REGIONS & LOCATIONS GUIDE

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1/2018

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Global Competitiveness Index

Productivity in the Fourth Industrial Revolution

Although global economic growth has been robust over the past two years, it remains fragile in the current changing economic and political context, according to the Global Competitiveness Report 2018. The annual report — issued by the World Economic Forum (WEF) — this year covers 140 economies and finds that amidst the transformations and disruptions brought about by the Fourth Industrial Revolution (4IR), adaptability and agility of all stakeholders — individuals, governments and businesses — will be key features in successful economies.

According to the report's Global Competitiveness Index (GCI), the United States is the closest economy to the frontier, the ideal state, where a country would obtain the perfect score of 100 on every component of the index. With a competitiveness score of 85.6, it is 14 points away from the frontier mark of 100, implying that even the top-ranked economy among the 140 has room for improvement. It is followed by Singapore (83.5) and Germany (82.8). Switzerland (82.6) comes in at place 4, followed by Japan (82.5), Netherlands (82.4), Hong Kong SAR (82.3). The United Kingdom (82.0), Sweden (81.7) and Denmark (80.6) round out the top ten.

With a score of 85.6 out of 100, the United States tops the 2018 rankings of the GCI 4.0, confirming its status of most competitive economy in the world. Canada ranks 12 overall with a score of 79.9, behind three Scandinavian countries: Sweden (9), Denmark (10) and Finland (11). Canada's performance across the 12 pillars is generally strong. Its labor market is characterized by high flexibility, combined with very strong workers' protections and gender parity for labor force participation. The country is fairly innovative, but not yet an innovation powerhouse.

Economic growth in Latin America picked up modestly in 2017. The region's economic recovery remains fragile as multiple economic and geopolitical factors could jeopardize growth. Some of these risks include a rise of trade protectionism in the United States; a spillover of Venezuela's economic and humanitarian crisis; policy uncertainty emerging from elections in the region's largest economies, Brazil and Mexico; and disruptions from natural disasters threatening Caribbean economies still recovering from the devastating impacts of the fall 2017 hurricanes.

Chile ranks 33 overall with a score of 70.3. The country is the most competitive in Latin America, followed by Mexico, which ranks 46 globally (64.6). Brazil (72, 59,5) is down three places from its 2017 score. Argentina ranks 81 with an overall competitiveness score of 57.5.

Europe

Real gross domestic product (GDP) growth was up for the majority of European countries in 2017, with current growth forecasts for the subset of euro area countries above 2% for 2018. While this looks like a continuation of the recovery, the situation remains fragile, as uncertainty over international cooperation and trade is dampening 2018's growth outlook.

Germany emerges as the strongest European performer in this year's competitiveness rankings and the third-strongest globally (overall score: 82.8). It also tops the innovation rankings in this year's GCI. Switzerland ranks 4 (82.6) globally and second in Europe. The Netherlands is the third-most competitive European economy and the sixth-best globally (82.4). The United Kingdom is the fourth-most competitive economy in Europe and 8 globally (82.0). Sweden ranks 9 globally in this year's index and 5 within Europe (81.7). Denmark, one of the smallest markets in Europe, ranks 10 globally (80.6). France secures a place among the top twenty economies globally (17, 78.0). Italy ranks 31 overall and 17 in Europe. The country's GDP is growing at 1.5%, the fastest rate since the 2008's financial crisis. Turkey positioned 61 on the overall GCI.

Eurasia

Eurasia is growing at a moderate pace (slightly above 2%) and is expec-

ted to continue on this trend for the next few years. The Russian Federation, the largest economy in the region, is expected to grow at 1.7% in 2018, and China is strengthening its position as a key commercial partner for the region.

Eurasia has attained a moderate competitiveness performance (58.4 out of 100). Most countries in the region achieve a GCI score between 52 and 65, and all share strong performances on health, education and skills and infrastructure. Yet, to secure a stronger competitiveness position, Eurasian countries should diversify their economies and work to build upon these strengths to increase their presence in higher segments of the value chain.

The best performer in Eurasia, the Russian Federation ranks 43 overall with a score of 65.6. This is a slight increase from 2017. Its competitiveness performance reflects better growth prospects; the country is growing at 1.7% in 2018, the highest in over five years.

East Asia and Pacific

The region's seven advanced economies all feature in the top 20 of the GCI rankings and three of the world's seven most competitive economies — Singapore (2, 83.5), Japan (5, 82.5) and Hong Kong SAR (7, 82.3) — stem from the region. Most boast world-class physical and digital infrastructure and connectivity, macroeconomic stability, strong human capital and well-developed financial systems. However, performance on the innovation ecosystem is uneven.

Among the region's emerging markets, the picture is more diverse. Malaysia (25, 74.4) and China (28, 72.6) are less than 30 points to the competitiveness frontier (the highest score on the GCI) and on par with many advanced economies. The largest ASEAN economies — Indonesia, the Philippines, Vietnam and Thailand — as well as Brunei Darussalam are 40 points or less to the frontier. Finally, Mongolia (99, 52.7), Cambodia (110, 50.2) and Lao PDR (112, 49.3) are only halfway to the frontier, reflecting major weaknesses that threaten sustained growth.

Australia ranks 14 overall (78.9), up one spot from 2017, four places ahead of New Zealand (18, 77.5). The Republic of Korea ranks 15 overall (78.8), Indonesia positioned 45 overall (64.9).

South Asia

South Asia continues to show strong economic growth and an improved macroeconomic outlook on the back of reforms in some of the world's largest countries. GDP growth is expected to pick up in 2018, reaching an average of 7.1%, confirming the region as one of the world's fastest-growing. India, which ranks 58 (62.0), remains the region's main driving force.

In spite of growing international flows, South Asia remains the region with the lowest trade penetration in the world. While some countries in the region have managed to localize segments of global industries — in terms of both services and manufactured goods — all will need to increase their innovation capacity and technological readiness in order to move towards higher value-added processes and productions.

Top 10 Countries in the Global Competitiveness Index 2018

Rank	Economy	Score[1]	Diff. from 2017[2] Rank	Diff. from 2017[2] Score
1	United States	85.6	—	+0.8
2	Singapore	83.5	—	+0.5
3	Germany	82.8	—	+0.2
4	Switzerland	82.6	—	+0.2
5	Japan	82.5	+3	+0.9
6	Netherlands	82.4	–1	+0.2
7	Hong Kong SAR	82.3	—	+0.3
8	United Kingdom	82.0	–2	–0.1
9	Sweden	81.7	—	+0.1
10	Denmark	80.6	+1	+0.7

[1] Scale ranges from 0 to 100
[2] Rank and score differences with 2017 index

Source: World Economic Forum (WEF) Global Competitiveness Report 2018

Middle East and North Africa

After a slowdown in 2017, growth in the MENA region is expected to bounce back this year. After facing the peak of financial turmoil, oil-exporting countries are continuing to reduce fiscal imbalances. This is expected to improve domestic demand and economic activity in non-oil industries, while future trends for the oil sector remain unsure due to uncertainty on both prices and production levels. Israel leads the Middle East and North Africa with a score of 76.6 (20). The country has grown to become one of the world's innovation hubs thanks to a very strong innovation ecosystem. Ranked 27 globally with a score of 73.4, the United Arab Emirates is next in the region in terms of competitiveness. Saudi Arabia ranks 39 overall with a score of 67.5 and can rely on a conducive macroeconomic environment.

Sub-Saharan Africa

The economic prospects of Sub-Saharan Africa are at a crossing point. The average GDP growth of the region has fallen below 5% since 2015 and is expected to grow at 3.4% in 2018. After having benefitted from a period of fast growth driven by strong foreign demand and high commodity prices, economies in the region need to strengthen their fundamentals to become more resilient to commodity price shocks and to compete successfully in the technology-driven global economy.

Kenya, the most competitive economy in East Africa (93, 53.7), is developing into one of the region's strongest innovation hubs. Mauritius ranks 49 globally (63.7) and achieves the best performance in Sub-Saharan Africa, in line with 2017. South Africa ranks 67 (60.8) and attains the second spot in Sub-Saharan Africa.

4IR: Opportunities and Challenges

With the Fourth Industrial Revolution, humanity has entered a new phase. The 4IR has become the lived reality for millions of people around the world, and is creating new opportunities for business, government and individuals. Yet it also threatens a new divergence and polarization within and between economies and societies.

For the second half of the 20th century, the pathway to development seemed relatively clear: lower-income economies would be expected to develop through progressive industrialization by leveraging low-skilled labor. In the context of the 4IR the sequence has become less clear, particularly as the cost of technology and capital are lower than ever but their successful use relies on a number of other factors.

The results of the GCI reveal the sobering conclusion that most economies are far from the competitiveness "frontier" — the aggregate ideal across all factors of competitiveness. In fact, the global average score of 60 suggests that many economies have yet to implement the measures that would enhance their long-term growth and resilience and broaden opportunities for their populations. In addition, it turned out that countries have a mixed performance across the twelve pillars of the index and that long-standing developmental issues — such as the lack of well-functioning institutions — continue to be a source of friction for competitiveness.

Yet there are bright spots — in the form of economies that outperform their peers and present valuable case studies for learning more about methods to implement the factors of competitiveness.

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This article is based on the Global Competitiveness Report 2018, issued by the World Economic Forum (WEF). The complete report is available at bit.ly/GCR-2018.

Global Prioritization Matrix

The First Step to Finding the Right Emerging Markets for Growth

In the past, much of the attractive growth for specialty chemicals companies came from China and the rebound of the US economy. In the future, companies need to consider a portfolio of emerging markets even more, despite the risk of market instability and the difficulty of projecting short-term growth in those markets. We suggest a pragmatic approach that explores the economic attractiveness, ease of access and strategic market size of potential new markets and allows companies to quickly create a shortlist for investment opportunities that fits their risk profile.

Specialty chemicals companies in Europe and other established markets face difficulties growing in home markets, beyond what can be achieved through GDP growth and small gains in market share. Overall, the specialty chemicals market is set to grow 3.5% per year, but the higher growth will likely come from emerging economies, where traditional western players may not have strong footprints. Some companies will find growth opportunities from the manufacturing rebound in the United States, and most companies have developed a strategy and channels for operating in China.

„There is a long list of emerging markets that offer potentially attractive opportunities."

However, to take advantage of more substantial growth, many companies will choose to expand more in emerging economies. Some recent examples are opportunities to sell electronics chemicals in Thailand, construction chemicals in the Middle East or textile chemicals in Turkey. Value chains will likely continue to move eastward, and their control points will increasingly become local in these countries. But finding the right approach for the next steps is often a challenge, because it is difficult to compare opportunities and risks in markets like India, Brazil and selected southeast Asian or southeastern European countries.

No matter which corner of the globe your company is tackling, we urge you to start early with a pragmatic approach to finding the right strategy. Companies should expect challenges getting that strategy in place, given the diversity and complexity of these markets. But the first step — creating a shortlist of targets — can be a relatively simple exercise.

We realize that in many cases, international expansion takes a backseat to other management priorities, and this is one reason a simple but data-driven approach is useful in the first step.

It can help busy executives set priorities with confidence and act more quickly in the face of disruptive changes in traditional markets. These include increasing administrative and environmental regulation, digitization of value chains, the electrification of automotive, and recent M&A. There's also pressure to create solutions that go beyond products, as well as uncertainty from China-US trade tensions, to name a few points.

A.T. Kearney's 2018 Foreign Direct Investment Confidence Index indicates that investors are uncertain about where to invest — beyond the largest, most obvious locations with the lowest perceived risks — even as they plan to increase their level of FDI. However, companies in developed markets can achieve attractive revenue growth over the mid-term in specific countries outside their home turf (see info box).

Tobias Lewe,
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Finding a Pragmatic Approach to Investing in Emerging Markets

Before getting started, it's critical to understand that companies eventually need their own assessments of the local industry and their own value propositions for target countries.

But there is a long list of emerging markets that offer potentially attractive opportunities and screening them is time and resource consuming. So, a methodology is needed that reduces the long list in a pragmatic way. As we like to say, just because a country's economy is growing, that doesn't make it a good place to invest.

