

# Rubber on a roll

**Synthetic rubber producers are gearing up to meet growing demand from the downstream car and tire markets, while natural rubber output keeps pace. But, says Clement Choo, butadiene feedstock supply is lagging**

**D**emand for synthetic rubber is booming. The key driver for the firm demand is the rapid growth of automobile ownership, especially in China and other developing countries, which despite high fuel prices shows little sign of abating.

In its Global Auto Report released at the end of last year, Canada's Scotiabank predicted that in 2012, car sales in emerging nations would surpass purchases in the developed world for the first time on record.

"We project that car sales in developing nations will expand by 7% in 2012, climbing to 31 million units and exceed volumes in the mature markets of Western Europe, North America and Japan," the bank said.

Industry analyst JD Power is bullish as well, stating in its 2012 forecast that Chinese sales will increase 8.4% to 19.667 million over the year, while Japan is also expected to see a rise in light vehicle sales as the country looks to rebound from 2011's tsunami-induced slump. JD Power, like Platts, is part of the McGraw-Hill Companies.

In January, the China Association of Automobile Manufacturers said domestic automobile sales in 2011 rose 2.45% to 18.505 million units on year. CAAM also said that local automobile production reached 18.418 million units, up slightly on the previous year.

Whether it is tires for new cars or replacement on existing models, tire producers are the biggest consumers of natural and synthetic rubber, especially for those based in China, which produced 832 million tires in 2011, up 8.5% on year, the China Rubber Industry Association said in January.

Elsewhere in Northeast Asia, car sales in Japan fell to the lowest level in 14 years in 2011 due to a tsunami-induced slump, but Scotiabank expects sales to see a

strong rebound with "a double-digit increase" in 2012, while JD Power is forecasting an increase in sales of 9.7% to 4.664 million units.

This February, Japan's Bridgestone Corp, the world's biggest tire maker, said it expects its output to rise 5.3% in 2012 to 1.99 million mt of tires.

As a result of the growth in tire production, China imported 2.1 million mt of natural rubber in 2011, up 13% from 1.86 million mt in 2010, Chinese Customs statistics showed. That figure is expected to rise in 2012 according to the Association of Natural Rubber Producing Countries, which expects China to import 2.950 million mt of rubber in 2012.

The ANRPC comprises Thailand, Indonesia and Malaysia – the world's top three natural rubbers producers – Cambodia, China, India, Papua New Guinea, the Philippines, Singapore, Sri Lanka and Vietnam.

Including rubber compound imports, the ANRPC said China is estimated to have consumed 3.503 million mt of natural rubber during 2011, up 2.5% from 2010. This year, the country is expected to consume 3.610 million mt.

Demand for high performance tires has been increasing rapidly due to government regulations and environmental concerns. Japan's Asahi Kasei has estimated that global demand for solution styrene-butadiene-rubber (S-SBR) will more than double to 1.1 million mt by 2020 from 500,000 mt in 2011.

## ENSURING BUTADIENE SUPPLIES

The growth in synthetic rubber production has resulted in producers taking steps to secure supplies of butadiene feedstock.

For example, to secure butadiene supplies for its synthetic rubber investments in Asia, Japan's Marubeni

last May signed a \$550 million long-term deal with Brazil's Braskem, which is expected to start up a new 100,000 mt/year butadiene plant in 2012. Braskem is also considering expanding the butadiene plant to 200,000 mt/year in the near future.

Marubeni needs the butadiene as it has a joint venture with Indian Oil and Taiwan's TSRC to build a 120,000 mt/year styrene-butadiene rubber plant at Panipat, India, which is expected to start up in the first quarter of 2013.

As SBR is mixture of 75% butadiene and 25% styrene, the plant will need an estimated 90,000 mt/year of butadiene feedstock.

Based on data collected by Platts, at least 675,000 mt/year of fresh butadiene production is expected to come into the supply chain by the end of 2018 (Table 1). However, by end-2016, an estimated 860,000 mt/year of synthetic rubber capacity is due (Table 2).

As Asian producers seek to secure butadiene supplies, demand from the US has drawn cargoes away from Asia, especially in 2011.

The US has become increasingly short of butadiene as light cracker feeds such as ethane are the preferred choice in US steam crackers, and with the increasing role of ethane from competitive shale gas plays this has become even more apparent. Therefore, butadiene output at US crackers is much lower than in Asia where naphtha is the preferred feedstock.

There is so far little expectation that this will change in the short term, although plans are in place to increase the domestic supply in the US with TPC Group looking into a detailed engineering study of on-purpose butadiene production.

