REACTION

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KPMG GLOBAL CHEMICALS INSTITUTE

Emerging chemical markets: What's next?

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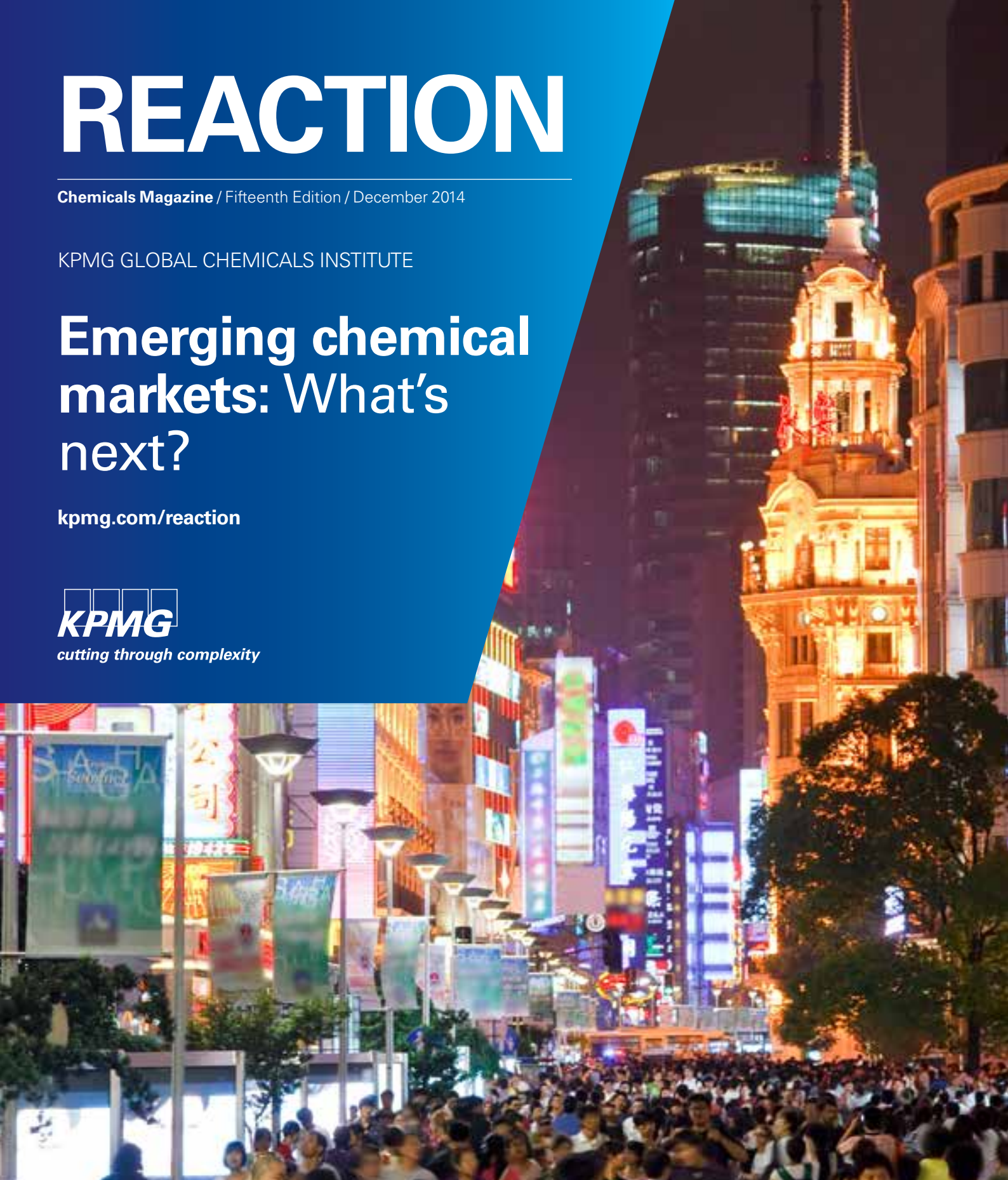
cutting through complexity



Introduction

As we approach the end of the year and look back at 2014, the year probably hasn't been as strong as many of us in the industry hoped and expected back in January. Indeed, there are as many clouds on the horizon now as there have been for a couple of years, with renewed economic concerns around the Eurozone, a pause in the recent Japanese recovery and a slowdown in many emerging markets, including China.

Despite that, we are keen to end the year on a positive note, so in this issue of Reaction, we bring you an up-to-date view of the continued opportunities available to chemical companies in China and India as well as a focus on the ASEAN region, which we believe will be at the forefront of the next wave of chemical industry growth.

With the holiday season upon us in many parts of the world, I hope you all have the opportunity to spend some time with your families and I'd like to wish you every success in 2015. We'll be back with the next issue of Reaction in March with a look at what's happening in some of the industry's key end markets. As ever, if there is anything you would like us to cover in future editions, please don't hesitate to contact us.

Mike Shannon
Global Chair
Chemicals and
Performance Technologies

Content

A changing industry for India's chemical companies

By **Gaurav Moda**

As one of the emerging 'tiger economies', of Asia, India has long enjoyed rapid growth. However, the global downturn left its mark on India's economic progress and the past several years have seen increased dissatisfaction within the country due to complex bureaucracy, inconsistent tax laws, infrastructure problems and other factors that impede job creation and economic growth. Over the last few years, India has slipped down the list of priority investment areas for a number of global chemical companies. New government leadership under Prime Minister Narendra Modi has promised a pro-business approach to address these issues. At the same time, a number of Indian petrochemical companies are making a move to increase their production levels and market share. Together, these two developments promise significant changes for a chemical industry serving markets in the world's largest democracy.

Industry update:

9th largest chemical producer in the world

6.7% estimated annual production growth in 2014

9.0% estimated annual market growth in 2014

Segment sales

2012, US dollars (billions)

Commodity chemicals 46.6

Specialties 18.8

Agrochemicals 2.7

Other 30.7

Total **98.8**

Indian chemical companies support a sizable and highly diversified industry, producing more than 70,000 commercial products that account for 13 percent of the country's gross national product (GNP).[1] Over the next two years, total sales are expected to reach almost US$200 billion.[2]

However, the country's chemical industry now stands at a crossroads, with challenges involving rapid demand growth, political change, a shifting competitive landscape and changes in feedstock availability.

Success could depend on taking action in a timely fashion while still maintaining a strategic view of India's future in Asia and the rest of the world.

[1] Federation of Indian Chambers of Commerce and Industry (FICCI)
[2] Indian chemical industry to touch US$190 billion in next two years: Report, The Economic Times, 9 October, 2014

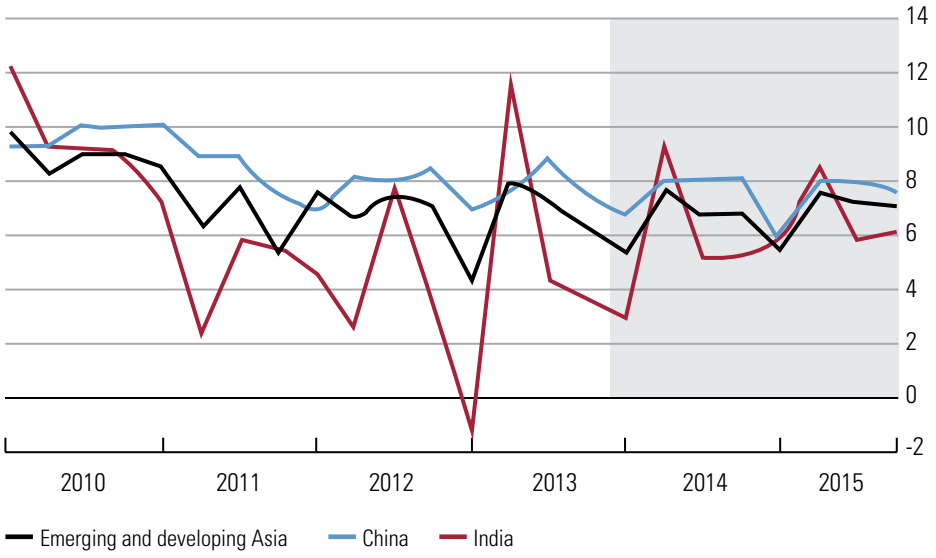
Continued growth
but challenges remain

Every year, India adds more people than any other nation in the world.[3] The country's total population has now reached 1.27 billion — over 17 percent of the world's population.[4] By 2030, India is expected to have more people than China.

These figures help explain India's overall market growth but equally important is how this population is becoming increasingly middle class and urban. Between 200 and 300 million Indians now have the earning power to support a lifestyle that includes modern appliances, modern housing, health care items, new automobiles, clothing and a diet that includes more protein and less grains.[5] Because half of India's population is under the age of 26, these consumer markets are expected to expand and diversify for decades to come.[6]

GDP growth forecasts

Emerging and developing Asia



Source: World Economic Outlook April 2014

[3] op. cit., www.indiaonlinepages.com
[4] www.worldpopulationstatistics.com
[5] United Nations, Department of Economic and Social Affairs, Population Division
[6] Ibid.

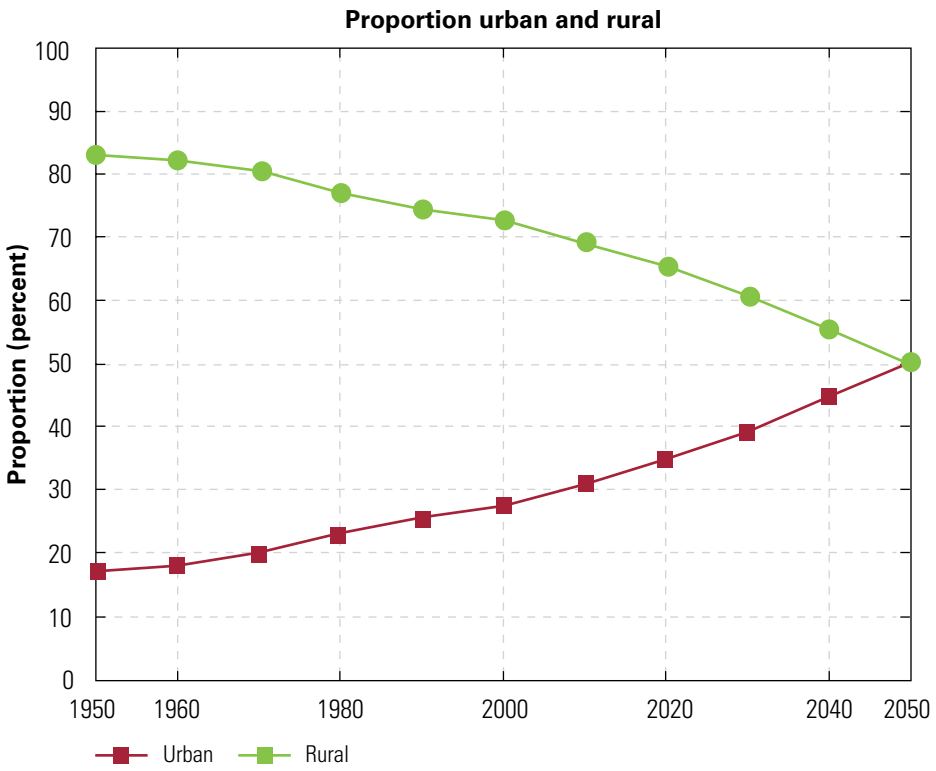
> India still faces **significant economic challenges.** Annual year-over-year GNP dropped below zero in 2012, made a strong recovery the next year but has remained at or **below the average for other emerging economies** in Asia.

Currently, more than half of the population lives in villages and remote areas, but within the next few decades, most Indians are expected to live in major urban areas such as Mumbai, Delhi, Kolkata, Chennai and Bengaluru. Much like other emerging economies, increased urbanization could create more product consumption and increased demand in areas such as transportation, water treatment, utilities, commercial and residential construction and public infrastructure such as roads and bridges, all of which could mean growing markets for chemical manufacturing.

Along with the country's huge domestic markets, Indian businesses also enjoy relatively low labor and production costs compared with developed countries. However, India still faces significant economic challenges. The annual year-over-year GNP dropped below zero in 2012. This made for a strong recovery the next year but has remained at or below the average for other emerging economies in Asia. Retail inflation rose almost 9 percent in 2013[7] and more than 20 percent of India's population still lives below the poverty line.[8]

In addition, recent studies indicate that many overseas investors, as well as the Indian business community itself, continue to struggle with issues such as starting a business, dealing with construction permits, getting electricity, registering property, paying taxes, trading across the border, enforcing contracts or resolving insolvency.[9]

Indian population shift to cities



Source: United Nations, Department of Economic and Social Affairs, Population Division

[7] Faster India inflation before election result adds rate pressure, May 12, 2014
[8] World Bank statistics, http://data.worldbank.org/country/india
[9] Ease of doing business in India, KPMG, April 2014

A red carpet instead of red tape

Key aims of India's proposed National Chemical Policy[10]

- Facilitate investments
- Create demand potential
- Support 'Responsible Care' certification
- Facilitate access to the latest technologies
- Establish a Chemical Standard Development Organization
- Set up a national chemical center
- Provide incentives for green products
- Develop a framework for chemical disaster management
- Expand research and development, specifically low-water intensive, environmentally compliant and safe, green processes

"INDIA is back in BUSINESS."[11]

That was the sentiment expressed by many Indians dissatisfied with a stagnant economy when a new government administration headed by Prime Minister Narendra Modi was elected in May 2014. Mr. Modi offered voters a conservative, pro-business platform, stressing smaller government, promotion of private enterprise, reduction of government subsidies, reduced bureaucracy and support for increased foreign direct investment (FDI).