This idea — that GDP growth doesn't tell the whole story — is an integral part of our approach to evaluating emerging market opportunities and creating heat maps.

We have worked to make our approach objective, data-driven and transparent. It measures economic attractiveness, ease of access and strategic market size, through short and medium-term indicators. For instance, for economic attractiveness, we recommend looking at the size of the national economy, growth projections, and stability of the economic environment. For ease of access, we look at: transparency, political stability, logistics infrastructure, accessibility and trade performance. For strategic market size, we calculate a figure that is a "proxy" for local chemical consumption, given the possibility of inconsistent data from heterogeneous and complex specialty chemicals markets.

"Just because a country's economy is growing, that doesn't make it a good place to invest."

When thinking about the starting point for the strategy, it is the mix of country-specific and company-specific questions that matters. With a structured approach, we can define a robust starting point for discussions with business leaders.

Questions to ask include: Which of your products and services fit best with local value chains, which competitive or complementary industry exists locally, and what is your company's own capacity for growth? Also, what is the local, country- or hub-specific supply and demand in the industry — e.g. where would additional volume help, and where would it create unnecessary trade-offs with existing business?

Country-specific questions include the size of an economy and its growth rates, but also how relevant and sustainable is the GDP for your business intent?

For instance, does GDP per capita indicate sufficient wealth in the country for a relevant share of the population to buy processed products on a regular basis — everything from fertilizers to consumer-packaged goods and durable household equipment? Are the government's investments in industrialization and human capital sufficient? How will demographics impact the opportunity?

The ability to get goods into the country and revenue out of the country are equally important factors to consider about a target market. This is impacted by infrastructure, the effectiveness of public administration, and integration of the economy into the global financial system.

In the end, companies need to understand the data that drive results in the model. Not all data points will exist for all countries. In many cases, country-level data is combined under the category "Rest of World." But it is possible to use available data to significantly reduce the scope for a detailed strategic analysis in a data-driven model. In short, companies looking to build up a chemicals value chain in a new market need a quick, accurate and data-driven way to narrow the list down to those countries that offer a strategic fit and growth potential that is built on solid footing.

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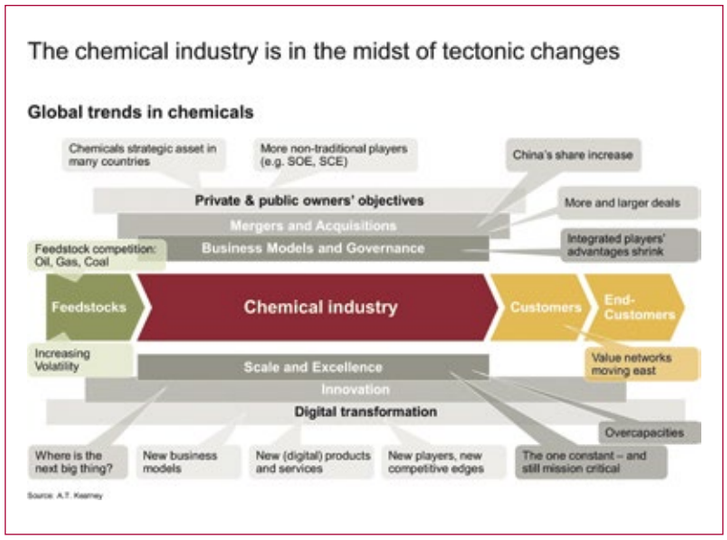

Fig. 1: Global trends in the chemicals industry

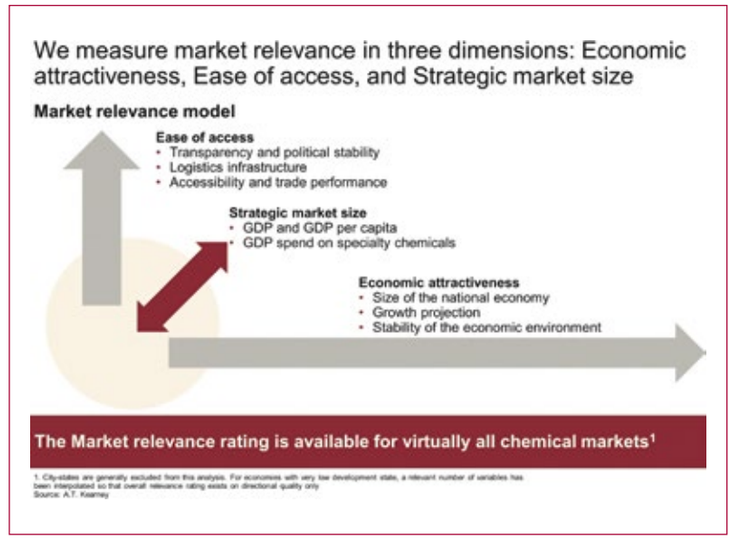

Fig. 2: A.T. Kearney's market relevance model

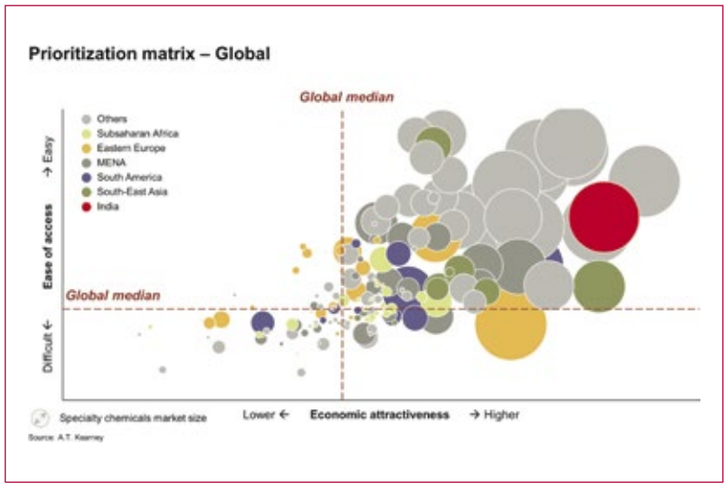

Fig. 3: A.T. Kearney's prioritization matrix

How One Company Approached Its Analysis

For one client, we examined their portfolio and mapped it to the producing industries in target countries. For its business producing food and animal feed, we considered the size and development of the agricultural sector in target countries and the consumption of specialty meats.

We created a footprint for the client's business and for the target countries, and then saw where they overlapped. In the end, we were able to reduce a long list of potential markets to six countries. The process confirmed some of the "obvious" candidates but some countries on the shortlist might not have been considered with the same intensity without the analysis.

Amidst all the changes going on in the chemicals industry, and the risk of competitors gaining increased market share or key partnerships in your target countries, a data-driven, objective analysis to quickly find opportunities for growth in emerging markets can give you confidence that no opportunities have been overlooked.

"Value chains will likely continue to move eastward, and their control points will increasingly become local in these countries."

It will also help you be prepared for discussions within your own organization with business units that are ready and waiting to argue why their current region-focused investment plan is the right one.

With Priorities Set, What Is Next?

We acknowledge that this methodology delivers the starting point to capturing additional growth opportunities and not the complete strategy. But it gives the right focus for defining the next steps, including building a commercial and supply chain model for the opportunities. Companies may also answer questions like what are the right channels, or where can additional demand be found in the global network?

By examining these questions, companies can reap additional benefits besides prioritization. For example, they may learn more about when a group of emerging countries could be served from one hub, or how synergy with an existing partner could lead to a local joint venture.

A robust model also gives an initial idea of the size of the opportunity. We have seen that this focused starting point, together with having a target to reach, helps get the growth strategy onto the management agenda.

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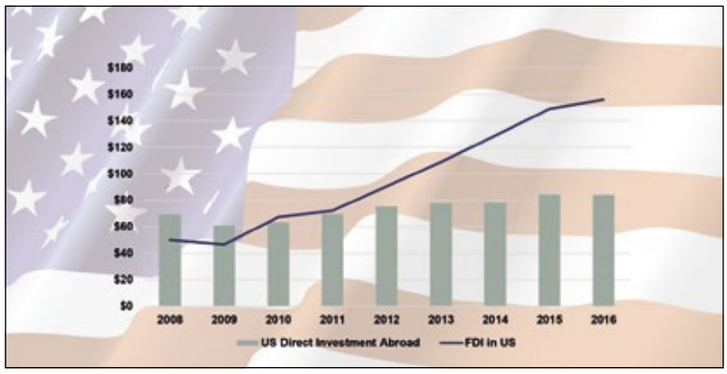
Foreign Direct Investment Confidence Index

A.T. Kearney's 2018 Foreign Direct Investment (FDI) Confidence Index illustrates three trends: Trend 1: The United States has topped the list of FDI recipients for six years and many European countries continue to attract significant investment. Executives are clearly focused on established markets, and companies must continue to consider where their competitors and customers are. Trend 2: Companies need more localization due to the increasing complexities of delivering customer-centric solutions locally, with a global supply and delivery network. At the same time, 80% of investors expect FDI to impact their profitability and competitiveness substantially. Trend 3: We see only four emerging economies in the list of top 25 FDI destinations: China, India, Mexico and Brazil. This is fewer than ever before in the index. The data shows limited action of companies to expand their local activities in many attractive markets. Nonetheless, 44% of respondents reported they are seeking to increase their investments in emerging markets.

USA: A Major Destination for Chemical Investment

The US is the second largest chemical producing nation, after China, and the nation's chemical industry is expected to continue to grow substantially over the next decade as abundant energy resources in the United States have tilted the competitive advantage in many types of chemical production toward producers in the U.S.

A world leader with $526 billion in chemicals shipments, the industry is making huge investments to capitalize on its advantages. Nearly $200 billion of investments in new shale-advantaged capacity have been announced since 2010, with half of that investment either already completed or under construction, according to the 2018 Elements of the Business of Chemistry report published by the American Chemistry Council (ACC). As the US has become a major destination for chemical investment, two-thirds of the announced investment represents foreign direct investment.



US Foreign Direct Investment Statistic 2008-2016 (billion $).

Foreign direct investment (FDI) is the funnel through which exports flow. In conjunction with growing exports, since the early 1980s, the US chemical industry has become increasingly global in scope, with growing US investment abroad and increasing foreign investments in the United States.

American companies have long established a presence in overseas markets, with many "going global" in the 1950s and 1960s. This presence has continued. Western Europe accounts for more than half of the overseas investment by American companies. Canada, Brazil, China, Australia, Singapore, and Thailand are other large destinations for American investment. Because investment positions are measured by book value, investments made by foreign companies in the United States tend to be more recent, and as a result, the position is higher than US investment overseas. In terms of replacement value, however, US investment overseas is higher. As its competitiveness improves, the US chemical sector is in demand across the world with exports of nearly $130 billion. In fact, the industry produces a large and growing trade surplus, reaching close to $33 billion in 2017. These positive contributions to trade contribute to the broader US economy. "Our continued economic growth and job creation is heavily dependent as access to global markets. Free trade and open markets are essential to maintaining our pro-growth, pro-competitiveness agenda", states Cal Dooley, the ACC's President and CEO. (mr)

Driving Innovation with Petrochemicals

Europe´s Chemical Industry Has a Secure Raw Material Basis

Petrochemicals make things happen. This is not only the tagline of the European petrochemical producers' association Petrochemicals Europe, this is a fact: 95% of all manufactured goods such as electronics, furniture, appliances, textiles and many more are based on petrochemicals. With 300,000 people directly employed in highly qualified jobs and in total 1.2 million along the entire chemical value chain as well as an average annual contribution of €155 billion to the overall European GDP, petrochemicals represent an important economic factor.

Additionally, they are also an enabler industry for many sustainable solutions such as insulation material to save energy, durable and resistant composites for light-weight smartphones and tablet PCs, sophisticated fuel additives to save emissions from transportation, or renewable energy devices like windmill blades and solar panels for a low-carbon economy.

Smart Solutions for Big Tasks

In the future these benefits will be needed even more than in the past to meet the upcoming societal mega challenges. In 2050, more than 9 billion people will live on earth. With no major changes, mankind will need the resources of 3 planets to meet the demands of this growing population in terms of clean water, food, energy, housing, mobility and communication. The answer lies in smart solutions — another aspect underlining the crucial role of petrochemicals in driving innovation projects in close cooperation with their downstream value chain partners, universities and research laboratories.

