

# Measuring China's Importance

## Chemical Quotient Quantifies Relative Status of Chinese Chemical Industry

In the past 10 years, we have gradually become accustomed to China's economic rise. In some ways, we are no longer as surprised by it as we should be. I realized this recently when looking at old forecasts. For example, a Deutsche Bank research report published in October 2005 gives China's global chemical market share as 8%, and continues with a forecast (which at that time was seen as rather bullish) of this share rising to 13% in 2015, an assumption based on the domestic chemical market growing by 10% each year. As we know, in 2013 the Chinese share of the global chemical market already reached 33%, and annual growth in the period of 2004 to 2013 was not 10% but 23%.



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Of course, during this period, not only the Chinese chemical market but also Chinese gross domestic product grew substantially. So is the increase of China's chemical market share only a consequence of its GDP growth? To answer this question, it helps to look at the relative importance of the Chinese chemical industry compared with the rest of the world, and how it changed with time. I would like to introduce a new measure to facilitate such a comparison — the Chemical Quotient (CQ).

This CQ compares the global chemical market share a country has with its share of GDP:

$$CQ = (\text{global chemical market share}) / (\text{share of global nominal GDP})$$

Thus a CQ value above 1 means the chemical market of a country has a higher importance than its share of GDP would suggest. Similarly, a CQ value below 1 means the chemical market of a country is below its expected value based on a country's share of global GDP.

### CQ Values

So what are the CQ values for selected countries? Take a look at figure 1. It shows the CQ for those 27 countries with the biggest global chemical market share — in fact these are all countries with a global chemical market share of 0.5% or above. These 27 countries account for a total of 88% of the global chemical market.

The graph clearly shows that some countries — in particular, Taiwan, Korea and China — have a much higher contribution to the global chemical market than to global GDP. This means that these countries should be of disproportionate interest to chemical companies. Among these three, China is by far the most important because of its large absolute size. In fact, the high values of Korea and Taiwan are probably due to their close proximity to mainland China and the resulting high production of chemicals for export to China. China itself is still the global production hub, and most production processes require chemicals; the CQ reflects this.

Most of the other countries with a CQ above 1 are smaller economies, which for a variety of reasons have a disproportionately large chemical industry. Among these reasons:

- Central location, particularly with regard to shipping (Nether-



lands, Belgium, Singapore, with their ports and the petrochemical industry there)

- Access to raw materials (crude oil for Saudi Arabia and Iran, minerals for Chile, oleochemicals and oil for Malaysia)

In contrast, larger highly developed countries such as the US, Japan, France and the UK have CQ values substantially below 1, reflecting the fact that the service sector — while adding a large share to the GDP of these countries — requires few chemicals. Generally speaking, large segments of the chemical industry are quite mature and commoditized and thus rather cost-focused, leading to a preference for locations with low labor and investment costs and cheap raw materials rather than one with a highly educated workforce. Germany with its strong manufacturing sector and a CQ of

almost 1 is somewhat of an exception. In contrast, the low CQ value of the UK is particularly striking. The country accounts for only about one-third of the global chemical market share to be expected based on its share of global GDP alone.

### Rise Of China

How has the CQ developed in the past 10 years? Figure 2 gives some indications.

Clearly the rise of China as a global industrial power was accompanied by an even stronger rise of its chemical industry, as witnessed by the substantial increase of the CQ during this period. Almost all other bigger countries and regions — with the exception of South Korea with its close links to the Chinese economy — saw a corresponding decline in the CQ as they had to cede market

share to the stronger Chinese competitors.

How will China's CQ develop in the future? An analysis of the past 15 years — though complicated by the lack of some data for global chemical market share during this period — indicates that it has likely reached its peak (Figure 3).

In other words, China's global chemical market share no longer grows substantially faster than its GDP, which will in the long run lead to a lower CQ. However, given the very high current CQ, it will take a very long time before China's CQ gets anywhere near the global average (which by definition is 1). Assuming zero growth for China's global chemical market share (which currently does not seem a realistic assumption as this market share has constantly increased in the past), China would have to ap-

proximately triple its GDP just to get to a world average CQ.

What does this mean for investment? China will remain a very important location for chemical industry investment. The reason is not only that China accounts for a larger and larger share of global GDP, but also that in a global comparison, China's chemical market share is proportionately higher than justified by its GDP size alone. So while there are many difficulties in profitably investing in China's chemical market, it is also almost impossible for global players not to do so.

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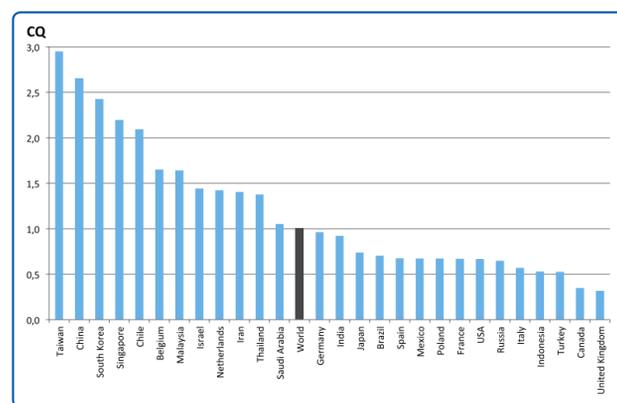