During the campaign, he talked about rolling out a "red carpet" for business rather than "red tape,"[12] often refering to his success in promoting businesses during his tenure as chief minister for the Indian State of Gujarat.

Mr. Modi has also repeatedly emphasized the importance of the chemical industry.[13] At an industry conference held in Gujarat last year, he cited the importance of chemicals manufacturing and how it facilitates growth across the economy. He also stressed the need to increase support for research and development (R&D), manufacturing clusters and the development of new skills for workers.

At the same time, India's chemical companies have encouraged the new administration to adopt the National Chemicals Policy, designed to help India's chemicals sector grow and become more competitive. Its goals include the rationalization of statutory regulations and controls as well as the creation of a "robust framework for promoting safety and security of chemical facilities across the value chain."[14] The policy is expected to be adopted in the near future.[15]

Whether Mr. Modi and the Bharatiya Janata Party will be able to effect major changes in the country's economy remains to be seen. India is a big ship and it will take time to change direction.

10 Ministry of Chemicals and Fertilizers
11 Andrew Holland, chief executive officer at Ambit Investment Advisors Pvt., Mumbai. Quote from Modi-led bloc wins biggest India mandate in three decades, Bloomberg, May 16, 2014
12 Narendra Modi's election win heralds new era in India, The Wall Street Journal, May 17, 2014
13 Research and innovation is the mantra for the future of chemical industry – Says Narendra Modi': 'India Chem Gujarat 2013' gets underway, FICCI, October 24, 2013
14 India updates draft national chemical policy, Chemical Watch, February 10, 2014
15 Industry urges new Indian PM to prioritise chemicals policy, Chemical Watch, May 28, 2014

A new competitive landscape for petrochemicals

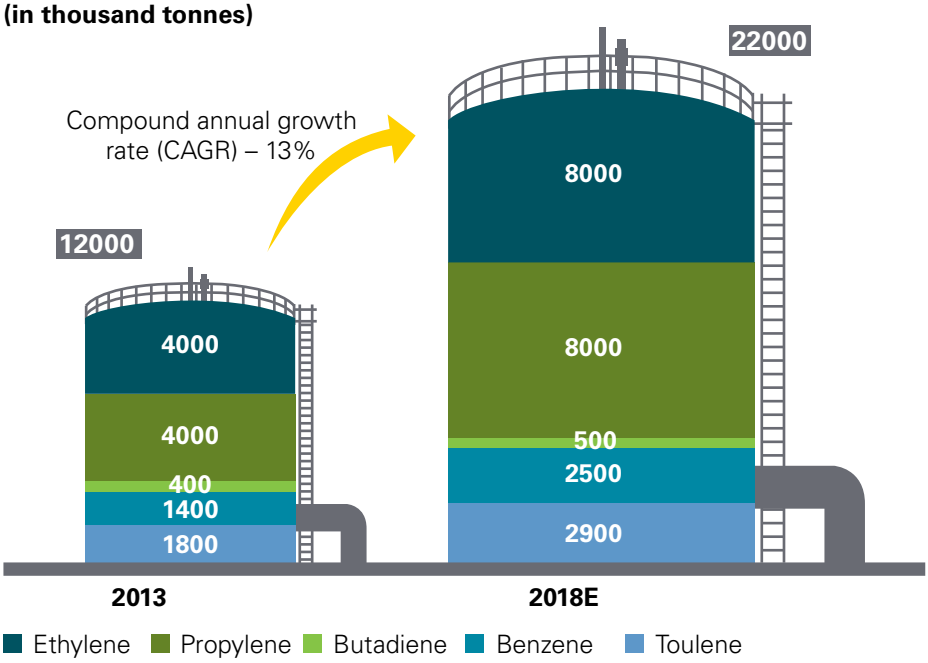
While many Indian companies have adopted a wait-and-see attitude toward the effect of the new government leadership on the economy, several ambitious petrochemical manufacturers have already taken dramatic steps to change the competitive landscape in their sector.

To understand the historic importance of this development, we need to recognize that the sector has long been dominated by a handful of players, most notably Reliance Industries Limited (RIL), currently with 56 percent.

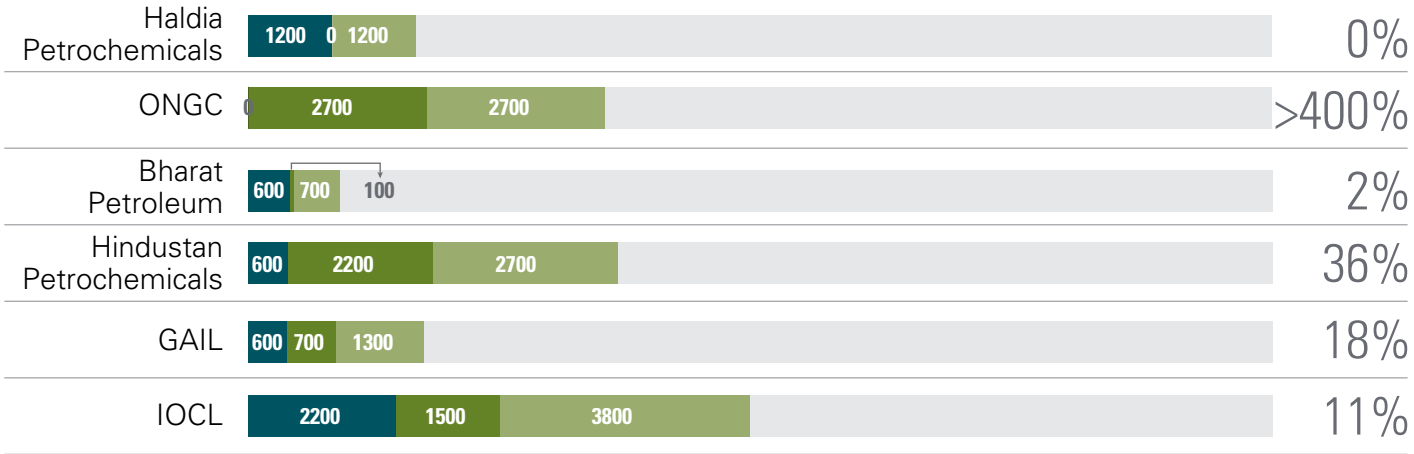
Challenging RIL are several companies that are planning and implementing significant growth in capacity:

- Indian Oil Corporation Limited (IndianOil or OICL), the country's leading national oil company and the second-largest player in the petrochemical market. IndianOil produces linear alkyl benzene (LAB),

Indian petrochemicals capacity (in thousand tonnes)



Petrochemicals competitive landscape



Note: IOCL includes Chennai petroleum, GAIL includes BCPL, HPCL includes HMEL, ONGC includes OMPL, OPAL

PTA and an extensive range of polymers. The company is planning to expand the capacity of its largest refinery at Panipat to 21 million tonnes. This includes more propylene-based petrochemical capacity and additional capacity in the future. Indian Oil is also exploring the possibility of expanding capacity at its Koyali refinery in Gujarat from 13.7 million tonnes to 18 million tonnes.[16]

- Oil and Natural Gas Corporation Limited (ONGC), is a multinational oil and gas company headquartered in Dehradun, India. ONGC Mangalore Petrochemicals Ltd. (OMPL), a company promoted by ONGC, is setting up an aromatic complex along with Mangalore Refineries & Petrochemical Limited (MRPL) at the Mangalore Special Economic Zone (MSEZ).[17]
- Hindustan Petrochemicals (HPCL) is an Indian state-owned corporation that commands over 30 percent of the domestic market for lubricants and associated products. HPCL plans to expand its Mumbai refinery from 6.5 million tonnes to 10 million tonnes in the next 3 years. HPCL is also setting up a large integrated refining and petrochemical complex in Rajasthan.[18]
- GAIL is the largest state-owned natural gas processing and distribution company in India. GAIL produces linear low-density polyethylene (LLDPE) and high-density polyethylene (HDPE) products and materials. The company is currently expanding petrochemicals capacity at its Pata site by adding a 450,000-m.t./year LLDPE-HDPE swing plant. With this expansion, GAIL is expected to double its petrochemical capacity by the end of 2014.[19]

RIL is in an expansion phase itself, with ongoing investments including the world's largest ethylene cracker (1.4 million metric tonnes per annum or MMTPA), PE capacity expansion by 1MMTPA, and capacity additions across the polyester chain, including 2.3 MMTPA of PTA, 2.3 MMTPA of Paraxylene (PX), and 0.6 MMTPA of PET.[20] With these additions, the company is expected to emerge as the third-largest producer of PTA and the second-largest producer of PX in the world.

However, both RIL and its challengers will continue to enjoy India's basic economic growth drivers: a large, relatively young population and a rapidly expanding middle class hungry for new products. The petrochemical industry can also support growth based on the development of niche products for exports and advanced integrated complexes for polymer production.

At present, the domestic distribution network is concentrated around a few producers. As a result, distributors face margin pressures and small-to mid-sized distributors are hindered by unreliability in supply. Petrochemical companies should develop strong sales and distribution networks and set up production plants to minimize landed costs. For exports, these companies need to develop a network of traders and agents to gain access to export markets. For domestic sales, they need to leverage the current distribution network by incentivizing distributors to partner with other players and consolidate competing networks. In addition, these companies might consider the development of models similar to Petroleum, Chemicals and Petrochemical Investment Regions (PCPIRs) and work with major end-product consumer firms to gain priority access to business customers.

> "Challenging RIL are **several companies** that are planning and **implementing significant growth** in capacity."

If the new policies are successful, overseas investors may re-engage with India, helping to drive renewed vigor and growth in the Indian chemical industry.

[16] Indian Oil planning to expand capacity of Panipat refinery: Oil Minister, Press Trust of India, Updated on November 30, 2013
[17] www.ongcindia.com/wps/wcm/connect/ongcindia/Home/SubsidiariesJVs/JVs/OMPL
[18] HPCL to invest Rs 17000 crore to expand capacities by 2018, The Economic Times, May 28, 2014
[19] India: Assembling a world-scale petrochemical industry, IHS Chemical Week, February 10, 2014
[20] KPMG research, 2014

Feedstock constraints

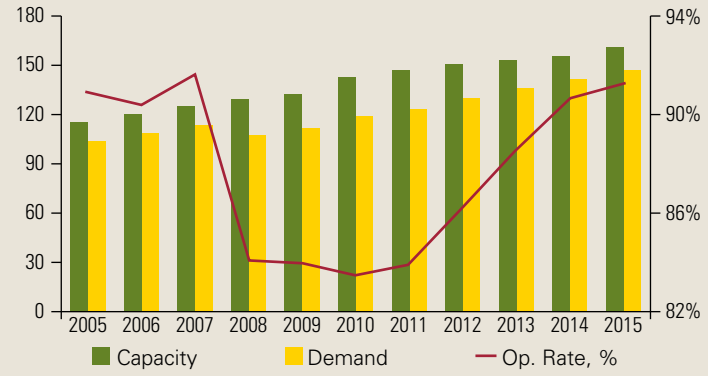
C2 chain

NGL/Naphtha/Bio → Ethylene → Ethylene derivatives

Ethylene is expected to be in over supply as a result of growing light feedstock availability.

As a result, ethylene prices are expected to witness a downward trend due to increased supply.

Global ethylene scenario



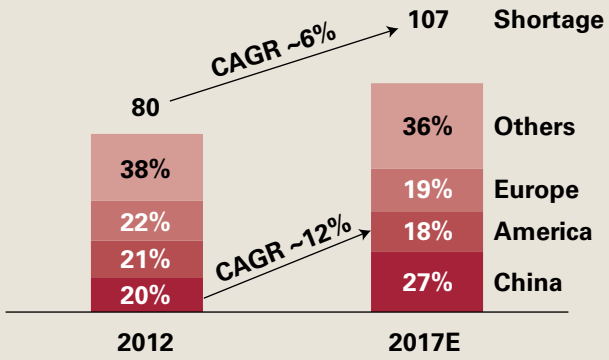
C3 chain

NGL/Naphtha/Bio → Propylene → Propylene derivatives

Increasing propylene demand, coupled with reduction in supplies, has led to increased prices for propylene squeezing margins for polypropylene.

This has lead to downstream portfolio changes as many large producers increasingly focus on higher value derivatives, particularly in North America and Western Europe.

Propylene demand (MTPA)



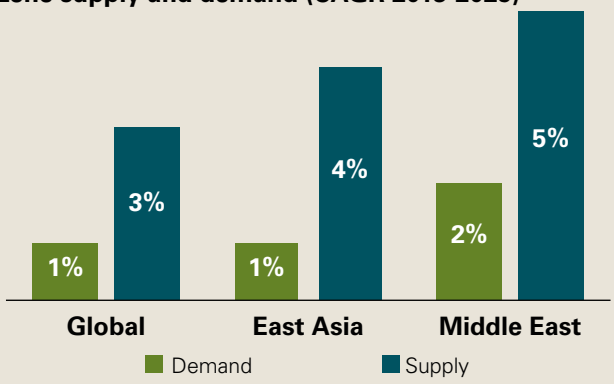
Aromatics chain

Reformate/ Pygas/Coal → Benzene, Toluene, Xylene → End products

BTX demand growth, particularly in Asia and Middle East, is outpacing capacity additions.

Feedstock developments are constricting supply from steam crackers, while environmental regulations are limiting BTX output.