From that perspective it seems only logical for chemical markets to grow steadily, and in fact, the global market volume is expected to increase by 3–4% each year to roundabout €6.3 trillion by 2030 from the 2013 level of roughly €3.2 trillion. Unfortunately, most of this growth will take place outside of Europe, with China alone being forecasted to account for 44% of the chemical markets by 2030. In contrast, the EU share is likely to further decline from 17% in 2013 to 12% by 2030 due to mature markets and an ageing population.

Petrochemicals in the EU

In the current structure of Europe´s chemical industry petrochemicals contribute approximately 27% of the total EU sales and are, hence, a very important industry segment. Since at the same time they mark the starting point of almost all chemical value chains, they also provide a secure raw material basis to all the subsequent segments such as specialties, fine chemicals or polymers, the more so as the majority of chemical plants in Europe is backwards integrated.

In this context it should be noted that currently Europe´s chemical industry requires 80 million t of feedstock each year, 75% of which originate from refined (= fossil) sources; renewables make up for 10%. This is a dimension which makes it extremely challenging to be substituted by renewables or bio-based raw materials without running into a competition for arable land for food, which is urgently needed to feed a strongly growing population on earth.

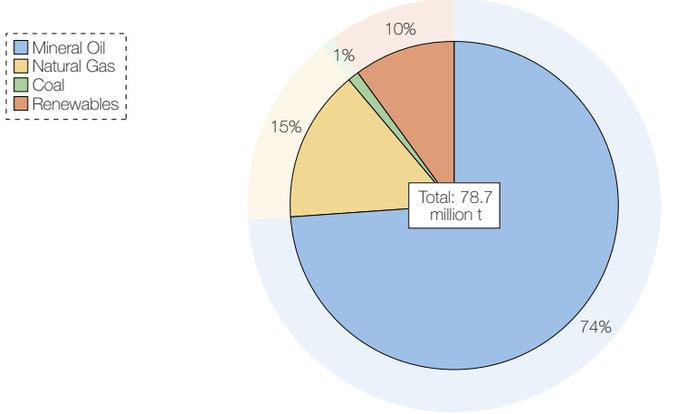
Moreover, the competitive advantage in Europe lies in a high level of integration and a tailor-made infrastructure, e.g. zero-emission pipeline systems to transport raw materials; both aspects are very closely linked to the current raw material basis. The pre-requisites for changing the existing system are big technological breakthroughs, which are not yet at the horizon despite ongoing research, and huge investments in new infrastructure, which will come at a certain societal cost.

Dorothee Arns, CEFIC

Bio-based = Sustainable?

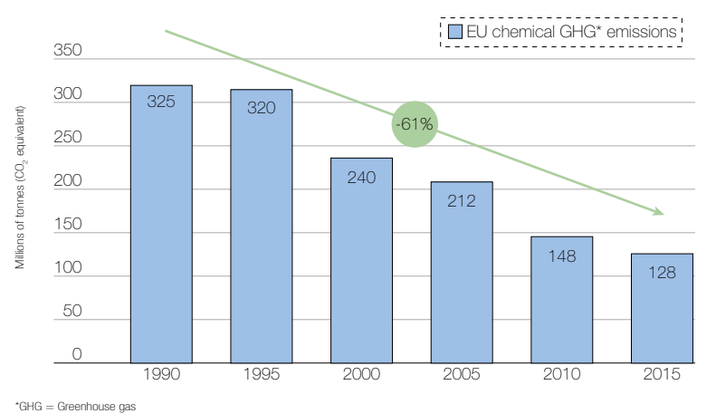
Another aspect to consider when comparing these two raw material options is, that "bio-based/renewable" is not necessarily always synonymous to sustainable and "oil-based/fossil" by default automatically unsustainable — in contrast to what public discussions usually suggest these days. Full-life-cycle analysis results have shown that products and processes can well be beneficial in one specific environmental aspect (e.g. greenhouse gas emission reductions), but at the same time be suboptimal in other environmental aspects, e.g. energy-efficiency or water use. This is one of the reasons why the issue is so complex and a one-size-fits-all solution rather unlikely.

Raw materials used in the European chemical Industry (2015) — Fig. 1



Source: VCI, CEFIC © CHEManager

Total greenhouse gas emissions of the EU chemical industry (1990 – 2015) — Fig. 2



Source: European Environment Agency (EEA), CEFIC Facts & Figures © CHEManager

To bring the previously mentioned deliberations to a conclusion: from today´s point of view it seems rather likely that oil and gas will continue entering the value chains of the chemical industry for the foreseeable future. At the same time the current raw material basis might well further diversify with renewables/bio-based feedstock and some other alternatives finding their way into more specialty chemicals' applications or new materials.

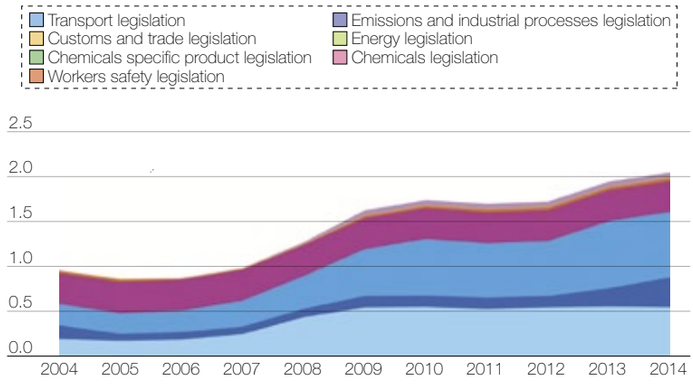
Environmental Responsibility

It should be stressed that petrochemical producers in Europe take their environmental responsibility very seriously, which implies working on further reducing GHG emissions wherever possible and enhancing circularity wherever feasible. The track record of the past 3 decades shows that Europe´s (petro-) chemical industry has substantially improved its own environmental profile: from 1990 to 2015 — a period which saw an 85% increase in production — it succeeded to reduce its GHG emissions and its energy consumption by roundabout 60% respectively, while at the same time providing the products enabling its downstream users to significantly reduce their own environmental footprint. As regards the latter, several independent studies have showcased that, e.g. for every unit of greenhouse gases emitted directly and indirectly by the chemical industry, more than two units of emission savings are enabled via products and technologies provided to other industry and consumers.

New EU Petrochemical Projects

Based on the above-mentioned aspects it is evident that European producers have a significant role to play also in the future. After many years, in which new investments in petrochemicals went almost exclusively to other regions — above all to the US and the Middle East — the recent announcements of new European projects came as good news for Europe. Most of the petrochemical projects announced address company-specific balance adjustments within specific integrated value-chains and are actually linked to non-crude raw materials (ethane, propane). However, they certainly also reflect to a certain extent that with the lower oil price from 2014 onwards the overall conditions for petrochemical producers in Europe have been easing up; especially the oil/gas ration has improved, and margins opened up for European cracker operators. Additionally, the demand has increased, based on renewed growth in the region.

Legislation cost in the EU during the period 2004–2014 — Fig. 3



Source: EU Commissions Report, "Cumulative Cost Assessment (CCA) for the Chemical Industry" (11 July 2016) © CHEManager

Overcoming Structural Challenges

Some structural challenges have, nevertheless, remained for European petrochemical producers, especially European energy prices, which are still amongst the highest in the world, and the regulatory burden. When referring to the latter, it is not about lowering environmental standards or eliminating regulation; all European producers are fully committed to comply with the legislation. The question is only whether the same targets could be reached in a more cost-efficient way so that European producers can compete successfully on the world markets. At the same time, it should be acknowledged that the current European Commission has raised several initiatives to tackle both issues. These are promising first steps, which are hopefully followed up further in the near future to maintain Europe´s traditionally strong industrial backbone, fully recognizing that it is very complex and quite a long journey to find optimal solutions which all EU member countries can fully support.

To balance off the above-mentioned disadvantages European producers can fortunately benefit from a series of strengths: apart from the high level of integration, a good infrastructure, strategic restructuring measures to flexibly respond to ever-changing global market conditions — which were already mentioned beforehand — it has also a skilled, motivated workforce, large domestic markets with strong customer industry clusters nearby, and increased feedstock flexibility.

Additionally, a huge part of Europe's cracker output is based on olefins other than ethylene, such as propylene, benzene and C4 streams, which is an essential element of Europe's broad chemical diversification. This wider portfolio range, together with the traditionally strong innovation efforts, are good prerequisites to generate new growth clusters and to solve the upcoming societal mega challenges, like energy-efficient uses or new materials.

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Cautious Welcome for Brexit Deal

Draft Brexit Withdrawal Agreement Bolsters Hopes but many Uncertainties Still Lie Ahead

The UK chemical industry was quick to support a draft UK-European Union Brexit withdrawal agreement when it was published in mid-November. "We have given it a cautious welcome," said Steve Elliott, chief executive of the UK Chemical Industries Association (CIA). "The priorities we set out soon after the Brexit referendum over two years ago—frictionless trade with the EU, regulatory consistency and access to skills—are all covered in the deal."

The agreement was also welcomed by Marco Mensink, director general of the European Chemical Industry Council (CEFIC). But he stressed that it was only a divorce arrangement, which opened the way to negotiations on a post-Brexit EU-UK free trade agreement (FTA). CEFIC and the CIA both wanted this FTA to disrupt EU-UK current chemicals trade as little as possible. He and Elliott were both speaking at a London conference on Brexit, arranged by the CIA months ago, which took place a day after the text of the deal was released by the European Commission.

Even though the chemical industry was relieved to see an agreed document at last on the table after almost a year and half of negotiations, there were still plenty of uncertainties about the future of the deal. UK Prime Minister Theresa May was soon faced with ministerial resignations and the prospect of a no-confidence motion by unhappy Brexit supporters among Members of Parliament (MPs) of her ruling Conservative Party.

Then it has to be approved by the governments of the remaining 27 EU member states before being subject to a vote by both the UK and European Parliament. If it got past all those hurdles, the UK would formally leave the EU on the scheduled date of Mar. 29, 2019, to enter a transition period lasting until the end of 2020 during which an EU-UK FTA would be negotiated.

Possible Outcomes

The withdrawal agreement allows for the transition period to be extended, particularly to try to ensure there is a deal on the status of the only land border between the UK and the EU — that between Northern Ireland in the UK and Ireland, an EU member. But there are two other possible outcomes — no deal at all or a second referendum on Brexit which, according to recent polls, would result in a vote to stay in the EU. Another referendum is strongly opposed by the UK government and, up to mid-November at least, did not have majority backing in the UK Parliament.

> *"It seems that the real option is between the deal now on the table and no deal, which would be disastrous for the UK economy,"*
>
> Tom Crotty, CIA president and group director of Ineos

The UK chemicals industry has been becoming increasingly alarmed about the prospect of a no-deal, which could result from a vote in the UK parliament against the draft withdrawal agreement. "It seems that the real option is between the deal now on the table and no deal which would be disastrous for the UK economy," Tom Crotty, CIA president and group director of Ineos, told the meeting.

He urged the industry to be more outspoken about the dangers of a no deal. "The industry needs to stand up and voice its views about the way the politicians are not taking into account the needs of the whole country," said Crotty who is also chair of the Manufacturing Council of the Confederation of British Industry (CBI), the main UK employers group. No deal would mean that the country would crash out of the EU after 45 years of membership without any agreement, especially on a future trading relationship between the EU and the 27 EU member states.

An electronic poll of 150 attendees at the conference, representing a cross-section of the industry, showed

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that after Brexit 46% wanted free trade with the EU and 36% regulatory "consistency" or an UK-EU alignment in regulations similar to that present. This vote was not surprising since currently 60% of the country's chemicals exports go to the rest of the EU and 75% of imports come from EU countries. "We are the UK's biggest exports earner (in goods)," said Crotty.

