USA's global ranking for innovation and sophistication

6

Source: World Economic Form 2012 Global Competitiveness Report

The chemical industry has always been at the forefront of innovation; today is no different. From life-saving pharmaceuticals to electronic touch screens to light weight plastic use in automobiles, it is very often the chemical component of a product or industry that drives its development and improvement. Indeed, with the increasing awareness of environmental concerns, products that save energy or lessen pollutants are reinforcing the preeminent role that specialty chemical research and development plays.

The US chemical industry invests $56 billion in R&D annually; 20% of all US patents are chemistry-related. The United States has long been a market leader when it comes to innovation. Going forward, it is imperative that this proud tradition continues if US specialty chemical companies are to be competitive against low-cost imports.

R&D spending is always a slight risk; substantial capital expenditure in science does not quickly, or even inevitably, lead to increased revenue. As Tony Stonis, president of Cardolite, a coatings manufacturer who uses cashew nut shell liquid (CNSL) technology, explains, "it is easier to wait for opportunities to reverse engineer and then sell on price, although maybe not as profitable in the longer term. This is especially the case in the coatings and friction industry, where we are selling an engineered product rather than a specific molecule. Unless customers are ready to take a risk, or they want to second-source, they will stick with the maker of a new product for years, as liabilities are very high in both of our end markets."

Yet the risk is worth taking. Stonis stated that Cardolite would rather invest in R&D than acquisitions, and Cardolite's development of CNSL has yielded some exciting results. CNSL is Cardolite's raw material, which is distilled in order to condense cardanol, the raw material for coatings products; anything left over is used in friction products. Friction material end users are used to make brake linings; for the coatings area, it is the people who make paints. The aliphatic portion of CNSL, which provides flexibility and mobility, "has good water resistance, which is needed for marine coatings. In over 80 years of cashew technology, there have only been two huge breakthrough areas, so finding applications is clearly not easy," said Stonis.

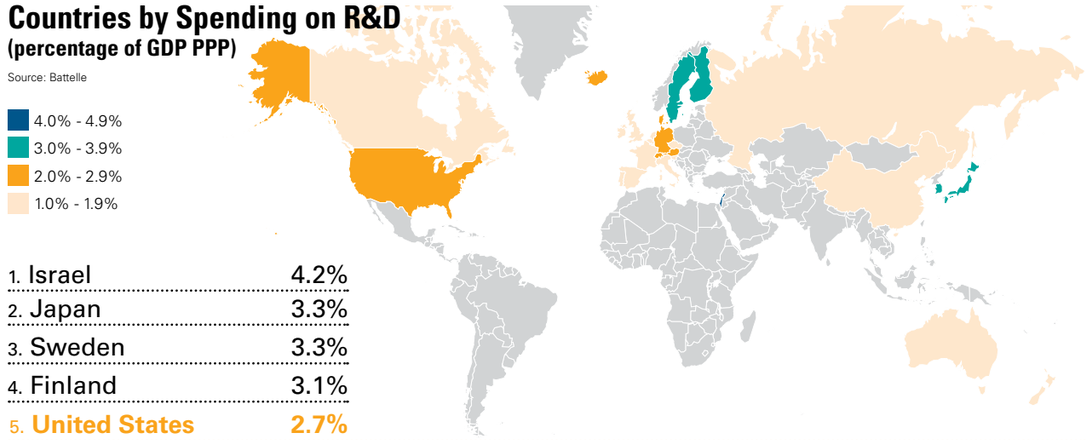
Newark, New Jersey-based formulator of adhesives and coatings Innovative Resin Systems Inc. attributes their achievements to a strong focus on innovation. "Currently, our 2012 sales are showing an increase of 33% year-on-year on our 2011 record year. The key to the driver of this increased business is our R&D; in 2011 we invested $250,000 alone on new manufacturing equipment," said Pina Patel, president of Innovative Resin Systems.

Faced with the inevitable commoditization of their products and flatter US and European markets, many specialty companies are placing increased focus on bringing cutting-edge products to market. Yet despite the example of companies such as Cardolite or Innovative Resin Systems, R&D funds are often the first to feel the pinch of the weak economy. In a 2012 survey of chemical industry executives conducted by KPMG, the number of US companies expecting to invest over 5% of their revenue in R&D dropped from 23% to 17%. While this remaining percentage is by no means negligible, it is nonetheless reflective of companies looking to rightsize their programs.

Companies are conscious of the need for R&D. According to John Cech, pres-

Countries by Spending on R&D
(percentage of GDP PPP)

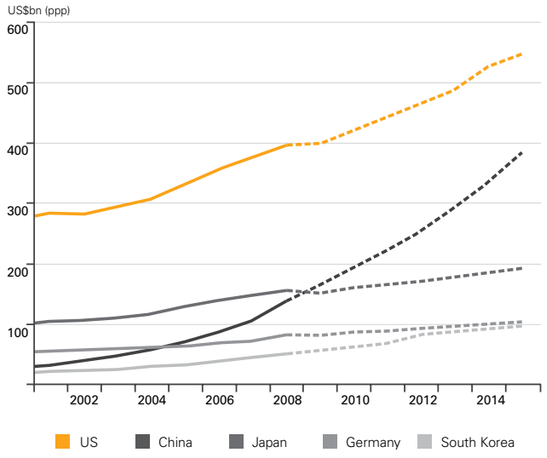
Source: Battelle



1. Israel	4.2%
2. Japan	3.3%
3. Sweden	3.3%
4. Finland	3.1%
5. United States	2.7%

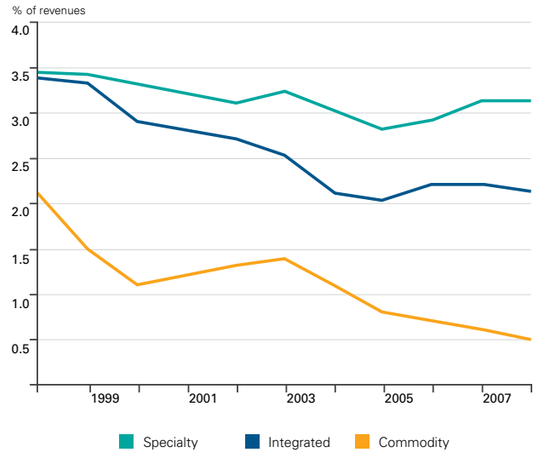
Forecast Growth in R&D Spending

Source: Royal Society



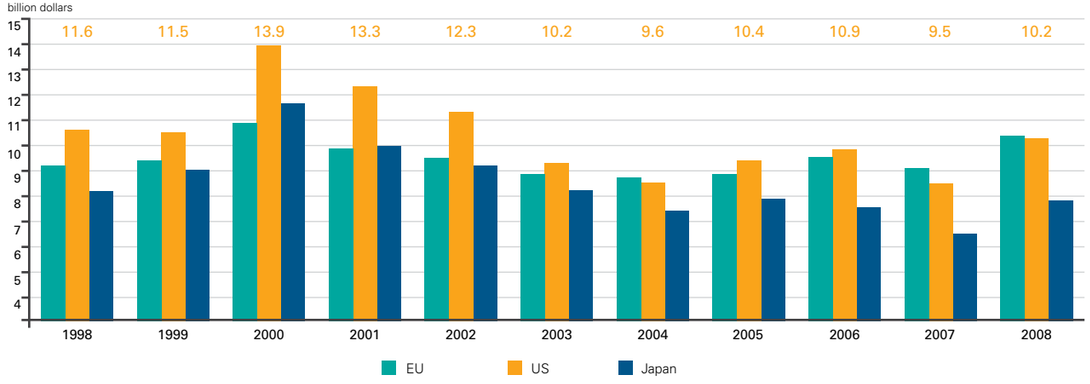
Global R&D Spending in the Chemical Industry

Source: Deloitte



International Comparison of R&D Spending in the Chemical Industry

Source: Cefic



ident of CVC Thermoset Specialties, a manufacturer of specialized epoxy resins, companies must increase their R&D spending in order to compete with lower-cost products on the market. "We make heavy investments in supporting the technological know-how of our products; over 18% of our payroll is research and development," he explained.

For CVC, who were acquired by Emerald Performance Materials LLC in 2008 and now operate as a subsidiary, the integration of Emerald's reactive liquid polymers business has led to four significant new materials in their product line that contribute to more than 5% of sales.

Yet in order to maximize their innovation budgets, companies are finding they need to been as lean and efficient as possible. This need for fuller pipelines at lower costs has created a significant appetite for partnerships. "So much of what happens in new development today does involve partnerships. Nobody has all the pieces of the puzzle by themselves and we can do it a lot faster and more cost-efficiently by forming alliances," said John Gaither, chairman, president and CEO of Reichhold.

Coming out of a successful 2010 restructuring process, global specialty manufacturer Chemtura reexamined its approach to R&D to maximize resources and speed up time to market. "We now have a much more disciplined stage-gate approach, so the hit rate on projects is much higher and the time frame is much shorter to commercialization. Innovation is a large part of why we have seen improved earnings, even though volume has been soft," said Craig Rogerson, president and CEO of Chemtura.

Furthermore, companies are realizing that their approach to R&D needs to be as global as possible. "Reichhold has three major R&D labs, one in North Carolina, Brazil and Norway. In the past there was very little coordination between these laboratories. They handled their own projects for customers and we were finding that they were often working on very similar things. We now have regular global technology meetings and we share information across all these groups. We prioritize the projects on which we are working on a global basis," said Gaither.

The much-touted "inevitability of progress" ensures that US specialty chemical manufacturers must continue to invest in research and strive for innovation: if they do not, they will be left behind. However there is a more important aspect to any R&D discussion: profits are important, but chemistry has the potential to solve much larger issues.

The Arkema Group, a leading global chemical manufacturer, is pursuing a focus on innovation and high value-added specialties to achieve their growth goals of 8 billion euros and an earnings before interest, taxes, depreciation and amortization (EBITDA) margin of 16% by 2016. Two thirds of the 150 million euros that the company spends annually in R&D is devoted to sustainability and megatrends, which present a golden opportunity for a company with experience in bio-based materials. "One billion people in the world have no access to drinking water today, and we have products which help supply it. We are also present in the field of environmental sustainability," said Bernard Roche, CEO of Arkema Inc. •

Interview with Tony Stonis

PRESIDENT, CARDOLITE

Can you provide us with an overview of Cardolite's evolution and milestones?

When Cardolite was acquired from 3M in the 1980s, it was generating less than $10 million in sales, mostly in the domestic market; today, 85% of our sales are outside the United States. Our two main areas are friction materials and coatings, which derives 80% of the business: we are making epoxy-type curing agents and compounds. Our company is descended from Irvington Varnish, who discovered a killer application for cashew liquid in brake linings, and was bought by 3M in 1953. After running the business as a cash cow in the 1960s, 3M decided in the next decade to sink more money into cashew research, and they developed a technology called phenalkamines that drove our coatings business. The technology proved to be best for marine coatings. A growing demand for shipbuilding in Korea and China led to our technology being perfect to relieve constraints caused by painting requirements. Cardolite first entered China in 1999, and since then the business has grown exponentially; we opened the Chinese plant in 2004.

CNSL is also good for many other coatings, and its aromatic portion has always been good for resistance and adhesion. The other part of the cashew molecule is the aliphatic portion, which provides flexibility and mobility. CNSL has good water resistance, which is needed for marine coatings. In over eighty years of cashew technology, there have only been two huge breakthrough areas, so finding applications is clearly not easy. Cardolite typically gears towards relatively large volume markets, which do not include personal care and pharmaceuticals.

What methods of extraction are used to extract CNSL?

There are various methods for extracting the liquid. In some cashew-producing regions, they take the shells, crack them by hand and send the shells to an expeller, which squeezes the oil out. The liquid is Cardolite's raw material, which we import to refine in our plants. We do not get involved in the processing stage, because the main crop is the nut. We distil the liquid in order to condense cardanol, which is the raw material for all our coatings products; anything left over is used in friction products. The epoxy coatings products are mainly liquids, so they are put into typical batch-chemical reactors. Our friction material end users are people who make brake linings; for the coatings area, it is the people who make paints. Cardolite rarely uses distributors, as we have our own sales force of around 25 people, located in the US, Belgium, China, Japan, Singapore, and India.

How cost intensive is this process, especially when compared to companies with proximity advantages?

Cardolite is building a plant in India, which should improve our costs. In the US plant, our cashew liquid generally comes from either Brazil or India, so producing in India will save one movement of raw materials. Also, we are operating in a special economic zone, which should mean tax benefits. Our China plant has already been a tremendous success.

How difficult is it to remain a market leader?

You are always gambling in the R&D business. It is easier to wait for opportunities, and then to reverse engineer and sell on price, although maybe not as profitable in the longer term. This is especially the case in the coatings and friction industry, where we are selling an engineered product rather than a specific molecule. Unless customers are ready to take a risk, or they want to second-source, they will stick with the inventor of a new product for years, as liabilities are very high in both of our end markets.

What future potential do bio-based materials like cashew liquid have in the speciality chemicals industry, and how will Cardolite fit in?

Almost all of Cardolite's business is based on cashew liquid. Unlike other oils, it has a finite supply, which can expand but is dependent on the nut industry, which is flat in the US and Europe, though growing in the places they make them. The supply limits prevent us from going after huge applications, so we have to pick and choose our end products. There are certainly elements in our business that want to branch out beyond cashew liquid, and go from being technology- and raw materials-focused to customer-problem focused. This almost has to be the way things evolve if we want to grow. We are now working on some interesting technologies, but development does not occur quickly in our industry. Customers are certainly not buying our products simply because they are bio-based; they clearly have to work and be cost-effective.

Where would you like to lead Cardolite in the future?

Cardolite would rather invest in R&D than acquisitions, and the company is based on organic growth. Our China plant is a financial joint venture, and we are open to partnerships. We have always sold our company on the basis of our strong technology and position in cashew liquid. We are not a big company, and those that we work with are only medium-sized, which make the partnerships a lot of fun – there are not a lot of layers of bureaucracy, the top people all know one another, and you can make great progress. Most customers do not like to tell you a lot, but as they get to know you, they trust you. •

Interview with
Pina Patel

PRESIDENT, INNOVATIVE RESIN SYSTEMS INCORPORATED

Can you give a brief overview of Innovative Resin Systems, Incorporated?

Innovative Resin Systems, Incorporated was established in 1996 as a specialty adhesives business, manufacturing predominantly adhesives but also electrical pottings and coatings. The niche market we felt we could fill was to service a whole range of adhesives to industry from aerospace to furniture manufacture; our products are not sold through retail outlets. We have custom-made equipment to manufacture our products; all our products are manufactured in our Newark facility, produced in a single three-hour shift with the capacity to increase if necessary. We currently have 17 employees on payroll, including an R&D manager and technicians; in addition, we have an independent sales force. We supply a one-component epoxy to a formulator who could be a competitor but is our biggest dollar sales customer; he then services big PTI companies. A resin is formulated for a specific application; Innovative Resin Systems has a wealth of experience in formulating a tailor-made application to accommodate a customer's needs.

Have your sales and growth developed to your expectations?

Innovative Resin Systems had a record sales year in 2008. Our sales for 2009 were disappointing, which was consistent with the industry as a whole. We were able to recover in 2010, and in 2011 we experienced another record year achieving $5 million in sales. Currently, our 2012 sales are showing an increase of 33% year-on-year on our 2011 record year. The key to the driver of this increased business is our R&D; in 2011 we invested $0.25 million alone on new manufacturing equipment.

How have you had to adjust your business model to address the needs of your global customers?

Approximately 30% of our total sales are to international customers: China, Mexico, Thailand, Germany, and Canada; currently, we have been unable to break into India due to a pricing issue originating from custom duty and freight charges. The markets that attract us are those with favorable tax rates and logistics.

What are some of the key objectives and challenges for Innovative Resin Systems over the next few years?

The most pressing objective for Innovative Resin Systems over the near term is to secure a work unit in Newark with more square footage. We do not wish to leave the Newark area, although if we were to move our facilities south to either the Carolinas or Texas, a company such as ours would be welcomed. These states are actively bringing industry to the area, and provide favorable loans to companies such as our. Loans for industrial concerns in the State of New Jersey are difficult to obtain especially for the chemical industry. There are only a few formulators in the state of New Jersey; chemical companies have relocated to other States, such as Indiana. In 1968 New Jersey was the world's capital for the chemical industry; however, a few chemical companies have caused the chemical industry to become unpopular resulting in the steady decline of the chemical industry in New Jersey.

As a family business with a strong corporate culture, where would you like to lead Innovative Resin Systems in the future?

Innovative Resin Systems, Incorporated is not for sale. We are financially sound, have no outstanding debts, and all our expenditure is via in-house earned capital. Expanding through acquisition would be entertained, ideally furnishing us with larger premises. The economy is improving; our customer base of 200 is keeping us very busy; this is driven by the upturn in manufacturing within the United States. Innovative Resin Systems is very successful, and have achieved this through honesty and hard work. •

Interview with
Brian Meldrum

PRESIDENT, FUJIFILM IMAGING COLORANTS INC.

Can you give us an overview of Fujifil Imaging Colorants (FFIC)'s recent developments?

We were acquired by Fujifilm in 2006, having been part of Avecia Chemicals, which came out of Zeneca Specialties. FFIC is a manufacturer of colorants and inks for the digital inkjet market.Originally our focus was on the development and manufacture of novel dyes for this market, but more recently we have moved into the area of pigments. 2011 saw a major milestone: Fujifilm Imaging Colorants formally launched its first inkjet pigment dispersions. In 2012, we acquired another facility at Delaware campus, which will be the main technical center for our ink business in the USA.

How important is the US market in terms of the company's global business?

The US is a particularly important market for us, because it is where most of our customers operate. Historically, our business has supplied multinational desktop printer OEMs, all of which have the US as one of their largest markets. Everyone recognizes that the desktop consumer market is maturing, but with technological advances the inkjet market is moving into many new areas. We are expanding into industrial and commercial sectors, where a lot of the new opportunities are found in the US.

In what areas are you looking to diversify?

Our core inkjet market is opening up as the technology takes us into different areas. Fujifilm Imaging Colorants is looking at large commercial printers, textiles, ceramics, labeling and packaging – the types of industries which have used more traditional offset printing but are now moving into digital printing.

What role does the US play in the company's global R&D strategy?

Fujifilm Imaging Colorants has a large research and development group in the UK, but a lot of on-site development also takes place in the USA. The two complement each other; our new on-site center here will support a lot of nearer term market opportunities. In the US, we concentrate on bringing things much quicker to market. This facility will customize products for companies throughout the world.

What distinguishes your approach to innovation over other players in the market?

Our strength comes from our depth of knowledge and technology, accumulated through many years of developing colorants for the inkjet market. We have been in the industry since its very early days, and have managed to bring together two unique types of technology. We have heritage in the old ICI/Zeneca textile chemistry, while Fujifilm has heritage in photographic chemicals. Merging these together has brought the best of both worlds, and put us in a very good position to address new and increasingly demanding market challenges, arising from the shift towards the commercial and industrial sectors.

What sustainability initiatives have you taken?

Fujifilm takes sustainability extremely seriously. We have to regularly report key parameters to Japan so that the corporate environmental profile is understood and improved upon. Closer to home, HSE is a top priority for us. We have key processes and systems to ensure there are no/minimal uncontrolled or unintentional releases from the plant. Numerous accreditations back this up, and we have a similarly excellent record on lost time. Fujifilm Imaging Colorants constantly looks at trends and requirements in the green chemistry market. One of the big focal points in commercial printing is de-inking, to enable paper recycling without the reprocessing facility getting into difficulties; we have invested a huge amount of time and effort into understanding this mechanism. Some of Fujifilm's latest product offerings highlight this. It is a challenge to strike the right balance with costs, but at the end of the day being unable to demonstrate sustainability will cause you problems in a competitive market environment. The market has expectations, so it makes good business sense for us to keep checking we are moving in the right direction.

You have received SOCMA recognition in the area of EHSS standards. What is the secret to your success?

Our EHSS success has mostly come just from engaging with the workforce and the local community, which is not far fromour facility. Equally, we work very closely with New Castle County in Delaware; we are constantly meeting with the local regulatory groups and updating them on any changes we may be making to the site. We are lucky to be supported very strongly by Fujifilm North America, and have many new initiatives that are leading edge in addressing EHSS. Many training programs are rolled out on a national level by Fujifilm to their various subsidiary companies.

What are your goals for the company within the next five years?

Inkjet printing has been around for more than 20 years. In the early days, it was limited to desktop printers at home. It has since moved onsignificantly , and new opportunities and markets are continuing to unfold. Innovation around colorants, and the ability to develop fluids, is where we need to focus our efforts. Fujifilm Imaging Colorants must remain at the forefront of this, to be able to come up with a variety of solutions to customers' problems, in all parts of the world. •

Interview with **Kevin Gallagher**

PRESIDENT, CRODA INC.

Can you give us a brief overview of Croda's operations in the United States and the company's main milestones in the region?

Croda's US division, Croda Inc., was founded in 1950 as a small sales office to sell lanolin and derivatives that were manufactured in the UK for the North American market. With the purchase of Hummel Lanolin in 1957, we acquired our first manufacturing plant in North America. Croda acquired the manufacturing facility in Mill Hall, Pennsylvania, which we still have today, in the late 1960s. We grew tremendously from Croda's acquisition of Uniqema from ICI in 2006, which gave us our largest North American manufacturing plant in Atlas Point, Delaware.

What are the key products and markets for Croda in the United States?

In the United States, Croda's sales are divided into two different areas, consumer care and performance technologies. In consumer care, we work in personal care, healthcare and crop care. In performance technologies, we have geo technologies, which encompass water treatment, oil and gas and mining; lubricants; home care and institutional cleaning; coatings and polymers; and polymer additives. Overall there is a fairly equal weighting in terms of revenues derived from consumer and industrial products, both globally and in North America.

As companies move to outsource manufacturing to cheaper markets, how does Croda remain cost competitive while maintaining its manufacturing presence in the United States?

Croda has learned from our customers that they want supply chain surety and part of surety comes from being able to source near where you are going to use the product. We have a large manufacturing footprint in North America because this is what our customers want from us. Many of our global customers want to buy our products made in North America when they are manufacturing in North America, just as they prefer to buy Croda products made in Asia when they manufacture in Asia. When it comes to the issue of cost, we have to balance local manufacturing and whatever cost structure it may have against manufacturing in a place where the labor costs may be lower but transportation costs are higher. For specialty chemicals, labor costs are not the driving force in the cost of these materials. While labor and controlling costs are important, costs are determined by raw material availability and raw material cost.