Benzene supply and demand (CAGR 2013-2025)



Source: KPMG International, 2014

Despite a modest but steady growth rate expected for Indian chemicals, the industry will likely have to deal with significant fluctuations in markets for the ethylene, propylene and aromatics chains. For example, an oversupply of ethylene is expected due to the impact of US shale gas, creating a downward price pressure that may encourage producers in the Middle East to seek alternative markets in Asia.[21] Lower prices will also increase the possibility that producers will dump their feedstocks for offtake and develop more flexible production product slates in the future. In addition, demand growth for aromatics (BTX) is outpacing capacity additions. Feedstock developments are constricting supply from steam crackers, while environmental regulations are limiting BTX output.[22]

Responses to these developments have included several innovative strategies by both the government and companies. New Delhi is planning to set up special economic zones in Iran and Myanmar to manufacture and supply chemical feedstock to the Indian industry.[23] India's Union minister for chemicals and fertilizers, Ananth Kumar, says the idea is to help Indian companies set up manufacturing facilities where raw material is available in abundance.[24]

The ICC is suggesting that the government should encourage the use of ethanol as a feedstock instead of fuel.[25] Ethyl alcohol is readily available in India and a number of chemical plants already manufacture products based on ethanol. At present, government policies support the use of ethyl alcohol as a part of the fuel mix for automobiles and trucks.

In the private sector, RIL plans to source 1.5MMTPA of ethane from the US.[26] The company has entered into storage and capacity agreements for liquefaction and export of ethane with a North American terminal, expected to begin operations in the second half of 2016. The company has ordered six very large ethane carriers (VLECs), which are expected to be delivered starting in the fourth quarter of 2016. Reliance is also building a world-scale receiving and storage facility in India for liquefied ethane and a pipeline to deliver ethane to its crackers.

"New Delhi is planning to set up **special economic zones** in Iran and Myanmar to manufacture and **supply chemical feedstock** to the Indian industry."

[21] KPMG research
[22] Ibid.
[23] India plans chemical feedstock zones in Iran, Presstv.com.
[24] Ibid.
[25] Encourage use of ethanol as feedstock instead of burning it as fuel: Yogesh Kothari, President, ICC, Business Standard, June 25, 2014
[26] Company website, www.ril.com

The way forward

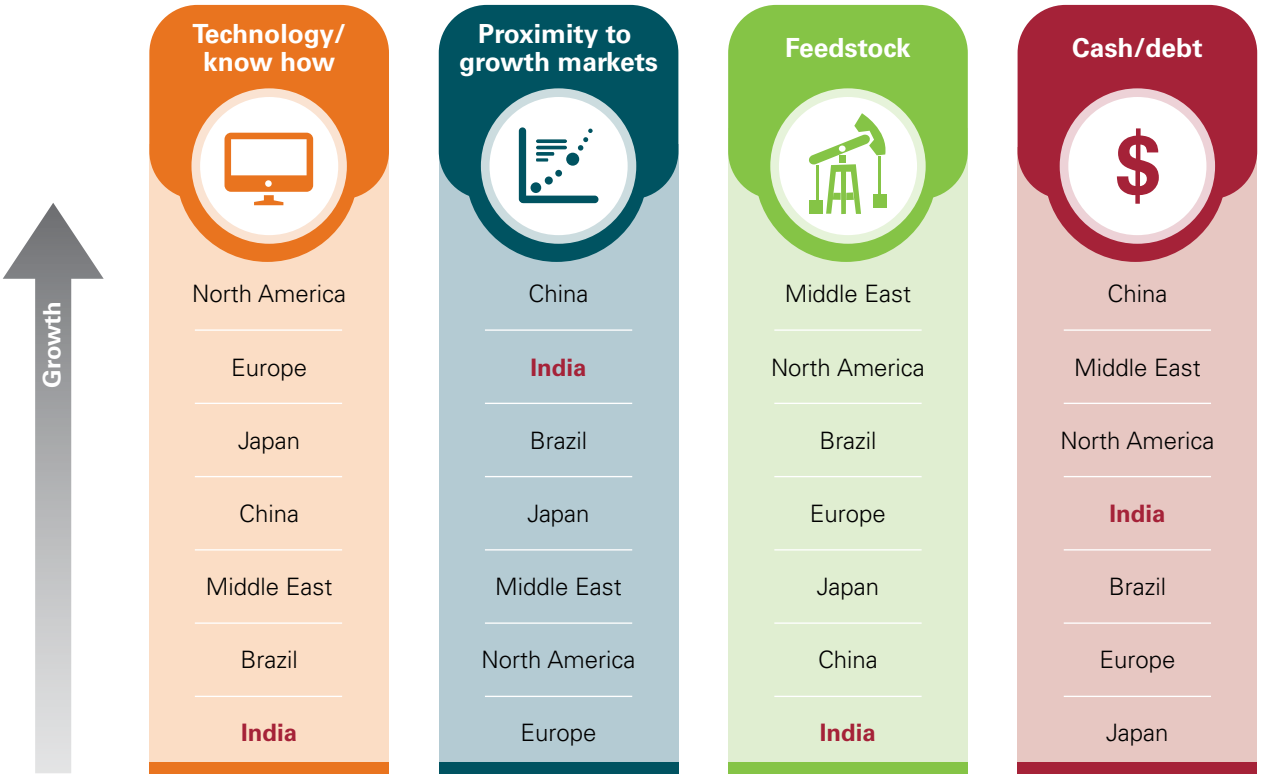
When we consider India's competitive position relative to other regional chemical industries, its proximity to growth markets and a relatively robust cash/debt position provide the country with a clear advantage. In contrast, access to feedstocks will likely remain a major issue for years to come, requiring Indian chemical companies to find new ways to increase manufacturing efficiencies and expand imports from the Middle East and North America.

The other relative disadvantage, technology and know-how, presents greater potential for improvement, considering India's growing middle class and rising school enrollments. India's higher education system is the third-largest in the world, with a growth rate in university enrollment comparable to that of the US.

Finally, KPMG's analysis and client experience across geographies suggest that sustainable progress depends on Indian companies building on existing capabilities and introducing new ones. These capabilities include greater financial strength, more efficient production of bulk chemicals, increased partnering, better marketing and distribution and improved management of margins across the refining and petrochemical sector. They also need to enhance project management, support more innovation and increase their understanding of customer business models.

"The Indian chemical industry has always grown 1 to 2 percent above the overall GDP growth rate in the country," notes H.S. Karangle, Director General at ICC. "This trend will continue and the chemical industry in India will grow about 2 percent above the GDP growth rate in 2014."[27] The question is whether new government policies combined with innovation, training and expanded capabilities can accelerate growth and increase India's standing as a major player in the global chemical industry.

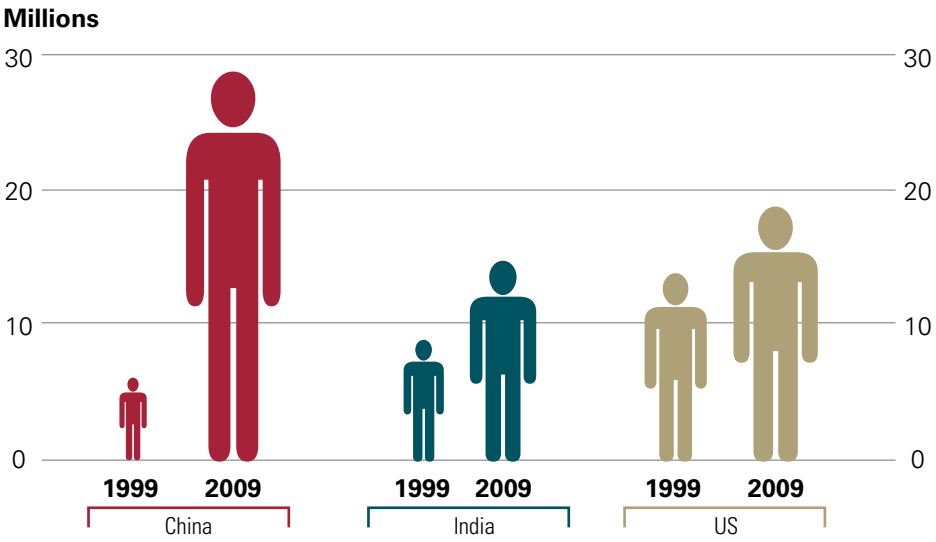
Relative advantages in the global chemical industry



Source: KPMG International 2014

[27] Outlook 2014: Looking forward, IHS Chemical Week, April 14, 2014

Growth in university enrolment



Source: Unesco, US Education Dept.

Conclusion

On the surface, India has all the requisite ingredients for a robust, high-growth chemical industry – the same ingredients that continue to drive chemical industry growth in China, including a large and growing population, mass urbanization and a rapidly expanding middle class supporting numerous consumer markets.

For too long, however, development of the Indian chemical industry has failed to realize its potential, held back by a multitude of issues, including feedstock constraints, poor infrastructure, rampant bureaucracy and a highly complex legal, tax and regulatory regime. These impediments seem to have frustrated not just overseas investors but also Indian chemical companies themselves. The result has been a significant decline in prominence and importance for India in chemical company boardrooms around the world.

With the new government comes new hope and the early signs are positive. If the BJP government can follow through on its commitments to foster a more business-friendly environment, the chemical industry can help serve as the foundation for further development of the country's industrial manufacturing value chain. Indeed, we may start to see the Indian chemical industry re-establishing its position as an engine of growth for the global chemical industry.

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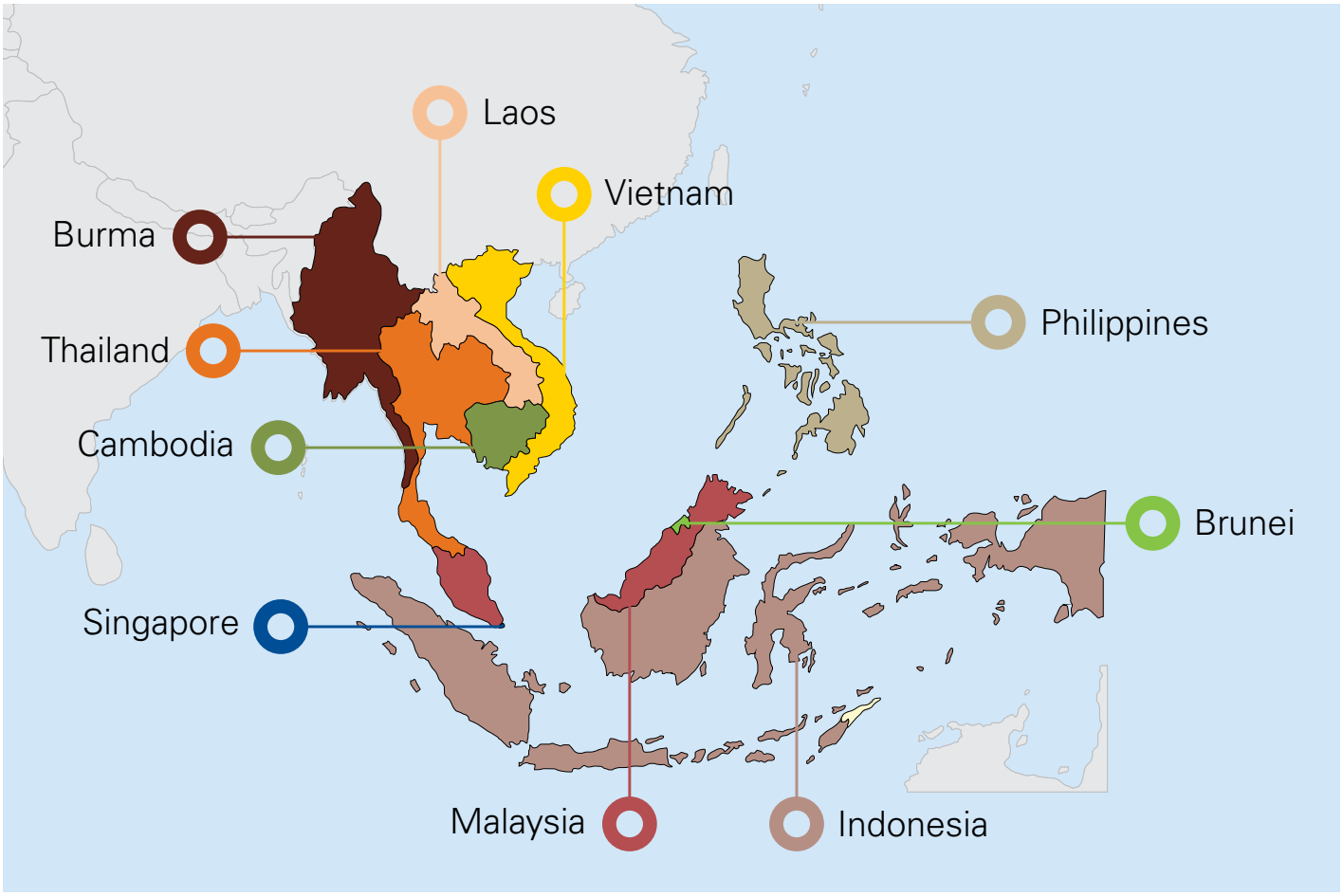
Emerging market leaders in Southeast ASIA

By Paul Harnick

China has long dominated Asia's economic growth, with India close behind. Likewise, even 2 or 3 years ago, in the boardrooms of chemical companies around the world, an Asian growth strategy would focus on China, India and nothing else. But in 2014, the playing field of Southeast Asia is beginning to shift. China's double-digit growth is settling into the single digits while the country's labor, transportation and other production costs are all on the rise. India is still struggling to overcome a massive bureaucracy, infrastructure limitations, feedstock constraints and other factors that impede growth. In contrast, the Association of Southeast Asian Nations (ASEAN) countries are emerging as strategic manufacturing centers with competitive export positions as well as many of the underlying fundamentals (population growth, urbanization and rising middle-class consumerism) that have driven the development of the chemical industry in China and India over the last 2 decades. The governments in many of the ASEAN nations have recognized chemical industry development as a key enabler of wider industrial growth and increasingly global chemical company executives are amending their Asian growth strategies to focus on the opportunities this provides. If current trends continue, 'Other Asia' is likely to assume an increasingly important role in the global chemical industry.