Complex Supply Chains

A lot of chemicals go in and out of the country within complex supply chains in which substances cross borders several times before the final production step. An industry objective in the negotiations on the EU-UK trade agreement, backed by the CEFIC and the CIA, is that a trading deal should not, as far as possible, undermine these supply chains. CIA and CEFIC aim to continue to maintain a united approach to the trade negotiations, if they take place. "We have very good co-ordination with CEFIC," said Tom Crotty. "You could not get a cigarette paper between us."

CEFIC is, for example, backing the CIA's demand for post-Brexit associate membership of the Helsinki-based European Chemicals Agency (ECHA), which is responsible for the administration of the REACh legislation. Associate membership, which is also an aim of the UK government, would allow the country to continue to participate in the agency's activities and, more significantly, might gain access to ECHA's database of information from the safety dossiers of each chemical registered with the agency.

Access to the database is seen as crucial to the ability of the UK in maintaining frictionless EU trade in chemicals and their downstream products. Without the data, UK companies would have difficulties avoiding duplicate registrations of their products with ECHA and a UK equivalent body, while the UK authorities would have problems assessing the risks of hazardous substances being imported into the country from the EU. The UK government wants a post-Brexit EU-UK system of single registrations with ECHA to avoid the costly necessity for duplications, Susannah Storey, director-general of the UK Department for Exiting the European Union (DExEU), told the conference.

> *"In the EU legislation governing ECHA there is no such thing as associate membership."*
>
> Marco Mensink,
> director general, CEFIC

Data Ownership Issues

A UK parliament report on post-Brexit chemical regulation, issued on Nov. 7 (2018) and cited at the conference, pointed out that the REACh legislation limited the use of registration data to ECHA activities. A UK government plan to "copy and paste" all ECHA registration data for use by an equivalent UK REACh agency "is not credible and raises serious legal concerns, including over copyright and data protection", said the report published by the EU committee of the House of Lords.

REACh registration data is owned by the chemical producers and not the agency so that the only recourse for the UK could be a data access deal covering all the REACh registrants, said a legal expert at the meeting. From the industry's viewpoint, data access is a key issue to be sorted out during the transition period negotiations. "At the end of the transition period the United Kingdom shall cease to be entitled to access any network, any information system and any database established on the basis of Union law (unless otherwise agreed)," says the draft withdrawal agreement.

There are even doubts about a deal on associate membership of ECHA which might open up the agency's database to the UK. "At the moment we are far from there (an associate membership agreement)," said Mensink. "In the EU legislation governing ECHA there is no such thing as associate membership."

Currently the UK chemicals industry is performing well with good short-term prospects. "The latest business survey showed 86% of CIA members report sales maintaining current levels or increasing," said Elliott. "Looking to the future, 61% of companies see expanding export markets as key opportunities for their business in the next 12 months."

New Strategy

Total investment by the industry will be £4.3 billion this year — at around the annual average for the last few years. According to the results of the poll of conference attendees, 52% revealed that the Brexit turmoil was having no effect on their capital expenditure but much of the rest were holding back on investment decisions until there was more certainty.

In the longer term, a new strategy by the UK Chemistry Council, a joint government-industry body, whose publication coincided with the conference, sets 2030 targets of a 50% increase in production, a 68% average rise in turnover, exports and annual investment and a 35% increase in jobs. The strategy has three platforms of accelerating innovation, particularly in digitalisation, new supply chains and growth in the regions and in infrastructure.

"We are well placed in having four chemicals clusters — in Scotland, and the North West, North East and Yorkshire and Humberside areas in England — which we can use to get our innovation projects off the ground," Steve Foots, chief executive of Croda International and joint chairman of the Chemistry Council, told the meeting. But a lot will depend on whether there is a smooth Brexit which assures the UK of a continued close partnership with the EU.

Sean Milmo, CHEManager

Investment Location Germany Experiences Brexit Effect

A potential 'Brexit effect' has made itself apparent in Germany's 2017 foreign direct investment (FDI) figures, with the number of UK investment projects jumping by 21%, according to the economic development agency of the Federal Republic of Germany, Germany Trade & Invest (GTAI). Currently, the large share of these projects involves service offices opening, but it will be interesting to see if production facilities are subsequently set up. Also notable: the UK was the largest source of merger, acquisition & shareholding investment.

"We are convinced that this increase in British FDI activity is a direct consequence of the Brexit decision," said Thomas Bozoyan, Manager of Research at GTAI. "It's a part of a larger trend, which has seen British FDI across Europe increase by 33%. Financial services and ICT are the main recipient industries of the investments, but the shareholding acquisition of British companies and investors in German companies has also increased sharply, which adds to the impression that this is a strategy to deal with Brexit."

Germany Accounts for 18% of all British FDI in Europe

Germany is, with 18% of all British FDI in Europe, the most popular investment destination. Altogether, Germany's federal states registered 1,910 settlement projects (greenfields, expansions, relocations, not M&A) in 2017. A further 1,925 investments were made in Germany by means of mergers, acquisitions & shareholdings.

US Investments Top the List

The most important investor zone in Germany remains the EU, from whose member states 41% of all investment projects originate. Almost every fourth project comes from Asia. The country setting up the most greenfield and expansion projects in Germany in 2017 were the United States with 276 projects. China registered 218, Switzerland 204, the UK 152, the Netherlands 124 and France 95 projects.

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Sales and Marketing Followed by Production and R&D

The most popular activity remains the opening of sales and marketing offices (39%). 19% of the companies use Germany as a production or R&D location, while process services account for 18% of all investment projects. As in years past, corporate and financial services are the main sectors for investment. They represent about 20% of all new projects, ahead of ICT & software with 16% and consumer goods industry at 10%. (mr)

Start-ups Accelerate Innovation

An Overview of the European Chemical Start-up Scene

Virtually all areas of our lives would be inconceivable without products that come directly or indirectly in contact with chemical production: It affects the modern office environment, our private lives and thus our well-being and life fulfillment including health, leisure and personal protection.

According to James Clark, professor at the University of York speaking at the Green & Sustainable Chemistry Congress, around 97% of the products around us derive from chemical production or contain at least one chemical process step in their manufacture.

Sustainable Development Goals as Innovation Driver

To create more sustainable products and services as well as to establish a circular economy we need innovative solutions. The UN has defined 17 Sustainable Development Goals (SDG). The associated goals will need new chemical solutions to become reality. For example, the goals related to affordable and clean Energy or responsible production and consumption. The road leads to higher efficiency, increased sustainability and more environmentally friendly products with more efficient production methods. The associated goals can only be achieved in an interchange across regional, cultural, systemic and cross-disciplinary boundaries in shared cooperation.

Market Push Drives Innovation

Chemistry has to be innovative to meet the ambitious goals of its customers. Ikea, one of the world's leading furniture retailers from Sweden, has an ongoing project to eliminate virgin fossil-based raw materials in its plastic products. The goal is to use only plastic products from renewables or recycled materials by 2030. The same goes for Lego, a big Danish toy manufacturer, which has started to use sugar cane for its world-famous bricks. Both examples show that chemistry has to continuously innovate. The value chains in chemical production will change dramatically over the next decades.

All About Start-ups

Nowadays talking about innovation means talking about start-ups. This applies generally, but now also in chemistry. Start-ups are flexible, can act faster and — this is maybe the most important aspect — they can think out of the box on a daily basis. They can develop visionary projects, away from the constraints of stock market prices.

Markus Steilemann, CEO at Covestro, also knows: „We need start-ups. No company today has the potential to solve everything alone."

Many large chemical companies also run so-called corporate venture units to finance start-ups. Nevertheless, a vibrant and broad venture capital scene is yet to develop. The business models of chemical start-ups do not always fit into the portfolio thinking of investors. One reason might be a service-based business model which limits the investor's opportunities to sell its shares. Another reason might be the high capital expenditures for plants. For sure not every start-up will make it at the end, there will be an economically driven attrition rate. However, to deliver the best chances vibrant marketplaces are needed where the community can learn together and build up trust, to increase the probability of meeting the right people with the right problem at the right point of time. Meeting points can be events of SusChem, the European Technology Plat-

Tobias Kirchhoff, BCNP Consultants

Holger Bengs, BCNP Consultants

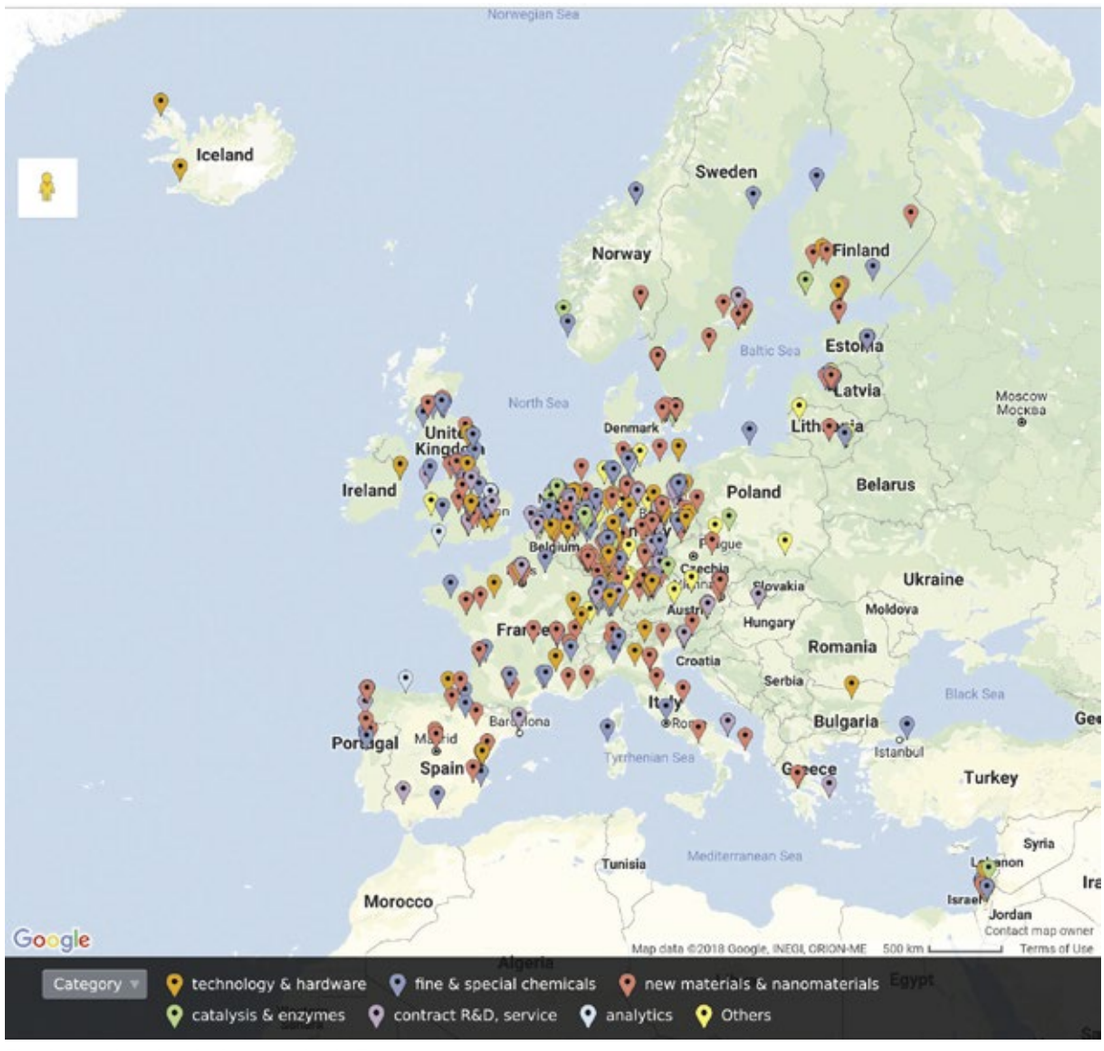

Fig.: Innovative chemical companies in Europe

form for Sustainable Chemistry, and of International Sustainable Chemistry Collaborative Center (ISC3), an international institution that promotes and develops sustainable chemistry solutions worldwide, or of course, the European Chemistry Partnering.

