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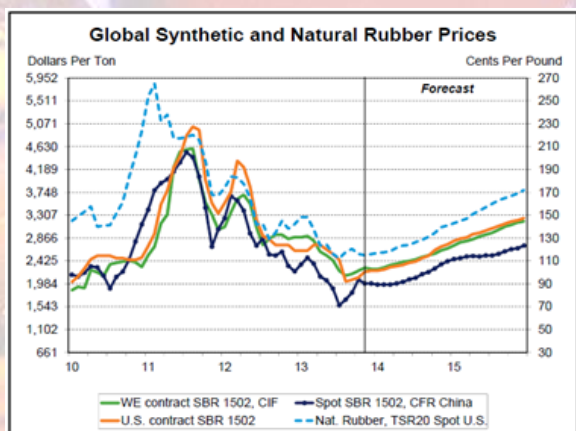
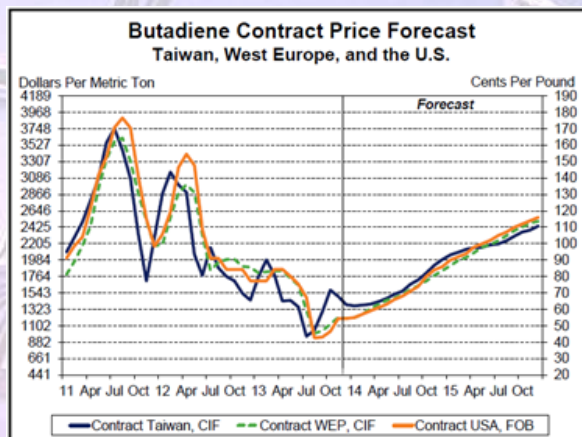
Leading World Technologies Through Innovation

Monthly Bulletin– December 2013



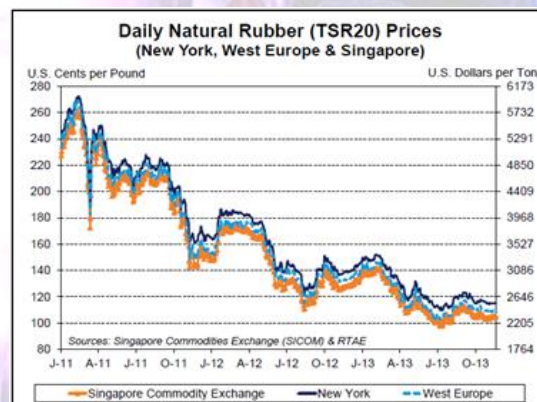
Executive Summary

Butadiene: The most troubling aspect of the global outage schedule will occur in the fall. At that time, a significant amount of capacity will be offline in Europe and especially Asia, outside of China. This should also be the time of most rapid demand growth, so there is a distinct possibility that the market will be short and prices could spike during the fall.



Synthetic Rubber: IHS Chemical’s posting for the November medium buyer negotiated SBR 1502 price increased to the 101 to 104 cents per pound range. The IHS Chemical posting for SBR 1712 continues to reflect a large differential. The price also increased to the 84.5 to 87.5 cents per pound range.

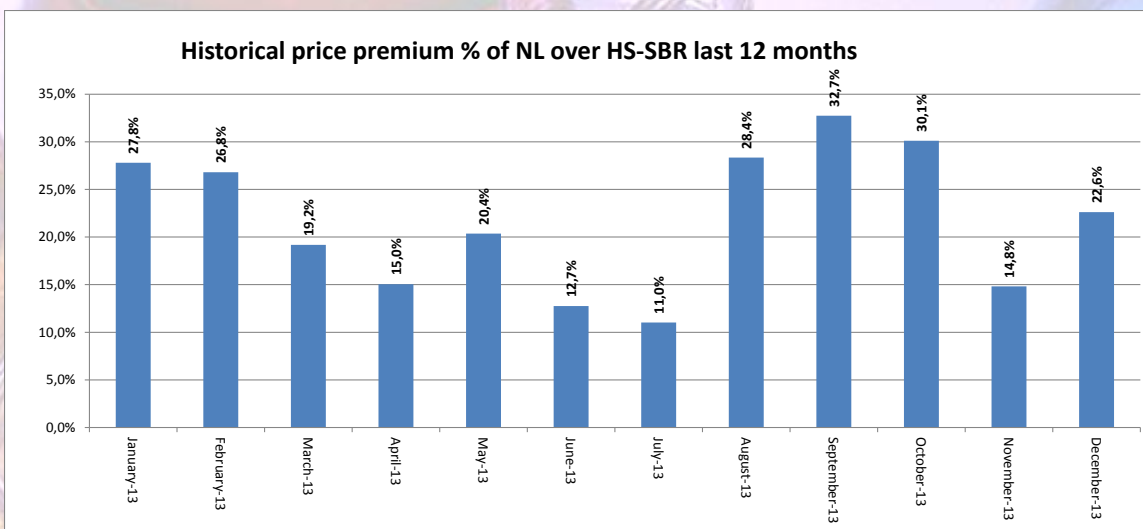
Natural Rubber: Natural rubber prices decreased slightly in November with the monthly SICOM average falling by just over half a cent from October to \$1.05 per pound (\$2,306 per ton). Prices in New York and West Europe also decreased this month. Monthly prices on the TOCOM through May 2014 increased from last month. SICOM TSR20 futures prices through May 2014 moved higher. IHS Chemical forecasts that U.S. TSR20 prices will move slightly higher in the coming months.