Member of ASEAN



Source: BBC

BRUNEI

The country's economy depends on revenue from natural resource extraction. Crude oil and natural gas production account for 60 percent of the country's GDP and over 90 percent of exports. Per capita GDP is among the highest in Asia and substantial income from overseas investment supplements income from domestic production. Attractive incentives are available for both local and foreign investors. Further, application procedures for incentives have been simplified and tax incentives for investors have been expanded to cover export-oriented manufacturing and services, R&D, transhipment, venture capital activities, overseas investment companies and new technology companies.

CAMBODIA

Since 2004, garments, construction, agriculture and tourism have driven Cambodia's growth. GDP climbed over 7 percent per year between 2010 and 2013. The garment industry currently employs about 0.4 million people and accounts for about 70 percent of total exports. In 2005, exploitable oil deposits were found beneath Cambodia's territorial waters, representing a potential revenue stream for the government if commercial extraction becomes feasible. Also, mining is attracting some investor interest and opportunities have been identified for mining bauxite, gold, iron and gems.

The sixth-largest economy in the world

ASEAN currently has a population of approximately 600 million people, almost 9 percent of the world's population.[28] If ASEAN were a single entity, it would rank as the sixth-largest economy in the world, ahead of India and well ahead of many developed economies.[29]

ASEAN both contributes to and benefits from the continued growth of the region. The GDP growth rate for Asia/Pacific is expected to increase from 4.8 percent in 2013 to 5.4 percent in 2014.[30] ASEAN chemical markets are keeping pace with this overall growth, based on large populations, increased urbanization and rapid middle-class growth. During 2014, overall chemical production in Other Asia/Pacific is expected to increase 6.7 percent.[31]

As one example of this industry expansion, Southeast Asia is now the world's largest market for plastics, increasing 9 percent annually.[32] Polymer consumption, in particular, is on the rise, driven in part by surging property markets. In Indonesia, property prices have quadrupled over the past 5 years in US dollar terms. In parts of Bangkok, the value of condos has reportedly doubled in just 3 years.[33]

> "If ASEAN were a single entity, it would rank as the **sixth largest-economy in the world,** ahead of India."

The next wave of chemical industry growth

In other parts of Asia, chemical companies in mature economies such as South Korea, Taiwan and Japan continue to rationalize old capacities and move into specialty chemicals. Meanwhile, ASEAN countries are boldly leading the next wave of emerging-market, chemical industry growth.

Indonesia's population gives it a massive potential consumer base, while Vietnam is becoming a favored destination for low-cost manufacturing, especially as wages in China continue to rise.

Investment is expected to be focused on the commodity end of the sector and establishing the basic building blocks of the industry. As the regional economies continue to develop and mature, further market opportunities are likely to include construction chemicals, consumer chemicals and personal care.

At the same time, ASEAN countries are strengthening their regional presence through a number of trade initiatives.[34] These include the ASEAN Free Trade Agreement (AFTA) in 2010, which has cut importation tariffs from 0 to 5 percent, the ASEAN-Korea Free Trade Area (AKFTA), the trade pact with China (ACFTA) and the Expanded Economic Engagement (3E) initiative. Investment opportunities should be further bolstered with the consolidation of the ASEAN Economic Community (AEC) by 2015 (see *ASEAN: an overview*, page 22).

[28] ASEANstats, ASEAN Secretariat. Accessed at ASEAN.org and ASEANFIC.org
[29] Ibid.
[30] Outlook 2014, Chemical Week, April 14, 2014
[31] Year-End 2013 chemical industry situation and outlook, American Chemistry Council
[32] K International Trade Fair, The Southeast Asian markets: A utopia for growth, April 4, 2013, accessed at k-online.de
[33] Market outlook: Growth opportunities in petrochemicals for Southeast Asia, ICIS Chemical Business, June 2013
[34] Op. cit., The Southeast Asian Markets: A utopia for growth

Increased government support for chemicals

> "The **Indonesian** government considers **petrochemicals as one of the key sectors** in which value-added programs need to be implemented."

In Singapore, the government announced its support to overcome the challenges and competition in the petrochemical industry. The Prime Minister highlighted key focus areas, including further development of 'Jurong Island Version 2.0.' (See *Jurong Island: Singapore's success story*, page 23)

The manufacturing complex has so far attracted more than SGD35 billion in investments from global chemical companies such as BASF, ExxonMobil, Lanxess, Mitsui Chemicals, Shell and Sumitomo Chemicals.

The Malaysian Investment Development Authority (MIDA) has urged more diversity and investments by new players in the oleochemical industry. In addition, MIDA hopes to see more players with new technology to produce bio-based oleochemicals to replace oil and fats from animal sources. This will help support a move toward environmentally-friendly green chemicals.

The Indonesian government considers petrochemicals as one the key sectors in which value-added programs need to be implemented. Since petrochemicals use oil and natural gas as feedstocks,

the government plans to build at least three oil refineries with a capacity of 300,000 barrels per day. Investment in the Indonesian petrochemical industry is expected to reach US$17 billion by 2017.

The government in Thailand has approved a soft-loan package for the bioplastics industry, which is expected to spur about THB100 billion worth of investment in the industry within the next 5 to 10 years. The ministry's primary focus is to attract investments in the upstream industry. The Ministry of Industry has set up a subcommittee to screen financial subsidies and to implement driving mechanisms in the bioplastic and biorefinery industry.

In Vietnam, the government has approved a plan to use advanced technology to produce quality chemical products at competitive prices in a sustainable, environmentally responsible manner. Under this plan, the operational and new chemical plants have to abide by the existing environmental protection and safety regulations. Older facilities using outdated and polluting technologies will be closed.

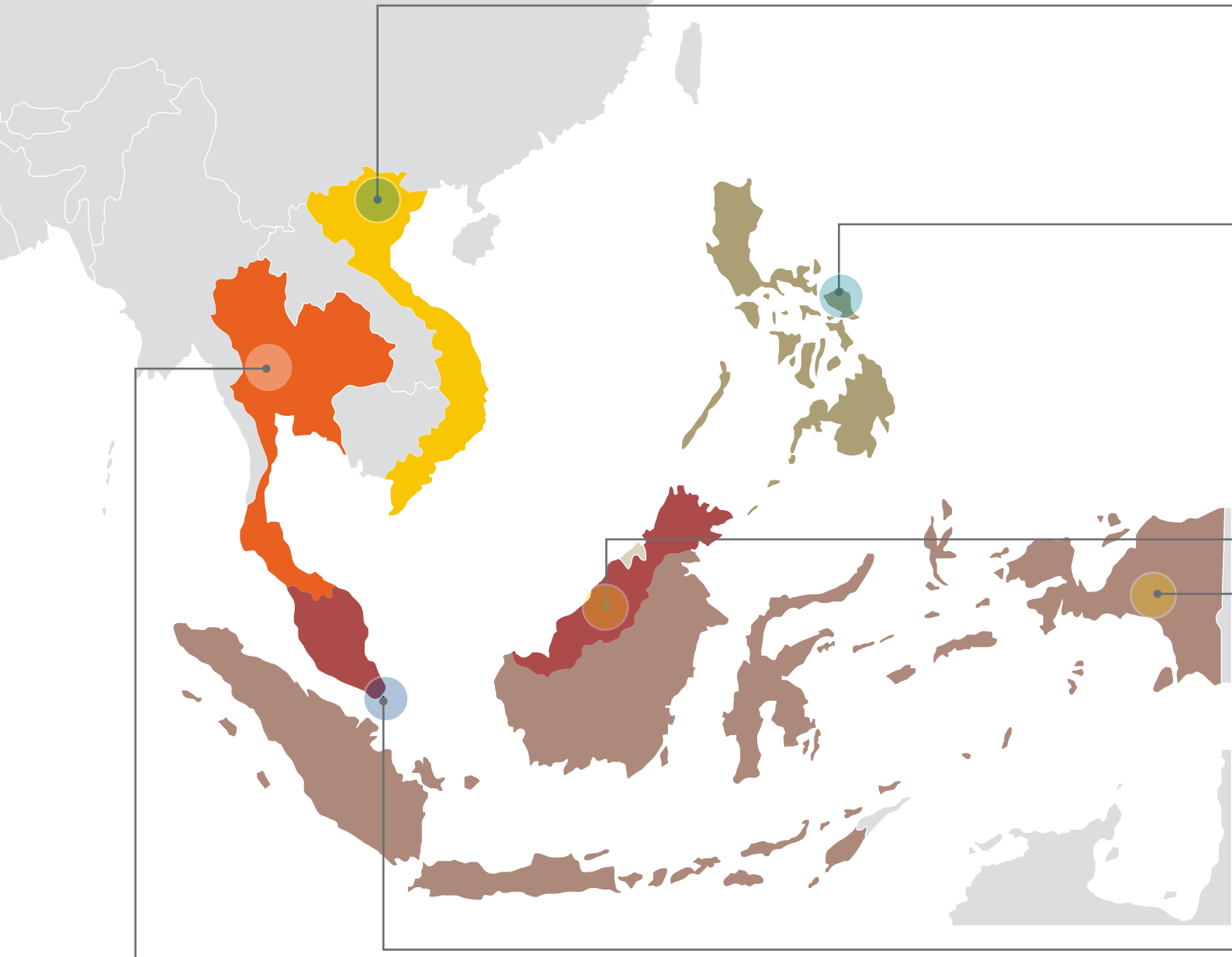
INDONESIA

Indonesia continues to post strong economic growth. The country's gross national income per capita has steadily risen from US$2,200 in 2000 to US$3,563 in 2012. During the global downturn, Indonesia outperformed its regional neighbors and joined China and India as the only G20 members posting growth. The government has promoted fiscally conservative policies, resulting in a debt-to-GDP ratio of less than 25 percent and historically low rates of inflation. Fitch and Moody's upgraded Indonesia's credit rating to investment grade in December 2011.

LAOS

Lao's GDP growth averaged 6 percent per year from 1988 to 2008, except during the short-lived drop caused by the Asian financial crisis that began in 1997. Laos' growth exceeded 7 percent per year during 2008–13. The economy also has benefited from high-profile foreign direct investment in hydropower, copper and gold mining, logging and construction, though some projects in these industries have drawn criticism for their environmental impacts. The World Bank has declared that Laos' goal of graduating from the UN Development Program's list of least-developed countries by 2020 is achievable.

ASEAN petrochemical country snapshot



Thailand

- Supported by offshore gas fields in the Gulf of Thailand, the Map Ta Phut industrial complex has grown into one of the world's biggest petrochemical hubs.
- Thailand's petrochemicals outlook, however, has been overshadowed by the domestic political unrest. Thailand has cut natural gas imports after demand growth in Asia's fourth-largest user of the fuel plummeted to 2 decade lows.
- The economy has experienced a slowdown. Hopes for export-oriented growth to offset domestic sales have not come to fruition. This is partly because China has become increasingly self-sufficient in petrochemicals.
- Due to internal country risk, Thailand's petrochemical players, PTTGC and SGC, have looked to other markets in ASEAN, in particular, Indonesia. In late 2013, PTTGC signed a Memorandum of Understanding with Pertamina to form a joint venture to establish a fully integrated petrochemical plant. The plant will produce products such as ethylene and propylene and commence operations during 2018 and it is hoped that it will eventually enjoy a 30 percent market share.

Vietnam

- Self-sufficiency in oil production gives a feedstock advantage, which has supported the development of the petrochemicals industry. Margins, however, are dictated by crude oil prices and, as such, are subject to cost volatility.
- Has attracted some foreign investment for polyvinyl chloride (PVC) production.
- A lack of refining capacity has hamstrung the domestic petrochemical industry for years. With a desire for value chain integration, refining expansion plans, tripling capacity by 2017, will likely improve margins.

Philippines

- Growth in the domestic resins market is prompting oil and petrochemical producers in the Philippines to consider investment in downstream industries. However, despite attracting international players, the domestic petrochemical industry is still in its infancy compared with North Asia and Singapore.
- With lackluster upstream activity, the Philippines is highly reliant on imported oil and gas.
- A factor affecting the viability of the industry is the subject of incentives, fiscal and non-fiscal, which will be made available to future plants. The ultimate objective is for naphtha to have a zero tariff, being the primary raw material of the cracker. Capital incentives and tax holidays are also expected to boost the otherwise marginal returns of the cracker plant.
- The Philippine economy is forecasted to grow at a real GDP growth rate of 6.3 percent in 2014. With GDP per capita increasing markedly, there is growing domestic demand for petrochemical products and plastics.