High Founding Figures since 2007

The increasing significance of start-ups for the chemical industry is also reflected in the trend towards higher start-up figures. Since 2013 BCNP Consultants has continuously researched the situation of innovative chemical start-ups and start-ups that influence the chemical value chain in Europe. Influencing the chemical value chain is not just about classical chemistry, but it is also about an enzyme producer helping to avoid heating and refluxing or a digital start-up helping to extract the better processing parameters out of the data available. Statistics show that since 1990 there were two growth steps. The first step was starting in 1997 when the yearly number of foundations raised from single-digit to double-digit numbers. Beginning with 2007 the yearly number of foundations increased again from around 15 to over 20 to 30 foundations a year. In the last years the statistic shows a decrease in the number of foundations. At least for the years 2017 and 2018 this will probably change because of companies that are still under radar or not founded yet (n.f.y.).

New Materials as Main Application

Thematically, chemical start-ups concentrate in particular on three fields of application. Most chemistry start-ups develop new or nanomaterials. This group accounts for almost a third (32%) of the start-ups. About a quarter (26%) of the start-ups produce fine and specialty chemicals. Following in third place are start-ups developing new technologies and hardware (21%). About a tenth of all start-ups focus on research R&D and services. Niche applications for chemical start-ups include analytics (4%) and catalysis and enzymes (4%). A relatively new field for chemistry start-ups relates to digitization issues. Meanwhile, these application accounts for 3% of foundations. The trend is clearly rising.

Big Economies are Ahead — Still?

The study on which the data is based initially focused on Germany. Therefore, most of the companies included in the database of Europe's Compass to innovative chemical companies are German based. Since initiation the expansion of the database is an accompanying project. More and more non-German based start-ups have been added. But the research is certainly not exhausted. Non-existent English-language homepages complicate the assessment even if foreign companies fit the innovation criteria. Therefore, the number of start-ups outside Germany is not that high yet.

Excluding Germany, especially Great Britain and France have start-ups along the chemical value chain. In addition to the hub of London and the elite universities of Oxford and Cambridge, Great Britain scores with Scottish companies. Relatively smaller countries are in the following places: Netherlands and Switzerland. While Switzerland has generally presented itself as a strong research nation, the Netherlands focusses its innovation on the bio-economy. The Universities of Delft and Groningen are two universities with high spin-off numbers resulting in chemical incubators such as the Brightlands Innovation Factory which help to make start-ups successful in the long term.

> *„We need start-ups. No company today has the potential to solve everything alone."*
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> Markus Steilemann, CEO, Covestro

Promotion is an International Question

The promotion of sustainable and green chemistry is becoming a top priority. While general Start-up promotion usually takes place at the country level, in the chemical industry where global value chains are crucial, international promotion instruments are developing.

SusChem was launched in 2004 as a European Commission supported initiative to revitalize and inspire European chemistry and industrial biotechnology research, development and innovation in a sustainable way. The European Investment Bank (EIB) is going to launch a European investment fund for the bio-based and circular economy, especially for investments in demonstration and industrial plants. The EIB will make up to €250 million available to chemical and biotech start-ups to scale up their technologies. At the same time, start-ups worldwide can benefit from the services of the ISC3 in Bonn and their international network with and for start-ups developing business models in the field of sustainable chemistry. In addition, international events such as the European Chemistry Partnering, the unique speed dating for the chemical industry, which brings together chemical start-ups with industry representatives and investors, are establishing themselves.

Problem: Price Competitiveness and Capital

Many good ideas find their way from the research institutes into start-ups. But the big breakthrough is missing. Price competitiveness with fossil-based products is mostly challenging. Large-scale plants, which generate economies of scale and therefore would increase price competitiveness, are expensive. The EIB fund already goes in the right direction as a catalyst for more private investment in large-scale plants. More initiatives like this are needed.

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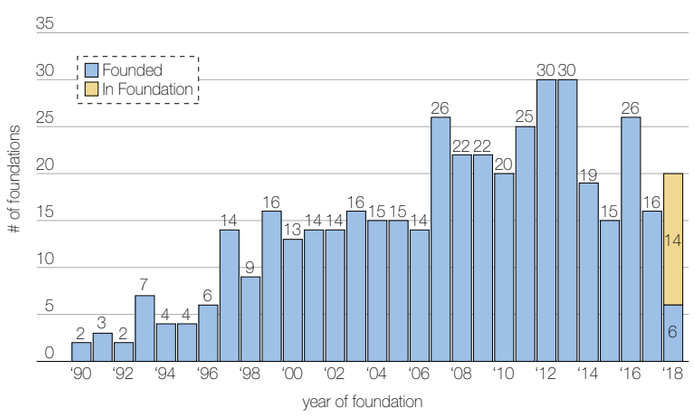
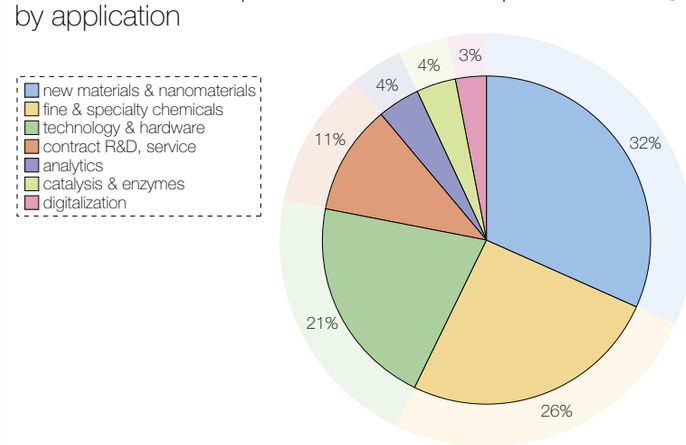
Foundations of innovative companies of the chemical value chain by founding year — Fig. 1



Source: BCMP Consultants © CHEManager

Distribution of European chemical start-ups by application — Fig. 2



Source: www.chemistry-compass.eu © CHEManager

Opportunities for Western CDMOs in China

Siegfried's View on the Evolution of the Chinese Pharmaceutical Environment

As part of its journey toward being a full-fledged advanced economy, the role and presence of China within the pharmaceutical industry has rapidly evolved throughout the recent years driven by targeted and developing policies. Over the last few decades, thanks to its investment-led model and leveraging its record-breaking urbanization and industrialization rate, China has risen to a leading position as a manufacturer in all major industries, including pharma.

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However, some of the key growth drivers behind it are now slowing down as urbanization rate decreases and labor rates increase. Recent data show that the model is running out of steam as capital productivity and corporate returns are falling, while low cost competition is increasing.

To address this, China now needs to move beyond being the world's greatest source of low-cost manufacturing capacity and "climb up" to a higher added value tier by focusing more on R&D/innovation on one end and sales/service on the other.

Such context has contributed to generating new government initiatives as China Manufacturing 2025, aimed at steering the economy towards the new targets through policies specifically looking at emerging and innovative industries such as bio/pharma.

This may in our view provide opportunities (along with challenges) within our industry and in particular for CDMOs.

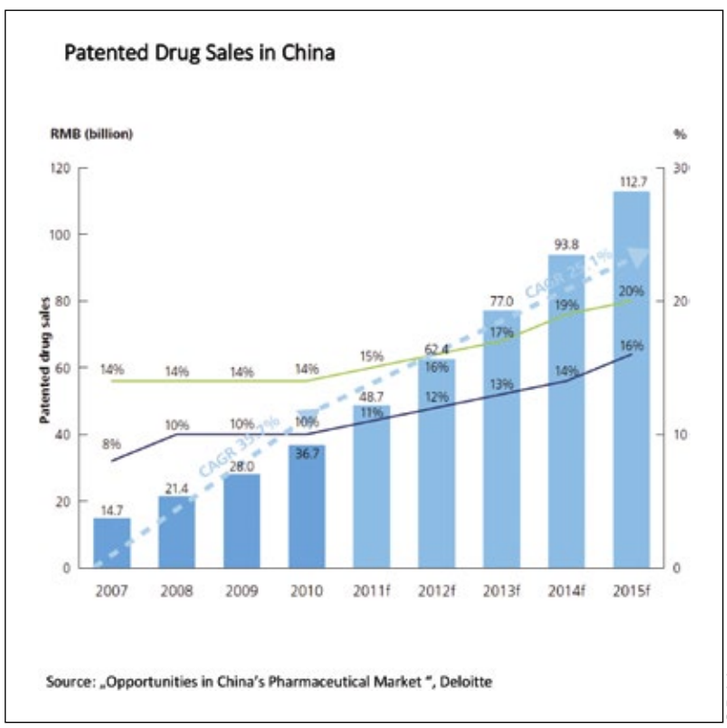

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Fig. 1: Patented Drug Sales in China

Growth-Driving Policies

Within the Chinese pharma environment, over the last three decades, one of the key growth-driving policies has been the Healthcare Reform led by the China Food and Drug Administration (CFDA), which has increasingly looked to international models to best organize its processes and institutions, until June 2017, when it officially joined the International Council for Harmonization of Technical Requirements for Pharmaceuticals for Human Use (ICH).

An important step in this path towards adopting "western models" in healthcare management has been China's establishment of a pilot marketing authorization holder (MAH) system.

Luca Parlanti, Siegfried

The internationally available drug licensing system can be divided into two categories: the first category separates drug market licensing and production license management, which can be observed in the European and North American pharmaceutical systems. The second category, which is used in China, is a merger of the two different licenses into one.

Since November 2015, ten Chinese provinces joined a 3-year marketing authorization holder (MAH) system pilot program ending by the end of 2018. The concept is quite similar to pre-existing systems in the rest of the world and provides to Chinese pharmaceutical research and development institutes, as well as individuals, the option to apply for a drug product license independent from the manufacturing license. Recently, the Chinese authorities have expanded the program's scope to include international applicants and license holders.

China's Pharma Market

Fueled by the above reform initiative the Chinese pharma market has undergone a sharp growth over the last decade with a CAGR of 25.9% between 2007 and 2010 and of 15.5% thereafter to an estimated value of $107 billion by 2016.

An increasing share of the market has been taken by patented drugs, growing from an 8% in 2007 to a 16% share in 2016, encouraging data indicating that in the future novel branded therapies will gain further market presence. These trends combined with Chinese consumers' traditional confidence in "Western Products" will likely help foreign pharma access to the local market. If, in addition, improved IP protection will actually be perceived by international innovators, then we could expect an increasing draw for global Pharma and its innovative products.

In fact, some of the top 20 global pharmaceutical companies have already expanded their R&D footprint in China (e.g. Pfizer, GSK, Novo Nordisk and BMS) also motivated by the requirement of carrying out domestic clinical trials in order to obtain regulatory/marketing approvals (although multi-regional clinical trial data are accepted to support market entry with certain conditions for preferential approval and examination for rare diseases).

Along with all these supporting policies, the government has on the other end recently implemented a number of enforcing initiatives aimed at aligning the industries to the nation's new standards and expectations. In particular, in the last 2 years the Chinese authorities have renewed their commitment to addressing the growing issue of air pollution through a campaign of strict enforcement of environmental regulations. As a result, since April 2017, approximately 149,000 plants nationwide across all industries were forced to shut-down, while temporary interruptions affected an estimated 40% of Chinese factories. The pharmaceutical industry was not immune to this wave with thousands of manufacturing sites affected and consequent supply chain disruptions worldwide, which are continuing to these days.