What are Croda's main strengths in the area of R&D?

Whatever market Croda is in, we have a good understanding of the structure-function relationships in chemistry. Whether in the personal care or industrial market, we know how to change the chemistry of a molecule so it can perform a different function. Croda's strength in R&D also comes from our direct relationships with customers. We understand the needs of our customers well enough to also be able to understand and, in turn, anticipate the needs of their customers. For example, we developed a UV protector for hair that we can deliver from a rinse-off product that stays behind on hair. We saw a need for this product because people were using conventional sunscreens in shampoos and conditioners but not much was being left behind. We changed the chemistry by adding a positive charge so that it stays behind on the hair in the same way a cream rinse does.

As the US progresses towards Green Chemistry, what steps has Croda taken to develop more sustainable manufacturing practices?

Croda Inc. has a 305 KW solar array system that provides roughly half of the electricity needs for the office and labs at our New Jersey site. Our solar panels are a major part of our effort to lower our carbon footprint and make us more sustainable. We have initiated another sustainability project that is much bigger in size and scope, which is a landfill gas project at our Atlas Point plant in Delaware. The project will provide more than half of the electricity and steam generation needs for the manufacturing site from landfill gas. Our US initiatives are part of Croda's global goal to supply 25% of our energy needs from non-fossil sources by 2015.

The company's share price has performed exceptionally well over the past few years. Is there something fundamental within Croda's business model that makes it so attractive to its investors?

Croda's share price exactly follows our financial performance. It is not as though the P/E ratio has altered dramatically. Croda's earnings have continued to increase even during the global financial crisis. We were one of the only publically traded chemical companies that never issued a profit warning during that stretch. In fact, Croda produced record financial results during that time. Our share price shows there is an acceptance on the part of the investment community that Croda has a great track record in producing results. We take a lot of pride locally in our contribution to these global results. Our key to success goes back to our ability to anticipate what our customers need. During the crisis, we were careful about costs, but we were also sure not to do anything we would regret later when the economy improved. We did not change our long-term investment in R&D, marketing or promotional work. At Croda, it is important for us to keep our eye on long-term objectives.

Where would you like to see Croda's US business in the next three to four years?

Croda Inc. will continue in the direction where we are going, toward a more sustainable business from the standpoint of our energy footprint and how we operate in the plant. We are furthering innovation and increasing sales of the new and patented projects that are coming out of the other end of it. In three to four years, Croda Inc. expects to be further down the road of having a larger portion of our business coming from these new and patented products. •

Interview with **Harold Fox**

PARTNER, STEPTOE & JOHNSON LLP

Can you give us an introduction to Steptoe?

Steptoe is a general practice law firm with a central office established in 1945 in Washington D.C., and eight other offices around the world. The foundation of the firm in D.C. is based on a large amount of litigation, federal regulatory work and other practice areas, including IP. Today our firm has more than 500 lawyers and other professionals working in offices from Beijing to London. Although we tailor our work to meet the needs of our clients, we specialize in many areas ranging from international trade to employment.

What is the significance of the chemical sector to the law firm?

It is relevant in a couple of different practice areas in addition to intellectual property, especially litigation around toxic tort actions. We also have a very active regulatory practice, including a group involved with chemical regulation. Within our IP practice area, we do specific work in the fields of life sciences, pharmaceuticals and biotechnology.

Within the IP practice, which segments of the market are most of your chemical industry clients coming from?

There are a couple of dimensions to that answer. Most of our work is domestic, but about 20 to 30% on the patent side is with companies that are based overseas and have smaller operations in the US. We help them navigate the challenges they face entering the US market while they are still based in China, Korea or Europe. They must be able to balance their needs back home while expanding abroad, and this can be challenging. Our practice is very mixed in terms of the industry: we have clients from all areas of big pharma, but we also do significant work with start-ups and universities. The volume of work naturally increases as the companies grow, but we do a lot of strategic counselling for smaller companies and universities. Both strategic counselling and litigation work are important parts of the practice.

What are some of the typical issues a chemical company would bring to your law firm with regards to IP protection?

These issues of course depend on many things, including the size of the company and the nature of their work. For start-up companies, we are often asked to give them counsel and protect their intellectual property while preventing potential IP problems that may arise in the future. This generally includes working with our clients to build patent portfolios, making decisions about protecting trade secrets, and giving them advice on brand issues to ensure they do not walk into a intellectual property infringement problem down the road. For the larger companies, most of them already have well-developed in-house capabilities. They generally need a law firm for either more challenging projects without clear legal answers or projects with an overwhelming amount of work that exceeds their in-house resources. We can guide them through the challenging projects as well as help them with the workload.

In your opinion, is the increased activity spurred by the US patent cliff constraining the country's IP protection framework?

Looking at the state of the economy and the pressures companies are currently facing, there seems to have been an uptick in innovation. People have had to refocus resource spending to areas of strategic advantage, such as intellectual property. Due to this shift, there has been an increase in counselling needs to deal with these strategic moves. Any pipeline issues, for example, with pharmaceutical companies, should resolve themselves once that innovation moves into development. There will be more intellectual property that is captured and chemical companies will be on stronger ground, but this is completely dependent on investment today. It is hard to say if the current patent infrastructure can handle the increase in activity, but there is always a rush of activity when there is a change in patent law. It is too soon to tell if there are any shortcomings in the American Invents Act, which was signed into law last year, because it has not yet been fully implemented.

What does the future hold for IP law in the United States?

The impact that IP law is experiencing is not only coming from legislation, but is coming from the courts. There has been a lot of activity at the Supreme Court level in patent issues for the past few years and there continues to be a lot of interest in key IP issues. For the chemical industry and biotechnology industries in particular, the recent Supreme Court decision on Prometheus is a significant one because it is changing the playing field with respect to what subject matter is eligible for patentability. Patenting is a long process: you must identify the innovation, decide how to protect it and then keep up with the continuous changes being made by the courts throughout the long granting process. Those kinds of changes are ones that make a bigger impact on the industries because they are difficult to predict.

What are Steptoe's strengths in providing IP protection services to customers in the chemical industry?

We have a few advantages as a firm. Because we are a general practice firm, we can tap into other practice groups, such as our litigation and regulatory groups, when it is helpful for clients. That has been particularly advantageous for some of our smaller clients who cannot go shopping to all of the different firms around the world to help them understand the issues they are facing. Within the IP group, we have grown a base of attorneys who have a broad set of experiences in industry, government, academics and the law. We are able to put together efficient teams to help triage all kinds of client issues when it comes to intellectual property. •

Courtesy of Chemtura

The Role of Outsourcing

Contract and toll manufacturing

Contract and toll manufacturing has always had a role to play, with well-established companies existing to do the work that more specialized manufacturers do not have the capacity, time, resources, or inclination to do. However, in today's market these have gone from providing a niche service to being a well-established buttress of the chemical industry.

For some, contract and toll manufacturing has been an effective strategy for companies with excess capacity to weather the recent economic storm. For Chemtura contract and toll manufacturing is not core to any of their business units, but it was a timely solution to the impact of market dynamics.

"Chemtura was put together by mergers and acquisitions, so with that we have a broad footprint and many assets. Many of our plants are very specific in their capability so it is difficult to consolidate them," explained Craig Rogerson, president and CEO of Chemtura. "In the down part of the cycle that we are in now, we have excess capacity. While we have a product development pipeline that should put new products into the plants, there is a gap in time, and our plan is to utilize those assets more fully by offering to contract and toll produce. The timing for this addition of services is good because there is a lot of consolidation in the industry and there is an increased need. "

While contract and toll producing is a stopgap measure for some, it is the bread and butter of a booming services sector. Not only are more contract services companies cropping up, but companies offering third party project management have also found a niche in the market. The business model of Lower Gwynedd, PA-based Richman Chemical, for example, revolves around developing partnerships between clients and contract manufacturers.

"Historically, many companies have approached custom manufacturing as a surplus business or fill in. In the last 25 years, more companies have started to actually specialize in it," said Edward Richman, president of Richman Chemical. "Innovations in chemistry and life sciences are accelerating and we are seeing increased demand for high-tech, high-value projects for these markets."

Innovations in the life sciences are particularly accelerating as big pharma confronts ongoing patent expirations and biotechnology advances spawn various and sundry start-ups. In the custom research and contract manufacturing field, companies are ready and waiting to aid in new molecule development.

"The patent cliff means that large pharmaceutical companies will have to reduce costs in order to recoup lost revenues. It allows companies to turn a fixed cost with underutilized capacity into a variable cost, and use the demand when they have a requirement for a specific capability," said Tim Tyson, president and CEO of Aptuit LLC, a pharmaceutical services company. "We have worked with everyone from virtual companies, with no lab or chemistry capability, right up to the biggest pharma companies in the world," said Robert Maddox, president of the North Carolina-based chemistry services company PharmaCore Inc. "However, it seems the biotechs and mid-sized companies have tremendous pipelines right now.

While activity spurred by the patent cliff is likely to have a significant impact on the service industry, not all contract services companies have high hopes for business from big pharma.

"You would expect the opposite, but many of the larger companies do not seem to have a lot of compounds moving forward," said Maddox. "Almost everyone we talk to has had their budget cut. The legal framework plays into it, but things also tend to grind to a halt when there are reorganizations, which we are seeing a lot of right now. There can be a slowdown for a couple of years before everyone gets back into the mode of discovering drugs."

Yet in spite of pharmaceutical budget constraints, molecule development opportunities coming from big pharma cannot be discounted.

Many companies look offshore to outsource their contract research and manufacturing needs, which has put pressure on Western-based CROs and CMOs to deliver more services at lower prices. The Chemistry Research Solution LLC (TCRS), a Bristol, Pennsylvania-based contract research organization that entered the market in 2009, has based their strategy on recognition of these outsourcing trends.

"The type of work that companies have outsourced to China and India is, for the most part, routine chemistry," said Michael Kirkup, president and CEO of TCRS. "A small biotech company is much more interested in complex, highly technical chemistry since they cannot afford to lose their limited intellectual property to an outsourced company. They are also not as well-equipped financially to keep tabs on an overseas company."

For pharmaceutical CMOs looking to work with big clients, the market is very competitive, according to Michael Staff, president of Minakem LLC, a manufacturer of fine chemicals and APIs. Staff said that large pharmaceutical companies at Phase III with projects that have failed in low-cost countries have approached Minakem. "It is important that we source some of our starting materials out of China and India, where we employ full time staff and carry out audits in order to ensure quality control," he said.

There is the perception that large pharmaceutical companies are no longer searching for the blockbuster product, but introducing more niche therapies concluding that there will be fewer blockbuster billion dollar drugs, according to Thomas D'Ambra, president and CEO of AMRI Global, a contract research and manufacturing company for the pharma industry. "In general, there is a redefinition of the industry's discovery and development strategy in which outsourcing will play a big part." •

Interview with Kate Donahue

PRESIDENT, HAMPFORD RESEARCH

Can you provide us with a brief introduction to Hampford Research?

Hampford Research is a specialty chemical manufacturing company located in Stratford, CT founded 30 years ago by my father, chemist Jack Hampford. The company manufactures products for the dental, personal care, industrial adhesives, printing/lithography and electronics markets. Hampford Research specializes in the scale-up and commercialization of materials developed by our customers as well as providing contract research services to customers for product development. Our customers fall into two categories: chemical companies that require a secure manufacturing partner for their specialty materials and firms that develop and use chemically engineered materials but lack the ability to manufacture them. We offer our customers a wide range of processing options: from lab scale (grams) through 2,000-gallon reactors. In addition, we have experience processing both solid and liquid materials.

I joined the firm in 2007, shortly before my father's death. Since then the company has been focused on improving efficiency, refocusing our product lines, streamlining our procedures, improving our infrastructure and building a data management system.

What key industries does Hampford Research serve?

Hampford Research serves the electronics, printing/lithography, dental, industrial adhesive and cosmetics industries. Our products fall into several categories: free radical and cationic photoinitiators, IR dyes, adhesion promoters, and specialty monomers. We have strong technical ties to our customers; working with them to monitor and leverage industry developments. One of our first customers was the biggest dental house in the world and we continue making material for them to this day. We specialize in the manufacture of free radicals and photoactive materials used in printed circuit boards. Hampford Research has attained a new level of competency in ultra high purity materials for the electronics business. We also manufacture products that are used in food packaging, traditional printing, digital printing and holographic materials.

Hampford Research also does contract research, where we work with customers to develop new materials while ensuring that the laboratory process is transferable to the plant. Our goal is always to develop a long-term relationship with our customers. The company has strong internal process controls, an excellent supply chain with at least two suppliers for every raw material and a very strong quality assurance department.

Is there an advantage to making small volume products in the United States as opposed to out sourcing high volume products?

Over the last two decades, many companies moved their manufacturing facilities to Asia or sourced key materials from Asia in order to reduce costs. We are starting to see this trend reverse itself – especially for small volume, specialty materials. There are a number of issues driving this change including the increasing costs of manufacturing in Asia, including labor costs; the costs associated with shipping and logistics to bring materials from Asia to the US, rising awareness of the cost of environmental damage, the cost to a company's bottom line and reputation of poor or inconsistent quality and concerns about protecting intellectual property. Hampford Research has found success by working with customers who need materials that are competitively important and who require a secure supply chain. We work hard with our customers and raw material suppliers to ensure we create the most beneficial relationship possible. It is vital for our customers to have a guarantee that a specific material will always be readily available and that the quality of the material will remain consistently high.

How do you see the industry evolving? What targets do you have for your growth strategy?

I see significant growth opportunities for Hampford Research. The demand for highly functional and highly specialized chemicals will only increase as will demand for ultra-pure materials used in electronics. We have put systems and infrastructure in place that allows us to quickly assess new opportunities and to maintain our ability to scale up projects rapidly and efficiently. We also expect our contract research business to continue to grow which provides a feeder system for our commercial manufacturing growth.

Where would you like to see the business positioned in five years?

We expect Hampford Research to double in size in the next two to four years. We expect to continue to operate in Connecticut and we hope to expand our operations into a second facility. We have strong long-term relationships with a Chinese-American company and an Indian-American company which give us flexibility in terms of raw material sourcing and logistics. Hampford Research is in a good financial position and we have been lucky to be able to finance our own growth. Our hope is that some of the external issues that have affected the chemical manufacturing industry will be resolved in the near term and firms like ours can focus on accelerating growth. Those issues include a resolution to the global banking crisis, especially in Europe; stabilization of the cost of transportation; increased investment in alternative fuel sources and resolution of environmental regulatory issues. The logjam in Washington DC needs to be broken and our legislators need to understand that there are key issues that need to be addressed. They need to find a balance between creating policies that protect the environment and those that encourage business growth. •

Interview with Carl Yerger & Joseph Zidick

PRESIDENT; & VICE PRESIDENT, CUSTOM MILLING & CONSULTING, INC

Custom Milling & Consulting was founded in 2002. How has the company evolved over the past 10 years?

CY: CMC has a toll processing division and an equipment division, where we build mixing and milling machines for a wide variety of industries. Today our company has a global focus and over the past 18 months we have set up representatives and partnerships with companies in Mexico, Brazil, Argentina, Europe and China. In the next year, we will focus on India, Southeast Asia, South Korea and most likely Russia.

JZ: Our primary customers here in the United States have been large companies like PPG, Dupont and BASF, but we have found in the last five years that the business climate in the United States has been relatively flat on the equipment side. Recently, however, it has begun to come back and we are seeing a lot more interest. Flat demand for equipment in the United States is one of the reasons why we have started to look internationally for new business. It has been out of necessity that we have gone international, but it has been a very timely move as it has resulted in very rapid growth for the company, upwards of 30%. Our contract processing business on the other hand has stayed pretty aggressive. When the business climate is slow in the United States, we see more interest in outsourcing. Although companies do not make as much profit on outsourcing, they benefit from the low commitment and increased flexibility.

Has it been difficult to enter into new markets in other regions as a new player?

CY: Our international growth was first driven by companies that we work with that are multinational. We have been asked to set up services and support mechanisms in other parts of the world so that they can buy our machines and keep them consistent in their factories. We bring a certain niche of particle-size reduction and we are very open to share our knowhow. People have been very receptive.

Which industries are offering CMC the largest opportunities for growth right now?

CY: Pigment is a big industry for us, combining paints, coatings and inks. We are also selling a lot of machines for the agrochemicals market in and outside of the United States. Another target focus for us is traditional ceramics. This has traditionally not been one of our focus markets but we have recently identified it as a huge opportunity globally.

In what key ways do your turnkey services benefit your customers?

CY: The benefit comes with new product launches. We allow our customers to focus on the development and marketing of their products. They do not have to worry about setting up processes. Through CMC, the time to market for a product is significantly reduced. We are small and flexible, and within two weeks we can get something done for a customer. If the processing grows to volumes where it makes sense for them to bring it in-house, we can work with clients to provide them with the equipment.

JZ: It also comes down to what it costs a customer to make a product versus what it costs us to make a product. Large companies have fixed costs that they need to overcome in order to make a product. In some cases we can produce that product for half of the cost. It is not just a matter of convenience; it is a better economic decision on their part to have it made outside. We provide an alternate source to get things done.

When it comes to R&D, in what strategic areas of focus do you make your investments?

CY: We focus on giving the customer more capability when they come here. This can be through analytical devices, as well as with our equipment. There is still a big push to make things finer and more uniformed. Within the mill, there are certain things you can do with the type of grinding beads that are used to go finer and finer, but you need to have equipment designs that can hold them in. We make continued investments to better our mill designs and understand mill performance as we scale up. Two years ago we invested in bringing chemists on staff. We find that a lot of customers will come here wanting a nano dispersion but find that their formula is not designed to handle it. Our chemists help make tweaks from a formulation standpoint.

What are CMC's longer term growth goals in the United States and globally?

CY: We are looking to recreate our company in other parts of the world by having facilities in other regions that will manufacture 70% to 80% of our equipment. Our goal is to not only manufacture equipment there, but also do the electrics there and even set up toll milling. We are currently exploring South America for our next location. What we bring to the table that others do not is our combined business model. We want to bring our added services to our global operations. •

Interview with Robert Maddox

PRESIDENT, PHARMACORE

Please provide us with an overview of PharmaCore and its recent milestones.

PharmaCore is a chemistry service provider, founded and based in High Point, North Carolina. Our services are in early stage drug discovery, research and development, med-chem and process development. We also have a pilot plant that has been operational for three years; it represented a very significant expansion for us, adding about 16,000 square feet. We are able to go up to as large as 2,000 liter glass-lined reactors. We have been doing GMP since 2001, but our customers needed greater scale-up capacity. Our pilot plant is a way for us to keep customers longer and remain competitive by providing large batches. We support compounds through Phase IIb and even Phase III compounds if they are very small-scale. We are different in that we are not producing a commodity week in and week out: every project we do is different.

How is your customer base evolving in light of industry trends?

Mid-sized pharma and biotech companies, with 3,000 to 5,000 employees, are our bread and butter. We have worked with everyone from virtual companies, with no lab or chemistry capability, right up to the biggest pharma companies in the world; however, it seems that the biotechs and mid-sized companies have tremendous pipelines right now.

Agrochemicals are certainly an area where we are looking to expand. From the companies we have spoken to, there is a clear need for strong US or European providers to supply products that are time-sensitive or very complex. Almost all of the projects that PharmaCore handles will involve process development, changing some facet of the chemistry to make a product work. We are always looking for new markets. PharmaCore has recently been providing more quotes to nutraceutical companies, as they now have to produce using GMP, and we have also worked with several clients in national defense areas.

Has the threat faced by big pharma of losing their blockbuster drugs had a big impact on the service industry?

The threat faced by a lot of companies of losing their blockbuster drugs will have a big impact on the service industry. The work done by facilities that are now closing has to go somewhere; while we have seen some of it, it trickles down slowly. Drug discovery is a long process and even outsourcing takes a long time. You would expect the opposite, but many of the larger companies do not seem to have a lot of compounds moving forward. Almost everyone we talk to has had their budget cut. The legal framework plays into it, but things also tend to grind to a halt when there are reorganizations, which we are seeing a lot of right now.

Are you feeling pressure from the low-cost international competition and the many new US-based CROs entering the market?

Three or four years ago, all of the CROs were in survival mode. Fortunately, PharmaCore has not been in this state for quite some time. More business has returned to North America, and our pilot plant has brought PharmaCore new revenue sources. Before it was built, our focus was custom synthesis, the building block business and some small-scale GMP, but a whole new horizon has now opened up for us. The challenge for us is not to find work, but to find work that is profitable. We have had to tell some potential customers that they are not the right fit for us.

How do you see the life sciences industry performing in the next five years?

It is hard to tell what the industry will need going forward, but customer service; going above and beyond expectations; will continue to be very important. There will be a place for companies that can offer this while remaining price competitive. Six or seven years ago, customers had fewer options, but now you know they are able to consult several different service providers. PharmaCore will continue to grow and evolve; in five years' time, our analytical support will be above and beyond what we offer today. Our focus is on small molecules, and while large molecule work is very popular right now, it is a cycle and we foresee small molecules coming more into favor within the next several years. •

Interview with **Charlie Lewis**

PRESIDENT, ACCELEDEV

Can you provide us with a brief overview of AcceleDev and your presence in the United States?

The company was established in 2003 as a custom synthesis, & raw material sourcing company. Customers would approach our company to find pharmaceutical raw material targets; if we could not find them, then we would look into custom-making them. AcceleDev established strategic alliances with key factories in China and helped build them up into top performing R&D sites. Over time, Acceledev built its own R&D & manufacturing sites in China and the USA. AcceleDev has one wholly owned site in the United States and also one in China. This is in addition to the original manufacturing partnerships.

The reliability of our supply from China, propelled deep partnerships to develop with multiple large pharmaceutical companies. This helped further establish and strengthen our R&D expertise and presence in the marketplace. Our customer partners greatly valued our work, & therefore promoted us internally, which led us to working with a range of different groups, each with different types of project requirements. Over time, it made sense for AcceleDev to integrate into the United States as the reduction of real estate prices and the cost of hiring chemists became much more cost effective, and began closing the gap with China. This US site now fits in within our model to be a low cost supplier in the United States in addition to our presence in China.