Malaysia

- Fiscal reform has catalyzed deepwater and enhanced oil recovery investment. In 2012, Malaysia discovered the fourth-largest amount of hydrocarbons in the world, the first time in many years a Southeast Asian state has been in the top 10.
- Malaysia is the world's second-largest exporter of LNG.
- Petronas' refinery and petrochemical integrated development (RAPID) project has been postponed until 2018, putting back 3 million tpa of new petrochemical capacity and a refinery with a processing capacity of 300 000 bpd.
- The facility will feature SRT VII cracking heaters, which are designed for cracking gas and liquid feedstock to produce 1.1 million tonnes of ethylene each year.
- RAPID has the potential to be a world-class and competitive project, rivaling the petrochemical plants of Singapore. Malaysia's Johor belt has the potential to meet its ambition to become a leading integrated refinery, petrochemical and storage hub in ASPAC but to sustainably compete, domestic petrochemical plants must tap into gas sources.

Singapore

- The Singapore government has proactively fostered a competitive and modern refining and petrochemical industry. Jurong Island remains a magnet for petrochemical investment.
- Singapore is gradually turning away from commodity petrochemicals and toward high-value specialties. ExxonMobil, Shell and Lanxess have all channeled huge investment into expanding the technological prowess and energy efficiency capabilities of their petrochemical complexes.
- Despite no natural energy resources, Singapore has sought to reduce feedstock exposure by supporting technological advancement and energy efficiency. Various R&D science parks have been created to support technological innovation.
- The first LNG terminal opened 2013 and there are plans for a second one. The diversification of Singapore's gas supplies will reduce gas feedstock supply concerns.

Indonesia

- Approximately 90 percent of Indonesia's cracker feedstock is naphtha, reducing Indonesia's competitive standing.
- One issue for the petrochemical business is the lack of production integration. Due to regulatory policy, petrochemical players in Indonesia lack value chain integration. Foreign companies can only operate in either the upstream or downstream sector, but not both.
- Crude oil production declined to 826,000 b/d in 2013. This is approximately 50 percent of oil produced in 1995. As such, security of feedstock is a concern. Indonesia is now a net-oil importer, contributing to a rising fiscal deficit.
- Vast and economically growing demand market of over 200 million people presents a huge opportunity to investors. Demand for petrochemical products far outweighs domestic supply.
- There is a particular need for commodity petrochemical investment such as in PE (Polyethylene), which has import portions ranging from 20-100 percent and PP (Polypropylene), which has an import share of 30 percent.
- To penetrate the Indonesian market, a joint venture with local partners is one potential solution that can facilitate market entry and operations.

New ASEAN projects and initiatives

Vung Ro Petroleum in Vietnam has broken ground on a US$4 billion refinery and petrochemical complex.[35] The refinery will produce 380,000 m.t./year of liquefied petroleum gas, 2.1 million m.t./year of gasoline, 655,000 m.t./year of jet fuel and 2.6 million m.t./year of diesel. The petrochemical complex will have the capacity to produce 73,000 m.t./year of benzene, 182,000 m.t./year of toluene, and 349,000 m.t./year of mixed xylenes, as well as polypropylene and sulfur.

PTT Global Chemical, Thailand's largest and Asia's eighth-largest chemicals player, has announced goals to double revenue to about US$30 billion by 2022, raise return on invested capital and reach the industry's first quartile in profitability.[36] Among many projects planned or underway, PTTGC is converting a 400,000-m.t./year linear low-density polyethylene (LLDPE) plant to metallocene technology and is building a 300,000-m.t./year LLDPE unit that is expected onstream by 2016. The company is also investing US$348 million to build a second phenol-acetone complex at Map Ta Phut, which will be designed to produce 250,000 m.t./year of phenol and 155,000 m.t./year of acetone, more than doubling existing capacity for each product.

In Indonesia, Pertamina has begun construction of the Arun liquefied natural gas (LNG) Storage and Regasification Terminal.[37] The facility, slated for completion in 2014, will support the shipment of natural gas from production fields in the east of Indonesia, which have historically served the export market, to the west of the country. The facility will also support LNG trade from Australia, North America and East Africa, supporting the expansion of the Asian LNG import market.

MALAYSIA

Since the 1970s, Malaysia has progressed from being a producer of raw materials, such as tin and rubber, to being a diversified economy and a leading exporter of electrical appliances, electronic parts and components, palm oil and natural gas. Malaysia was one of 13 countries identified by the Commission on Growth and Development in its 2008 Growth Report to have recorded average growth of more than 7 percent per year for 25 years or more. In 2010, Malaysia launched the New Economic Model (NEM), designed to help the country reach high-income status by 2020 while ensuring that growth is also sustainable and inclusive. The NEM includes a number of reforms to achieve economic growth that is primarily driven by the private sector and moves the Malaysian economy into higher value-added activities in both industry and services.

ASEAN: an overview[38]

ASEAN was established on 8 August 1967 in Bangkok, Thailand, with the signing of the ASEAN Declaration (Bangkok Declaration) by Indonesia, Malaysia, Philippines, Singapore and Thailand. The other five countries joined over the next 3 decades.

The organization is currently engaged in creating the ASEAN Economic Community (AEC), a multifaceted model for greater cooperation that will support the free movement of goods, services, investment, skilled labor (and freer flow of capital) as early as 2015. The AEC is based on four pillars:

- a single market and production base (essentially a free trade zone among ASEAN states)
- a competitive economic position supporting regulatory structures and policies for consumer protection, intellectual property rights and fair taxation
- equitable economic development among member states
- full integration into the global economy.

[35] Company website, vungropetroleum.com
[36] PTT Global Chemical: Seeking to double sales and grow overseas, Chemical Week, July 18, 2014
[37] Pertamina import terminal marks opportunity for LNG exporters to Indonesia, IHS, November 14, 2013
[38] Central Intelligence Agency website, World Bank, KPMG research

Jurong Island:
Singapore's success story

One of the most impressive achievements of the Southeast Asian chemical industry is Jurong Island, an integrated manufacturing complex developed by Singapore. Over 95 global companies are based on the island, including Shell, ExxonMobil, Chevron, DuPont, BASF, Sumitomo Chemicals and Mitsui Chemicals. Jurong Island has drawn cumulative fixed asset investments of over SGD30 billion, with about 8,000 personnel now working in the complex.

Jurong Island provides companies with a plug-and-play environment where companies can quickly ramp up their operations. This unique feature has helped to bring in investments from both upstream and downstream companies.

In the same way, industry integration enables companies to easily buy and sell feedstock and products, with the output of one plant serving as the input for neighboring plants. Moreover, integration in utilities and logistics not only creates production synergies but also supports added cost efficiencies.

Also located on Jurong Island is Banyan LogisPark, an area dedicated to third-party logistic services including chemical warehousing, tank filling, cleaning and maintenance, drumming and water treatment facilities. As Singapore's first integrated chemical logistics park, it serves as a one-stop hub to handle both bulk liquids and solid chemicals, supporting the entire value chain of chemical logistics services.

As other ASEAN countries seek to develop their chemical industries, Jurong Island sets a great example for what can be achieved in a relatively short period of time and perhaps offers a roadmap for development.

MYANMAR

Since 2010, the government of Myanmar has embarked on an ambitious economic, political and governance reform program and initiated a series of reforms to remove economic distortions, such as floating the currency, new fiscal regulations to rationalize personal income tax and reduce consumption tax, liberalizing the telecommunications sector, reforms aimed at developing the private sector and stimulating direct foreign investments, a review of the financial sector, promotion of access to finance and creating an environment conducive to job creation. Myanmar's economy grew at 7.3 percent between 2012–13, driven by increased gas production, services, construction, foreign direct investment and strong commodity exports. The economy is projected to grow at 7.5 percent in 2013–14 and rising to 7.8 percent in the medium-term, owing to continued increases in gas production, increased trade and stronger performance in agriculture.

PHILIPPINES

Philippines has been one of the most rapidly emerging markets in the region, given its sound economic fundamentals and highly skilled workforce. Growth in the country has been averaging about 5 percent since 2002, significantly higher than the previous 2 decades. Amid global uncertainties, the economy posted a 6.6 percent GDP growth in 2012, driven by higher government spending and exports. The country's strong economic growth, as well as the government's sound fiscal management, helped the country to attain investment grade status from the Japan Credit Rating Agency, following similar upgrades from major credit raters in 2012.

Key challenges remain

> Despite the remarkable achievements by ASEAN countries over the past decade, **critical issues must be addressed** if the region is to **maintain current growth** trends.

Despite the remarkable achievements by ASEAN countries over the past decade, critical issues must be addressed if the region is to maintain current growth trends.

Too many ASEAN countries are still burdened by regulations and government policies that discourage new business investments. In the World Bank's 2014 'Ease of Doing Business' Index, six ASEAN countries are found in the bottom half of the list (though Malaysia and Thailand are in the top 20 and Singapore ranks number one).

Indonesia continues to struggle with poverty and unemployment, inadequate infrastructure, corruption, a complex regulatory environment and unequal resource distribution among regions. Laos remains a country with an underdeveloped infrastructure despite high growth, particularly in rural areas. Agriculture accounts for about 25 percent of the GDP and 73 percent of total employment.

The Thai economy has weathered internal and external economic shocks in recent years. The global economic recession severely cut Thailand's exports, with most sectors experiencing double-digit drops. In 2011, Thailand's recovery was interrupted by historic flooding in the industrial areas in Bangkok and its five surrounding provinces, crippling the manufacturing sector.

At the regional level, the gradual cooling of the Chinese economy is cause for concern. China has long been a destination for heavily export-trade-dependent economies such as Malaysia, Thailand and Singapore. If China continues to maintain a policy of moderate growth, many sectors across the Southeast Asian economy may undergo increasing stress or even contraction.[39]

Ease of doing business in ASEAN countries

Singapore	1
Malaysia	6
Thailand	18
Brunei	59
Vietnam	99
Philippines	108
Indonesia	120
Cambodia	137
Lao P.D.R.	159
Myanmar	182

Source: World Bank, 2013

SINGAPORE

Singapore has a highly developed and successful free-market economy. It enjoys a remarkably open and corruption-free environment, stable prices and a per capita GDP higher than that of most developed countries. The country provides the world's most business-friendly regulatory environment for local entrepreneurs and is ranked among the world's most competitive economies. In the decades after independence, Singapore rapidly developed from a low income country to a high income country. GDP grew an average of 7.7 percent since independence. Over the longer term, the government hopes to establish a new growth path that focuses on raising productivity. Singapore has attracted major investments in pharmaceuticals and medical technology production and plans to continue efforts to establish Singapore as Southeast Asia's financial and high-tech hub.

[39] Op. cit., Market outlook: Growth opportunities in petrochemicals for Southeast Asia

THAILAND

With a well-developed infrastructure, a free-enterprise economy, generally pro-investment policies and strong export industries, Thailand has been achieving steady growth, owed largely to industrial and agriculture export (mostly electronics, agricultural commodities, automobiles and parts and processed foods). Unemployment is less than 1 percent, one of the lowest levels in the world. After severe flooding in 2011, Thailand's economic activity has gradually returned to normal.

VIETNAM

Agriculture's share of economic output has continued to shrink from about 25 percent in 2000 to less than 20 percent in 2013, while industry's share increased from 36 percent to more than 42 percent in the same period. The global recession hurt Vietnam's export-oriented economy, with GDP growth in 2013 at 5 percent, the slowest since 1999. In early 2012, the government unveiled a broad, 'three pillar' economic reform program, proposing the restructuring of public investment, state-owned enterprises and the banking sector.

Conclusion

Many of the fundamentals that support chemical industry demand, including GDP growth, urbanization and growing middle classes, continue to move in a positive direction, which can only be beneficial to industry growth.

There has also been a fundamental shift over the last 18 months in the way ASEAN countries are viewed. When we talk to senior executives of the world's biggest chemical companies, there is increasing interest in Other Asia. No longer is an Asian growth strategy just about China or India. The challenge for governments in Southeast Asia is to continue to adopt policies that will engender investment and growth, continue to support investments in basic infrastructure and encourage transparent business practices.

Several countries in Asia will be at the forefront of the next wave of emerging-market chemical industry growth. They include Indonesia, Malaysia, Thailand, the Philippines and Vietnam, each with different specific strengths. For example, Indonesia's population is the foundation for a large consumer base, while Vietnam offers relatively low-cost labor for manufacturing. The one thing they all have in common is strong fundamentals for growth.

Initially, the chemical industry in this region has to learn to walk before it can run, so investment is likely to be focused on the commodity end of the sector and establishing the basic building blocks of the industry. However, with increased urbanization and continued middle-class growth, there are also likely to be opportunities in segments such as construction chemicals, consumer chemicals and personal care.

The challenge for ASEAN countries is to have all of the fundamentals in place, including support for chemical industry supply chains, legal structures and business practices, so that higher-value chemicals can be manufactured in-country rather than imported from abroad. For global chemical companies, the region represents a huge opportunity for growth and should be increasingly high on the list of strategic growth considerations.