Siegfried's Site in China

Since the very first steps of its growth strategy and driven by the intent of becoming a fully integrated CDMO on a global level, Siegfried's vision has been to consider this evolution of the Chinese pharmaceutical environment as an attractive opportunity for horizontal and vertical integration of its value proposition. Through the establishment of our site in Nantong in 2012, Siegfried completed the build-up of its global manufacturing network with a site offering complementary benefits and significant synergies vs. the pre-existing facilities in Europe and North America. Located in a state-of-the-art industrial park (NETDA) and easily accessible from Shanghai or the nearby YangZi river port, the Nantong facility offers not only the typical lower cost back integration option for manufacturing intermediates, but also a lifecycle management opportunity for our client's API as well as an option for Chinese market entry. In line with the observed

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Swiss Drug Contract Manufacturer

Siegfried is a global fully integrated CDMO providing API and drug product development and manufacturing to the pharmaceutical industry. With its 145 years history and 750 million CHF revenue (as of 2017) the company offers industry leading reliability and a proven track record in pharmaceutical manufacturing. Its network includes 9 sites located in the US, Europe and China, presenting diverse and customized options to each client. The headquarters are established in Zofingen, Switzerland.

evolution of the Chinese economy, we designed the site to be a full-fledged GMP API manufacturing plant in line with the most current western standards, from an engineering, regulatory and environmental standpoint, ready to operate in full compliance with the higher standards and more restrictive regulations of nowadays China. Examples of such context and vision are the establishment in Nantong of our own waste water treatment and solvent recovery facilities, allowing us to minimize the discharge to the shared industrial park system.

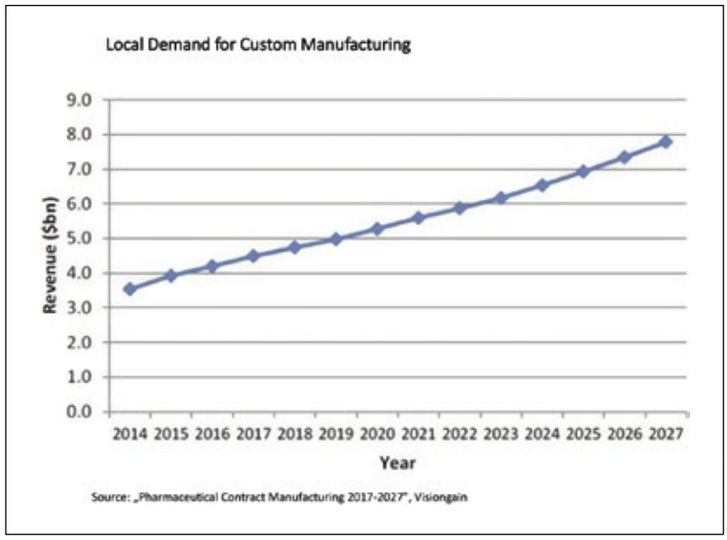

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Fig. 2: Local Demand for Custom Manufacturing in China.

From the early days of our presence in China, our view has been to position ourselves within the world's fastest growing economy (and pharma market) and to contribute to its development by bringing, together with our clients, high value added and innovative products, rather than just leveraging the low cost opportunity, which is not surprisingly showing to be a very transient benefit given the rapid economic development and the consequent rise of the living standards.

In that sense we have built local R&D and pilot capabilities to support introduction of new projects and process development/optimization.

Figure 2 shows how the domestic demand for custom manufacturing has developed over the course of the last years and, more importantly, how it is expected to grow in the future. Clearly, these figures make the case for a presence in China and represent an attractive opportunity for a CDMO with global reach like Siegfried

Outlook

In conclusion, although some significant challenges still remain with respect to actual approval timelines, changing regulatory requirements, price pressure, labor efficiency and IP protection (e.g. recent US Trade Representative (USTR) complaint at WTO on Chinese patent regulations) we believe that the Chinese and global pharmaceutical industry will develop an increasing demand for local higher value services (e.g. manufacturing of innovative/patented drugs), while the higher standards enforcement is increasing Western CMOs competitiveness and attractiveness.

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References to this article are available from the author.

Praxair Expands in China, South Korea

Praxair, now part of the new Linde group, is to build, own and operate three new air separation units for Shanghai Huayi's new complex in Qinzhou, China, which will produce methanol, acetic acid and other chemicals to meet the country's growing demand.

The plants, in which Praxair expects to invest its largest sum in China so far, will supply up to 7,500 t/d of oxygen and 5,000 t/d of nitrogen. Start-up is scheduled for the second half of 2020.

"This new project will further demonstrate our strengths in supporting major chemical industry projects and allows us to build density in south China — a region positioned for future growth," said Praxair China's president, Will Li.

Shanghai Huayi already has a strong presence in the eastern part of the country and the Qinzhou complex will extend its footprint into the south.

Praxair operates a joint venture with French partner Air Liquide, the Shanghai Chemical Industry Park Industrial Gases Company (SCIPIG), that in 2015 invested in the construction of a new 900 t/d air separation unit and an integrated liquefier at the Chinese chemical site.

Separately, Praxair will build a fifth plant in Hwaseong, South Korea, to supply ultra-high purity nitrogen to Samsung's semiconductor facility. The facility is due to start up in late 2019. Praxair will also install multiple purifiers and a new pipeline system to support the project.

BS Sung, president of Praxair Korea, said the project increases its presence in the region and positions it for future expansion.

In April this year, Praxair announced two other long-term agreements with Samsung affiliates in South Korea. One was to supply a semiconductor plant in Pyeongtaek with ultra high-purity industrial gases and the other was to supply nitrogen to a multi-layer ceramic capacitors plant in Busan.

Under the deals, Praxair will build, own and operate several new plants, which are due to go into operation in 2019. (eb, rk)

Sirio Pharma Opens Gummy Plant in China

Sirio Pharma, a global nutraceutical contract development and manufacturing organization (CDMO), has opened a gummy production plant at its new development and manufacturing facility in Ma'anshan, China, expanding output to 2.4 billion gummies annually.

The new facility is being built in several phases and will form a center of excellence covering an area of 240,000 m^3.

The recently completed first phase of the expansion comprises a 26,000 m^3 production space and adjunct building designed to accelerate development and manufacturing of gummy formulations for global customers.

With the plant extension, Sirio said it will have more capacity to make innovative products such as liquid filled, center-filled, swirled and multicolored gummies.

The company also produces standard gummy formulation options to be sold in the US and EU. Some of them have vegetarian options including carrageen and pectin, as well as sugar free and low-sugar options. Rui Yang, CSO of Sirio Pharma said the advantage of operating an integrated site is that it can develop much more custom tailored products while also expediting development timelines and market share for contract services. Management expects "exponential growth" for the gummy lines in 2019, and with the new capacity Yang said it can supply "even the largest of nutraceutical brands".

In the US and Europe, the company said it sees "significant growth potential" in gummy formulations, as they represent a more consumer friendly dosage form.

Founded in 1993, SIRIO regards itself as the leading global nutraceutical CDMO specialized in developing and manufacturing quality products including softgel, capsule, tablet, powder, gummy, oral liquid, probiotics and other dosage forms.

The company has multiple manufacturing sites in China, as well as plants in Europe and marketing teams in the US. (dw, rk)

4chiral: The Chemistry Cluster in Central Germany

Already in 2006, the cluster 4chiral was founded in Bitterfeld-Wolfen — a town in Central Germany's chemistry triangle. Starting with only seven locally established SMEs, today, this horizontal network comprises 30 companies and about 10 research partners of public institutes and universities. The common subject is "(bio)chemical synthesis" — or in other words: "To create value by transforming matter". The companies of 4chiral not only share the same activity fields, but — as independent, mainly staff-owned SMEs — also a comparable culture, flexibility and customer focused approach.

Together, nearly every request regarding the development of new syntheses or the manufacturing of fine chemicals can be addressed. These activities comprise everything from consulting, research, computational modelling to enzymes and GMP or ton scale production as the following compilation shows.

Abbreviations: GMP=GMP syntheses; cR&D=contract research & development; BIO=bio- and enzyme technology; PD=process development; C=consulting; PR=non-exclusive products

- Arevipharma: GMP, PR, g to tons
- c-LEcta: enzymes, BIO, PR, <50 kg
- Chiracon: GMP, PR, <50 kg
- ChiroBlock: cR&D, PD, C, mg-50 kg
- CreativeQuantum: quantum mechanics, computer simulations, C
- Emp Biotech: BIO, PR, bio-chromatography
- Enzymicals: BIO, PD, PR, enzymes
- EW-Biotech: BIO, PD, kg to tons
- FEW-Chemicals: dyes, PD, PR, g to tons
- Hapila: GMP, mg to <50 kg
- IBZ-Salzchemie: cR&D, C, PR, nano particles
- Laborchemie Apolda: GMP, PR, >50 kg to tons
- Merseburger Spezialchemikalien: organometalics, PD, PR, mg to >50 kg
- Miltitz-Aromatics: fragrances, PR, >50 kg to tons
- Minascent: GMP, PR, mg to tons
- Organica: PD, PR, >50 kg to tons
- Orgentis: PD, PR, mg to 100 kg
- Synthon Chemicals: PD, PR, g to <50 kg
- TGZ Bitterfeld-Wolfen: C, support, labs

One Belt, One Road

The Impact of China´s Belt and Road Initiative on the Chemical Industry

The Belt and Road Initiative (BRI), also called the One Belt, One Road policy (OBOR), is an initiative launched by the Chinese government in 2013. The core idea is to improve infrastructure, cooperation and trade between China and countries in Asia, Africa and Europe. This is to happen along two major corridors — one on land which essentially follows old silk trading routes (the "Belt"), and one across the sea following old Chinese maritime trading routes (the "Road", in a somewhat confusing term).

As with any such initiative, the first question to ask may be whether it is just a slogan or has some real relevance. So far, the massive investment of China into the BRI (about $150 billion per year over a five-year period) and the high emphasis placed on the initiative in China´s policy indicate that BRI is indeed an initiative with a substantial impact on the real world.

The massively increased rail links between China and Europe — with new connections started almost every month — point in the same direction. Train transportation is much cheaper than air freight and much faster than shipping, allowing more intensive long-distance cooperation.

Effects and Implications

Next, the question is what impact BRI may have for the chemical industry:

The initiative may shift patterns of chemical trade, increasing trade among those countries included in the infrastructure corridors. As a consequence, chemical companies based either in China or Eurasia may to some extent benefit from BRI.

Another differentiator will be whether companies are Chinese or foreign-owned. According to the Economist, 86% of BRI projects have Chinese contractors. So Chinese chemical companies are likely to benefit more than foreign ones.

Different chemical segments will be affected to a different extent. Segments such as basic commodity chemicals and chemicals required for construction are likely to benefit more from the BRI than specialty chemicals.

The initiative may lead to increased cooperation between petrochemical companies in China and in the Middle East. Involvement of Western chemical companies may be reduced as their traditional role as providers of knowledge and innovation matters less for commoditized petrochemicals.

BRI-related Projects

Several major Chinese chemical companies are already working on BRI-related projects, most of them in the area of petrochemicals and commodity plastics.

Kai Pflug, Management Consulting — Chemicals

"China's Belt and Road Initiative may shift patterns of chemical trade."

In 2017, Sinopec and SABIC agreed on studying joint projects in Saudi Arabia and China. Such a cooperation may include a joint venture with Chinese investment in Saudi

Arabia, strengthening cooperation within the area covered by the BRI.

PetroChina has indicated a similar preference for investment in areas covered by the BRI initiative. In March 2018, PetroChina chairman Wang Yilin stated „We will focus more on acquisition opportunities in nations covered by the initiative as part of our globalization strategy", and indeed PetroChina has just won a bid for 10% stakes in two projects off the coast of Abu Dhabi, an investment of more than $1 billion.

Sinochem also intends to leverage the BRI in its pursuit of internationalization. In a statement to the South China Morning Post, chairman Ning Gaoning stated that „In the future, we will stick to internationalization and strive to become a multinational company which is competitive in the world market, taking advantage of the Belt and Road Initiative". In fact, Sinochem claims a leading role in the BRI, stating on their website that the Sinochem rubber business makes the company the pioneer in the BRI of the central government.

Wanhua also started expansion towards Europe early, acquiring the Hungarian chemical company Borsod in 2011. The development of this plant is partly financed by a multimillion dollar credit line provided by China Development Bank, indicating government support. However, currently the company seems to focus its investment more on the US — with an MDI plant planned in Louisiana — than on the BRI area, indicating that internationalization in general may be the main motive, rather than a specific promotion of the BRI area.

ChemChina has pursued a policy of buying companies particularly in Europe, culminating in the massive acquisition of Syngenta. This indicates that while improving infrastructural ties with Asia are a major objective of the BRI, the final objective of the initiative may be to strengthen cooperation between China and Europe.