AcceleDev is known for our process design and development; 90% of our business is custom synthesis in which customers give us a target structure in early development. Our chemists design a scalable process to develop the molecule on a larger scale. We have partnerships with three of the top five main pharmaceutical companies, and close collaborations with many others. AcceleDev is focused on developing deep customer partnerships, where both organizations can more greatly benefit. In terms of its original raw material sourcing business, AcceleDev was one of the first China companies to set up analytical facilities to analyze materials before they ship out of China. Customers also found that we could handle intellectual property protection, which led to the increased amount of custom synthesis work.

As the market becomes more competitive, what are AcceleDev's competitive advantages?

The market is becoming more competitive and as a small company, AcceleDev has to compete with those much larger, who have large infrastructure in place. AcceleDev remains highly competitive for many reasons, including chemistry expertise, efficient communication & a driving commitment to "always deliver on-time". Our efficiency and speed are partly due to our ability to deeply understand and predict what our customers want, in advance. This comes from a rich level of pharmaceutical experience within our organization.

Is AcceleDev planning to capitalize on the future growth of the market?

We have the potential to expand, although we employ a conservative approach before investing. We are hiring more employees in the United States and China now, and we are upgrading our manufacturing sites as more companies are starting to outsource active ingredients in addition to raw materials. AcceleDev plans to employ at least 10 more R&D chemists within the next one to two years, and grow the manufacturing site to expand reactor capability and also increase staff by 20%.

What cost savings can companies achieve by manufacturing in China?

China used to offer savings of five to 10 times in general, over suppliers from other countries competing on the same material. Labor costs in China are increasing quickly, partly because of the high demand for chemists generally, and also for more highly trained chemists with an American or European background. The Chinese education system has been opened up to allow a lot more students in each classroom, while the number of teachers has not increased at the same rate. So the level of training is not quite as good as it once was. AcceleDev is very selective and recruits only experts in R&D, so this can often make the hiring process difficult and lengthy in china. At the same time, it is becoming easier to recruit in the United States as more companies are shutting down sites and there are more highly trained chemists who are willing to work for a lower salary.

What can other companies learn from AcceleDev's experience in building successful partnerships in China?

It is vital to have a broad range of industry experience, in order to help overcome any type of challenge facing you in a difficult marketplace. Fast & effective problem solving ability is essential. Equally important is to have the same level of expertise in the leadership chosen to be on the ground in china. A team that deeply understands the culture and unique systems is key. Companies need to be interconnected to the government and able to find essential local elements and advantages, and maneuver successfully through any types of unique local challenges is key to the growth & stable long-term establishment. It is a challenging market and many companies have a false sense of security if they lack a deep understanding.

Is AcceleDev interested in expanding its international presence?

Nearly all of AcceleDev's business is from Europe and the United States; we expect our growth will continue to come from the western market, although we are also looking to grow in India and China. It is vital for AcceleDev to always deeply understand our customer's ever changing requirements in order to be successful. Pharmaceutical companies are consolidating and getting rid of their R&D facilities and internal production. They are outsourcing more often, but the number of programs they are being put through development is significantly less. This means that R&D companies like ours will need to continue to work hard to better themselves, in order to remain competitive over these next few years, while pharma companies continue to change and find their way forward.

Where would you like to see AcceleDev in the near term?

AcceleDev is focused on working on sophisticated chemistry and more of the unique chemical operations that require hydrogenation or low temperatures that our competitors do not have the expertise for. Our employees have a good understanding of both markets in China and the United States. Our business model is to continue to grow and expand our breadth of capabilities in order to better meet the new needs of those customers who want to outsource more generally, and more sophisticated intermediates and ingredients. •

Interview with **Michael Kirkup**

PRESIDENT & CEO, THE CHEMISTRY RESEARCH SOLUTION

The Chemistry Research Solution (TCRS) is a relatively new CRO on the market. Can you give us an overview of the company's development?

The Chemistry Research Solution is a three-year-old contract research organization. The difficulty of starting up a company like this is actually getting started and finding your first client. Aggressive advertising and attending trade shows helped tremendously in getting TCRS off to a good start. Successful completion and timely delivery of projects is of paramount importance for any company but especially the new kid on the block. Usually it takes three years to move up to the next level of business, but we have been successful in going beyond that step, financed entirely on earned income and personal savings. We have gained a reputation within the industry and people now know about us. Just recently we were awarded a five-year government contract with the National Cancer Institute. Banks are beginning to show interest as well, since we are showing profit and will soon begin to expand even further.

As you expand your client base, what are your core competencies that you are marketing as unique services?

TCRS is a custom synthesis company with expertise in medicinal chemistry. My business partner and I both have many years of experience working at large pharmaceutical companies. Not too many years ago medicinal chemistry was a niche service provided by only a few chemistry CROs but since larger pharmaceutical companies are now dramatically reducing their research staff, the demand for these skills is on the rise. It is difficult chemistry and many CROs do not have the necessary skills or depth of experience to work in this area. We have gotten projects from small to medium-sized biotech companies that either do not have a chemistry department or staff only a small number of analytical chemists.

We are also developing another niche in the field of antibody drug conjugates and linker technology in the oncology area. Only a few chemistry CROs are willing and capable of handling the highly cytotoxic materials used in this field. While we and only a few other CROs have supplied our clients with "chemical warheads" attached to customized activated linkers, even fewer CROs are attaching these agents to the antibodies directly. This is generally something biotech companies prefer doing in house. We have one client who is trying us out in this area for a current project. While this is a growing field among biotechnology companies we feel TCRS, as a chemistry services provider, is getting into this area of research ahead of the pack.

How have you developed your laboratory capacity to better serve your clients?

There is now a huge inventory of chemists in the Northeast who have been laid off. Since there is no shortage of talent, we have been able to hire very talented employees quickly. People are willing to work for small companies because they are more visible and, if they are good at their job, they are able to move up quicker and take on more responsibility as the company grows. With larger companies, these talented employees and their work sometimes become buried.

In addition we have a strategic alliance with an Indian partner to fill in the skills and services not yet provided in house at TCRS and vice versa. We each have our own strengths and each compliments the other in terms of services provided. When a client needs to have a process that was developed at TCRS, scaled-up under GMP guidelines, we transfer the technology to them as part of the agreement with the client and they would handle the manufacturing.

As more companies look offshore to outsource their research needs, is there increasing pressure on a Western-based CRO such as TCRS to deliver more services at lower prices?

The Chemistry Research Solution's strategy is based on our recognition of these outsourcing trends. The type of work that these companies have outsourced to China and India is, for the most part, routine chemistry. They are more interested in quick turnover than complex, highly technical chemistry. A small biotech company is much more interested in the latter since they cannot afford to lose their limited intellectual property to an outsourced company. They are also not as well-equipped financially to keep tabs on an overseas company. Sending a technical representative overseas to monitor a project is a big expense, and something that is difficult to do by phone alone for more complex projects. In addition, large pharmaceutical companies will generally outsource the same project to several different CROs to guarantee a timely product delivery. This is something that would strain the budget of smaller companies.

Is there a lot of risk associated with concentrating a majority of your business on start-ups?

There is always a risk with smaller companies whose projects are generally of shorter duration, but we are constantly looking for new projects and clients. Whenever there is a slowdown from one client, we must have something with which it must be replaced. We have been very lucky and successful at finding the right clients. It takes time to develop a trust and confidence to invest with a company like ours long term, but that is our overall goal. The initial smaller projects we do for a client must be successful to solidify these long-term investments.

Where would you like to see TCRS in five years?

Our long-term goal is to double our business every year for as long as we can. We have a lot of natural visibility due to our size and specialization. For the time being, our goal is to grow organically without outside financial assistance. With proper planning and developing, domestic outsourcing will make a big comeback in the industry. •

Interview with **Pierre Lunel**

CEO, NOVASEP INC

What is the significance of the North American market to Novasep's global operations?

Novasep has been in the United States with our subsidiary for 14 years. North America is a very important market for us. There is a very large number of start-up or medium-sized companies here who are very active in the development of new molecules, in many different areas including pharma, Biopharma, Food and functional ingredients, Fine chemicals, and bio-based chemicals. While the US does not have the same growth rate that Asia does, the molecules and processes that we are initiating here have the potential to lead to bigger sales, systems and CMO activity either in the United States or somewhere else in the world.

What are Novasep's core strengths in process development and custom synthesis?

Novasep provides the customers with a choice between insourcing and outsourcing. Our customers have the choice of buying the equipment for the process that we have developed with them and operating it themselves, or subcontracting the manufacturing of the compounds to Novasep. We provide not only purification solutions, but upstream services. For instance we can also work on the synthesis using the expertise we have in the chemical field, going from hazardous chemistry, to very classical chemistry.

As we have been seeing manufacturers start to bring their outsourcing back to the United States, which industries are providing the most growth opportunities for Novasep?

We have not yet seen clear examples of companies coming back to North America, but it is a trend in the pharmaceutical industry. The majority of our business is in the pharmaceutical field. Agrochemicals are also a large market for us. The agrochemical sector is addressing the patent cliff with sometimes similar ways to the pharma industry, where companies with racemic compounds on the market are proposing not the racemic compound but the pure, active enantiomer. With Novasep's continuous chromatographic systems, we can have this purification realized in a competitive way. We have also been working on a three-year project with a company in the electronics industry using chromatographic technology. The electronic industry is requiring more and more pure products and we are developing purification processes specifically for a number of different intermediates.

When it comes to R&D, what is the role that Novasep's US operations play within the company's global strategy?

In North America, we are a centre of expertise focusing on purification technologies for all our markets. North America has all of the different markets that Novasep works in: from the pharmaceutical and biopharmaceutical industries to food and functional ingredients and to agrochemicals, electronics and specialty chemicals. This is not the case in other markets where we are present, so our North American operations allow us to develop processes directly with the whole range of our customers.

What are some examples of Novasep's initiatives to develop more sustainable processes?

Our Varicol and SMB continuous chromatography processes allow for better productivity and yield pure enantiomers with almost no solvent consumption, due to the integration of advanced solvent recycling technologies. We are able to develop a process by screening the right stationary phase, obtain a very good productivity for the stationary phase, then, using our proprietary computer modelling tools, implement that in a continuous process and obtain a very pure product at a very competitive price. In pharma, we have numerous examples where companies have switched from crystallization to the Varicol system for commercial manufacturing because this technology is more competitive and more sustainable: this is sometimes difficult to believe for an organic chemist, but our chromatography processes consume much less solvents than classical purification processes such as crystallization! Varicol can also be competitive in the agrochemical field, on a case-by-case basis.

We also use our continuous chromatography technologies to purify omega-3 products in a very cost-effective and environmentally friendly way.

We are now starting to apply the concept of continuous chromatography to the biopharmaceutical industry. To our knowledge, none of the industry has yet switched from batch chromatography to continuous process. We are coming up with more efficient and productive solutions that use less of a production footprint. This switch will definitely happen, but it is a question of time.

What are some of the growth goals that you have for the company in the medium term?

There is a lot of potential for our US business to expand by three or fourfold. We are building new business related to products and consumables for the biopharma market, such as our unique range of disposable tangential flow filtration, and we are launching a revolutionary protein for antibody purification, which will generate increased repeat business. We expect to grow significantly in biopharma in the coming years. Our growth will come either through our operations in Europe or, why not, through an acquisition in North America so to have local capacity to manufacture from Phase I to Phase III or more. •

Towards Green Chemistry

Environmental responsibility in the chemical industry

With the modern emphasis on environmental responsibility, companies across a broad range of industries are focusing on reducing their environmental footprint. Few industries, however, have been as successful in this endeavor as the chemical industry: an economic sector that is not only reducing its own emission, but helping others to do the same.

The US, so often at the forefront of innovation, has similarly played a leading role in this global trend. According to Beate Ehle, executive vice president at BASF, chemistry and sustainability will play key roles in solving the demands for food, transportation and energy that currently exist. "We need to do things differently, which drives us to look into niches. Big-volume, classical chemicals do not solve key issues, such as water and heat management, but more sophisticated high-tech chemistry combined with interdisciplinary activities can help to address these concerns."

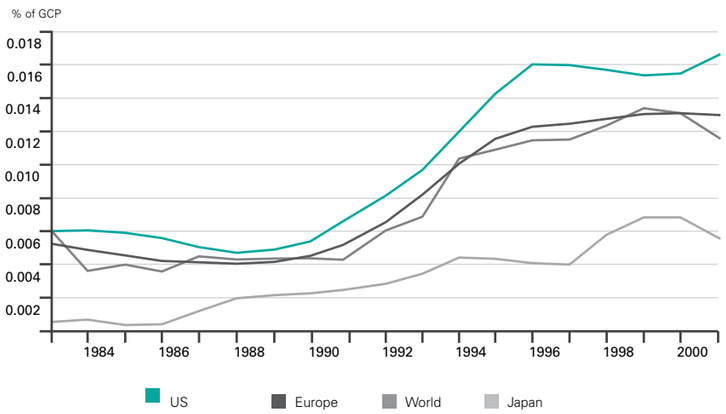
The importance placed on these issues is becoming increasingly evident not only in traditional sourcing and manufacturing strategies, but as with DSM, in their business models. "DSM is one of the only listed companies that have a substantial component of our business model dedicated to our sustainability performance indicators. A lot of products need to be converted from traditional chemical processes to bio-chemical or pure biotechnology processes. We make a life cycle analysis of every development product that we manufacture; each product must have a life cycle that is at least 20% more efficient than the driver in that category," said Wessels of DSM.

Companies are also striving to develop new and more efficient manufacturing processes. Croda has a 305 kW solar array system that provides roughly half of the electricity needs for the office and labs at their New Jersey site. Gallagher, Croda Inc. president, expanded on the project's role in Croda's overall strategy: "our solar panels are a major part of our effort to lower our carbon footprint and make us more sustainable. We have initiated another sustainability project that is much bigger in size and scope, which is a landfill gas project at our Atlas Point plant in Delaware. The project will provide more than half of the electricity and steam generation needs for the manufacturing site from landfill gas. Our US initiatives are part of Croda's global goal to supply 25% of our energy needs from non-fossil sources by 2015."

The future of the United States specialty chemicals industry rests heavily on its ability to react to the changing global market dynamics while retaining a strict focus on leadership in research and development. By virtue of their targeted business model, specialty chemical companies are well positioned to capitalize on the evolving demand cycles that are proving challenging to their commodity-focused counterparts. According to Mathias Greger, local business unit manager of performance materials at DKSH, a Swiss company specializing in market expansion services: "While US growth rates are relatively stagnant in comparison to Asia, it is still possible to achieve double-digit growth here in niche and specialty areas. The growth and innovation coming from the US will always make it attractive, even key for a company's survival." •

Green Chemistry Patents by Country

Source: UNEP



Interview with Richard McNeel

CHAIRMAN, PRESIDENT & CEO, LORD CORPORATION

Can you give us a brief overview of Lord Corporation and your recent milestones?

We are a private company with $790 million in sales last year. Half of our business is dedicated to chemicals, such as adhesives, coatings and electronic chemicals, while the other half is focused on mechanical and electromechanical products. We have 350 scientists and engineers with 85% of them working in the US. Our goal is to continue developing our core technologies into unique, high quality products for select markets. We have a long history of delivering breakthrough innovation for demanding industries, and are globally situated to tackle customer needs.

Does your work in the specialties chemical unit of the business feed into your vibration control systems business?

It does in the sense that most of the passive systems are alternating layers of elastomers, rubber and metal, and adhesives bind them together. The core of the chemical side of the business is our proprietary Chemlok adhesive. It solves the problem of bonding rubber to metal and is still the major product used around the world for this purpose.

What are your growth projections for the end of 2012?

We should reach about $860 million in sales, about 9% growth, which we can attribute mostly to helicopters. We won a lot of programs related to helicopters over the last few years resulting in 30% growth this year on the aerospace side of the business. We have also seen growth in our electro-mechanical systems, which is a relatively new area for us. Most of this growth is from the installation of active systems on helicopters, which are replacing standard passive systems that cannot respond to different conditions. Additionally, our tactical feedback devices, which give customers the feel of the mechanical brake with an electronic system for forklifts and some agricultural equipmen applications, are also supporting this growth. This year, most of the growth has been in the US with sales abroad levelling out due to exchange rates and weakness in Europe, China and Brazil.

Are you looking to enter new markets to increase your growth on the chemical side?

We started up entities in Indonesia and Argentina last year, and we will be setting up in Colombia and areas in the Middle East in the near future. Initially these will all be sales entities as we continue to expand to other parts of the world. About 25% of our business is in emerging economies outside of the US. Our basic philosophy is to make our chemical intermediates in the US to protect intellectual property, and then we ship those around the world to our other plants for production of the finished product. Once in a while we export these products back to the US, but generally they are sold in the markets in which they are made.

What are some examples of specialty products and customized materials coming out of your R&D efforts?

We do not try and sell commodities. We make many different products for many different applications, and we are constantly working to develop new products to solve customers' problems. The most obvious example of this innovation is our attempt to shift our customers over from solvent-based adhesives to aqueous adhesives since they are much better for the environment. The conversion of a portion of our two US industrial plants over to this adhesive has been successful, and we are making progress in other markets as well. In electronic chemicals, one of our scientists came up with a polymer that has strong thermal and electrical conductivity with limited precious metal content relative to competitive products. The first planned application for this is lightning strike protection on composite aircrafts to replace the heavy copper wire mesh protection currently in use. We are also constantly looking at new adhesives to solve problems in the aerospace industry.

What percentage of your revenues are you investing back into R&D?

It is somewhere between 8% to 10%, which is pretty high compared to other companies. Our board is very committed to innovation: we are not a commodities producer, we solve people's problems. We are currently working on solutions for the next generation of products. Our focus on innovation allows us to grow as rapidly as we do. Our employees love working here because we are always working on something new.

Are you seeing an increase in customer demand for the use of Green Chemistry in your products?

Bringing green chemicals to the industry is an objective of the Lord Corporation. This shift is inevitable, so it makes sense to invest. We have been working on products for a several years, but the interest is slowly developing and we will be ready when the market is ready to make the switch. After years of improvements, our aqueous adhesive is now close to the performance of our solvent adhesive. One of the challenges to convincing customers to switch to more sustainable solutions lies in the initial capital investment required to make this switch. As long as they do not have to switch, they do not want to, unless they are very dedicated to sustainability. The European companies are a little more progressive in this area, so that is where we are finding most of the current opportunity for green chemicals.

Where would you like to see the company positioned in the market in the next five years?

We are going to continue to expand globally, especially in Central and South America. We have not done much in Africa or the Middle East yet, but there is always potential there. Innovation is really driving the rest of our growth. Protecting our strong base business of adhesives and control systems and expanding with market demand is obviously a top priority, especially since they are some of the best in the world. •

Courtesy of Siegfried

Curing the Market: **America's Pharmaceutical Sector**

"The United States and Europe have always been a hub for the pharmaceutical industry and therefore a key driver for the company. The impact of what gets done here is felt well beyond the US borders."

- Joseph Barendt, COO, Chiral Technologies Inc

The Growth Potential

An introduction to the US pharmaceutical industry

While our modern way of living depends, in a very real and tangible sense, on the chemical industry, for many people it is the act of living itself, rather than simply the way of living, which relies on the innovation and work of the chemical industry. Although there does exist some debate about whether pharmaceuticals should be classed a specialist chemicals, the importance of the role they play mean that they cannot be ignored in an examination of any chemical industry.

The US East Coast, and specifically the northeast, is the home of American pharmaceuticals. Companies are attracted by hordes of graduates from top-tier universities and a high concentration of scientific professionals: New Jersey alone is home to 15 of the world's top 25 pharmaceutical companies. Although the sector has experienced similar challenges to their chemical counterparts, such as outsourced manufacturing, for smaller pharmaceutical companies who rely heavily on innovation, the depth of talent available ensures that the East Coast will remain the centre of the pharmaceutical industry in the years to come.

Aceto Corporation is a Long Island, NY-based virtual manufacturer who shifted their business model from industrial chemicals to focus on pharmaceutical manufacturing. "Aceto found that many of our industrial chemicals also had pharmaceutical applications, which offered more attractive margins and less cyclical dependence," said Albert Eilander, chairman and CEO of Aceto.

In 2010, the company penetrated the market by acquiring Rising Pharmaceuticals in order to focus on finished dosage forms. "With the introduction of generic drugs into the market a number of years ago, the need for pharmaceutical involvement became much greater. Our pharmaceuticals business has grown at greater rates than our other businesses and we have become involved in intermediates and active pharmaceutical ingredients," said Albert Eilander.

Having an East Coast footprint is also attractive to European companies looking to expand their presence in the United States. Swiss-based Helsinn Therapeutics has been focused primarily on supportive care and has a niche focus on supportive cancer care. In 2009, the company acquired Sapphire Therapeutics, a New Jersey-based biopharmaceutical company, in order to acquire a cancer supportive care agent and a GI supportive care molecule that was in development. The acquisition also allowed Helsinn to have a direct commercialization presence in the United States.

Aloxi, the main revenue generator for Helsinn Therapeutics, is the market leader in the United States and Japan for the treatment of chemotherapy-induced nausea and vomiting. The company is also developing Anamorelin, which is used for the treatment of cancer-associated cachexia. The drug is currently in Phase Three and will be launched in the United States under the Helsinn brand. According to William Mann, president and CEO of Helsinn Therapeutics, "there is a huge opportunity to bring innovation to increase patients' quality of life while they undergo chemotherapy; the market is ready for new agents that will help patients deal with their disease."

For Novacap Group, a French diversified chemical company, market entry into the United States came with the November 2011 acquisition of Rhodia's salicylic and acetaminophen businesses, which they renamed Novacyl, Inc. "Before the acquisition of Novacyl, the company was focused predominantly on Western Europe with assets mainly in France; the acquisition increased the company's international presence and asset base, particularly in North America," said Gilles Grenier, Novacyl's general manager.