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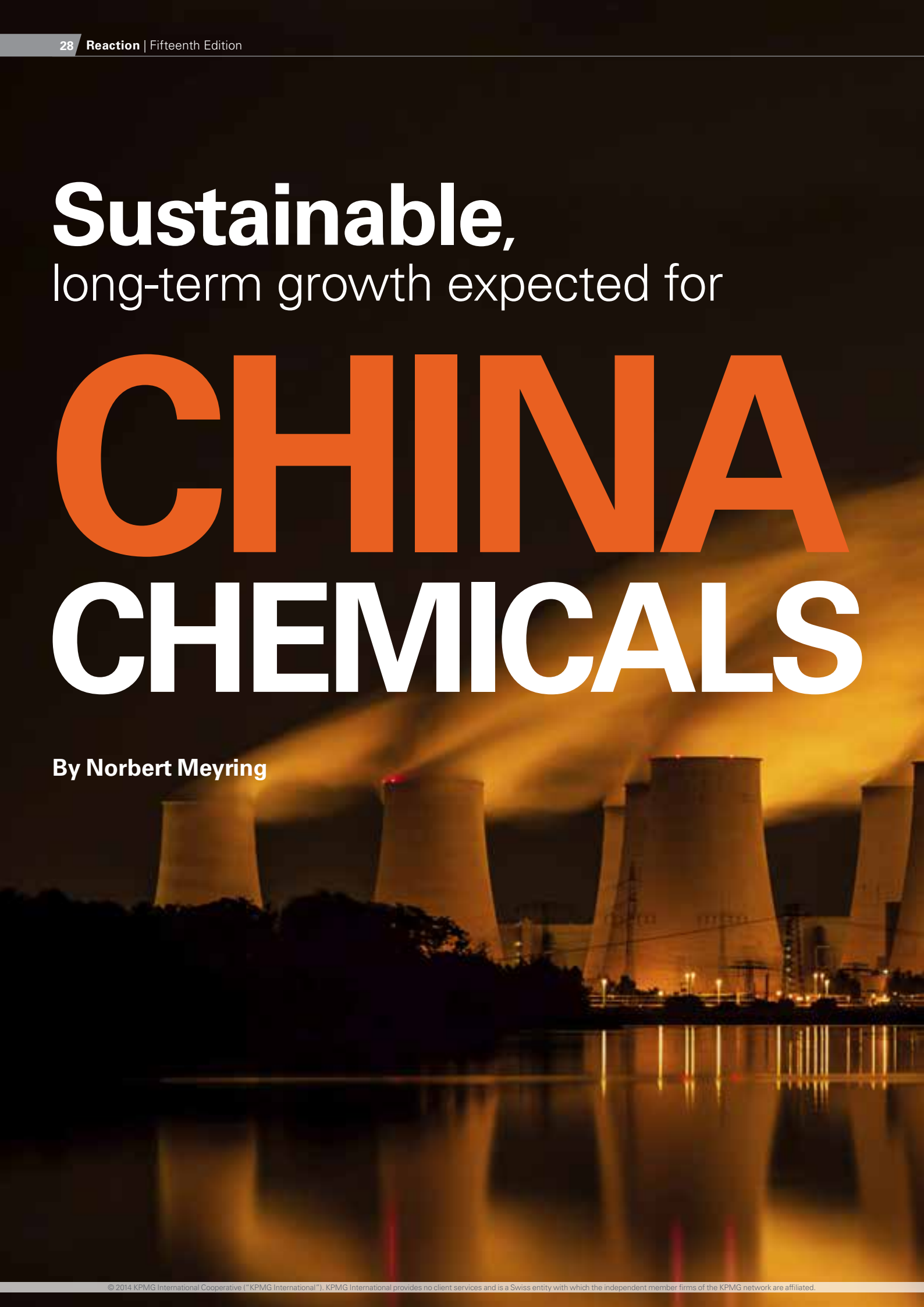
Sustainable, long-term growth expected for CHINA CHEMICALS

By Norbert Meyring



China's GDP growth rate is the envy of many countries, but the percentage is expected to decline slightly in 2014.[40] This is actually good news for a country taking significant steps to avoid soaring inflation and market disruptions from an overheated economy. The government's 'mini-stimulus' strategies have encouraged steady but moderate growth in chemicals through a gradual liberalization of policies designed to promote financial services, increase business opportunities, encourage foreign investment and support specific industry subsectors such as coal-to-chemicals production. No one is planning for a return to the same level of double-digit growth figures seen in previous years. Nevertheless, Greater China[41] is expected to represent 64 percent of the chemical market in Asia Pacific by 2020.[42]

[40] National Bureau of Statistics (NBS), KPMG analysis. See Investment in China: Numbers and Trends, KPMG, 1Q 2014

[41] Mainland China, Hong Kong, Macau and Taiwan

[42] Presentation, BASF Investor Day Asia Pacific, June 2013

Tapping the brakes on a powerhouse economy

"Slow but steady wins the race," might not be the official motto of Chinese policy makers, but it reflects a prudent, sustainable long-term perspective that the county's economic policies appear to support.

For several years, China has dealt with a problem many countries would like to have in a global downturn — not how to stimulate growth but how to properly manage it. In 2014, the major economic indices for China have shown moderate declines, a pattern that some analysts expect to continue through at least 2020.[43] Nevertheless, GDP growth is expected to remain above 6.5 percent, well above that of developed countries.

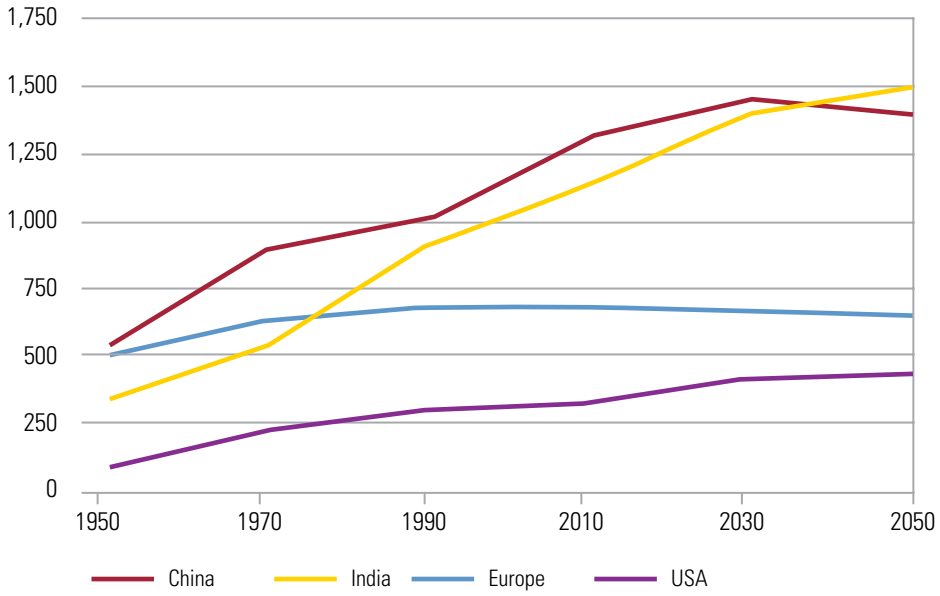
China's population growth continues to be its main engine for economic development. The country has well over a billion people, with 1.5 billion expected by 2030. The population is also becoming increasingly urban and middle class. In 1978, less than 20 percent of China's population lived in cities. By 2012, this figure more than doubled, an increase of more than 500 million people. This includes 260 million people moving to cities from rural areas. By 2030, 70 percent of China's population of one billion people is expected to live in urban areas. In line with this urbanization is a rapidly growing middle class supporting new and larger markets for consumer goods, healthcare, construction and other areas.

China's GDP grew by 7.5 percent for the second quarter of 2014, meeting exactly the government's target.[44] According to KPMG analysis, GDP growth is expected to slow to around 6.5 percent until 2020 due to changes in demographics, reduced exports

Population in China

Population growth and projections

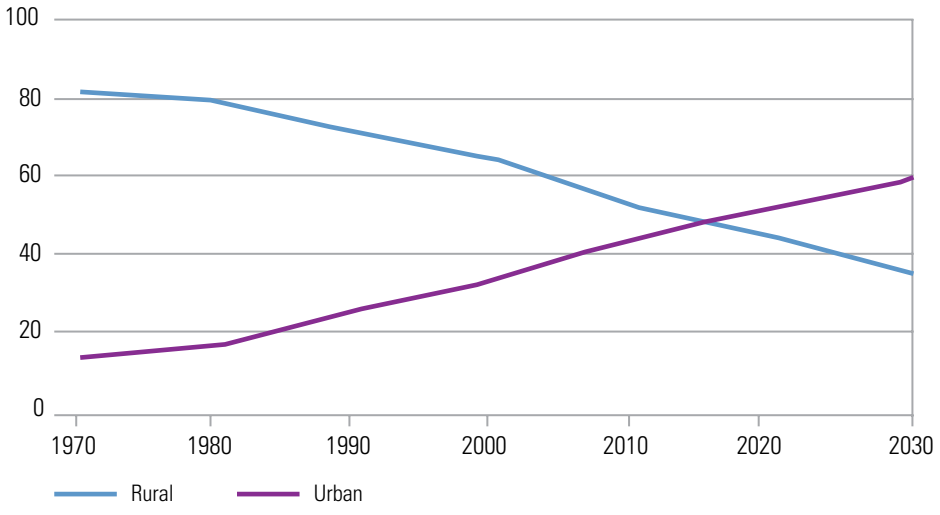
Millions



Source: UN

Rural and urban population

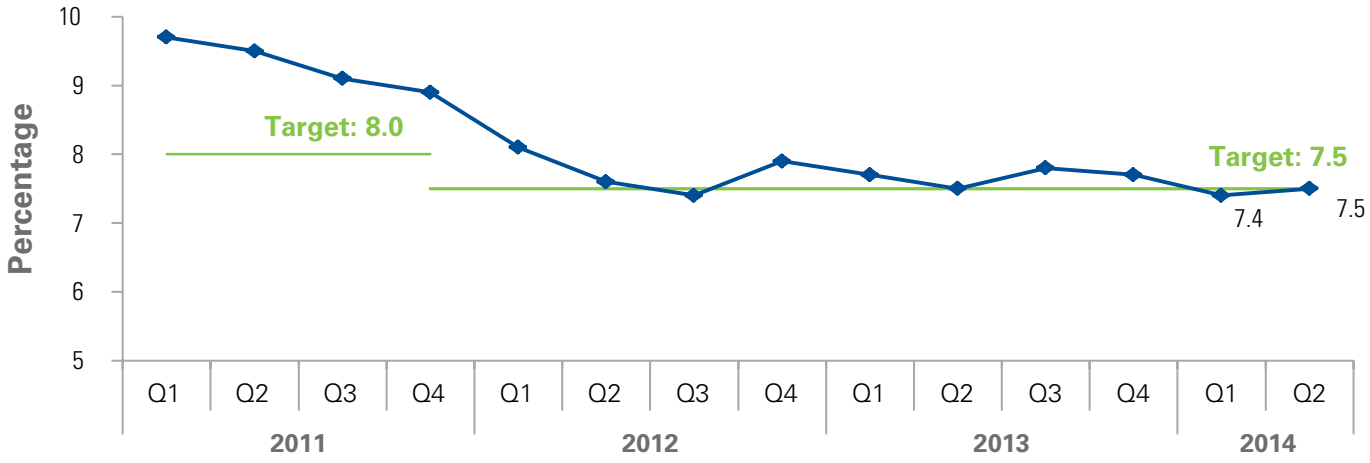
Percent



Source: UN

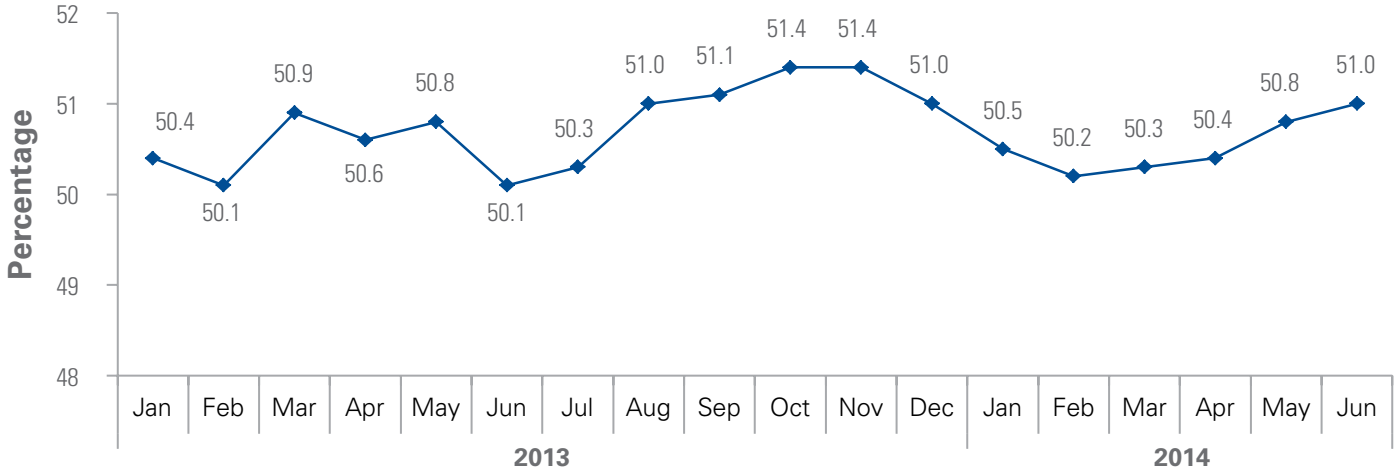
[43] Outlook 2014: Looking Forward, Chemical Week, April 2014
[44] Statistics from Investment in China: Numbers and Trends, KPMG, 2Q 2014

GDP quarterly growth rate, year-on-year



Source: National Bureau of Statistics (NBS), KPMG analysis

Monthly Purchasing Managers Index (PMI)



Source: National Bureau of Statistics (NBS), KPMG analysis

because of a higher Renminbi and increased costs for labor.

As of June 2014, the Purchasing Managers Index (PMI) hit a 6 month high of 51.0.[45] This increase can be attributed to rising demand for industrial products, resulting from more infrastructure investment and new export orders.

The Consumer Price Index (CPI) increased by 2.3 percent, below the government's target of 3.5 percent. However, the Producer Price Index (PPI) decline narrowed to 1.1 percent in June, indicating that manufacturers are becoming more active.[46]

[45] Ibid.
[46] Ibid.