"The BRI may not be a very exciting business opportunity for foreign chemical companies."

However, ChemChina has also made investments in numerous other countries in the BRI area, e.g., in Vietnam, Israel, Bangladesh, Singapore, Saudi Arabia and Russia.

Impact on Chemical Production within China

The BRI may also lead to a shift of chemical production within China. At the 2018 Chinaplas, there was discussion of polymer resin production moving from eastern China to inland provinces. China´s largest plastics compounder Kingfa has announced plans to build a new plant in Chengdu, Sichuan while competitor China XD already has a plant in Nanchong, Sichuan. Both companies have invested in BRI areas outside of China, e.g., in Dubai (China XD) and in India (Kingfa).

Multinational chemical companies also see opportunities in projects related to the BRI.

BASF invested in a major MDI production plant in Chongqing, Sichuan. Admittedly, approval for this plant was already given in 2011, long before the BRI was announced. However, at that point the plant was aligned with another government policy, the "Go West" policy which promoted investment in China´s central and Western provinces. It is obvious that the BRI is both a continuation and an expansion of this earlier policy.

Dow is also anticipating a production shift towards inland China and has therefore built a new coatings plant in Chengdu. The company seems quite positive about the BRI initiative, as indicated by a statement of Jim McIlvenny, president of Dow Asia-Pacific (to China Daily): „Belt and Road is extremely exciting. It will open up new markets… And I think it will bring tremendous innovation, tremendous growth to the western part of China."

In pursuing BRI opportunities, Honeywell formed a dedicated team called "East to Rest" that manages sales and marketing to Chinese firms expanding abroad. Honeywell formed a partnership with a leading domestic chemical service provider, Wison Engineering. The aim of the JV is to particularly target customers in regions covered by the BRI initiative.

"Segments such as basic commodity and construction chemicals are likely to benefit more from the BRI than specialty chemicals."

Covestro sees great potential for its materials in the planned infrastructure projects, giving the example of working with Chinese companies on waterborne polyurethane coatings solutions for urban rail and freight trains. Covestro also benefits from the improved transportation links that are a part of the BRI. Using rail transportation and temperature-controlled containers, the company has managed to reduce the transportation time of their cold-sensitive materials from 2–3 months to 20 days.

This overview shows that indeed the BRI seems relevant for many chemical companies, though many of the projects described would have made economic sense in any case. However, it is certainly easier to execute such projects in the favorable political environment created by the BRI.

The Bottom Line

What can chemical companies with activities in China do to maximize the benefit derived from BRI? For local companies, ensuring good information on current projects covered by the initiative may be sufficient. Foreign companies may have to partner with local players for a meaningful participation in BRI projects as they are not likely to be the main contractors in major projects.

Overall, the BRI may not be a very exciting business opportunity for foreign chemical companies as the Chinese project leadership and the focus on infrastructure and construction projects limit the chances of multinationals. Still, the initiative indicates that China is supportive of global trade at a point in time when the US takes a step in a different direction.

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BASF and Sinopec to Build Second China Cracker

BASF and Sinopec have signed a Memorandum of Understanding (MoU) to expand their existing joint venture and build a second steam cracker in Nanjing, China.

The companies said the basic chemicals provided by the additional cracker, which will have an ethylene capacity of 1 million t/y, will enable them to expand capacity at BASF-YPC, their existing joint integrated "Verbund" site in Nanjing.

"This additional investment into a new steam cracker and the expansion of our BASF-YPC joint venture in Nanjing underline the strong partnership between Sinopec and BASF and the commitment to our customers in China," said BASF chairman Martin Brudermüller.

BASF-YPC's existing cracker at Nanjing has a capacity of 740,000 t/y ethylene with the site producing around 3 million t/y of chemicals and polymers for the Chinese market. The jv posted sales of around 21 billion yuan ($3 billion) in 2017

BASF and Sinopec are also exploring new business opportunities in battery materials due to the rising importance of alternative energy, especially in the automotive sector. (eb) ■

Encouraging Talent Flow into GCC Chemical Sector

The chemical industry makes up the second largest manufacturing sector in the Arabian Gulf region, producing over $108 billion worth of products per year with over 166,000 employees in the Gulf Cooperation Council (GCC). The chemical sector is poised for even more growth. To sustain this growth and meet the challenges of the future, the industry needs to develop the right human resources with new and more highly developed skills.

The Gulf Petrochemicals and Chemicals Association (GPCA) is taking a lead role in the development of local talent in the Arabian Gulf region in collaboration with its members. At the 13th Annual GPCA Forum in Dubai, GPCA hosted the 9th edition of Leaders of Tomorrow, an initiative that provides university students engaged in science, technology, engineering and mathematics (STEM) an opportunity to learn about the sector and encourage them to start a career in chemistry and allied industries.

According to a recent GPCA report, the number of science graduates, including chemistry graduates, reached more than 20,000 between 2007–2017, which accounts for 7% of all university graduates. (mr) ■

A New Way of Thinking

Integrated Pharma Manufacturing Group ACG Creates a Single New Identity

Founded as Associated Capsules Group in 1964 by brothers Ajit and Jasjit Singh, Mumbai, India-based ACG today delivers end-to-end manufacturing solutions for the pharmaceutical industry across continents. In five decades the company has expanded its global footprint to over 100 countries. Its scope has grown from empty hard capsule manufacturing to include equipment production, packaging, inspection, testing, research and development. In mid-October 2018, the integrated pharma manufacturing group announced the consolidation of its multiple businesses and regional brands into a single new ACG identity and its portfolio into four businesses: Capsules, Films & Foils, Engineering, and Inspection. CHEManager discussed this strategic move with the company's chief marketing officer, Peter Neve, who has been leading the brand identity overhaul project.

CHEManager: Mr. Neve, what initiated the ACG brand identity overhaul project, why did you think a new identity was needed?

Peter Neve: ACG had a large number of individual businesses, each with their own identity. We felt the time had come to create a new identity, which would consolidate and reflect the group's unified purpose throughout its diverse operations and entities. In doing this, we are also making it easier for the industry to understand the full range of products and services we provide.

Which considerations and requirements led to ACG's new structure? Was it a company-driven — inside-out — or a market-driven — outside-in — approach?

P. Neve: The new structure came out of a marketing exercise to simplify how we talk about our product range — based on both internal and customer inputs. We wanted to make it as easy as possible for customers, as well as potential customers, to understand our full product range. This is how we ended up segmenting into Capsules, Films & Foils, Engineering and Inspection divisions. Once we had done this, it didn't take long for the whole organization to align itself to this segmentation. We ran a number of internal marketing and communication campaigns and believe the rebrand has been well received.

ACG claims to be the only supplier in the world offering integrated manufacturing solutions for the pharmaceutical industry. How do you explain and justify this claim?

P. Neve: The majority of suppliers only supply into one or — at most — two of the four main segments which we operate in, so we are confident in making such a claim. We offer many integrated solutions: consumables and equipment for the entire capsules manufacturing value chain and the same for tablets. We can offer special incentives to customers buying a

"We are continuing to increase our global footprint."

Peter Neve,
chief marketing officer, ACG

combination of products from us. We have so many ways to help our customers get the most out of working with ACG. The huge range of skills and technologies already encompassed by the team offers endless opportunities for our business.

Could you briefly summarize the core competencies in terms of skills and technologies of the four businesses?

P. Neve: In our Capsules division we supply everything needed to fulfill a diverse range of capsule requirements. In Films & Foils we are covering all requirements for reliable pharma packaging solutions. The Engineering division provides everything needed to achieve superior manufacturing performance. And in the Inspection division ACG is covering all global pharma serialization and inspection demands.

Do you also see opportunities to leverage synergies arising from your newly consolidated structure?

P. Neve: We have massive synergies in ACG overall — we are dedicated to creating an organization to exploit these synergies wherever possible, to the benefit of our customers. Having one supplier across the board creates a win-win solution for us and our customers. For the customers, they benefit from integrated support and service teams, which helps them to maximize manufacturing performance and efficiency. On our side, at ACG, we sell a wider range of products to each customer and can use our experience and technologies to help customers bring better products to the market, faster.

> *"We are dedicated to creating an organization to exploit synergies wherever possible, to the benefit of our customers."*

Along with the consolidation into four key businesses ACG has introduced a new strapline: Absolutely Committed. What is ACG absolutely committed to?

P. Neve: That is simple; we are absolutely committed to our customers. The strapline reinforces the feedback we get from our customers that we provide excellent, worldwide support services. We are proud of our agile and responsive approach — ensuring that their every need is met.

We also use the strapline as an important part of our internal communication. Today, it is the main focus of our internal processes, development and growth programs.

ACG has a global footprint with locations in over 100 countries. How satisfied are you with your presence in the different geographical pharma markets from a brand awareness or name recognition point of view?

P. Neve: We are working hard to increase the awareness of ACG in both the pharmaceutical and nutraceutical industries, especially in our key growth markets. We are doing this through a combination of targeted marketing and PR campaigns for ACG overall, and for each of our business segments.

As an example, we recently created a very short corporate video to explain our four main business segments and the scale of ACG in each of these. This has already had over one million views, which we are extremely proud of — and an indication of a hugely successful B2B marketing campaign.

Following the change of the company structure, what will be the next strategic moves to expand ACG's market presence, technology expertise and manufacturing and supply capabilities? Any investments in human, technology or distribution resources planned?

P. Neve: Over the next five years, ACG has plans for much of its talent to be based outside of India. In line with this plan, we are continuing to increase our global footprint for both our manufacturing facilities and local sales and support teams. This allows us to provide improved services and responsiveness to our customers on a global basis. You will be seeing many more announcements about this over the next year or so. It is an exciting time at ACG, and it is very satisfying to be part of the team that is delivering so much change, both within the organization and to our customers throughout the world.

www.acg-world.com

Indian Pharmaceutical Industry Attracting FDI

India enjoys an important position in the global pharmaceuticals sector. The country is the largest provider of generic drugs globally. The Indian pharmaceutical industry supplies over 50% of the global demand for various vaccines, 40% of generic demand in the US and 25% of all medicine in the UK.

Market Size

India's pharmaceutical sector was valued at $33 billion in 2017 and is expected to reach $55 billion by 2020. The country's pharmaceutical exports stood at $17.27 billion in 2017–18. In 2018–19 these exports are expected to cross $19 billion, according to a report published recently by the India Brand Equity Foundation (IBEF).

Investments

The Union Cabinet has given its nod for the amendment of the existing Foreign Direct Investment (FDI) policy in the pharmaceutical sector in order to allow FDI up to 100% under the automatic route for manufacturing of medical devices subject to certain conditions.

The drugs and pharmaceuticals sector attracted cumulative FDI inflows worth $15.83 billion between April 2000 and June 2018, according to data released by the Department of Industrial Policy and Promotion (DIPP).

Between April and June 2018, the pharma sector in India witnessed private equity and venture capital investments of $396 million. In 2017, the sector witnessed 46 M&A deals worth $1.47 billion. It is expected that the exports of the Indian pharmaceutical industry to the US will get a boost, as branded drugs worth $55 billion go off-patent between 2017 and 2019.

Road Ahead

Medicine spending in India is expected to increase at 9–12% CAGR between 2018 and 2022 to $26–30 billion, driven by increasing consumer spending, rapid urbanization, and rising healthcare insurance, among others.

Going forward, better growth in domestic sales would also depend on the ability of companies to align their product portfolio towards chronic therapies for diseases such as such as cardiovascular, anti-diabetes, anti-depressants and anti-cancers that are on the rise.

The Indian government has taken initiatives to promote the pharmaceutical sector and has taken many steps to reduce costs and bring down healthcare expenses. Speedy introduction of generic drugs into the market has remained in focus and is expected to benefit the Indian pharma companies. In addition, the thrust on rural health programs, lifesaving drugs and preventive vaccines also augurs well for the pharmaceutical companies. (mr)

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MENA Pharmaceutical Landscape

Opportunities for Foreign Companies in a Rapidly Growing Market

The MENA (Middle East and North Africa) region is a largely untapped, yet potentially hugely fruitful part of the world for the pharmaceutical industry, both as a sales region and for the establishment of manufacturing facilities.