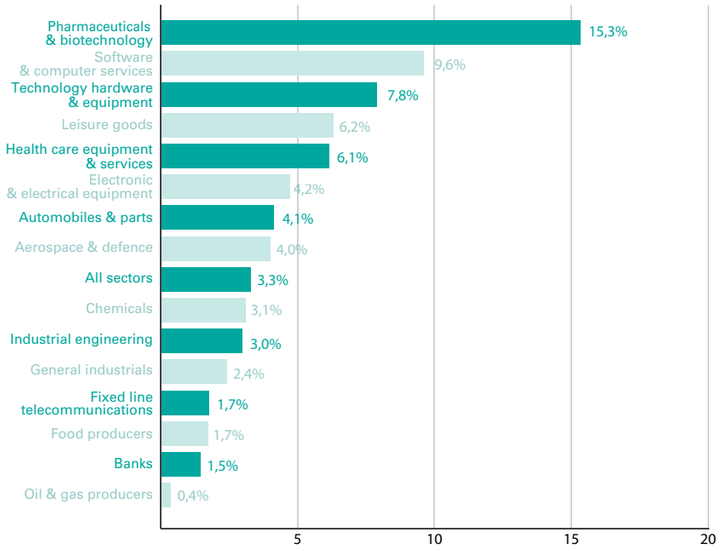
Last year, the American market represented $45 million of the company's $125 million global revenue.

Many of the same issues facing specialty chemical companies are prevalent in the pharmaceutical industry; however, pharmaceutical companies must also cope with unique challenges. With some of their blockbuster products coming off patent soon, major pharmaceutical companies are facing a prospect of tens of billions of dollars of lost revenue over the next several years. This segment of the industry is facing the so-called "patent cliff" in different ways.

"What we have seen in response to this situation is considerable competition among these players when it comes to the right kinds of technologies, opportunities, and developmental products. Some of these organizations have a lower appetite for risk now, and are hesitant to take on products that are going to require a considerable amount of additional investment to move along. Factors in the larger financial market have made less venture capital and private equity available, so there are many companies looking for partnerships and acquisition opportunities," said William Wofford, partner and member of the Executive Committee of Hutchison Law Group PLLC, a North Carolina-based firm that specializes in the life sciences industry. •

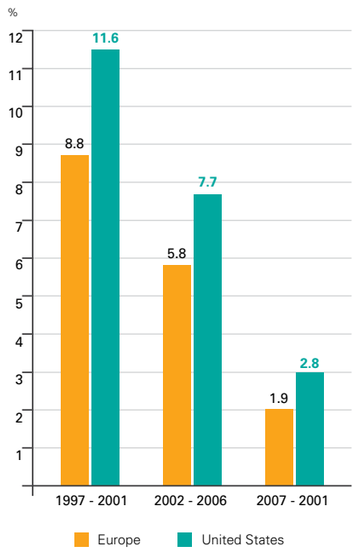
Ranking of Industrial Sectors by R&D as a % of Net Sales (2010)

Source: EFPIA



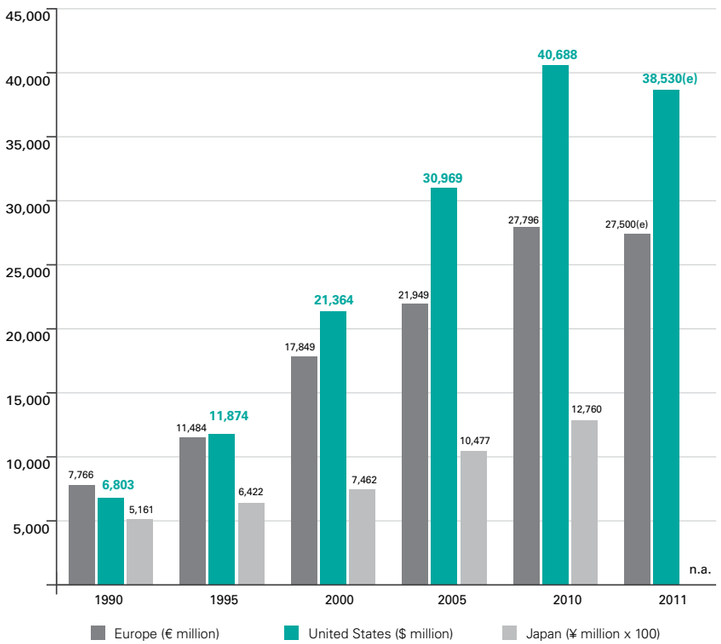
Pharmaceutical R&D Expenditure Growth Rate

Source: EFPIA



Pharmaceutical R&D Expenditure (millions of national currency units)

Source: EFPIA



Sales of new medicines launched 2006 to 2010 by country

Source: IMS MIDAS

United States	56%
Europe	24%
Japan	12%
Rest of the World	6%
Pharmerging	2%

Interview with **William Mann**

PRESIDENT AND CEO, HELSINN THERAPEUTICS (U.S.), INC.

How important is the United States market to Helsinn's international business?

Since the establishment of the Helsinn Group by Gabriele Braglia in 1976 in Chiasso, Switzerland, the organization has been pursuing a unique business model based on in-licensing products at an early stage, development through registration, and out-licensing them once marketing authorization has been achieved. Helsinn bears the development risk but shares the marketing risk by selling our products through distributors worldwide (currently in 86 countries). In addition, the Group has both API and finished product manufacturing capabilities in Switzerland and Ireland, respectively. The company has been focused primarily on supportive care and especially cancer supportive care.

Helsinn acquired the US company Sapphire Therapeutics, Inc. in 2009 which then became Helsinn Therapeutics (U.S.), Inc. Both the technology and the people at Sapphire Therapeutics were complementary to the Helsinn Group, with compounds in development for cancer and GI supportive care. The acquisition established a presence for Helsinn in the US and the plan going forward is for Helsinn Therapeutics to establish direct sales, marketing and distribution in the US marketplace.

Helsinn Therapeutics (U.S.), Inc. current employs 38 associates and is based in Bridgewater, New Jersey. The company is focused on advancing its pipeline through registration and marketing authorization and is preparing to establish a commercial presence. Although the first US developed product will be launched in 2016, we have an option to co-sell a currently marketed Helsinn product alongside the existing distribution partner starting as early as 2013.

Helsinn's business model is based on expertise and excellence in clinical development, API and finished product manufacturing, and marketing support to our distributors. Helsinn has achieved a high success rate in developing compounds through successful commercialization. The business model allows Helsinn to acquire compounds at an early stage and to add value through successful development and commercialization.

What specific characteristics are unique to Helsinn's products?

Helsinn's products are supportive care products in cancer, GI, pain and inflammation. The vision of the Group's CEO, Riccardo Braglia, is for Helsinn to become the premier Quality of Life Company. There is a huge need to develop innovative therapies to help patients deal with the side effects of their disease and to thereby increase their quality of life.

Aloxi™, launched in the US in 2003, is the main revenue generator for Helsinn and is the market leader in the United States and Japan for the prevention of chemotherapy-induced and post-operative nausea and vomiting (CINV and PONV). The key to its success is its long half-life, which means that one dose remains effective for several days. Helsinn is developing a second generation product that is currently in Phase 3 development and the expectation is that it will continue to advance the treatment options available for cancer patients at risk for CINV.

Anamorelin is a product under investigation for the treatment of cachexia associated with non-small cell lung cancer. It is currently in Phase 3 development in 19 countries and will be commercialized directly in the US by Helsinn Therapeutics. The co-primary end points of the Phase 3 are handgrip strength and lean body mass. We are also measuring quality of life benefits using validated Patient Reported Outcome instruments.

Helsinn has clear development and fiscal plans in place to support the development of new and innovative molecules and is actively looking to in-license new molecules to develop and commercialize.

How much of a challenge is it for Helsinn to keep costs competitive and protect the products under the Helsinn brand?

Helsinn seeks to innovate in areas of unmet medical need and has the ability to diversify as necessary. For instance, Helsinn has a minority investment in Thorne Research, Inc., a high quality US nutritional supplement company which will develop products meeting the needs of people living with cancer. Riccardo Braglia, Helsinn Group's CEO, has a vision to support patients through pharmaceutical agents, nutritional supplements, and other services as they become available. Helsinn has API and finished product manufacturing facilities in Switzerland and Ireland respectively. The Swiss facility, Helsinn Advanced Synthesis, is engaged in both general and high potency manufacturing. Third parties contract with Helsinn Advanced Synthesis because of its long reputation for high quality manufacturing. For instance, there has already been interest from third parties in a new cytotoxic facility which is due to open at Helsinn Advanced Synthesis in 2013. Helsinn Advanced Synthesis' long reputation allows it to compete with chemical manufacturers in China and India.

What characteristics does Helsinn look for in a potential acquisition or partnership?

Helsinn is open to acquisitions and partnerships with other companies and has a global business development team that is based out of Switzerland. Helsinn looks for opportunities that are compatible with its portfolio and for which there is a good business case. We look for development stage opportunities and marketed products to which we can add value through innovation.

As Helsinn is a private company and has not taken on any debt, any company acquisition would need to be of a certain size. While our primary focus is in oncology supportive care, we are also looking at products that would complement the products that will be commercialized in the US by Helsinn Therapeutics. However, if economically viable, we will also consider products in other therapeutic areas.

Where would you like Helsinn to be positioned within the next five years?

The Helsinn Group intends to cement its reputation as the leader in supportive care. Helsinn is committed to supporting patients by developing products to help patients deal with the side effects of their disease. We will maintain our innovative culture to identify opportunities to help patients that may be overlooked by our competitors. •

The Implications of "Obamacare"

One of the main debates of the recent presidential election was over the 2010 Patient Protection and Affordable Care Act (ACA), otherwise known as "Obamacare". Arguably more than any other presidential policy of recent decades (bar, perhaps, the Iraq War), the ACA has strongly divided both political and public opinion; polls still show an American population evenly split on its merits or faults, with very few people undecided on the issue.

The ACA, for whatever else it may be, is certainly a historic act. The creation of universal healthcare coverage, taken for granted by so many developed countries, has repeatedly run into hurdles when various figures have tried to introduce it in the USA: it failed to pass under Franklin Roosevelt in 1934, Harry Truman in 1945, John Kennedy in 1962, and Bill Clinton in 1993.

In the pharmaceutical industry, opinion towards the ACA is often difficult to ascertain, with political rhetoric on both sides referencing them either in support of their arguments, or to attack the opposition. Any attempt to seek out their views more readily brings up quotes from politicians saying what "Big Pharma" says, rather than direct quotes from the pharmaceutical industry itself. Nonetheless, with the US pharmaceutical industry accounting for well over 50% of global sales of new drugs and 39% of all global drugs, the economic impact of this legislation comes in a close second after social impact when assessing its impact.

The free-market model of the US pharmaceutical industry obviously works. Despite worries that clinical trials and research would be increasingly dominated by emerging economies such as China, as of 2010 the USA still carried out 51% of all global clinical trials. Relatively new fields, such as biotechnology, have grown rapidly in the USA: in 2010 there were 1,452 biotech companies in the United States employing 180,000 people. Given this, there is a school of thought that suggests it would be foolish to tinker with the system.

Yet there are strong arguments for the ACA. In 2010, 49 million Americans were uninsured. While on a social level this seems almost incomprehensible to a European observer (roughly 60% of all bankruptcies result from medical bills), economically this is also a problem. Research has shown that average prescription drug spending for uninsured people under 65 is little over a third of the spending of those with insurance. The additional revenue gained by pharmaceutical companies from accessing a newly insured market of the size the ACA will create could potentially triple pharmaceutical industry revenue by 2020. Without it, an ageing population will certainly grow the size of the market, but not nearly to the same extent.

Some concerns have credibility. Profitability will not increase in the same volumes due to additional taxes and fees on pharmaceutical firms, for example. However, other concerns, such as worries that this additional revenue will be offset by mandates for the use of generics, arguably fail to see the full picture.

Generics are a danger. By 2015, it is estimated that an additional $95 billion of current prescription drug revenue could switch to generics, due to the so-called "patent cliff". Yet the largest prescription drug market, senior citizens, are afflicted by ailments such as Alzheimer's that still require new drugs; drugs that are currently in research pipelines of the big pharmaceutical companies. These conditions have not been solved and their remains plenty of room in the market for new and patented drugs. While generics have been increasingly gaining ground in terms of number of prescriptions (30% in the 1980s to 75% in 2010), branded drugs are expected to continue to dominate overall sales figures (generics still accounted for only 16.5% of sale value in 2010).

Furthermore, arguments for and against the ACA cannot simply deal in numbers: the market will increase in size by this much, the taxes will be this much, and so on. Some important aspects of the ACA are not only aimed at increasing healthcare coverage, but will change the nature of healthcare coverage.

The implementation of an independent payment advisory board, as well as outcomes research funded by the federal government, is expected to provide more information to patients who often previously reliant on information provided by just a single source. With this greater awareness of the function of a drug and its value for money, some experts predict that the US healthcare market will increasingly demand therapies and prescriptions that are specific to their specific condition and fit with their particular genetic or disease profile. This greater product customization cannot be done through generics; it requires the expertise and research capabilities of specialized pharmaceutical companies.

There is a discrepancy in US healthcare. A nation that has the largest and most advanced pharmaceutical industry in the world also spends 60% more on insurance and patient care than any other country in the OECD while achieving roughly the same (and sometimes worse) results in life expectancy and infant mortality. The challenge was always going to be removing the latter problem while retaining the former strength.

Now is the time to test this. The American pharmaceutical industry, despite the rough years of the global financial crisis, has a solid underlying foundation for future growth: an ageing population as the "baby boomer" generation enters retirement. If the ACA does present hardship for the sector, it is better that these difficulties are faced when companies have the strength to overcome them. Yet although the debate will no doubt continue for quite a while, often about issues completely unrelated to the pharmaceutical industry, the research so far suggests that "Obamacare" could be blessing. •

Interview with
Albert Eilender

CHAIRMAN AND CEO, ACETO CORPORATION

Can you provide us with an introduction to Aceto Corporation?

Aceto is a virtual manufacturing company that markets and sells a variety of pharmaceutical and performance chemical products on a global basis. In the last 15 years, the company has shifted from primarily representing US and European manufacturers to representing Asian producers. Today, about 60% of Aceto's products originate from Asia. Concurrent with the company's global migration, there has also been an industry migration from industrial chemicals to pharmaceutials. We found that many of our industrial chemicals also had pharmaceutical applications, which offered more attractive margins and exhibited less cyclical dependence. Therefore, we decided to pursue the pharmaceutical markets.

With the introduction of generic drugs into the market a number of years ago, the need for pharmaceutical involvement became much greater and Aceto was in the right position at the right time. Our pharmaceuticals business has grown at greater rates than our other businesses and we have become involved in pharmaceutical intermediates and active pharmaceutical ingredients (APIs). At the same time, we have also been developing supplier relationships with companies in Asia that do not have the capability to enter into the US and European markets on their own. These companies were looking to go up the value-added chain into finished dosage form pharmaceuticals and we partnered with them as suppliers. Our recent pharmaceutical focus led us to our 2010 acquisition of Rising Pharmaceuticals, Inc., a finished dosage form pharmaceutical business.

Can you elaborate on what growth goals Aceto had in mind when it decided to acquire Rising?

About five years ago, Aceto embarked on a program to bring finished form generic drugs to market under the Aceto name. We had a number of products but it was not really a successful venture and it became obvious to us that we needed to do something more significant to penetrate the market. For Aceto, this meant going into a joint venture, partnership or acquisition. We decided to acquire a mid-sized company where we felt we could quickly and dramatically impact the business going forward. Rising, like Aceto, is a niche-oriented company, so the acquisition fit very well with our strategy and culture. Rising's competitors are also our customers on the pharmaceuticals intermediates and ingredients side of our business, so we set Rising up as a standalone subsidiary and keep the company separate from our other businesses which supply intermediates or APIs to Rising's competitors.

Aceto has three newly named business segments: human health, pharmaceutical ingredients and performance chemicals. Where does the division of revenue fall within these lines?

The bricks and mortar of the company has always been the chemicals side of the business, which represents about 40% of our sales. Our pharmaceuticals segment represents 36% of sales and human health constitutes the remaining 24%. Aceto plans to continue supporting and growing all of our businesses, but we expect to see the pharmaceutical and human health businesses become a relatively larger percentage of the overall business in the future. Human health is growing well in excess of 20% a year and pharmaceutical ingredients are growing more than 10% a year. Performance chemicals, in comparison, are tied to GDP and so this line is growing between 1% and 2%.

The generic drug market is poised to grow robustly, especially considering the patent cliff in the United States. What strategies do you have to increase your market share and what will that bring for Aceto?

Although the thrust into generic drugs for blockbuster drugs has reached a peak, Aceto has always played in a smaller market where there is still a lot of opportunity. The absolute number of drugs that are going to become generic over the next five to ten years is continuing to grow. Aceto expects this is going to be a very robust area for us. We are currently investing heavily in our new product development pipeline, and plan to continue to do so in the future. When we consider a product, we look for a drug that has few or no generics and a market size between $25 million to $50 million. Out of the 45 products in our pipeline, we are the first to file for 18 of them. Our sweet spot is the range of niche products that fall under the radar, and this is how Aceto will continue to grow robustly for the foreseeable future.

Looking at Aceto's stock performance, your share price has climbed over the past year. How closely does your stock performance relate to your business earnings?

Generally our stock price is on trend with our sales and earnings and it is a nice track record over the past four years, but we think that the company's stock price is undervalued We are certainly going out and raising investor awareness because we believe there are still many potential investors who do not really know Aceto. We are being proactive here, and we also need analysts to follow us who really understand our business. Investor reaction has been good thus far. We do not have the liquidity for the very large investors, but we do have an attractive quarterly dividend policy. Ultimately our business performance will drive the stock price and that is what we are focused on; however, there are still elements that are out of our control. Our trend lines are in the right direction and we expect for next year to be another strong year for us. Having said that, I do temper my optimism with concerns about the global economy, seeing as 40% of our business is subject to GDP growth rates. •

Interview with
Jaeyon Yoon

VICE PRESIDENT OF MARKETING, SK LIFE SCIENCE

Can you provide us with an overview of SK's business divisions and explain how SK Life Science fits into the company's strategy?

SK is the third largest conglomerate in Korea and its major business is oil and telecommunication. SK integrated its technology and experience in oil and petrochemicals into pharmaceuticals through SK Life Science, which has two divisions: drug discovery and custom manufacturing. On the drug discovery side, the goal is developing new drug entities in specific areas. On the custom chemical manufacturing side of our business, we are providing products and services in advanced intermediates and APIs for pharmaceutical companies using highly specialized technology which we accumulated from our oil business, continuous flow chemistry. This technology differentiates us from other conventional manufacturers, who primarily use batch-type reactors. Continuous reaction technology uses tubular-type reactions that have higher productivity. This type of reaction can handle high pressure, high to low temperatures and hazardous reactions.

How is SK's petrochemical expertise put to use in pharmaceutical manufacturing?

The company has a long history in the petrochemical industry, our management wanted to diversify by moving into the fine chemical and pharmaceutical area. With in depth knowledge and experienced staff, SK designed a continuous reaction system that allows for high flexibility in making small- and medium-sized quantities. Although the manufacturing concept itself is very similar to the petrochemical industry, the fine chemical and specialty pharmaceutical areas have very diversified and delicate reactions. We have done a lot of research to implement sophisticated chemistry required to convert to continuous reaction in the fine chemical area. We have since expanded our business areas more toward downstream products with API manufacturing.

At a time when the US chemical industry is increasingly focusing on Asian markets, how does SK Life Science exploit these synergies between its home market and the USA?

Almost all of SK's revenues come from the United States and Europe; less than 1% of our pharmaceutical revenue is generated from Korea. Our primary target market is pharmaceutical area, where still US and Europe are the most active and where the most business in. So we will keep focusing these areas with our key technology. Challenges from China and India are getting tougher, however we believe our business will keep growing with differentiated technology. The advantage of being a Korean company right now is the free trade agreement that Korea recently signed with United States, making all manufactured products in Korea duty free. Korea also has a similar agreement with European companies that was put into effect last year. China, in comparison, is paying about 6% to 8% custom duties, depending on the product. The FTA will hopefully bring some business back from China and lead to resurgence in Korean manufacturing.

In light of the rising US interest in Asian markets, how has this led to increased competition amongst your peers?

Asian competition is growing and more and more companies are trying to outsource from Asian companies; however, pharmaceutical companies are very sensitive on intellectual property (IP), reliability and quality issues. It is not easy to find the right manufacturer to meet all of these requirements. In Korea, labour and other costs are a little cheaper than Western companies, but our cost structure is still high compared to China and India. However the quality of work and business environment is almost equal to Western standard. SK's strategy is not to directly compete on cost. If you compete with raw materials or early-stage intermediates, cost is more important because a customer may able to handle the issue of lower quality at a later stage. When it comes to downstream products, where SK Life Science is focused, customers are more concerned about quality, reliability and IP because it is closer to the final product.

SK Life Science has a goal to become a global R&D specialty company. Can you elaborate on how this is reflected in the business itself?

In SK's custom manufacturing business, research and development is at the forefront. In many cases we are working with big pharmaceutical companies in joint R&D, where they give us their lab procedure and we repeat and improve it and then supply them with the material. On the other side of our R&D is the promotion and adaption of continuous reaction in as many areas as possible. SK Life Science's R&D teams consist of engineers as well as chemists, which gives us an advantage over our peers. One-third of our R&D people are engineers and we involve them in the early stages of development to eliminate application problems down the road. Once you bring a technology to the plant, sometimes it cannot be applied in the plant or the cost is not what was expected. Involving our engineers helps us to avoid these issues.

How has the industry's push towards green chemistry affected your manufacturing process?

Continuous flow chemistry is the perfect fit for green chemistry. For example, continuous process productivity is very high; usually use very small reactors with minimum exposure to the environment. One of continuous flow system we have, 300L reactor can produce 10~12MT per month. It can be all closed system and highly automated. Continuous reaction is also greener because it use less energy and less solvent, in harsh conditions (600oC, 300 bar etc) that reduce catalysts, reaction time and waste. Batch reactions can also generate a lot of waste and it is much easier to recycle with continuous reactors. A lot of pharmaceutical companies are now trying to adapt continuous flow system, which will be the solution for low cost, safe, reliable green process. •

Interview with **Jeanne Thoma**

COO MICROBIAL CONTROL, LONZA

Can you provide us with a brief overview of Lonza's presence in the United States?