Fig. 1: Chemical Quotient (2013) for selected countries

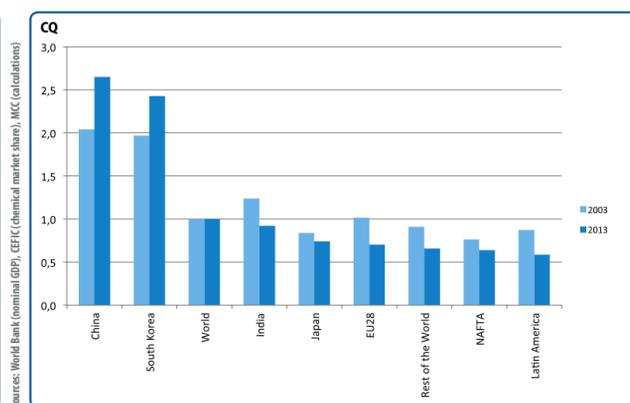


Fig. 2: Chemical Quotient (2003 and 2013) for selected countries/groups of countries

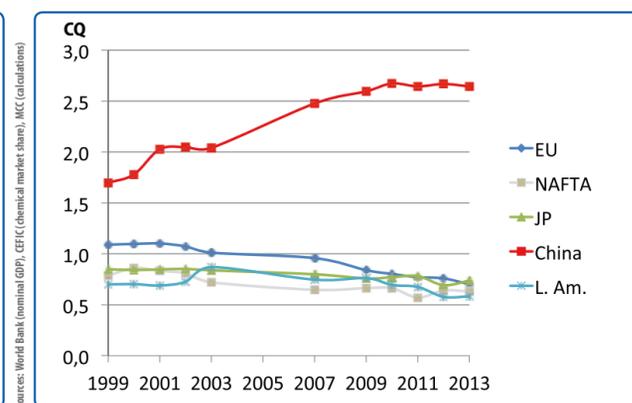


Fig. 3: Historical chemical quotient for China and selected other countries/groups of countries

## Shell Starts New Singapore Plants

Citing increased demand in Asia, Shell has started up a new 140,000 t/y high-purity ethylene oxide (HPEO) purification plant and a new 140,000 t/y ethoxylates unit at its site on Singapore's Jurong Island, thereby doubling supply to local and regional customers.

The multinational oil and petrochemicals group delivers HPEO through an ethylene oxide pipeline grid to "over-the-fence" customers and its own expanded ethoxylation operations on Jurong Island. Feed-

stock comes from the group's ethylene oxide/mono-ethylene glycol plant, which is integrated with its ethylene cracker and refinery on Pulau Bukom.

Shell said Singapore continues to be an important refining and petrochemicals hub, with the new Jurong Island plants further deepening its chemicals footprint in Asia. The availability of both ethylene oxide and propylene oxide (PO) at the same location offers an advantageous value proposition for specialty chemical

companies, who commonly use both of these intermediates to produce value-added products, it added.

As part of the same process, Shell increased polyols capacity by more than 100,000 t/y in 2013 and added new grades. In December 2014, it took 100% control of Ellba Eastern, the styrene monomer and propylene oxide (PO) joint venture with BASF, a move it said enabled integration with and optimization of Shell's existing assets on Jurong Island in a difficult cost environment. (dw) ■

## AkzoNobel Expands Coatings in Vietnam, UK

AkzoNobel is doubling capacity for powder coatings facility at Dong Nai, Vietnam, and opening a new office in Ho Chi Minh City. The new production line, which will go on stream in November with a 20% increase in its workforce, will also supply customers across Southeast Asia, India, Australia and New Zealand.

Conrad Keijzer, AkzoNobel's executive committee member responsible for Performance Coatings, said

Vietnam is strongly emerging as a manufacturing base in Asia, which continues to be an attractive growth market.

The Dutch company is the country's largest paints and coatings producer, with four manufacturing locations for both decorative paints and performance coatings.

In the UK, AkzoNobel plans to spend more than €1.3 million on a pilot plant for coatings resins to be

built at its Performance Coatings site in Felling and scheduled to go on stream in the first quarter of 2016.

The new facility, part-funded by the UK government's "Let's Grow" regional growth fund, will initially provide resin samples for product testing and later is planned to be scaled up to commercial manufacturing dimensions. Felling is the business's largest R&D site worldwide. (dw) ■

## BASF Starts First Chinese MDI Plant

BASF has started its first production of MDI at its new 400,000 t/y plant in Chongqing, China. Production will be ramped up gradually in line with market demand, the German group

said. The plant's output will support key industries in China's western regions using the polyurethane feedstock in products for insulation, automotive parts and energy

in buildings. MDI is also produced by BASF in Caojing, Shanghai, as well as in Antwerp, Belgium, Yeosu, South Korea, and Geismar, Louisiana, USA. (eb) ■

South Korea's Hyosung Corporation has taken its second license for the Unipol polypropylene technology now owned by US chemical producer W.R. Grace. The process will be used in the company's new

200,000 t/y plant scheduled to start up in Ulsan, Korea in 2017.

Grace, which acquired the Unipol process with its \$500m takeover of Dow Chemical's Polypropylene Licensing and Catalysts business

segment in 2013, regards itself as a leading supplier of polyolefin catalyst technology. The company claims to have the broadest portfolio of any independent PE/PP catalyst manufacturer. (dw) ■