TPC's plan would utilize an existing idled dehydrogenation unit at the company's Houston plant. The unit would

use normal butane as the primary feedstock. Normal butane is a natural gas liquid found in the US shale gas plays, which could provide an abundant, low-cost feedstock for the plant.

South Korean producers have moved fast to supply the US with butadiene, and in 2011, several South Korean producers signed term contracts with US buyers.

Statistics show this shift clearly, with South Korean exports of butadiene to the US surging by more than 170% to 95,117 mt in 2011, compared with 34,685 mt in 2010, according to data from South Korean Customs.

Due to increased local production in China, its butadiene imports from South Korea fell from 109,706 mt in 2010 to 54,990 mt in 2011, according to statistics from Chinese Customs (Chart 1).

Market participants estimated that 470,000 mt/year of new butadiene capacity had come online in China in 2011, with for instance BASF Yangzi Petrochemical Company, or BASF-YPC, bringing on line a 130,000 mt/year butadiene extraction plant in late September.

China's total imports of butadiene decreased to 183,016 mt in 2011 from 215,687 mt in 2010 (Chart 2).

Not only has butadiene production been increasing in China, downstream SBR plants were brought on line as well in the past year.

In April 2011, China's Tianjin Lugang Petroleum & Rubber started up a new 100,000 mt/year SBR plant at Dagang District, Tianjin province. And in December, China's Keyuan Petrochemicals started commercial production at its new 70,000 mt/year styrene-butadiene-styrene plant at Ningbo, Zhejiang province. Keyuan has signed a one-year butadiene supply agreement with CNOOC and Shell Petrochemicals Co., or CSPC, for 2012. CSPC has a 165,000 mt/year butadiene plant at Huizhou, Guangdong province.

With synthetic rubber producers roaming the global markets for term and spot butadiene, prices have become extremely volatile (Chart 1). When a shortage of spot butadiene emerges in the US for instance, this can easily set off a bull run in the Asian markets as well. Although synthetic rubber producers have made it their highest priority to secure a stable feedstock supply, the imbalance is not expected to ease any time soon. Butadiene producers should be looking forward to enjoying very healthy margins in the coming few years.

## NEW BUTADIENE CAPACITY

Startup	Company	Capacity	Location
2012			
Jul-Aug	PetroChina Fushun	120,000 mt/year	Liaoning, China
Jul	Braskem	100,000 mt/year	Camacari, Brazil
2013			
Jun	Petrokimia Butadiene	100,000 mt/year	Cilegon, Indonesia
Oct	ONGC Petro-additions Limited	115,000 mt/year	Gujarat, India
2015	Petrochemical Corp of Singapore	100,000 mt/year	
2016?	Honam Petrochemical	140,000 mt/year	Cilegon, Indonesia
2018	Qatar Petroleum/ Qatar Petrochemical	83,000 mt/year	Qatar
?	Uzbekneftegaz/China National Petroleum Corp	60,000 mt/year	Uzbekistan
<b>Total</b>		<b>818,000 mt/year</b>	

## NEW SYNTHETIC RUBBER CAPACITY

Startup	Company	Capacity	Location
2012			
May	Huamao New Material	100,000 mt/year S-SBR	Shandong, China
H1,	Lanxess/TSRC	30,000 mt/year NBR	Nantong, China
Q3	PetroChina Fushun	200,000 mt/year SBR	Liaoning, China
2013			
Q1	Indian Oil Corp/TSRC/Marubeni,	120,000 mt/year SBR	Panipat, India
Jun	JSR/BST Elastomer (Phase 1)	50,000 mt/year S-SBR	Map Ta Phut, Thailand
Jul	Zeon	40,000 mt/year SBR	Jurong Island, Singapore
Q4	Sumitomo Chemical	40,000 mt/year S-SBR	Jurong Island, Singapore
2015			
Jan	Asahi Kasei	50,000 mt/year S-SBR	Jurong Island, Singapore
H1	Lanxess	140,000 mt/year N-PBR	Jurong Island, Singapore
End-2015	JSR/BST Elastomer (Phase 2)	50,000 mt/year S-SBR	Map Ta Phut, Thailand
2016			
H1	Zeon	40,000 mt/year SBR	Jurong Island, Singapore
Feasibility Study – late 2011	Uzbekneftegaz/China National Petroleum Corp	60,000 mt/year BR	Uzbekistan
<b>Total</b>		<b>920,000 mt/year</b>	