Lonza has four different sectors: custom manufacturing, microbial control, bioscience and life science ingredients. Lonza has a strong presence in the United States; our largest R&D center in the US is based in Georgia. From a manufacturing perspective, the United States continues to be an important market for Lonza. A major focus for Lonza is continuous process improvement, which is part of our overall sustainability objective. Lonza has certain advantages in our manufacturing process which enable us to manufacture products in the United States that can compete successfully against Chinese manufacturers in the Chinese market. One of the current advantages for US manufacturing is competitive energy costs and a strong local market.

Following the acquisition of Arch Chemicals in 2011, Lonza is focused on developing new business opportunities created through our combined portfolio and expanded market expertise. The integration has been very successful; Lonza strengthened its global manufacturing footprint as well as our market presence in Asia and South America. The acquisition provided experience in BtoC sales and marketing and a talented workforce. The growth that Lonza plans for this business will be achieved in large part from our combined portfolio.

How does your position as the leader in microbial control affect your presence in bioscience and life science areas?

Lonza is also the leader in chemical and biological custom manufacturing and cell therapy for the pharmaceutical and biotech industries. With our broadened portfolio, we are seeing some synergies between our businesses. For example, Lonza is looking to utilize our technology to make it more affordable to introduce peptides into the microbial control or personal care market. The acquisition brought additional expertise in fermentation technology, which could be applied to the personal care market. Lonza's bioscience sector is working on manufacturing a skin substitute, which, down the line, could have applications in the personal care area. Our bioscience business also offers a rapid testing technology for the pharmaceutical industry that could be adapted for use in the microbial control industry for testing surfaces for contamination and providing instant results.

What trends are you seeing for Lonza's products in the United States?

The global trends that drive our business obviously includes US markets. One of these trends is a growing increasingly mobile population, which leads to an increased spread of infection. Another trend is an ageing population which is increasing the demand for Heath care products and facilities. Water reclamation and providing access to potable water is another trend and focus for Lonza for other regions of the world. .

Our business is diversified which is also an advantage. Our diverse portfolio allows us to leverage our strength in traditional markets to access new or developing markets. For example; today some of our largest revenue drivers in the Microbial Control sector are in the recreational water, personal care and wood protection markets. Our experience in these markets provide us the expertise and technology to access other growth markets like hygiene, oil and gas, materials protection and water reclamation.

Lonza is focused on sustainability by finding solutions that reduce waste streams and energy requirements and improve capacity utilization to ensure that our plants operate more efficiently.

What innovative presence does Lonza have in the United States?

We are proud of our $10 million technology center in Alpharetta, Georgia, although innovation is not limited to the United States or to a specific site.

The competitive global market drives innovation. For Lonza microbial control our innovation is focused on mainly on development versus invention. Specifically, applications development will includes new formulations, delivery systems and process technology improvements. Lonza has laboratories located all over the globe. Each laboratory has to adapt to different regional requirements, regulations and customer preferences. Applications development focuses more on what customers are demanding in the short-term, whereas our technology center focuses on the long-term trends.

How would you characterize the regulatory environment within the United States?

We consider our regulatory expertise to be a market advantage. Lonza is a company that takes very seriously our compliance responsibilities. Overall, a strong regulatory environment creates a safer, stronger more sustainable market. The regulatory environment can be challenging, but it also encourages innovation and process improvement that provide companies with a competitive advantage in a global market.

Where would you like to see Lonza positioned in the market in five years?

As the leader in microbial control and custom manufacturing. We will get there by building creditability with our customers, our shareholders and our employees by setting clear expectations and then delivering on those expectations. •

Interview with **William Wofford**

MEMBER, HUTCHISON LAW GROUP

Can you give an introduction to Hutchison Law?

Hutchison Law is a firm based in the Southeast US, headquartered in Raleigh, North Carolina. The bulk of our clients are in biopharmaceuticals, clean technology, and information technology. Our concentration is biotechnology and pharmaceuticals; we generally work with companies who are trying to commercialize new technologies. If a new potentially therapeutic molecule is discovered in a lab, that chemical is a long way from being a drug. We work with the innovators over the course of sometimes a decade to move that project to market. Our work involves financial transactions, strategic alliance arrangements for product development and commercialization, mergers and acquisitions, as well as negotiated transactions related to intellectual property. Our strengths come from our ability to help our clients think about how to capitalize on opportunities and avoid pitfalls that we have encountered before.

Would you say that a lot of your business is being driven by the patent cliff?

When you talk about the patent cliff, it is fair to say that any major pharmaceutical company is facing that in a different way. Some blockbuster products are coming off patent soon, so clearly that segment of the industry is facing the loss of tens of billions of dollars of revenue in the next several years. What we have seen in response to this situation is considerable competition among these players when it comes to the right kinds of technologies, opportunities, and developmental products. Some of these organizations have a lower appetite for risk now, and are hesitant to take on products that are going to require a considerable amount of additional investment to move along. Factors in the larger financial market have made less venture capital and private equity available, so there are many companies looking for partnerships and acquisition opportunities.

What legal challenges hinder the ability to bring new molecules to market?

In the life sciences area, there is a higher level of uncertainty regarding the FDA. People talk about a pendulum when it comes to how regulatory bodies work; the FDA can swing back and forth from being arguably too permissive in approving new drugs to being so focused on safety that new therapies are withheld from the market. A lot of people in the drug development business would say that the FDA's emphasis on safety has become so strong that it is impairing the ability to get value, therefore acting as a restraint on investment.

What does a venture capitalist look for in an innovative partnership?

Priorities vary, depending on the particular emphasis of the specific fund or partner, and where that fund is in its lifecycle. The themes we consistently hear are that investors want technologies with a strong intellectual property position, in both the US and other key markets. Investors also want an experienced management team, as well as the backing of a world-calibre scientific team.

How would you characterize current investor interest in life sciences?

Because of the patent cliff, pharma companies are highly motivated to fill their pipeline, but the financial crisis has created a shortage of new investment funds. One result of this shortage is that there has been a slowdown in merger and acquisition activity, so we see a backlog of companies that should have been bought in 2010 or 2011. Until this backlog is worked through and those dollars are freed up, we have an environment that is keeping some capital from being invested in this sector.

Looking at the future of life sciences, how do you expect it to perform in the medium-term?

We will continue to see the generics business grow. There will be new products, and we will continue to see the bar go up in terms of delivering therapeutic benefits, but also in terms of cost to the system. With the innovations in the human genome and personalized medicine, we will see breakthrough after breakthrough from new products that will deliver better outcomes. Biomarkers will allow pharmaceutical companies to find the right target for their new drugs and innovations. There are a lot of things that have failed, but could have been successful if targeted properly. We are now beginning to get the tools in place to draw those connections. •

Facilitating Success: **The Services Available to the US Chemical Industry**

"If all you have to offer is price, you are not really adding a lot of value to the supply chain. Our survival mechanism has been to try to identify unique opportunities where our insight and technical background can lend some advantage to a customer and find them something that they cannot get from a larger player."

- H. Douglas Thornley, President, Thornley Company

Chemical Networks

The importance of good transportation and logistics

Source: Bureau of Transportation Statistics

Built up around the mammoth US chemical industry is a healthy sector of supporting players that perform crucial services. From consultants to guide companies through the current uncertain in regulatory environment and the USA's giant of a financial sector providing the capital for new projects, to those constructing the factilities and transporting the products, this network is just as important for the success of the US specialty chemical industry as it would be for manufacturers operating in more challenging jurisdictions.

For third-party logistics providers (3PLs) with the supply chain and transportation expertise, it is an industry where the opportunity is ripe, if complicated. As one of the most advanced nations in the world in terms of its infrastructure capabilities, it may be thought that 3PLs play a less important role than they would in scarce-capacity markets. However, current situations have brought the importance of effective and efficient supply chain management to the fore.

Carrier capacity was whittled down over the course of the financial crisis as shipment volumes dropped. As volumes improve in the recovering climate, there is a need for creative solutions to lingering capacity problems that have been further constrained by the dramatic increase in shale play.

"The shale gas boom has caused us to think outside the box," said Stephen Hamilton, president and CEO of ChemLogix, LLC, a 3PL based in Blue Bell, PA. "A lot of capacity, especially for tank trucks, has been consumed by shale gas and oil. This increased demand has exacerbated an already existing shortage of drivers and equipment."

With carrier capacity tight and their clients downsizing, 3PLs have stepped up and taken more active roles in managing supply chains. "Companies are smartly evolving in how they engage third party logistics companies," said Frank McGuigan, senior vice president of operations for Transplace.

Transplace, a 3PL and technology company that expanded into the chemistry market just 18 months ago, is already making a name for itself in the industry. "Some of our strongest relationships are built upon the foundation of value that is identified and created through a Transplace Consulting engagement. Our consulting group engages in benchmarking, network analysis and optimization as well as procurement for customers, creating an early understanding of the value that a third party relationship delivers, and the problems it solves downstream," said McGuigan.

BDP International, a leading logistics provider for the industry, is another example of a 3PL constantly looking to bring more value to the supply chain.

"BDP has become more extensively involved in product classification and determining on the import side which government agencies need to be involved. Increased focus on safety has also led to intense focus on the whereabouts of products. We have designed our technology so that we can tell our customers where their goods are while in transit," said Michael Andaloro, global COO of BDP International.

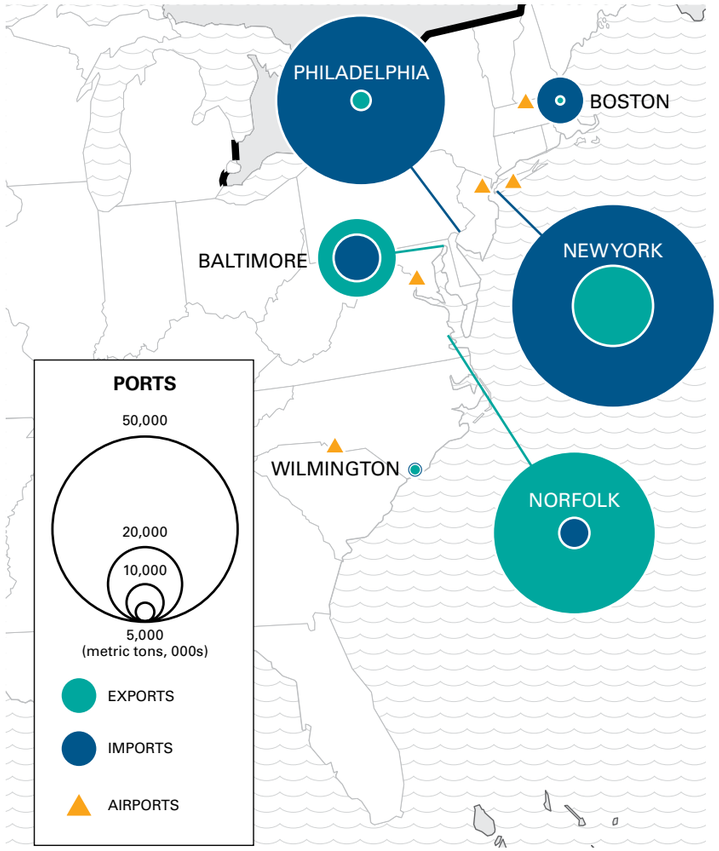
Faced with intense competition coming from lower cost marketplaces, chemical companies need more from logistics providers to keep their supply chains globally competitive.

"Now the impetus in the US chemical sector is staying competitive without building up inventory globally. BDP has evolved to offer clients an array of value added supply chain services focused on shortening transit time, shortening inventory cycle time and reducing costs to help our customers meet their end customers' required delivery dates," said Andaloro.

This ability of 3PLs to bridge the competition gap between American manufacturers and their emerging market counterparts will stay relevant long after current issues of capacity shortage resulting from the global financial crisis, or the added volumes of shale gas, have been dealt with. For all the research done and world-beating developments produced, US specialty chemical manufacturers will still struggle if their products take too long to get to market at too high a cost. •

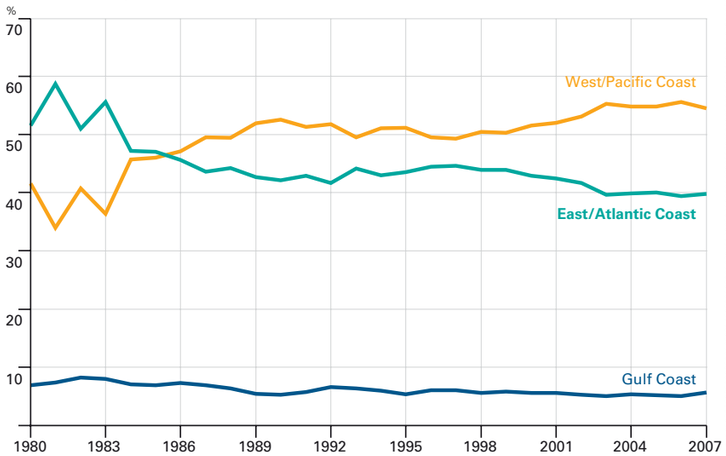
Port Map of East Coast USA

Source: Bureau of Transportation Statistics



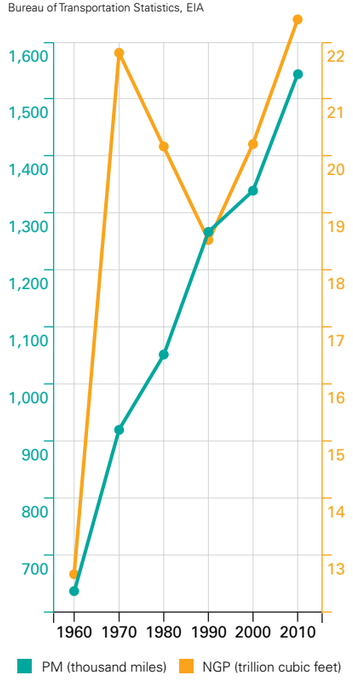
US Shipping Trade by Region

Source: Bureau of Transportation Statistics



Natural Gas Production vs Pipeline Mileage

Bureau of Transportation Statistics, EIA



Total Domestic Freight by Type (2007)

Source: IMS MIDAS

Basic chemicals	2.32%
Pharmaceutical products	6.60%
Chemical products and preparations	2.84%
Plastics and rubber	4.29%

Interview with Michael Andaloro & Arnold Bornstein

GLOBAL COO & EXECUTIVE DIRECTOR OF CORPORATE COMMUNICATIONS, BDP INTERNATIONAL

Can you give an overview of the services that BDP International provides to the chemical industry?

MA: BDP International provides services to eight of the top ten chemical companies around the world. We also partner with small and mid-sized manufacturers and distributors, who greatly benefit from our capabilities. After a sale has been negotiated, we take care of executing the logistics, whether it involves import transactions, export freight forwarding and transportation, warehousing and distribution services. We are also heavily involved in terms of activities such as trade management and consulting, as well as project

How have you evolved your service portfolio to the meet the changing demands of the chemical sector?

MA: Over time, BDP has become more and more of a partner in the supply chain, especially as many of our chemical customers are outsourcing actives in the compliance arena. BDP has become more extensively involved in product classification and determining on the import side which government agencies need to be involved. Increased focus on safety has also led to intense focus on the whereabouts of products. We have designed our technology so that we can tell our customers where their goods are while in transit. Our clients in the US are also facing a more global environment where there is intense competition coming from certain lower cost marketplaces. Now the impetus in the US chemical sector is staying competitive without building up inventory globally. BDP has evolved to offer clients an array of value added supply chain services focused on shortening transit time, shortening inventory cycle time and reducing costs to help our customers meet their end customers' required delivery dates.

BDP started its international operations in the early 1990s, in step with many companies' globalization and outsourcing initiatives. How is BDP positioned to grow in markets outside the US?

MA: BDP is no longer a US centric firm; we are a truly global corporation. Over the course of the last two years, our revenue streams from the rest of the world have now slightly surpassed our US revenue streams. A big part of our success has been taking US-based relationships and successfully transitioning them into international relationships as our clients move into places from Kuala Lumpur to the Czech Republic. We are well positioned for this type of growth and we want to bring customized solutions to clients worldwide.

AB: In 2005, approximately 69% of our revenue share from a global standpoint was derived from US operations. For 2012, that percentage is projected to be 45%. We have diversified and grown in other regions, significantly in Asia Pacific, as well as in Europe and South America, particularly in Brazil.

What growth potential does the shale gas boom in the United States pose for BDP?

MA: The increased chemical production that will take place in the United States because of lower feedstock costs will not be consumed in the US. The resulting output will be exported abroad, and having excess capacity of a desired product in one market that is in demand in another is a great thing if you are sitting in BDP's position

AB: For the chemical sector, many of the companies based in the US can take advantage of the great infrastructure in place and the reduced risk of establishing capacity in the United States. The importance of shale gas and its potential for the economy is very compelling for the chemical sector and for BDP's future. While the US market in recent years has not been the growth market that Asia Pacific has been, now with the arrival of fracking technology, it is potentially a game changer.

What strategies does BDP employ to overcome regulatory compliance challenges?

MA: What makes BDP unique from our competitors is that we are not simply sitting back and waiting to see what happens in terms of regulations. We have invested heavily in a proactive approach. While our government has the best intentions, the challenge is often how to attain their objectives in a way that trade can comply. BDP is actively involved in organizations such as the NCITD, ACC and the Dangerous Goods Advisory Council. Once legislation is enacted, we go about aggressively training not only our personnel, but offering webinars and training sessions to our client base.

Can you leave us with a final message about BDP International as you look to the future?

MA: At BDP, we are very cognizant that chemical manufacturers have a number of challenges. They face a constant balancing act between cost and services and we are confident that we can help the industry. We want to be the outsource provider of choice and we can deliver very solid service at a competitive price, as well as customized services that meet the needs of individual firms. Beyond that, we think the chemical industry here in the US is very well positioned and we see a tremendous amount of growth and opportunity not only domestically but more so for chemical exports abroad and we would like to be the partner that the industry turns to facilitate that growth. •

Interview with Frank McGuigan

SENIOR VICE PRESIDENT OF OPERATIONS, TRANSPLACE

Can you give us an introduction to Transplace and the company's recent milestones?

Transplace was created in the late 1990s by six different publicly traded trucking companies that merged their non-asset based logistics capabilities. In 2009, the Transplace Executive Team partnered with the private equity firm CI Capital, and bought the business away from the original investors. Transplace made its first acquisition in 2011 with the purchase of Philadelphia-based SCO Logistics. The purchase enhanced Transplace's capability and experience in the chemical sector and expanded our operational footprint into the Northeast. In the past 18 months, we very successfully completed the integration of the two businesses while growing our presence in the chemical sector.

What was the strategy behind the company's move into the chemical industry?

Transplace remains one the largest non-asset based logistics providers in North America. We have a strong presence in consumer packaged goods (CPG), manufacturing and retail as well as chemical. Currently, the chemical industry is less than 20% of the portfolio, but it is growing at a strong pace.

How has the company been received by the chemical industry as a new player in logistics?

When it comes to transportation management, the chemical industry has traditionally been dominated by three or four smaller providers (by global standards). The industry has welcomed Transplace as a newcomer with proven technology and a very diverse portfolio of customers. We have successfully leveraged both operating knowledge and best practices from our other vertical supply chains that are traditionally faster, have further global reach and require more visibility.

Can you provide us with a breakdown of the services that you provide the chemical industry?

Transplace offers our entire portfolio of services to Chemical Companies across North America. We utilize our propriety SaaS transportation management system to deliver a fully managed service offering, including third party logistics, consulting, freight brokerage, and services available from Celtic International (IMC).

How are you evolving your service portfolio to act as a more strategic partner in your clients' supply chains?

Companies are smartly evolving in how they engage third party logistics companies. Some of our strongest relationships are built upon the foundation of value that is identified and created through a Transplace Consulting engagement. Our consulting group engages in benchmarking, network analysis and optimization as well as procurement for customer, creating an early understanding of the value that a third party relationship delivers, and the problems it solves downstream.

How has your client base been evolving in accordance with industry trends?

In our chemical vertical, Transplace works predominantly with manufacturers. Through them, we are seeing increased acquisitions/divestitures and as a result, they are in need of our services to optimize and execute an enlarged network or to support the reduced opportunities that a smaller network provides (divestiture). However, we have seen more activity in the last 12 months from large chemical distributors who have grown through acquisition and are looking for both optimization and visibility across their regional businesses. We work to centralize, consolidate, automate and bring visibility to everything that is going through their networks.

Given how many US chemical companies also operate internationally, is Transplace looking to expand abroad?

We are a North American-centric company, but many of our chemical customers are asking us to provide our technology in Europe, South America and Asia; and we are listening. Transplace is working with some of our customers on their European SaaS needs and will likely deliver in the next 12 months. As companies strive towards a global instance of their ERP, they also are looking for a more global instance of their TMS. We have an active interest in supporting them from an IT standpoint. Further, Transplace's International group is supporting their global freight flows today.

How has the shale gas boom impacted the US logistics framework and its ability to serve the chemical industry?

The shale gas boom has allowed has increased the demand for specialized equipment, especially in the bulk-trucking sector. The natural gas boom has also been great for shippers, who are benefiting from lower cost fuel sources. This result has been an increase in Capex for plant projects in the United States, especially in the Chemical sector.

Can you leave us with a final message about Transplace for our readers?

In the last month, Transplace has renewed several contracts with large customers. For most of them, the renewal is one of many contract cycles in a lengthy business relationship. A relationship with Transplace does not peak in the commercial cycle. We invest heavily in Strategic Account Management and our customers realize value through continuous delivery underpinned by meaningful professional relationships. •

Reaching the End-User

Distribution and marketing

The globalization of chemical production has not only impacted manufacturers but also, unsurprisingly, distributors. The large volumes of production shifting to Asia, combined with the worldwide trend for consolidation of suppliers means that manufacturers' representatives and regional distributors have fewer small companies to represent and face increased competition from national and multinational players.

"The manufacturing base in the United States has eroded, and the distributors serving these industries no longer have demand for their products," said Mike Travers, director of new product research and development at Morre-Tec Industries, Inc., a New Jersey-based distributor of bromine compounds and specialty chemicals.

For Thornley Company, a distributor in Newark, Delaware, industry consolidation has eroded their traditional supplier base. "As a small, independent manufacturer's representative, we feasted on small, entrepreneurial business. New companies needed representation and we presented a great opportunity for low cost entry into the marketplace. Over the years, however, we saw a tremendous evolution in the marketplace that caused us to reevaluate our business model," said H. Douglas Thornley, president of Thornley Company.