However, it is by no means a simple task for international firms to enter this market. This is due to a variety of factors, such as vastly differing spending powers amongst its constituent nations, the lack of a centralized pharmaceutical regulator, and varying preferences for branded products vs generics.

Market Share and Growth

Consisting of approximately 22 countries and with over 350 million inhabitants, the MENA pharmaceutical market was worth $36 billion in 2016, which represented 2% of the global market. This relatively low starting base is now seeing projected growth of 10%, vastly outstripping the current global growth rate of 4–6% — even surpassing the traditional "pharmemerging" economies such as Brazil and China.

Demographics

The growth of the pharmaceutical market in the MENA region is driven by a number of demographic factors. These include rapidly changing population dynamics, where populations are expanding, but also ageing. Additionally, lifestyle changes have led to higher incidences of non-contagious chronic diseases and conditions — most notably cardiovascular diseases, obesity and type-2 diabetes.

Pharmaceutical Usage and Government Policy

The current pharmaceutical markets in the MENA region vary greatly between different nations. For example, a high spending power and a cultural preference for expensive foreign brands in Saudi Arabia has resulted in 85% of pharmaceuticals in the country being imported, whereas in Egypt, 90% of consumption is domestically produced with a much greater market share for generics.

Africa as a whole has grown its pharmaceutical industry well over the past decade, with an expected value of around $40 billion by 2020. This is being driven significantly by urbanization, with more economically developed cities meaning that more people have the means to access medicines. Government policy is also encouraging local manufacturing of drugs, as imports currently outweigh exports. However, the rise of non-communicable diseases, and rising healthcare costs are likely to attract foreign investment into the continent, as well as the further development of domestic manufacturing capabilities.

In Sub-Saharan Africa, the largest pharmaceutical manufacturing market is found in South Africa, which is currently worth $2.8 billion. In recent years South Africa has turned increasingly to generic drugs, providing a great opportunity for both domestic and foreign manufacturers, with the generics market forecast to grow by a robust 12% compound annual growth rate (CAGR) during 2017–2022.

Another promising pharmaceutical industry is in Nigeria, with its compound growth rate projected to be around 9%, hitting $3.6 billion by 2026. Its population is also set to become the third largest in the world by the year 2050.

Countries in North Africa that have managed to establish pharmaceutical manufacturing industries in recent years include Morocco, Tunisia and Algeria. In 2015, the industry in Morocco was able to cater for 65% of the demand in the country (compared to 49% in Tunisia and 30% in Algeria). Pharmaceuticals produced in Morocco were also exported to Europe, other parts of Africa, and the Middle East. These capabilities could lead to partnerships being made between foreign and North African firms that have strong manufacturing and distribution networks.

Cara Turner, UBM

Governments are central to the pharmaceutical industry in the MENA region, with their Ministries of Health regulating the industry and product prices. In an attempt to cut their healthcare spending and diversify their economy, the Saudi government is actively trying to increase generic consumption through regulating imported branded drugs and promoting local generics production. This has seen some notable recent investment from foreign firms into the country, including partnerships with domestic manufacturers, as well as the building of new facilities.

The European excipient certification organization, EXCiPACT, has now issued certificates in Saudi Arabia, indicating not only the development of the manufacturing industry in the country, but also its ability to meet high quality standards.

These developments could represent new trends developing over coming years for foreign pharmaceutical firms. On one hand, these firms could

provide foreign direct investment (FDI) into the MENA region in order to penetrate the market through local manufacturing. Another trend could be the partnering with other domestic manufacturers or CMOs to license their products and bring them to the region that way.

One of the crucial aspects of the MENA pharma market is the existence of the Gulf Cooperation Council (GCC). The GCC is a multinational partnership consisting of Bahrain, Oman, Saudi Arabia, Kuwait, the UAE and Qatar, who came together in 2014 to establish a drug price harmonization strategy in order to standardize drug prices within the region.

Although there was a growing awareness in many populations in the region for personal health and the benefits of over the counter pharmaceuticals, domestic regulations previously inhibited growth of some markets. The introduction of the GCC could see many of these regulatory barriers reduced, with an excellent example being the free trade agreement between the GCC and India that will likely result in further generic penetration into the Middle East market. It may be the case that final products are imported into the region from Indian generics manufacturers. However, due to a high average spending power and a cultural distrust of cheaper foreign made products, it is perhaps more likely that APIs will be imported, with local manufacturers providing the final product.

Another aspect to the Middle East pharmaceutical region that could be conducive for the growth of branded generics manufacturing is the increasing pressure on governments to cut healthcare budgets. This pressure could result in the implementation of compulsory healthcare insurance policies in order to reduce the burden on governments and pass costs onto private hands. This, in combination with a potential free trade agreement with India, could provide great opportunity for branded generics manufacturers. Due to insurance providers pushing for cheaper drugs to be used, plus a consumer preference for a recognizable brand, locally produced branded generics, perhaps using APIs from India, could thrive in coming years.

Egypt has a strong manufacturing industry; it is the largest producer and second largest consumer (after Saudi Arabia) of pharmaceuticals in the whole of the Middle East and Africa. Prices of both OTC and prescription drugs are controlled by the government.

Another part of the Middle East region that has a strong established pharmaceutical market at the moment is Israel. The market has been projected to grow to $2.12 billion by 2020, at a compound annual growth rate of 3.9%, according to a study by GlobalData.

Israel already has a strong network of academic and research institutes, R&D facilities and advanced medical facilities. Advancing biotech will likely be a driver of the market in future. This contrasts to the other markets in the region, many of which are emerging and are only just starting to build up this infrastructure to support their pharmaceutical industries.

Israel's generics market, which accounts for around 20% of the market sales, is underpinned by Teva, the world's leading generics manufacturer, which owns several manufacturing and export facilities across Israel, North America and Europe. However, there has been talk in recent months about Teva transitioning away from generic drugs in the future, to focus more on branded drugs and the development of new specialty pharmaceuticals, in the wake of growing competition from manufacturers based out of countries with cheaper labor costs.

This could present an opportunity for foreign businesses if Teva closes or sells some of their generics operations in the country, as they made $9.85 billion in generics revenue in 2016.

Future Trends

The healthcare agendas of countries in the MENA region are more heavily shaped by the government's economic development agenda than those in Europe. For example, Saudi Arabia is trying to move away from being a purely oil-based economy, and so growing their healthcare sector is a good way of diversifying. However, this investment is also, in part, out of necessity — 25% of Saudis now have diabetes, as compared to just 10% of Americans. This may not only be due to increasing Westernized and sedentary lifestyles, but also to genetic predispositions, and so encouraging innovative drug discovery is very much in the country's interest. This is a problem that is also facing Africa as well, as Western fast food grows in popularity and more people lead inactive lifestyles.

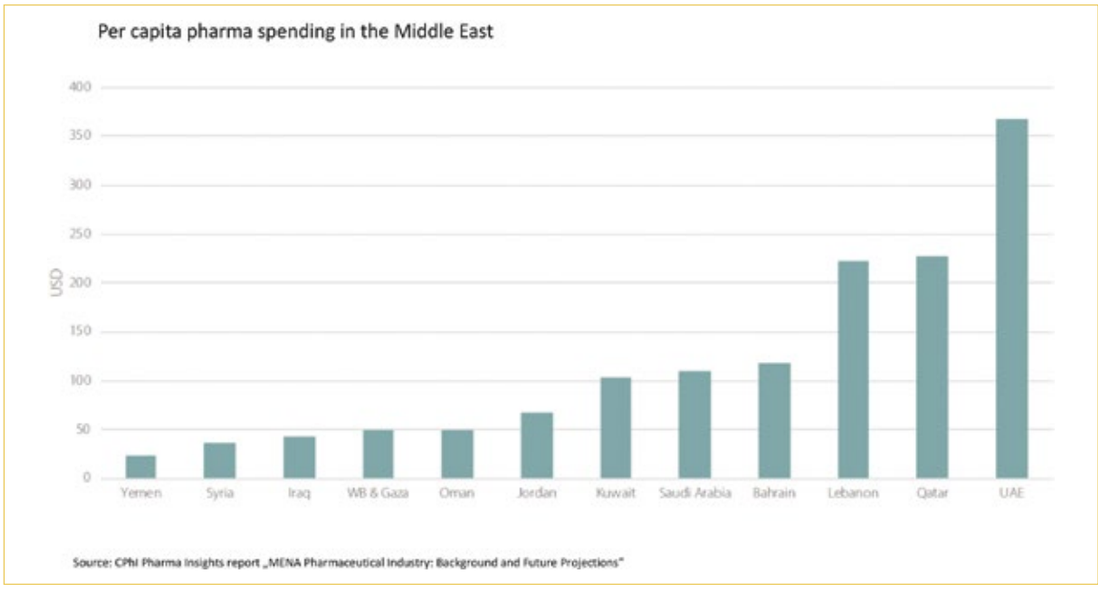
Another disease area that is increasing in incidence is the rising oncological concerns in the MENA region. This is linked to increasing life expectancy, as age is the largest risk factor in any given cancer. One way in which foreign firms could benefit countries facing an increased cancer incidence is through education and encouraging the population to take diagnostic tests to address diseases earlier on.

There are also some difficulties faced when foreign companies attempt to introduce generics to the market in the MENA region. Stringent registration processes of a generic product and even its packaging, means a lot of effort is required to introduce a generic into a country. A lack of a centralized regulator means that these protocols will also differ from country to country, resulting in a reluctance for some foreign businesses to attempt to enter the generics market.

Conclusion

The diverse economic, political, cultural, and public health profiles in the MENA region are mirrored by a highly varied market environment for the pharmaceutical industry. In general, prospects look good for both foreign and domestic firms, with growing populations and longer life expectancies producing a much greater demand for pharmaceuticals in the Middle East and North Africa, with huge growth in the market projected over the coming years. Local generic manufacturers, and potentially foreign generic firms from countries such as India, who could set up manufacturing bases in the region and export from there, are likely to have good prospects.

However, this may not be the case for all international firms looking to enter the region; there is a current preference amongst several MENA countries to reduce imports of foreign branded drugs and increase both domestic production and consumption of generics. Nevertheless, foreign firms producing branded products have recently begun to enter the region with direct investment in manufacturing facilities, such as Sanofi in Saudi Arabia, and this may be one of the optimal ways to enter this potentially highly lucrative market.



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European Chemistry Partnering (ECP)

The ECP is Europe's leading industry speed dating for the chemical industry and its diverse user industries. The event brings together chemical start-ups and SMEs with industry representatives and investors as well as other stakeholders. The 3rd European Chemistry Partnering will take place in Frankfurt on Feb. 26, 2019. The organizers expect more than 1,000 participants from more than 30 countries all over the world.

www.ecp2019.com

BIO International Convention 2018

The BIO International Convention, hosted by the Biotechnology Innovation Organization (BIO), represents more than 1,100 biotechnology companies, centers, institutions and related organizations across the United States and in more than 30 other nations. The event, which in 2019 takes place in Philadelphia, PA/USA, June 3 – 6, is known for its networking opportunities with 16,000+ attendees and as a platform for initial business and investment contact.

http://convention.bio.org/2019

InformEx 2019

InformEx, the specialty chemical focused zone at CPhI North America, to take place April 30 – May 2, 2019, in Chicago, IL/USA, has a 30-year. The integration with CPhI North America delivers an audience of sourcing and procurement professionals from big pharma and beyond. InformEx is a marketplace designed to foster micro-communities where people of like interest can connect, learn, inspire, and become plugged into the centers of both the high-value chemical and pharma industries.

www.informex.com

Chemspec Europe 2019

The 34th edition of Chemspec Europe will take place June 26 – 27, 2019 in Basel, Switzerland, one of Europe's major hubs for the fine and speciality chemicals industry. Europe's major sourcing and networking event for the fine and specialty chemicals industry includes an exhibition as well as conferences and seminars. The two-day event offers manufacturers, suppliers and distributors of fine and specialty chemicals for a large range of applications a dedicated marketplace to intensify contacts and meet with buyers.

www.chemspeceurope.com

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