National policies to support business

China is now in the fourth year of its 12th Five-Year Plan, which is focused on the promotion of sustainable growth, industrial upgrading and domestic consumption. Four industries directly related to the chemical sector are benefiting from the Plan: new energy sources, new materials, automotive manufacturing and green, energy-saving products.

A number of government policies support:

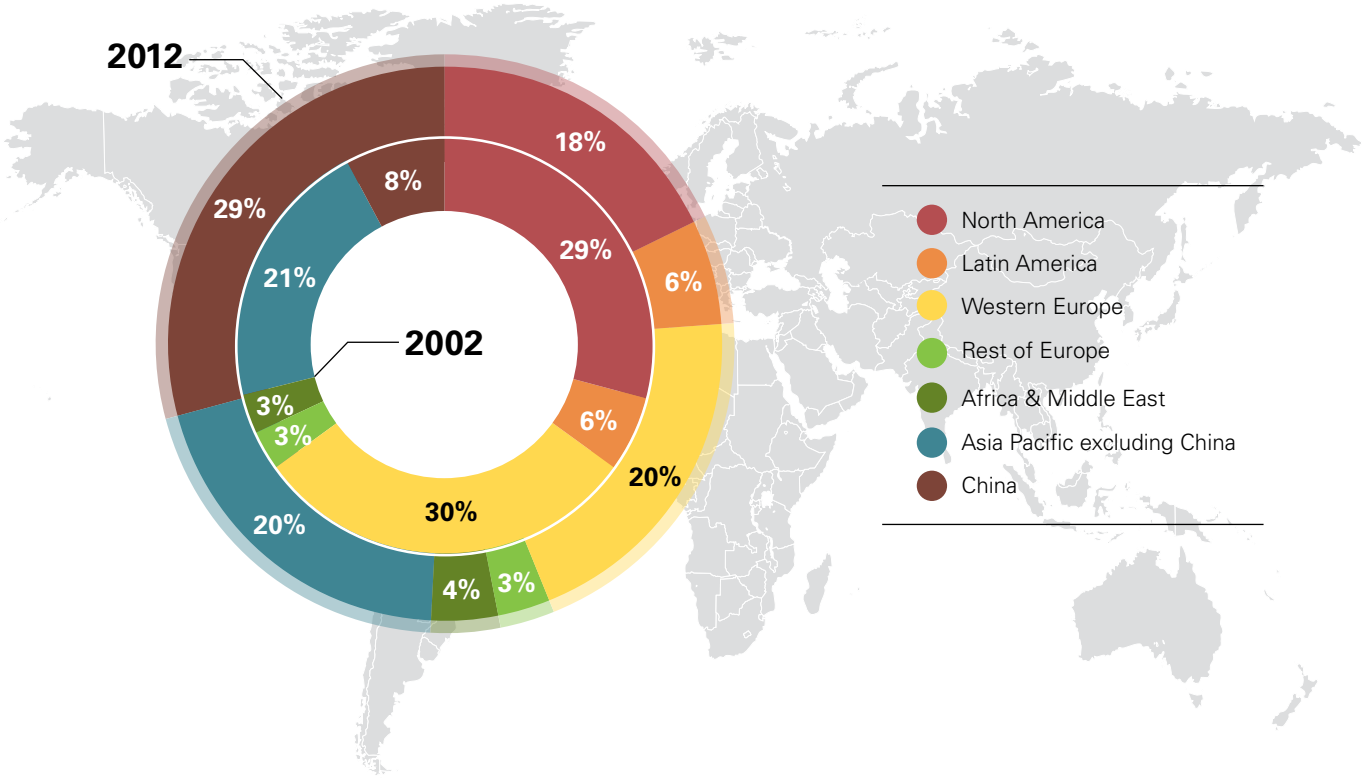
- innovation in the financial services sector. Measures include interest rate liberalization, the cross-border use of the Renminbi, support for new types of financial products and services and relaxed control over the insurance industry.
- a unified and open market, a market-based pricing mechanism, and further decentralization. These actions will deepen the reform of the administrative approval system and minimize interventions from the central government on microeconomic affairs.
- increased international trade and outbound investment (See below: *Increase in foreign direct investment*). The government is pursuing and signing investment treaties, free trade zone (FTZ) developments such as the pilot FTZ in Shanghai and other initiatives like the 'Silk-Road Economic Belt' and an 'Economic Corridor' between China and Southeast Asian countries.
- the private economic sector, which is being given new room to grow with the reform of state-owned enterprises (SOEs), the opening of monopoly industries and the introduction of new tax deduction and exemption rules.

- domestic demand. The government has stipulated that it will increase wages and income, which will further enhance the consumption function of GDP.

Various policy-related uncertainties persist for the Chinese business community, including exactly when and to what degree specific policies will be fully implemented, restrictions in the servicing areas, details about banking and foreign exchange regulations and local concessions to specific industries. However, we predict the government will continue to support 'mini-stimulus' policies, speed up the pace of investment projects and encourage greater private sector participation across more industries to help support sustainable growth.

10 percent growth expected for chemicals

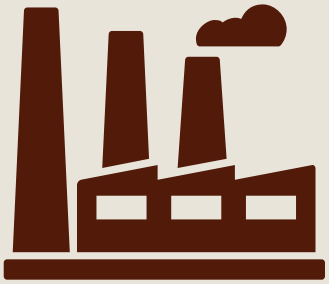
World chemical shipments by region (2002 vs. 2012)



Source: Global business of chemistry, American Chemistry Council

China's chemical segment sales 2012

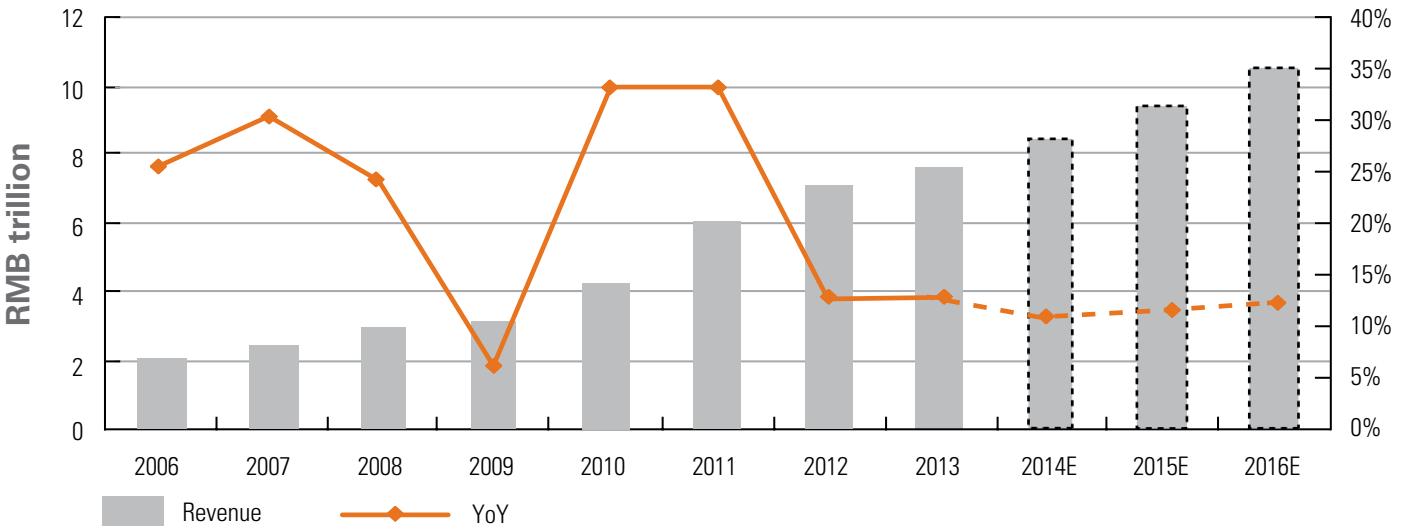
US dollars (billion)



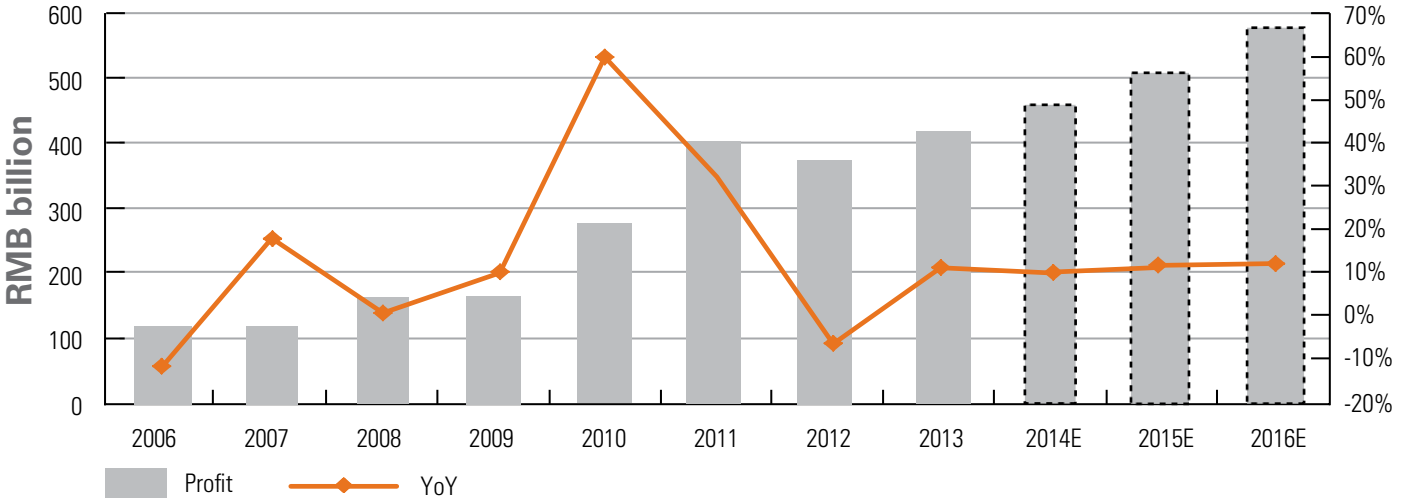
Commodity chemicals	617.6
Specialty chemicals	92.3
Agricultural chemicals	84.0
Other	172.1
Total value	966.0

Source: Chemicals in China, Datamonitor, February 2014

Chemical sector revenue



Chemical sector profit

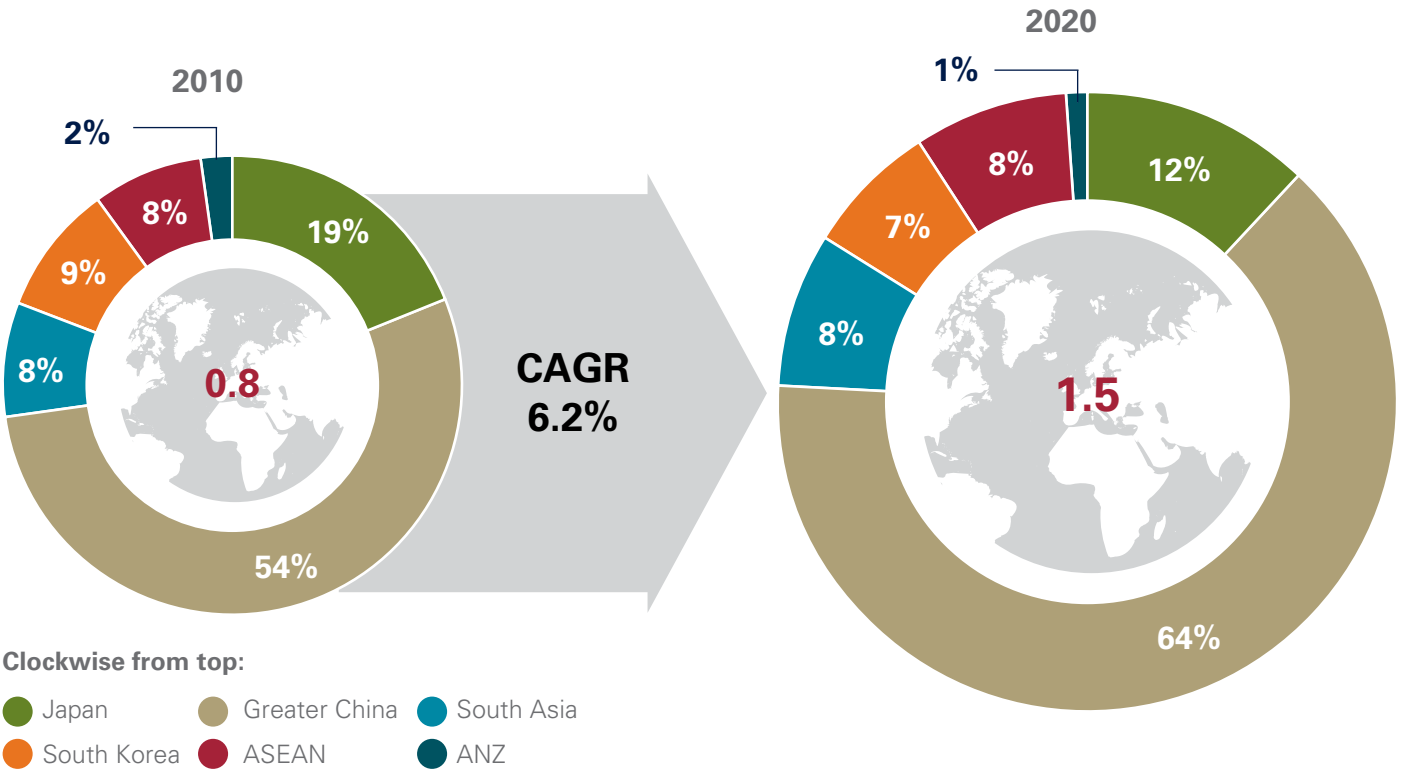


Source: CPCIF, CEI

Selected product (2013)	Output volume (million tons)	Growth % (YoY)
Fertilizer	71.536	4.9%
Concentrated nitric acid	2.681	1.3%
Ethylene	16.226	8.5%
Synthetic resin	58.367	11%
Soda ash	24.293	0.6%
Sulphuric acid	80.776	5.8%
Synthetic rubber	4.088	6.2%