Thornley Company's solution to the problem was to move into marketing products under their brand. "We source materials from supply partners and utilize the expertise that we have gained over the years to add value to the supply chain," explained Thornley. "While our sales dollars have gone down, our profitability has improved and we have greater control and ownership of our market."

While a shift into this business model incurs greater risk, many companies are finding it is well worth it to have greater control over their customers and the specialty products that they have helped a supplier to develop.

Just as some distributors are readjusting their business models to play a more strategic role in the supply chain, others are seeing the start-up culture propelled by biotechnology and new molecule development as an attractive new frontier.

"We look at the ever-expanding group of newer start-ups that need distributors. There is a renaissance going on in the market right now and smaller companies will continue to pop up," said Vince D'Andrea, president of EM Sullivan Associates, Inc., a specialty distributor serving the Mid-Atlantic and Southeast.

The globalization of the chemical industry has created unique challenges for the distribution industry; however, access to low-cost raw materials from emerging markets has also been advantageous to the industry.

"Years ago, it was a challenge to market products sourced abroad, but many of the chemicals we sell are not even made in the United States anymore," said Ben Gutmann, managing director of Bass-Tech International , a New Jersey-based supplier of specialty raw materials. "If a company can buy something from China that is half the price and they can be assured it is of good quality, they want to use it. Companies cannot ignore what is going on outside the US."

Customer acceptance of international procurement has grown as distributors strengthen their quality control systems with on-the-ground agents, plant audits and quality assurance and quality control (QA/QC) testing. "In this global economy, we would be doing ourselves and our customers a disservice if we did not keep an open mind with respect to technologies offered by Asia or South America," said Sam Morell, president of S.P. Morell & Company Inc., a specialty distributor and manufacturer's representative based in Armonk, New York.

"With many customers, we supply some strategic raw materials that have actually kept them competitive against the global market. They can continue to stay in manufacturing because we can give them alternative sources of raw materials at workable prices," added BassTech's COO, Alan Chalup.

Global distributors such as Brenntag AG and Univar, Inc. have been actively pursuing opportunities in the specialty chemical sector to take advantage of the high-value nature of the sector; a characteristic that enables it to be more resilient against global downturns. "The specialty sector is critically important to Univar. It represents about half of our sales, and offers high growth opportunities in many areas," said J. Erik Fyrwald, president and CEO of Univar, a leading global distributor of industrial and specialty chemicals. The US market represents nearly 60% of Univar's global sales revenue.

Brenntag has been active in the specialty chemical segment directly since September 2007, when the company formed Brenntag Specialties Inc. According to William Fidler, president and CEO of Brenntag North America: "There are many specialty chemicals that are not currently in the distribution channel because producers believe that they have the skill sets and equipment to penetrate the market; however, smaller customers do not necessarily have access to some of the technical support capabilities that producers offer and so we have started to fill this gap as a distributor."

Distributors in particular are in the fortunate position of being able to look inward at the domestic market for their growth; currently, only about one in 10 chemical manufacturers utilize distributors, making the potential to increase market share exponential. "The distribution industry and particularly specialty distribution is not even close to being mature and it is quite exciting for us," said Fidler of Brenntag.

With larger distribution companies refocusing their strategies to incorporate specialties, the market is becoming highly competitive, forcing smaller, family-owned companies such as New York City-based Biddle Sawyer Corporation to utilize their adaptive strengths. "There are greater profit margins in the specialty chemicals industry, which causes even the big distributors to make inroads into the industry. Biddle Sawyer competes in a different area; we see ourselves as a smaller subset of specialty chemicals," said the company's president, Neil Chavkin. •

Interview with
Benjamin Gutmann & Alan Chalup

MANAGING DIRECTOR; & COO, BASSTECH INTERNATIONAL

Can you give us a brief introduction to BassTech International and your global operations?

BG: BassTech International is a family-owned and operated distribution company with a unique international focus. The company, founded in 1994, is a leading supplier of specialty raw materials for companies both domestic and overseas. Although a large percent of our business used to be in the United States, it has since dropped from 80% to 60% of our sales. We opened our first international office in Qingdao, China in 2006, followed by an office in Chennai, India in 2009 and finally an office in Belgium in 2011. In addition to our global offices, we also have representatives in every other major market, among them Korea, Japan and Brazil. BassTech supplies more than 125 different raw materials to our customers in over 24 countries; we also have a global system of warehouses. We specialize in sourcing difficult to find raw materials on time and on budget with a consistent focus on the customer. We have very long-term supply relationships, some of which predate the company, and many that have developed since the company was founded.

How has your global sourcing and distribution network evolved over the years?

AC: Originally, BassTech's foreign offices were set up to support our business domestically in the United States. As time went on, those markets overseas not only became a supply source but a customer source for us. Now trade is moving in both directions. BassTech's foreign offices have evolved to specialize in their specific export advantages and input needs. At our US headquarters, we have attempted to create a synergy between all the organizations as business grows between our networks.

BG: BassTech is planning to open a second office in China in the near future to increase our sales force in that country. China's market is huge and we are now moving a large variety of products into the country. Our business in China used to be split evenly between inorganic chemicals and polymers, but our polymer business is growing much faster and has huge future growth potential.

Why is BassTech's distribution model particularly apt in the context of current conditions facing the US chemicals industry?

AC: There was a demand from our customers to take advantage of supplies from China and India and to diversify their risk of being single-sourced in one direction. Sourcing abroad, however, can be a risk in terms of quality and arrival time. Our customers want higher-end products, so we put together a secure domestic supply from an offshore source. BassTech took the responsibility of auditing and visiting the facilities overseas to identify which factories can make products with the quality we require. We consistently work with these factories, approving and testing their material at independent laboratories before we ship it to a warehouse location here in the United States or Europe. Once the materials have arrived, they have already been 100% pre-qualified. Our customers are assured that when they pick up the phone on Monday and say they need a truckload on Tuesday, what arrives at their facility is perfect. BassTech's basis for success is that we have taken the unknown, the risk and the long lead-time, eliminated them and offered the customer the equivalent of a domestic source.

How do you overcome inventory and logistical challenges on a daily basis?

AC: At BassTech, we are careful to maintain sufficient inventories of our products. It is the cost of doing business and it enables us to offer sufficient safety stock and security of supply. BassTech has a big advantage at times when the cost of a material is rising because we keep inventories of three to five months; this offers a buffer zone to our customers to protect them from price spikes. Another challenge is high freight costs, which represent a large portion of a product's final sales price. We are always looking for more innovative ways to handle shipping items, whether in bladders, bulk tanks or totes. We look for what is most cost effective and a better value to our customers.

What would you say is the value of being an internationally focused distributor in today's market?

BG: Through BassTech's international reach, we are able to do things that others cannot. We can supply customers with the qualities they need at the prices they require and we have the capacity to keep materials in stock so they can have them just in time. We also perform other functions for our customers, including helping them save freight by putting different products on a truckload, providing necessary packaging, developing proprietary blends and allowing extended payment terms to our customers. •

Interview with
Chris Jahn

PRESIDENT, NATIONAL ASSOCIATION OF CHEMICAL DISTRIBUTORS

Can you provide us with an overview of the association's mission and structure?

The National Association of Chemical Distributors was established in 1971 to represent and enhance the chemical distribution industry in the United States. As an organization, we are active through government advocacy, our Responsible Distribution® program and the promotion of member improvement. NACD has over 400 member companies, contributing to $28 billion of total US chemical industry sales.

How does NACD advocate for its members in Washington?

NACD has an important role to play as an advocate on Capitol Hill to raise awareness about the unique role of the distributor in the supply chain. Distributors respond to a market need and they fulfill that need. They are not responsible for how a molecule was created or what its intended use may be. Because our members are neither the manufacturer nor the end user, we need to make sure the people on Capitol Hill recognize this and treat distributors appropriately. Lawmakers first need to understand who we are, so there is a lot of educational work to be done.

Chemical security is a huge issue for our members. NACD was the first trade association to put security into its code when we incorporated chemical security into our Responsible Distribution® program directly following 9/11. Although CFATS got off to a rocky start, DHS has done its best to identify issues with the program that need to be fixed. NACD believes that CFATS as a whole is fundamentally solid and the law itself needs to be extended for the long-term and fully implemented by DHS. We do not think it is necessary to start over and waste all of the work that has already been done. Our members have invested millions of dollars in security and we do not want to see that go to waste. Although we would love to see a long term extension move forward as soon as possible, the odds are against us in this election year. However, hopefully as DHS improves its implementation of the program, we will see progress in the near future, whether it is at the end of this year or next year.

Can you explain the key elements of your Responsible Distribution program and NACD's role in enforcing them?

Responsible Distribution® is a comprehensive program designed specifically for distributors that has environmental, health, safety and security components. Every NACD member is required to do an on-site verification where a third party auditor reviews its policies and procedures and verifies that the company actually follows them. We take the program very seriously and occasionally we have to kick out members that do not pass. It is unfortunate because it is not in our interest as an organization to send people away, but on occasion we have companies who cannot meet our standards and we do not lower the bar just so we can keep them. This on-site verification process occurs once every three years, but our members are required to self-audit on an annual basis. It is a robust program and when our results are compared against government data on our industry sector, it is how that our members are 80% safer than non-members.

When it comes to distribution companies, many feel they are undervalued within the chemicals sector and viewed as an unnecessary expense. Do your members express similar sentiment?

While some companies may feel that way, we have seen a growing recognition by the chemical manufacturing community of the key role of distribution. They see chemical distribution as a key part of their portfolio and they realize that chemical distributors serve the small customers that they cannot serve profitably themselves. When they have a plant continuously pumping out a product, they want to send it out by rail car but many of the customers who ultimately use that product do not need an entire rail car. This is where chemical distributors come in. If you did not have chemical distributors, manufacturing in the United States would grind to a halt. If you look at the ACC, their members serve maybe 200,000 customers. While they do a lot more than we do in terms of volume, our members have 750,000 customers, servicing almost every industry sector. Our members support small businesses that are creating jobs and keeping the economy growing. People recognize the important role of the distributor and the future looks bright for our members.

Looking to the future, what are some of the goals that you have for your stewardship at NACD?

NACD's strategic plan focuses on three areas: government advocacy, Responsible Distribution and member value. Government advocacy is hard to measure, but the bottom line is to make sure our members' views are heard and considered in Washington, DC when decisions are made on TSCA reform, CFATS and a variety of other environmental, health, safety and security issues. As for Responsible Distribution®, we want to continue to raise the bar in terms of our members' performance. NACD's goal is to be able report in three years that the numbers are even better than they are this year. We also want to expand our membership base. NACD already has approximately 85% of the market's throughput volume and sales, but our goal is to have 100%; then we will be able to say that every distributor is following Responsible Distribution®. Whether it is our customers or the general public, they will be able to be confident that chemicals are being handled safely. The final piece of our strategic plan is bringing value to our members. We are focused on creating opportunities for our members to operate successfully and profitably. If our members continue to be successful, then NACD can consider itself successful. •

Interview with
Len Glass, Mike Travers, Greg Jobin and Paul Caskey

PRESIDENT; DIRECTOR, NEW PRODUCT RESEARCH & DEVELOPMENT; MORRE-TEC INDUSTRIES INC.

Can you give us a brief overview of Morre-Tec?

LG: Morre-Tec began in 1987 as an exclusive distributor for Dead Sea Bromine Group; it was founded on the principle of distribution of bromine based compounds in less- than- truckload(LTL) quantities. We began to look at other opportunities, and expanded our portfolio to include magnesium chloride, and we concentrated on its use in food. Having built our reputation as a viable, professional supplier, we examined ways to continue adding products to our portfolio. We grew one product at a time, independent of whether it was a bromine-based compound; we either had a unique process or a customer with a unique need to fill. Six years ago Morre-Tec entered the personal care market, not to supply me-too commodity items, but to look for the niches; we saw the market evolving towards more eco-friendly products, natural products, that could replace existing chemical entities. The industry is rapidly becoming more conscious of replacing products that are chemically based, and Morre-Tec has followed that trend.

Morre-Tec is not a retail-based supplier, so we work with small and large companies who formulate finished products. Historically, the primary role that a small company played was simply to offer cost savings (as a result of lower overhead), but as the industry became more regulated, we have had to substantiate our credibility and industry certification in all that we do. As a result, today many of our customers are Fortune-100 companies.

How does Morre-Tec insulate itself against market fluctuations?

MT: Morre-Tec continued to experience significant growth during the recession, due to a number of integral aspects of our business model. We are very diversified; with products that go into pharmaceuticals, nutrition and coatings. Also, we are not competing in the commodity chemicals field that is much more exposed to economic downturns.

PC: We never operated out of fear; we saw the recession hit and adjusted our business model accordingly. The fundamentals of how we wanted to grow the business did not change because the economy was weak.

LG: Morre-Tec is a small company, but we operate as if we are a multibillion-dollar player; we have the same systems in place as large corporations, such as GMP and ISO-certifications. We are able to compete with much larger companies; we try not to bite off more than we can chew but we have the ability to persevere through increased competition. The key to our successful growth has been our willingness to diversify our product lines. We also work with the larger distributors in the US market; Brenntag and Univar come to us for bromine compounds. All of the "mom and pop" distributors are disappearing because they cannot compete. The market is consolidating and large distribution companies are acquiring smaller, regional operations. A distributor must have the products in stock by having an inventory large enough to cover orders.

What differentiates Morre-Tec from the multitude of other distributors in the industry?

LG: Morre-Tec caters to four market segments, but we are still best known for our expertise in bromine-based chemistry; we know where to go for our customer's needs. We also cater to the personal care and nutrition industry, and we have a small manufacturing business. On the manufacturing side, we have unique technologies; we are the only company in the US market to have license rights to an Israeli-developed technology called tornado, or vortex, milling. This gives us the ability to micronize particles down to less than 3 microns, competing effectively with jet milling. The technology is less expensive and heat-sensitive; we are able to manufacture a finer particle sized material more competitively than anyone else. Right now we are pursuing avenues to use this technology to use on products that are already in the marketplace; we are not looking to use this on products that have already been micronized by somebody else; we are looking for somebody who has a problem that micronization can solve. Morre-Tec's strategy is to do something in the industry that can be value-added rather than "me-too."

PC: Being small is an advantage for us because we are nimble; if we see something happening, we can move very quickly in either direction.

MT: Morre-Tec does business with very large chemical companies. The challenge for us, as a small company, is that we have to be important enough for them to give us any consideration. Many of our customers regard us as being much bigger than we actually are.

What are some trends appearing in the wider market, and how do they affect Morre-Tec's business model?

GJ: We are able to maintain security of supply by staying in close contact with our customers. You must have a personalized relationship with your customers, because we are dealing with very specialized products. Most of our products have only one or two customers, which makes it more challenging for us. Communication needs to go both ways, between Morre-Tec and our suppliers and customers; both are equally important to our success. The industry has changed; the purchasing staff are all chemists now and people have a much broader understanding of the industry as a whole. We need to be able to solve problems quickly because of the speed at which information flows nowadays; it is much easier for clients to find another partner so we are forced to be on the top of our game.

LG: Morre-Tec cannot expect to be exclusive forever; there is a lifespan for any product. We will continue to do our best to be competitive, and provide the highest-quality products for our customers. For a small company like Morre-Tec, diversification is critical, although there are not many companies who are as highly diversified as we are. As an entrepreneurial company, we must be willing to try different things and "brush ourselves off" in the event that a new venture does not work out. Now that we have the experience, we know what needs to be done in order to be successful. We understand the chemistry, pricing issues and the importance of client relationships. Over the last 20 years there has been a proliferation of Chinese products in the marketplace, and regulations overseas have historically not been as strict. We look to China as a source, but we are very careful about who we work with; we have strong, well-established relationships with trusted suppliers in China.

Where would you like to see Morre-Tec positioned in the market in the near term?

LG: Morre-Tec never expected to achieve this level of success, so to be in this position today is a huge accomplishment. We have the right formula for continued successful growth, through a combination of the right people, strong product knowledge and expounding on our strengths; we are looking to increase our sales team by one or two additions per year. Having said this, we will not lose sight of what makes this company so successful, and that is the strength of our relationships both with our clients and with each other.

GJ: The market will decide where Morre-Tec will be in five years. We must continue to be in touch with the market fluctuations, and be flexible in working within it. This is especially critical in the specialty chemical industry: taking advantage of any given situation and moving quickly to adapt. Being a small company, we can do that with ease.

MT: The manufacturing base in the United States has eroded, and the distributors serving these industries no longer have demand for their products. Morre-Tec is different because we are very niche-oriented, and we follow market trends; we can also use our existing contacts from our years of experience in the industry in order to reach out to new customers.

Do you have a final message to share with our readers?

LG: The specialty chemicals industry is rapidly evolving, and the product mix is always changing, thereby creating new opportunities. There will never be a substitute, though, for a relationship-based business, both with customers and suppliers. Transparency, credibility and integrity are the keys to success. •

Interview with **Neil Chavkin**

PRESIDENT, BIDDLE SAWYER

Can you give us an overview of Biddle Sawyer?

Biddle Sawyer began as a chemical and pharmaceutical raw material trader in the 1950s; we moved into the specialty chemical industry in the 1960s. Our chemical business began as manufacturer's representatives for Japanese, European and Indian-based manufacturers, which is still part of our strategy today; our business is to represent our producers for the marketing and sales of their products in our markets. About fifteen years ago, Biddle Sawyer diversified into APIs for the generic pharmaceuticals industry, which has been a major growth area for the company in recent years. The generic industry for us has grown both on the API side and the Excipient side of our businesses. On the industrial side of our business, while we have had steady growth, there has been a lot of fluctuation. There have been changes in supply sources and different pricing trends over the last fifteen years. On the industrial side, we are involved in colors, water treatment, rubber chemicals, plastic additives, and coatings.

Can you expand upon Biddle Sawyer's global network?

Biddle Sawyer was one of the first companies to begin sourcing products in China when USA-China trade relations began in the 1970s. Our business in China has steadily increased and today we have a fully staffed Chinese office that acts as a liaison to the manufacturers that we represent in the United States, and we have personnel in India that represents a similar function. Our sales efforts are concentrated within the United States, South America, Central America, and a small exposure in Europe. We sell the vast majority of our products domestically; the US is our primary market. Our international presence is growing.

Biddle Sawyer keeps foreign nationals on the ground in our overseas offices in order to maintain the highest standard of quality control. We work extremely closely with our customers to qualify sources and ensure that our partners are producing to the standards and specifications that we have put in place. It is not an easy process; part of our role as a manufacturer's representative is to provide the comfort to the customer that they will receive the proper quality products on time.

How would you characterize the effect of tightening regulations on your business model?

The regulatory environment continues to be increasingly stringent. We work closely with our suppliers and customers to manage these regulatory requirements. It is one of the biggest challenges for the industry to keep on top of current regulations. The international regulatory environment is increasing as well, especially in markets like China and India. The environmental controls that have been instituted over the last decade have had an important impact on producers and have resulted in higher costs; some manufacturers have not been able to survive the changing regulations.

Why do you think the US market is particularly conducive to smaller distribution companies, and how is the industry changing?

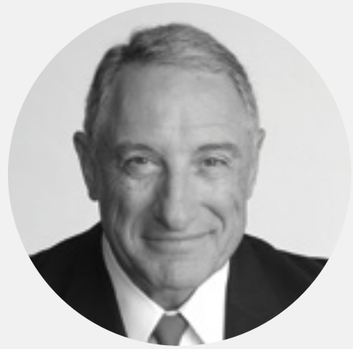
Biddle Sawyer is a customer service-oriented company, and we believe we play an important role in the supply chain. As a smaller company, we are able to provide the customer service that bigger companies cannot. We have long-standing relationships both domestically and internationally. Our role is to continue to add value to both our suppliers and customers. We see growth continuing on a steady path in the United States. The chemical industry has had its ups and downs, but there has been resurgence in domestic manufacturing, which helps our business. We will also continue to grow our sales internationally; we are focused on Central and South America as growth markets, and growing our Chinese business as a profit centre.

Where would you like to see Biddle Sawyer in the future?

Biddle Sawyer's focus is on working with our customers and suppliers with the same consistent service as we have always had. If we can do this well, then the growth will take care of itself. We are a very personalized company that believes in the value of relationships and we understand the critical role we play within the distribution chain. We will continue to provide our customers with the attention to quality and the service that they may not receive from larger companies. •

Interview with **William Fidler**

PRESIDENT & CEO, BRENNTAG NORTH AMERICA



How significant are Brenntag's US operations for the company's global business?

North America including the US is very important for Brenntag. In 2011, North America made up close to one third of Brenntag's global revenue. It is a mature market compared to Asia and Latin America and is a big part of our strategy of diversification, which is a foundation of our success. We strive for geographical diversification along with market, product, customer and supplier diversification. We have about 40,000 clients in Brenntag North America and the average order size is approximately 8,000 pounds, but these averages do not provide the whole story. We have some very large customers that are either global, national or corporate accounts, but we also have thousands and thousands of smaller companies that rely on us to deliver to them the products and services they need.

How do you use your global operations to your advantage in the US marketplace?

Our global and national accounts create a unique platform for growth for both industrial and specialty chemicals. We currently have over 35 global accounts that are generating nearly one billion dollars of business annually. We have open arteries of communication throughout Brenntag that enable us to take advantage of opportunities with customers who have international operations and want to harmonize their supply chain. We do not have a peer who can competitively handle the breadth of geography, products and services that these customers require. That is an area where our communication network and best practice sharing enable us to react quickly to changing market conditions as well as customer and supplier requirements. No one runs into a problem that someone has not seen before.

As such a large company, how do you maintain customer service at the local level?

We maintain our customer service at the local level by utilizing our global strengths but concentrating on local execution. We have empowered our local managers to make the right decisions necessary to take care of our customers. We measure our performance consistently throughout the whole organization in North America. The defining difference between competitors is how effectively they execute at the local level; it is not enough to just be big: most importantly you must be effective. In North America, roughly 80% of our products are delivered the next day.

Brenntag has announced that the company plans to make further inroads into specialty chemicals distribution. What is driving this push into what is traditionally a SME-dominated market?