Source: CPCIF, CEI

China's chemical market growth in Asia Pacific: US dollars (trillions)



Source: BASF. Real chemical production, excluding pharma

Over the past decade, global shipments for chemical products from China have more than tripled. Presently, the industry involves over 25,000 companies, including industry giant Sinopec, now the world's second largest chemical company.[47] Commodities currently make up more than 60 percent of the Chinese chemical industry, followed by specialties and agrochemicals, each with about 10 percent. China became the world's largest chemical producer in 2010 and by 2012 the country accounted for about 25 percent of global production. This figure is expected to reach 50 percent in 2030.[48]

China's chemical industry will likely continue a period of slower but solid growth, analysts say. The American Chemistry Council expects production in China to increase 8.5 percent in 2015 compared with 8.8 percent in 2014 and 8.5 percent in 2013.[49] Both KPMG and the China Petroleum and Chemical Industry Federation (CPCIF) forecast production growth in the chemical sector of around 10 percent for 2014–15.[50]

Over the next 5 years, profits and production are expected to rise.[51] According to the CPCIF, main business revenue for the chemical sector in China increased 10.4 percent year-over-year (yoy) to RMB4.16 trillion and total profits for the sector increased 8.9 percent yoy to RMB185.54 billion.[52]

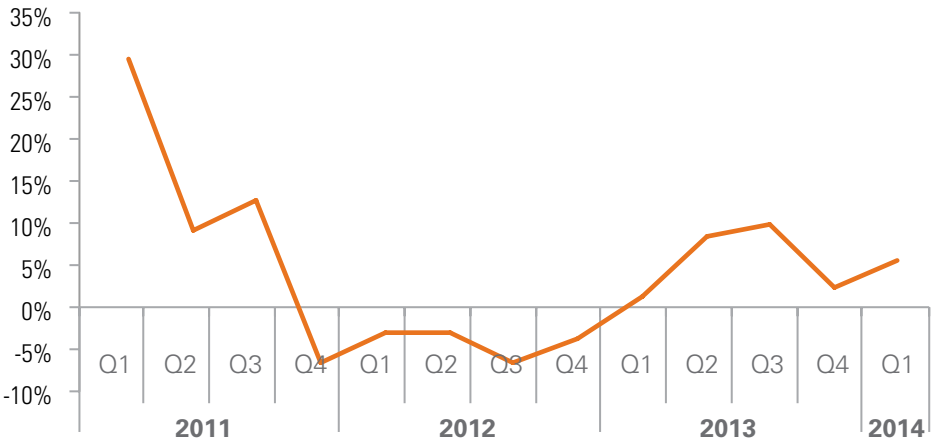
As with other maturing chemical industries moving up the value chain, the proportionate share of fine chemicals and specialties is expected to increase over that of commodities. Subsectors such as lubricants, synthetic rubber and engineering plastics will benefit from the Chinese automotive market, which is expected to grow at an annual rate of 5 percent until at least 2020.[53] In the first half of 2014, fertilizer demand declined 1.8 percent yoy to 34.45 million tons, while synthetic resin increased 11.4 percent yoy to 33.71 million tons.

Key challenges for chemical companies in China include rising costs for labor, transportation, financing and regulatory compliance for environmental laws. In addition, the first half of 2014 saw various pockets of overcapacity, such as caustic soda with 80 percent utilization, calcium carbide with 65 percent, polyvinyl chloride (PVC) with less than 70 percent, and methanol with 62 percent.[54] This overcapacity pushed a number of product prices downward. For example, average prices of caustic soda fell more than 17 percent yoy between January and June, calcium carbide was down 9.2 percent and urea declined more than 25 percent.

47 KPMG analysis, Chemical Week
48 Ibid.
49 Op. cit., Outlook 2014: Looking Forward
50 CPCIR, KPMG research
51 CPCIF, China Chemical Reporter
52 Ibid.
53 Op. cit., Outlook 2014: Looking Forward
54 Op. cit. China Chemical Reporter

Increase in foreign direct investment

FDI growth rate by month, year-over-year



Source: Wind, KPMG Analysis

Foreign investors in the chemical industry have cited a number of obstacles to doing business in China, including increased costs, talent recruitment and retention, growing competition from Chinese companies and licensing.[55]

In addition, multinational companies are encountering increased competition from 'local champions' in the Chinese chemical industry. Along with setting up mega production bases and expanding their product range in an integrated manner, these companies have begun to innovate and are swiftly incorporating technological changes into their production processes. Enterprises are investing considerable resources and capital in the manufacturing of new chemical materials used in information technology, aviation, aerospace, energy, automotive and green construction. These domestic companies pose a strong challenge to foreign multinationals by their sheer ability to invest along the entire value chain.

That being said, China continues to provide significant opportunities for foreign multinational chemical companies. Total foreign direct investment (FDI) increased by 5.5 percent year-over-year in the first quarter of 2014. The service sector saw a double-digit year-over-year growth, although the manufacturing sector continues to decline. Western and central China FDI growth significantly outpaced the eastern region.

Announcements since 2013 of inbound deals in chemicals include the acquisition by Nippon Paint (Japan) of equity interests held by Wuthelam Holdings in a number of Nippon Paint's entities in China for US$1.02 billion and the investment by Rockwood Holdings (US) in Talison Lithium for US$196 million.

Completed inbound deals include an investment by Croda International (UK) in Sichuan Sipo Chemical for US$58.6 million, and a US$22.1 million investment by Koninklijke DSM (Netherlands) in Yantai Andre Pectin Co., Ltd. In addition, Dongsung Chemical Co Ltd (South Korea) acquired equity interests held by the parent in Guangzhou Dongsung Chemical Co Ltd. for US$21.2 million.

In contrast to this inbound activity, China's outbound direct investment (ODI) in the non-financial sector decreased by 16.5 percent year-over-year, to US$19.9 billion in the first quarter. However, total Chinese ODI for 2014 is expected to increase due to a number of factors, including a new regulation by China's Ministry of Commerce to encourage overseas investment and the ongoing negotiation of an investment agreement between China and the US.[56]

[55] Statistics in this section from KPMG research, Bloomberg, company press releases and the US-China Business Council & EUCCC 2014 Business Confidence Survey

[56] China's ODI growth to beat forecasts, Global Times, October 23, 2014

Coal to olefins

One of the major developments for Chinese chemicals today involves coal-to-olefins (CTO) production. China faces a huge energy demand to support GDP growth, while oil prices have increased dramatically since 2009. Imports still represent more than half of China's oil consumption. Accordingly, the Chinese government is supporting policies to exploit the country's rich coal resources and develop a major CTO chemicals industry.[57]

More than 120 CTO chemical projects have already been announced in China. The country currently has 400,000tpa of coal-based ethylene and 1.4mntpa of coal-based propylene in production. In 2012, 75 percent of China's methanol and ammonia capacity, 85 percent of its PVC capacity and 25 percent of its benzene production were based on coal feedstock. KPMG analysts believe that the rate of coal-based chemicals capacity growth may even outpace shale-based expansion in North America, with 20 million tons per annum (mntpa) of CTO capacity set to come on-stream by 2020 compared to 13 mntpa of ethylene and propylene capacity in the US.[58]

The government's focus on self-sufficiency currently overrides questions raised about the sustainability of CTO production. These include:

- overcapacity, especially in commodity segments
- environmental concerns, including a high level of waste generation and carbon emissions
- water shortages in western China and other regions with rich coal resources
- high up-front capital investments, up to three times the amount for traditional steam crackers[59]
- a complex government approval process.

Despite these uncertainties, some analysts suggest that by 2017, approximately 40 percent of the olefins produced in China will be based on unconventional technologies such as coal to chemicals and propane dehydrogenation, about twice the current percentage.[60]

Coal-to-olefins projects in China

	Number of new projects	Cumulative capacity, ethylene/ propylene (million tonnes per year)
2011	3	1.5
2012	0	1.5
2013	2	2.6
2014	5	6.3
2015	6	8.4
2016	11	16.3
2017	12	23.3
2018	4	27.0

Source: China Polylefin Industry Outlook, CNIC Consulting, May 2014

Major operational coal-to-olefins projects

Plant	Capacity (kt/y)	Operational
Shenhua Baotou	600	2010
Shenhua Ningmel	500	2011
Datang Duolun	460	2011
Sinopec Zhongyuan	200	2011
Wison Nanjing	295	2013
Ningbo FUND Energy	600	2013

Source: China Polylefin Industry Outlook, CNIC Consulting, May 2014

Note: kt/y-thousand tonnes per year

[57] EPCA 2014: Healthy outlook for petchem demand growth and industry profitability, IHS Chemical Week, October 10, 2014

[58] KPMG analysis

[59] EPCA 2014: Healthy outlook for petchem demand growth and industry profitability, Chemical Week, October 10, 2014

[60] Ibid.

Strengthening a China presence

Jan Kreibaum

Regional President, Greater China and Korea, Clariant

Jan Kreibaum is the Regional President of Greater China and Korea for Clariant, a Swiss specialty chemicals MNC with 1,500 employees in China and over 18,000 globally.

"Chinese firms are moving up the value chain and becoming more sophisticated," he says when asked about local competition. "The quality is often comparable. They are also improving rapidly in terms of introducing better processes and documentation. Many local companies are putting more and more emphasis on innovation and some privately owned enterprises (POEs) are acquiring foreign talent by whatever means possible. For instance, I've seen some local competitors hire experienced Japanese retirees."

However, he argues that Clariant has the ability to stay ahead by creating new market openings. "Our customers are also increasingly demanding and that creates opportunities for us. Take food safety as an example. A lot of our products go to the food packaging industry and our customers increasingly want full traceability. They want to be able to go to their suppliers further up the value chain and trace where all our products are coming from. Clariant is really good at this. We are very good at adapting or developing our existing offerings."

Clariant's market has meanwhile changed in recent years as China's domestic economy evolves. Much of the big growth nowadays is coming from the booming locals, especially the POEs. Take the mobile phone industry and its use of pigments. In the past, we would have done a lot of development work with Western mobile phone companies. But now there are local companies that are selling huge volumes and also planning to go outside China. We are currently putting a lot of focus on such booming local companies and their needs," he says.

Does operating in a highly regulated industry create challenges for Clariant? "The regulatory framework is in place and it is being more strictly applied as a result of the recent anti-graft measures. We see the Chinese Government putting more emphasis on enhancing the enforcement," he says.

However, Kreibaum also notes that tightening regulations have in some cases benefited MNCs. "We have seen instances where the government has shut down a producer near a first-tier city because the company was unable to deal with tightening environmental or other regulations. Because of the high level of standards Clariant adopts globally, we get chances to support local partners and customers to upgrade their production facilities to comply with the new regulations. That creates opportunities for us to grow our domestic business."

However, such an ambition means having enough feet on the ground to understand local demand and develop local relationships. "We have 1,500 employees in Clariant spread across 18 cities in China. Our expatriate employees either have Asia Pacific roles or specific technical skills. We also want to bring more Asian nationals into top management positions, including regional roles. In addition, several key talents have been transferred to Switzerland with the expectation that they will develop skills and relationships before returning to Asia."

Is it hard to retain such top local talent? "When I came in 2005, people were switching jobs mainly because of salary, but now they are moving for career opportunities or CV development. Training programmes are very much in demand as a result and we have also set up a special retention programme for the 'must keep' talent, such as those with special technical skills or those critical to the business. But it's still tough sometimes to compete with the POEs, which will offer special packages with guaranteed payouts, such as after an IPO," he says.

Factors for future growth

For 2014, the news is generally positive for the Chinese chemical industry. The sector is maintaining growth a few percentage point points above the country's GDP growth rate. Industry scale continues to expand. Innovation is increasing and the industry's infrastructure is supporting higher levels of productivity, efficiency and cost-effectiveness. Downside risks include profitability declines, overcapacity in certain sub sectors, an insufficient supply of high-end products and increased regulatory pressures to save energy and reduce carbon emissions.

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KPMG in the industry

CIA Chemical Industries Association

Working for chemical and pharmaceutical businesses

KPMG in the UK recently hosted a table at the CIA's Annual Dinner in London. It was also an opportunity to meet and have some topical discussions with members of the UK chemicals community.

KPMG STRATLEY A KPMG Entity

KPMG and Stratley were key sponsors at the 9th Annual Gulf Petrochemicals & Chemicals Association (GPCA) Forum which took place in Dubai, UAE. Paul Harnick, Global Chemicals, COO was featured in a video discussing the role of the Middle East and upcoming global changes, such as the impact of shale and new emerging players, within the chemical industry. To watch, please visit kpmg.com/chemicals.

KPMG Global Chemicals Institute

Our upcoming Reaction 15 webcast, taking place in early February will feature Gaurav Moda. This webcast will focus on the changing industry for India's chemical companies.

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