Brenntag is known for our dominance in industrial chemicals and that has overshadowed the fact they we are also the largest specialty chemical distributor in North America. Specialty chemical distribution is not a mature market when compared to industrial chemical distribution. There are new chemistries being developed and many existing specialty chemicals that are not currently in the distribution channel because producers believe that they alone have the technical skill sets and application labs to penetrate and support the market; however, smaller customers do not necessarily have access to the technical support capabilities that producers offer so we have started to fill this gap as a national specialties distributor with broad technical capabilities and specific application labs.

In terms of acquisition, Brenntag has been incredibly active in the US market. Going forward, is that a strategy that the company will continue both globally and in North America?

Mergers and acquisitions are a defining part of Brenntag's strategy. It is a remarkably fragmented market globally and we have white spots that we are looking to fill, either organically or through acquisition. We are not doing acquisitions just for acquisition's sake. We look to fill voids in geography, industries, skillsets and product lines. We are going to spend an average of €250 million a year out of our free cash flow on acquisitions globally. The industry's M&A appetite is quite strong, and we except to see consolidation throughout the channel continuing in the near term. There may be more room for it in Asia and Latin America, but there are also excellent opportunities North America and Europe.

There is also growing consolidation among your clients and suppliers. What sort of pressure is this putting on Brenntag's business model?

Brenntag has never looked at the industry's consolidation as pressure; we see it as an opportunity. Our suppliers are looking to do more business through fewer channel partners. They want to concentrate their efforts on the partners who they believe are going to deliver results. The same thing is happening with our customers; when they consolidate, they look to reduce their cost base and to reduce the number of personnel that they have dedicated to acquiring products. The distribution industry and particularly specialty distribution is not even close to being mature and it is quite exciting for us. , We will not forget our local customers who demand excellent local service. Our partnerships with local customers are good for the customer and efficient for us. The more customers that we have along our lanes of distribution, the more efficient our logistics are. •

Interview with **Sam Morell**

PRESIDENT, S.P. MORELL

Can you provide us with an introduction to the company and the industries you serve?

S.P. Morell was founded in 1984 as a manufacturer's representative in the Northeast region of the United States. While we started with Air Products and Chemicals' specialty line of surfactants, called acetylenic dios, we needed to supplement that product line with other raw materials that were not competitive but would serve as a compliment to the industries we served. Our second vendor was King Industries in Norwalk, CT - a producer of catalysts, polyols, and additives principally for the coatings industry . . . . we gradually picked up other vendors along the route.

Five years after we were founded, we ventured into the specialty chemicals distribution business since one of our vendors decided to transform their existing line of manufacturer representatives into stocking distributors. S.P. Morell primarily services the coatings industry, our largest market segment, as well as graphic arts, adhesives, plastics, and the rubber industry. We also supply all technologies within those sectors including solvent, high solids, waterborne, powder, and radiation curable.

Why did you choose to expand into distribution and how has this shifted the company's focus?

S.P. Morell's expansion into distribution was motivated by one of our vendors who were transitioning their channels to market from agencies to distributors. They wanted to work with distributors, and we viewed this as an opportunity to get on the learning curve with respect to inventory management, accounts receivable, customer service, etc. The added advantage of distribution was the ability to combine materials from different vendors which would facilitate the purchase order process for our customers significantly.

Since your move into distribution, how have you set up your distribution channels in the areas you serve?

Our distribution territory covers the northeast region of the United States, from New England to Maryland. We currently work with a public warehouse in Farmingdale, NJ which is capable of delivering our products to any of our customers usually within 24 hours. This warehouse is centrally located to within the region we currently service.

S.P. Morell has a small employee base, but manages to serve 300-400 customers with supplies from your eight vendors. How are you able to do so much with so little?

At S.P. Morell, we pride ourselves on having developed efficiencies with respect to information technology. For example, we created a unique software program that we call SAGE, an acronym for Scientific Application GuidE. It catalogues of all of the raw materials we represent and enables us to quickly suggest the most appropriate products based on any combination of criteria including chemistry, end use, system, properties, or features. That type of productivity translates to quick response to our customers with the most effective product recommendations.

S.P. Morell recently added a new vendor, Eternal Chemical, a Chinese company that produces a specialty line of monomers and oligomers for the radiation curable market. Is this your first sourcing partner in Asia and will it become one of many?

Our partnership with Eternal Chemical is our first entry into examining any supplier throughout the world that has specialty and value added products. In this global economy, we would be doing ourselves and our customers a disservice if we didn't keep an open mind with respect to technologies offered by Europe, Asia, South America, etc. After all, we purchase foreign cars, foreign consumer electronics, foreign appliances, etc based on value added benefits with respect to technology, quality, service, and economics. Why not with specialty chemicals? As a result, we make it a point to attend trade shows and symposiums to ensure we are ahead of the curve with respect to new technologies.

As the chemical industry moves toward further consolidation, how does S.P. Morell differentiate itself from other distributors in a tightened supply chain?

We pride ourselves with our knowledge of chemistry and application of specialty chemicals to the industries we serve. We have written various technical articles for trade publications and we have been invited to speak at technical conferences including the American Coatings Show and the European Coatings Show. Our company is solely focused on specialty chemicals because it allows us to use our chemical engineering education and background to help solve customer challenges. As a result, we see ourselves more as a consultative representative adding value to our customers by bringing them closer to finding a solution.

How would you compare the climate of the chemical industry on the East Coast to other regions in the country?

The East Coast is a lot more receptive to industry in comparison to the West Coast. California, for example, has an abundance of hefty regulations and barriers making it difficult for any industry let alone the chemical industry. This has cost them dearly and will do so for many years. The Southeast appears to represent more of an opportunity for manufacturing than the Northeast, since that region has less stringent regulations and can be very competitive since the cost of living there is lower, compared to the Northeast, and, thus, attract more operational personnel. However, the Northeast will continue to be the home of many administrative offices and R&D centers. •

Courtesy of Akzonobel

Staffing the Industry

Finding a skilled workforce

Key to staying globally competitive is finding the right people. Luckily for the chemical industry, there are outside sources ready to offer solutions to staffing problems.

Access to a highly educated workforce and globally-leading research centers is part and parcel to the US chemical industry's continued success. While on one hand industry consolidation has freed up a rich talent pool of experienced executives, companies have also voiced concern that new talent is not as profuse as it once was.

"We have heard from companies that they cannot find the scientists that they need. The paradox is that if you look at the manpower that is produced by the government or independent agencies there is no shortage," said Tritton of the Chemical Heritage Foundation.

"There is a lot of uncertainty in the marketplace but one thing that is consistent is that the supply and demand for mid- to senior-level executive talent is increasingly becoming more misaligned," said Jason Hersh, managing partner at Klein Hersh International, an executive search firm dedicated to the life sciences.

Chemical Search International Ltd., an executive search firm solely dedicated to the chemical industry, has a global solution to this misalignment. The firm has opened offices in Philadelphia, London, Singapore and Mumbai to better serve the globalizing chemical industry.

"Companies are coming to us because they can no longer find people using their own resources. Prior to the great recession, you could count on picking up the phone and finding people from colleagues in the industry," said Ronald Thompson, principal consultant at Chemical Search International. "This is drying up because the well of university feedstock is drying up. We plan to grow our business through academic partnerships, in essence filling the pipeline of talent for years down the road."

The future of the industry's talent pool is also looking stronger thanks to the shale gas boom. The optimism surrounding the US natural gas reserves is not only bringing new investment into chemical plants, but many industry leaders are foreseeing renewed interest in chemical industry careers.

"It will be a boost for the right kind of high-skill, high-value jobs in the United States that we need more of," said Andrew Sandifer, vice president of strategy and development and investor relations at FMC Corporation. "The US chemical industry has a maturing workforce and there are tremendous long-term career opportunities for young people." •

Global rankings for availability of scientists and engineers

Source: World Economic Form 2012 Global Competitiveness Report

1. Finland
2. Japan
3. Sweden
4. **United States**
5. Taiwan, China
6. Iceland
7. Canada
8. Tunisia
9. Puerto Rico
10. Israel

Top Ten Global Universities

Source: Shanghai Jiao Tong University (Academic Ranking of World Universities)

1. Harvard University
2. Stanford University
3. Massachusetts Institute of Technology
4. University of California, Berkley
5. University of Cambridge (UK)
6. California Institute of Technology
7. Princeton University
8. Columbia University
9. University of Chicago
10. University of Oxford (UK)

Chemical Industry Employment by Type (2011)

Source: Bureau of Labor Statistics

Job Type	Title	Average mean wage
Chemical Engineers	27,860	$99,440
Chemical Technicians	59,650	$44,560
Chemical Plant and System Operators	40,580	$54,920
Chemical Equipment Officers and Tenders	49,020	$46,440
Biochemists and Biophysicists	25,160	$87,640
Chemists	80,040	$74,780

Chemical Industry Jobs and Dependent Jobs

Source: ACC

State	Direct Employees	Dependent Jobs
New Jersey	57,430	377,574
New York	43,213	156,524
Connecticut	13,117	64,513
Massachusetts	17,747	87,296
Pennsylvania	43,582	278,691
Delaware	3,624	14,619
Maryland	11,951	50,053
North Carolina	41,572	229,775

Interview with Ronald Thompson

PRINCIPAL CONSULTANT, CHEMICAL SEARCH INTERNATIONAL

Can you provide us with an introduction to Chemical Search International?

Chemical Search is a British executive search firm for the global chemical industry that was founded in 1999. The value proposition that we bring to the market is that we are global and the only true pure player in this market segment. Because the chemical industry is growing more global and complex, the difficulty of finding qualified candidates for positions is only increasing. Chemical Search International is exclusively dedicated to the sector. We are able to recruit quicker, better candidates for C-suite positions in the industry, providing top level talent for manufacturers, distributors, traders, consulting companies, financial institutions and other related industries.

What is the value that Chemical Search brings to the market as a recruitment firm exclusively dedicated to the chemical industry?

Search firms have never served the chemical industry well. Larger firms lack teams dedicated to the sector and the smaller firms are limited in scope by geography and function. We have found that while there are many firms that are good at placing financial or technical personnel, they lack the understanding to serve all the hiring needs of the chemical industry. The career path of an R&D director, versus someone in M&A or finance, is very different and generalists miss the nuances of the field. At Chemical Search, we know what is important for each type of candidate to move to the next level.

What resources does Chemical Search draw from to identify the best candidates for the industry?

The members of our international team have very strong chemical backgrounds. We have been very good at using our in-house expertise, but we have also brought on a group of advisory consultants from the industry in different segments like paints and coatings, supply chain management and refining.

How important is the US market to Chemical Search and your international clients?

Chemical Search has been successful in leveraging the connections that come from being a Europe-based company to work in the United States, primarily with European companies that have a North American footprint. We opened our US office in Philadelphia in January 2012 and we are coming up the curve in the United States very quickly, cutting our teeth in the US market.

Is the increasingly global nature of the industry posing a staffing challenge for many companies?

For the industry today, borders do not matter. If a company wants talent, they do not care where it comes from. This is why at Chemical Search we now have offices in London, Singapore and Mumbai, in addition to our USA office. We are able to source talent internationally using our industry leading database of middle to senior level professionals, as well as our unique global networking site ChemPeople.com.

What trends are you seeing in the hiring market for the US chemicals industry?

The industry is seeing a hollowing out of the center. The personnel in middle management positions are getting older and more risk averse. With the economy being what it is today, experienced professionals are wary of moving and not having a job to come back to if it does not work out.

Many companies have reported that it is difficult for them to find qualified young professionals to add to their staffs. Does Chemical Search have a solution to this shortage?

The economy is weak and recovering and we have many students who are not going into science anymore, which is a long-term weakness in the system. Companies are coming to us because they can no longer find people using their own resources. Prior to the great recession, you could count on picking up the phone and find people from colleagues in the industry. This is drying up because the well of university feedstock is drying up. Chemical Search is looking to shepherd talent at the university level, which is a very underserved market. We plan to grow our business through academic partnerships, in essence filling the pipeline of talent for two to three years down the road. We have already begun to facilitate cross-fertilization between Germany and the United States through the placement of post-doctoral candidates.

Where would you like to see the company positioned in the US market in the next five years?

Chemical Search has been quite successful in Europe and we will continue to grow the business with the establishment of our US office. We have many great universities nearby and the Northeast is still a hub for the chemical industry, most definitely for pharmaceuticals. There are still big companies doing manufacturing, they are just doing it in a different, more targeted way and they still have staffing needs. In five years, we expect to be the premiere firm for the chemical industry in the United Sates.

Can you leave us with a final message about Chemical Search International for our readers?

Chemical Search is a boutique firm. We do not aspire to be the biggest, but we do aspire to be the best. We are faster, more efficient and better at finding the right talent at a range of levels right up to to C-suite needs of companies within our niche. •

Challenges Recruiters Face in the US Chemical Market

Many chemical companies at all echelons of the industry have been complaining of a dearth of qualified professionals to join their ranks.

Whereas there appears to be no shortage of candidates submitting applications supported by resumes that look impressive; many of those applicants falter even before the first interview. The critical reasons for this are twofold in our experience: the proliferation and increasing reliance on online data via networking sites and the installation of RPOs and elaborate candidate tracking systems on many company web portals.

When HR Business Partners look for candidates online; they confront a chimera that offers the illusion of quality, choice and access. As open source code does not a successful programmer make; more online data on potential hires do not guarantee access to these individuals, do not improve selection or do not obviate the need for professional recruiters to facilitate finding better candidates faster. Similarly, a qualified, viable candidate, even if accessible online, still has to be courted, convinced and converted; and there is plenty of evidence that many candidates prefer to work through an intermediary, such as a professional head-hunter to represent their interests in a search process.

Perhaps, in part, to shift from quantity to quality, many companies have become enamoured with candidate RPO tracking software that gathers and filters candidates' resumes with pre-defined words and phrases for role relevance and suitability. In theory this is great; in practice, many candidates express frustration that the application process can often be tedious and that their painstakingly crafted resumes are rendered worthless. Worse, the search for both system efficiency and perfection can often exclude potentially ideal candidates, who happen to have the wrong word choices on their resumes. These systems are here to stay, but we believe just as with a Sat-Nav, to avoid getting lost, they should never be relied on in isolation!

Another significant factor is the paucity of chemists and chemical engineers, graduating and entering the workforce. This is affecting succession planning and creating a major skills gap, particularly in middle management where there are too few professionals to go around and insufficient in the "pipeline". According to the National Science Board, "the percentage of science and engineering doctoral students in the United States, who are U.S citizens, has dropped from 70% to 65% in the last 25 years; the average enrolment dropped steadily from 118,000 in 1992 to about 100,000 in 1998." For the subset of chemists and chemical engineers this is even starker.

Companies are increasingly engaging our services because of the difficulty in finding candidates of quality, using their own resources. Although we principally focus on middle and senior management search across the chemicals spectrum, we also stay close to new talent at the doctoral and post-doctoral academic levels, who will generate the feedstock for the future leaders in our industry. •

Chemical Search International *specialises in executive recruitment solutions for the global chemical sector and its closely related value chain: polymers and petrochemicals; materials, coatings and specialty additives; biosciences, and "green" and emergent technologies. Its international consulting team employs only exceptionally experienced professionals from those areas. This gives the company unrivalled understanding of clients' needs and the ability to deliver better candidates faster.*

The author *brings over two decades of specialty chemical and pharmaceutical sector sales and marketing expertise to the role of Principal Consultant in North America. A Bachelor of Science (Chemistry) from the University of Manitoba and an MBA from Moravian College have been undergirded by a post-graduate Chemistry programme in Germany and broad U.S sales and marketing experience across coatings, specialty additives, industrial gases and pharmaceuticals. His broad perspective in these key areas gives him good insight into the challenges that are faced by recruiters in the chemical sector.*

Interview with Jason Hersh, Josh Albert & Dan Sherwood

MANAGING PARTNER; MANAGING PARTNER; & SENIOR DIRECTOR OF CMOS, KLEIN HERSH INTERNATIONAL

Please provide us with an introduction to Klein Hersh International and your recent milestones.

JH: We are a 14-year-old executive search firm dedicated to the life sciences industry, covering the whole drug development continuum from discovery-related scientific roles through clinical and commercialization positions. Our practice areas range from medicinal process and analytical chemists to related IT placements, such as discovery-related software companies and clinical technology organizations. In 2011, we placed close to 400 executives, within pharmaceutical companies, as well as on the service provider side. This year we are on track to increase our placements by 20% as we continue to grow as an organization and continue to see an uptick on our client side.

Are you seeing a trend towards cross-border placements in the life sciences?

DS: With both Indian and Chinese organizations, we are seeing a need for subject matter experts that were trained in the United States. Companies in India and China are looking for executives to be brought back to lead large groups of people, from regulatory operations to even business development. We are seeing larger demand than we were five years ago for professionals skilled in their various disciplines, but it is not a fundamental increase.

JH: A big differentiator for us is our subject matter expertise in specific skill sets and disciplines. Depending on the search, if it is an area where we have the expertise, we will take it on regardless of where it is located globally. We also have strategic partners internationally to help us serve our clients who have staffing needs outside of the US.

Is what you are seeing in hiring for the US market consistent with speculation that pharmaceutical manufacturing and outsourcing are returning to the home market?

DS: We had seen a slowdown for a number of years, but we are now hearing that there is a portion of business flowing back into Europe and the United States. Our clients who sell custom synthesis services are telling us that they are capturing more business and the industry is seeing more robust, unique projects. Although it is not as robust as it was five to ten years ago, we are making steps forward and there is a more positive outlook in the industry. This trend is expected to continue over the next several years as Asia becomes more expensive and as the US remains more innovative than other geographies. As business flows back to the US, we are seeing an uptick in other areas, such as in process and analytical chemists. Our clients are winning Phase I and II projects and they have a need for talent again.

How is this trend affecting staffing needs on the drug discovery side?

JA: For so long, companies had been putting programs on the shelf. Pharma companies were cutting down on their staff and not actively forming business partnerships. Venture money was sitting on the side-lines and companies were not committing big dollars to entrepreneurial endeavours. Today we are seeing venture funding pour back into the marketplace, funding fewer companies with more significant dollars. We are seeing very new areas of science being pioneered. Outsourcing has been very popular in the last few years, but a lot of companies are considering the value proposition that they get for one FTE and how that correlates to productivity. We will see a lot more academia and industry partnerships in drug discovery efforts. Biotech companies are hiring stronger candidates and a lot of people in pharma are considering opportunities in biotech organizations, across the scientific staff.

How are the on-going patent expirations affecting the hiring industry?

JA: The pharmaceutical industry is increasingly strategically aligning with and buying and partnering with biotech companies. The industry is starving for new drugs and they are paying premiums for compounds. They are not necessarily finding them in blockbusters and are looking more to hit singles and doubles.

DS: For CROs and CMOs, the increase in insourcing and partnership work is creating a need for more talent on the scientific side so that they can send their people over to work in-house on drug discovery with pharma and biotech companies. The on-going patent expirations are a driver for this trend, but it has also been driven by internal R&D staff cuts and clinical study recruitment challenges, both in the United States and Europe. The cost of contract R&D is often far lower and contracts can be cancelled more easily if they are done through a partnership as opposed to dismantling an in-house team. There is a high level of regulatory scrutiny, coupled with a low rate of new drug approvals, which increases the need for CRO.

Can you leave us with a final message about Klein Hersh International?

JH: There is a lot of uncertainty in the marketplace but one thing that is consistent is that the supply and demand for mid- to senior level executive talent is increasingly becoming more misaligned. At Klein Hersh, we have built successful relationships over the last 14 years with many executives, whether they are aggressively looking to make a career change or not. We stay in touch with them and add value to their careers by sharing insights and trends. We complement in-house human resources and use our industry knowledge to find the right fit for executives and companies. •

Courtesy of Akzonobel

Into the Future: **Final Thoughts, Company Guide, and Index**

"It is hard to tell what the industry will need going forward, but customer service; going above and beyond expectations; will continue to be very important. There will be a place for companies that can offer this while remaining price competitive."

- Robert Maddox, President, PharmaCore

"EPA hopes that the industry will continue to support TSCA reform as well as the need to prioritise and assess the safety of chemicals, and to provide EPA with the data needed to carry out assessment. Pending TSCA reform, industry will likely be required to comply with a variety of state chemicals laws. Industry is also likely to receive increasing demand from customers to provide them with safer chemicals. Ensuring the safe use of chemicals in this country is a priority for the agency. While we continue to support TSCA reform, the agency is using the tools available under TSCA to the fullest extent possible."

Wendy Cleland-Hamnett,
Director of the Office of Pollution Prevention & Toxics, EPA

"In the last five years the company has become much stronger, and we anticipate our growth to continue. Any company with a production base in China is going to have a difficult time ahead, because China is going to experience various problems with energy and political issues among others. Whoever will be able to survive these next years will be very strong. We have a very good reputation in China. We pay high taxes because we are profitable and we do not bribe officials. In the US, we will continue to be a strong player in manufacturing of various chemicals."

Pingxin Wang PhD,
President, Varsal Inc.

"We do not wish to leave the Newark area, although if we were to move our facilities south to either the Carolinas or Texas, a company such as ours would be welcomed. These states are actively bringing industry to the area, and provide favorable loans to companies such as our. Loans for industrial concerns in the State of New Jersey are difficult to obtain especially for the chemical industry. There are only a few formulators in the state of New Jersey; chemical companies have relocated to other States, such as Indiana. In 1968 New Jersey was the world's capital for the chemical industry; however, a few chemical companies have caused the chemical industry to become unpopular resulting in the steady decline of the chemical industry in New Jersey."

Pina Patel,
President, Innovative Resin Systems Incorporated

"Our main advantage is being a local company, and the United States is still after all the biggest specialty chemical market. We can communicate with customers easily, we can offer better service than offshore companies, and we can turn around projects quickly. The US may be outsourcing, but the market here is so big that a company like Tyger Scientific only needs a tiny share of it. America still has the highest amount of R&D spending in the world; lots of research is still taking place as well as new exciting developments in areas like green chemistry, organic photovoltaic, and energy storage."

Adam Yuan,
CEO, Tyger Scientific

Global Business Reports
Industry Explorations

"Netherlands able to supply Eastern Europe and Russia. As we remain profitable, we can grow organically and expand our footprint by building new facilities. Some parts of the US chemical industry will enjoy a fundamental advantage arising from the cost of natural gas, and will become much bigger exporters. Our area, however, typically grows at GDP-type rates. Right now the pigments industry is relatively soft, but we are confident of demand picking back up and prices increasing at a stable rate."

Tom Casey,
Chairman & CEO, Tronox

"With the latitude of less barriers on the trade side and the higher degree of acceptance in the market, the improvements in quality that we bring to the table is readily accepted by the US market here. As technology demands become greater we have to be innovative and keep in step with the needs of our customers and our customers' customers. By working with the customer one-on-one, we have mitigated issues with timeliness, supply and material availability. Within in the next five years, we plan to have production facilities here via an acquisition or joint venture. Credibility as a local producer is paramount in many companies' minds and we want to be closer to our customers."

Robert O'Toole,
President, Miwon North America

"There is definitely a trend of less manufacturing amongst big pharmaceutical companies, but most of them try to keep at least a few of the GMP steps for their non-generic products in-house. PCAS saw many years ago that Asian competition is very strong in basic raw materials, so in the 1980s and early 1990s it moved away from a pure focus in these towards more complex downstream chemicals. Bringing in new technologies to continue to compete has been very important. Expanding the catalogue API business is very important for the US operations. Most of the business will continue to grow through an agent, but we see a big trend of emerging pharmaceutical companies finding new formulations and applications for older products, so this is an area in which we expect to expand."

Joe Tessier,
Vice President, PCAS

"EM Sullivan's projected growth is market-related. We look at the ever-expanding group of newer start-ups that need distributors. Over the years, we have been fortunate enough to be in the right place and ready for business. We want to start early with these accounts and ensure they are getting exactly what they want and need. There is a renaissance going on in the market right now and smaller companies will continue to pop up. Some of these accounts could take 10 years to develop, but this is where we see our future growth coming from. To grow at a good rate, you have to start early with these young companies."

Vincent D'Andrea,
President, EM Sullivan

This list represents a selection of the companies operating in the US East Coast chemicals industry and should not be considered a comprehensive guide. GBR holds an exclusive and extensive chemicals database for Brazil and the wider region. For further information on database access packages, please contact info@gbreports.com or call +44 20 7612 4511.

NAME OF COMPANY	WEBSITE	PAGE
Associations and Government		
American Chemical Society (ACS)	www.acs.org	7, 17, 20, 24
American Chemistry Council (ACC)	www.americanchemistry.com	12, 14, 52, 56
Chemical Heritage Foundation	www.chemheritage.org	16, 61, 110
CropLife America	www.croplifeamerica.org	
Massachusetts Chemistry & Technology Alliance	www.masscta.org	
National Association of Chemical Distributors (NACD)	www.nacd.com	21, 103
New York State Department of Environmental Conservation (DEC)	www.dec.ny.gov	
Pennsylvania Chemical Industry Council	www.pcic.org	52, 54
Society Of Chemical Manufacturers & Affiliates (SOCMA)	www.socma.com	22, 24, 27
The Chemistry Council of New Jersey	www.chemistrycouncilnj.org	14, 58
U.S. Chemical Safety & Hazard Investigation Board	www.chemsafety.gov	
U.S. Environmental Protection Agency (EPA)	www.epa.gov	20, 21, 24, 116
U.S. Occupational Health & Safety Administration (OSHA)	www.osha.gov	
Chemical Manufacturers		
Abbey Color	www.abbeycolor.com	
Adesis	www.adesisinc.com	
AGC Chemicals Americas	www.agcchem.com	
Agno Pharma	www.agnopharma.com	
AkzoNobel	www.fleishman.com	40
Albemarle	www.albemarle.com	
AMZO Corporation	www.amzocorp.com	
Arichem	www.arichem.com	
Arkema	www.arkema.com	46, 49, 64
Ash Ingredients	www.ashingredients.com	
Ashland Specialty Chemicals	www.ashland.com	
Atlantic Specialty Chemicals	www.ascc1.com	
BASF	www.basf.com	
Bimax	www.bimax.com	
Bluestar Silicones	www.bluestarsilicones.com	32, 62
BOC Sciences	www.bocsci.com	
Borden & Remington	www.boremco.com	
Boron Specialties	www.borons.com	
Borregaard Synthesis	www.borregaard.com	
Cabot Corp.	www.cabot-corp.com	40
CHEM Group	www.chem-group.com	
Chemetall Foote	www.chemetall.com	
Chemtura	www.chemtura.com	21, 44, 45, 64, 71
Croda	www.croda.com	14, 32, 68, 69, 80
CVC Thermoset Specialties (Emerald Performance Materials)	www.emeraldmaterials.com	64
Daicel	www.daicel.com	
Daikin America	www.daikin-america.com	
Deepwater Chemicals	www.deepwaterchemicals.com	
Deltech Corporation	www.deltechcorp.com	
DSM	www.dsm.com	13, 14, 32, 35, 52, 80
DyStar	www.dystar.com	
Everchem	www.everchem.com	57
Evonik Degussa	www.evonik.com	
Ferro	www.ferro.com	
Fujifilm Imaging Colorants, Inc.	www.fujifilmic.com	67
Galata Chemicals	www.galatachemicals.com	
Hydromer	www.hydromer.com	
Infineum	www.infineum.com	
Innovative Resin Systems Inc.	www.rez-cure.com	62, 66, 116
J&E Sozio	www.jesozio.com	
Johnson Matthey	www.jmusa.com	
Kowa American Corporation	www.kowa.com	
Kureha America, Inc.	www.kureha.com	19, 34, 36, 52
Lab Express International Inc.	www.labexpress.com	32
Lanxess	www.lanxess.us	
Lord Corporation	www.lord.com	81
Maryland Chemical Company	www.mdchem.com	
Metabolix	www.metabolix.com	
Minakem, LLC	www.minakem.com	47, 72
Miwon	www.mwc.co.kr	117
Novacyl	www.novacyl.us	
Novomer	www.novomer.com	
PCAS	www.pcas.com	117
Pflaumer Brothers	www.pflaumer.com	
Phoenix Chemical	www.phoenix-chem.com	
Polysciences Inc.	www.polysciences.coom	38, 40
Pressure Chemical	www.presschem.com	
Proviron America	www.proviron.com	

NAME OF COMPANY	WEBSITE	PAGE
Chemical Manufacturers		
R.S.A. Corporation	www.rsa-corporation.com	
Reichhold	www.reichhold.com	40, 42, 43, 64
Rhodes Technologies	www.rhodestec.com	
Rhodia	www.rhodia.com	
Rockwood holdings inc.	www.rockwoodspecialties.com	
SABIC Innovative Plastics Holdings BV	www.sabic-ip.com	14
SantoLubes Manufacturing, LLC dba	www.santolubes.com	
Summit Chemicals	www.summitchem.com	
Technichem	www.technichemcorp.com	21
Thomas Swan & Co	www.thomas-swan.com	
Tronox	www.tronox.com	40, 117
Voltaix	www.voltaix.com	
Whitford	www.whitfordww.com	
Pharmaceutical Manufacturers		
Aceto Corporation	www.aceto.com	84, 90
Actavis	www.actavis.com	
Amerigen	www.amerigenpharma.com	
Apicore	www.apicore.com	
Bayer	www.bayerus.com	56
Gedeon Richter	www.richterusa.com	
Glenmark	www.glenmarkpharma.com	
Helsinn Therapeutics	www.helsinnthera.com	84, 86, 87
Lonza	www.lonza.com	92
Lupin	www.lupinworld.com	
Merck	www.merck.com	
Novacyl, Inc.	www.novacap.us	84
SK Lifescience	www.skechem.com	91
Contract Manufacturing Organisations and Contract Research Organisations		
AcceleDev Chemical	www.acceledev.com	34, 76, 77
Albany Molecular Research, Inc. (AMRI)	www.amriglobal.com	
Alliance Pharma	www.alliancepharmaco.com	
Applied Clinical Intelligence	www.a-ci.com	
Aptuit	www.aptuit.com	72
Arichem	www.arichem.com	
ChemDesign Products	www.chemdesign.com	
Chemspec-API	www.chemspec-api.com	
Chiral Technologies	www.chiraltech.com	83
ClinSmart	www.clinsmart.com	
Custom Milling & Consulting	www.cmcmilling.com	74
DanChem Technologies	danchemtechnology.com	
DavosPharma	www.davos.com	
Dishman USA	www.dishmangroup.com	
Divis Laboratories	www.divislaboratories.com	
GenScript	www.genscript.com	
Hampford Research	www.hampfordresearch.com	14, 32, 73
Hovione	www.hovione.com	
J&W PharmLab	www.jwpharmlab.com	
Laviana	www.lavianacorp.com	
Melior Discovery	www.meliordiscovery.com	
Novasep	www.novasep.com	79
Pharmacore	www.pharmacore.com	72, 75
Quintiles	www.quintiles.com	
Richman Chemical	www.richmanchemical.com	72
Siegfried	www.siegfried.ch	
Sinova	www.sinovainc.com	
The Chemistry Research Solution	www.tcrs-us.com	72, 78
Tyger Scientific	www.tygersci.com	116
Upscale Microwave	www.upscalemicrowave.com	
Varsal	www.varsal.com	116
Legal, Financial and Consultancy		
ARC Advisory Group	www.arcweb.com	
Bergeson & Campbell	www.lawbc.com	
Beveridge & Diamond	www.bdlaw.com	20, 21, 25
BioChemInsights	www.biocheminsights.com	
Buchanan Ingersoll & Rooney	www.bipc.com	
Cardno ENTRIX	www.cardno.com	21, 24
Gordon & Rees	www.gordonrees.com	
Hutchison Law Group	www.hutchlaw.com	46, 84, 93
Intertrek	www.intertek.com	23

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NAME OF COMPANY	WEBSITE	PAGE
Legal, Financial and Consultancy		
Keller and Heckman	www.khlaw.com	26
Kline Group	www.KlineGroup.com	48
KPMG	www.kpmg.com	46, 57, 62
Sidley Austin LLP	www.sidley.com	
Squire Sanders	www.squiresanders.com	
Steptoe & Johnson	www.steptoe.com	70
Sullivan & Worcester	www.sandw.com	
TSG	www.TSGUSA.com	
Valence Group	www.valencegroup.com	46
Wiley Rein	www.wileyrein.com	
Transportation, Logistics, Supply and Distribution		
American International Chemical	www.aicma.com	
Amsyn	www.amsyn.com	
Astro Chemicals	www.astrochemicals.com	
Austin Chemical Company	www.austinchemical.com	
Basstech International	www.basstechintl.com	100, 101, 102
BDP International	www.bdpinternational.com	57, 96, 98
Biddle Sawyer Corporation	www.biddlesawyer.com	101, 106
Bimax	www.bimax.com	
BKM Resources	www.blmresources.com	
Brenntag	www.brenntag.com	46, 100, 101, 107
DB Schenker	www.dbschenkerusa.com	
DKSH North America	www.dksh.com	
Doe & Ingalls	www.doeingalls.com	
Dunleary	www.dunleary.com	
EM Sullivan Associates	www.emsullivan.com	100, 117
Fanwood Chemical	www.fanwoodchemical.com	
FCG Solutions	www.fcgsolutions.com	
Harry W Gaffney & Co	www.hwgco.com	
Hawk Chemical Company	www.hawkchem.com	
Helm U.S. Corporation	www.helmusa.com	
Hubbard-Hall	www.hubbardhall.com	
ICC Chemical	www.iccchem.com	
Industrial Chemicals Incorporated	www.industrialchemicals.com	
Inolex	www.inolex.com	
KODA	www.koda.com	
Lidochem	www.lidochem.com	
Lipo Chemicals	www.lipochemicals.com	
LOGISTICS Plus	www.logisticsplus.net	
Morre-Tec Industries Inc.	www.morretec.com	31, 100, 104, 105
Panalpina	www.panalpina.com	
Parchem	www.parchem.com	
Pfaltz & Bauer	www.pfaltzandbauer.com	
R.T. Vanderbilt	www.rtvanderbilt.com	
RE Carroll	www.recarroll.com	
Roberts Chemical Co.	www.robertschem.com	
S.P.Morell	www.spmorell.com	100, 108
Sojitz Corporation of America	www.sojitz.com	
Technichem	www.arrowtechnichem.com	
Thornley Company	www.thornleycompany.com	95, 100
Tilley Chemical Co.	www.tilleychem.com	
Transplace	www.transplace.com	96, 99
Univar	www.univarusa.com	
Van Horn, Metz & Co.	www.vanhornmetz.com	
Veckridge Chemical Company	www.veckridge.com	
Human Resources, Information Technology, and Security		
Kincannon Reed	www.krsearch.com	
The Chemical Search	www.chemicalsearch.co.uk	110, 111, 113
Klein Hersh	www.kleinhersh.com	110, 112
Alliance Technologies	www.alliancetechgroup.com	
The Wercs	www.thewercs.com	
Unlimited Technology	www.utiglobal.com	
Allied Barton	www.alliedbarton.com	
Equipment and Other Services		
Ecrecon	www.ecrecon.com	
PerryVidex	www.perryvidex.com	
Spectrum Chemicals & Laboratory Products	www.spectrumchemical.com	
Alaqua	www.alaquainc.com	
SPEX CertiPrep Group	www.spex.com	
AVS	www.avsinc.com	
Artisan Industries	www.artisanind.com	

Peaks and Troughs

Source: American Chemistry Council

Source: Federal Reserve Board

	National Bureau of Economic Research (NBER)	CAB	Revisions from Prior Month	Chemicals Activity Barometer (CAB)	% Δ M/M	% Δ Y/Y	CAB (3MMA)	% Δ M/M	% Δ Y/Y	Total IP			Total IP (3MMA)	% Δ Y/Y
2007M1				99,6	0,2	1,2	99,1	0,6	1,7	98,2	-0,5	1,4	98,2	1,7
2007M2				99,8	0,2	1,5	99,6	0,5	1,7	99,4	1,2	2,6	98,8	2,0
2007M3				100,5	0,7	2,3	100,0	0,4	1,7	99,4	0,0	2,4	99,0	2,1
2007M4				100,7	0,2	2,5	100,3	0,4	2,1	100,2	0,8	2,8	99,7	2,6
2007M5		P		101,1	0,4	3,2	100,8	0,4	2,7	100,1	-0,1	2,8	99,9	2,6
2007M6				101,0	-0,1	3,2	100,9	0,2	3,0	100,1	0,0	2,5	100,1	2,7
2007M7				101,0	0,0	3,5	101,0	0,1	3,3	100,2	0,1	2,5	100,1	2,6
2007M8				99,9	-1,1	2,3	100,6	-0,4	3,0	100,2	0,0	2,2	100,2	2,4
2007M9				100,1	0,2	2,4	100,3	-0,3	2,7	100,7	0,5	3,0	100,4	2,6
2007M10				99,6	-0,5	1,8	99,9	-0,5	2,1	100,1	-0,6	2,4	100,3	2,5
2007M11				99,2	-0,4	1,0	99,6	-0,2	1,7	100,6	0,5	3,1	100,5	2,8
2007M12	P			98,3	-0,9	-1,1	99,0	-0,6	0,6	100,7	0,1	2,0	100,5	2,5
2008M1				97,0	-1,3	-2,6	98,2	-0,9	-0,9	100,4	-0,3	2,2	100,6	2,4
2008M2				95,9	-1,1	-3,9	97,1	-1,1	-2,5	100,3	-0,1	0,9	100,5	1,7
2008M3				94,8	-1,1	-5,7	95,9	-1,2	-4,1	99,9	-0,4	0,5	100,2	1,2
2008M4				94,3	-0,5	-6,4	95,0	-0,9	-5,3	99,1	-0,8	-1,1	99,8	0,1
2008M5				94,0	-0,3	-7,0	94,4	-0,7	-6,4	98,6	-0,5	-1,5	99,2	-0,7
2008M6				93,1	-1,0	-7,8	93,8	-0,6	-7,1	98,4	-0,2	-1,7	98,7	-1,4
2008M7				91,4	-1,8	-9,5	92,8	-1,0	-8,1	97,9	-0,5	-2,3	98,3	-1,8
2008M8				89,5	-2,1	-10,4	91,3	-1,6	-9,2	96,2	-1,7	-4,0	97,5	-2,7
2008M9				85,5	-4,5	-14,6	88,8	-2,8	-11,5	92,3	-4,1	-8,3	95,5	-4,9
2008M10				84,1	-1,6	-15,6	86,4	-2,7	-13,5	93,0	0,8	-7,1	93,8	-6,5
2008M11				80,5	-4,3	-18,9	83,4	-3,5	-16,3	91,9	-1,2	-8,6	92,4	-8,0
2008M12				78,2	-2,9	-20,4	80,9	-2,9	-18,3	89,4	-2,7	-11,2	91,4	-9,0
2009M1				77,8	-0,5	-19,8	78,8	-2,6	-19,7	87,4	-2,2	-12,9	89,6	-10,9
2009M2				77,3	-0,6	-19,4	77,8	-1,4	-19,9	86,9	-0,6	-13,4	87,9	-12,5
2009M3		T		76,1	-1,6	-19,7	77,1	-0,9	-19,6	85,4	-1,7	-14,5	86,6	-13,6
2009M4				77,3	1,6	-18,0	76,9	-0,2	-19,1	84,7	-0,8	-14,5	85,7	-14,1
2009M5				78,4	1,4	-16,6	77,3	0,5	-18,1	83,8	-1,1	-15,0	84,6	-14,7
2009M6	T			79,9	1,9	-14,2	78,5	1,6	-16,3	83,5	-0,4	-15,1	84,0	-14,9
2009M7				81,2	1,6	-11,2	79,8	1,7	-14,0	84,3	1,0	-13,9	83,9	-14,7
2009M8				83,0	2,2	-7,3	81,4	1,9	-10,9	85,1	0,9	-11,5	84,3	-13,5
2009M9				84,0	1,2	-1,8	82,7	1,7	-6,8	85,7	0,7	-7,2	85,0	-10,9
2009M10				84,8	1,0	0,8	83,9	1,5	-2,8	85,9	0,2	-7,6	85,6	-8,8
2009M11				85,5	0,8	6,2	84,8	1,0	1,7	86,2	0,3	-6,2	85,9	-7,0
2009M12				86,6	1,3	10,7	85,6	1,0	5,8	86,6	0,5	-3,1	86,2	-5,7
2010M1				87,2	0,7	12,1	86,4	0,9	9,6	87,4	0,9	0,0	86,7	-3,2
2010M2				86,9	-0,3	12,4	86,9	0,5	11,7	87,8	0,5	1,0	87,3	-0,7
2010M3				88,0	1,3	15,6	87,4	0,5	13,4	88,3	0,6	3,4	87,8	1,5
2010M4				88,6	0,7	14,6	87,8	0,5	14,2	88,7	0,5	4,7	88,3	3,0
2010M5				87,5	-1,2	11,6	88,0	0,2	13,9	90,1	1,6	7,5	89,0	5,2
2010M6				86,7	-0,9	8,5	87,6	-0,5	11,5	90,2	0,1	8,0	89,7	6,7
2010M7				86,6	-0,1	6,7	86,9	-0,8	8,9	90,9	0,8	7,8	90,4	7,8
2010M8				86,4	-0,2	4,1	86,6	-0,4	6,4	91,1	0,2	7,1	90,7	7,6
2010M9				87,3	1,0	3,9	86,8	0,2	4,9	91,4	0,3	6,7	91,1	7,2
2010M10				87,0	-0,3	2,6	86,9	0,2	3,5	91,1	-0,3	6,1	91,2	6,6
2010M11				87,7	0,8	2,6	87,3	0,5	3,0	91,4	0,3	6,0	91,3	6,2
2010M12				89,6	2,2	3,5	88,1	0,9	2,9	92,4	1,1	6,7	91,6	6,3
2011M1				89,5	-0,1	2,6	88,9	0,9	2,9	92,5	0,1	5,8	92,1	6,2
2011M2				89,9	0,4	3,5	89,7	0,8	3,2	92,3	-0,2	5,1	92,4	5,9
2011M3				90,7	0,9	3,1	90,0	0,4	3,1	93,1	0,9	5,4	92,6	5,5
2011M4				90,1	-0,7	1,7	90,2	0,2	2,7	92,6	-0,5	4,4	92,7	5,0
2011M5				89,7	-0,4	2,5	90,2	-0,1	2,4	92,9	0,3	3,1	92,9	4,3
2011M6				89,3	-0,4	3,0	89,7	-0,5	2,4	93,1	0,2	3,2	92,9	3,6
2011M7				89,7	0,4	3,6	89,6	-0,1	3,0	93,9	0,9	3,3	93,3	3,2
2011M8				88,5	-1,3	2,4	89,2	-0,4	3,0	94,2	0,3	3,4	93,7	3,3
2011M9				88,3	-0,2	1,1	88,8	-0,4	2,4	94,4	0,2	3,3	94,2	3,3
2011M10				88,2	-0,1	1,4	88,3	-0,6	1,6	94,9	0,5	4,2	94,5	3,6
2011M11				88,3	0,1	0,7	88,3	-0,1	1,1	95,1	0,2	4,0	94,8	3,8
2011M12				89,1	0,9	-0,6	88,5	0,3	0,5	95,9	0,8	3,8	95,3	4,0
2012M1				89,6	0,6	0,1	89,0	0,5	0,1	96,6	0,7	4,4	95,9	4,1
2012M2				89,8	0,2	-0,1	89,5	0,6	-0,2	97,1	0,5	5,2	96,5	4,5
2012M3				90,3	0,6	-0,4	89,9	0,4	-0,1	96,5	-0,6	3,7	96,7	4,4
2012M4				90,0	-0,3	-0,1	90,0	0,1	-0,2	97,3	0,8	5,1	97,0	4,6
2012M5				89,4	-0,7	-0,3	89,9	-0,1	-0,3	97,3	0,0	4,7	97,0	4,5
2012M6			0,1	88,9	-0,6	-0,4	89,4	-0,5	-0,3	97,4	0,1	4,6	97,3	4,8
2012M7			0,2	89,2	0,3	-0,6	89,2	-0,6	-0,4	98,0	0,6	4,4	97,6	4,6
2012M8			0,2	89,6	0,4	1,2	89,2	-0,6	0,1	96,8	-1,2	2,8	97,4	3,9
2012M9			n/a	89,9	0,3	1,8	89,6	-0,6	0,8					

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