Executive Summary (Cont.)

Natural vs. Synthetic Rubber: The gap between the price of natural and synthetic latex for the beginning of December is 8% higher than it was at the beginning of the previous month over last month due to an increase in the price of Natural Latex relative to that of Synthetic Rubber Latex. This is to be expected as we are near the wintering period that affects NL plantations' yields whereas not much change is expected on the side of SL for the time being. Expectations are such that the price of NL should increase modestly over the months to come.

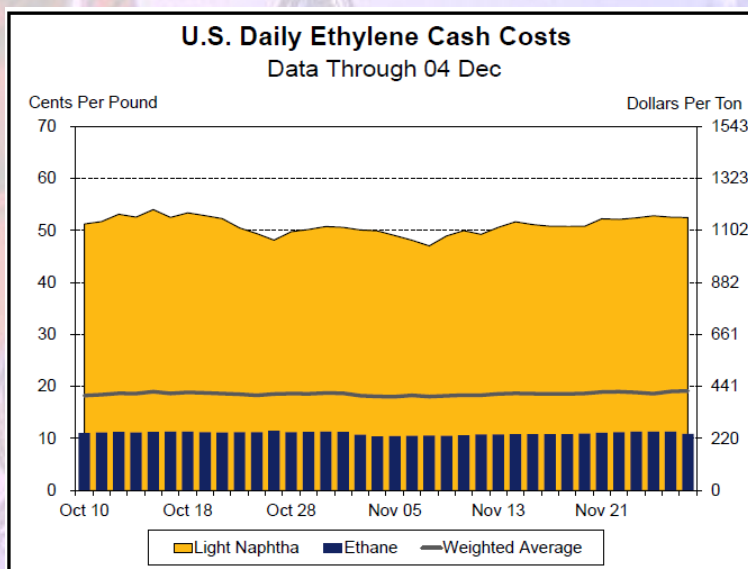




Feedstocks & Crude C₄s

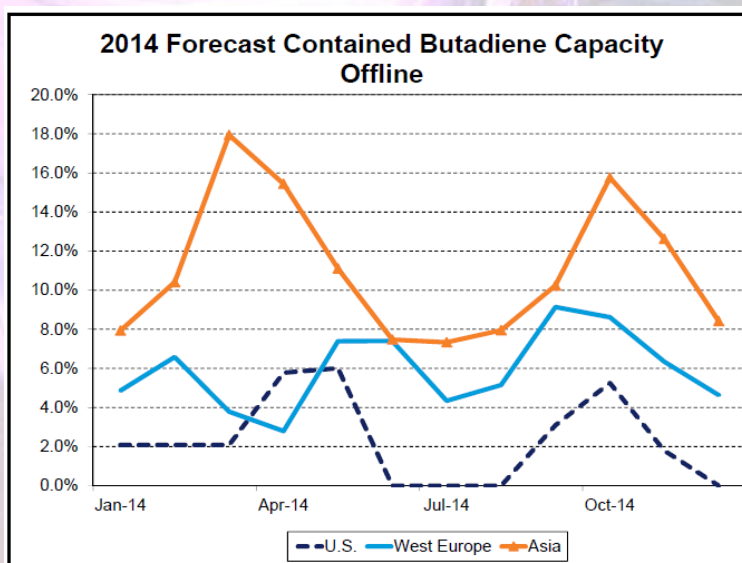
Market update

Global crude oil prices traded in a tight range during November. Brent prices trended upward somewhat in the second half of November, but none of the global crude oil markers moved significantly during the month. *IHS outlook for the coming months calls for more of the same price stagnation with a general bias toward slightly lower prices. US natural gas prices in November were nearly unchanged from the previous two months. The outlook calls for relatively flat prices through 2014.*



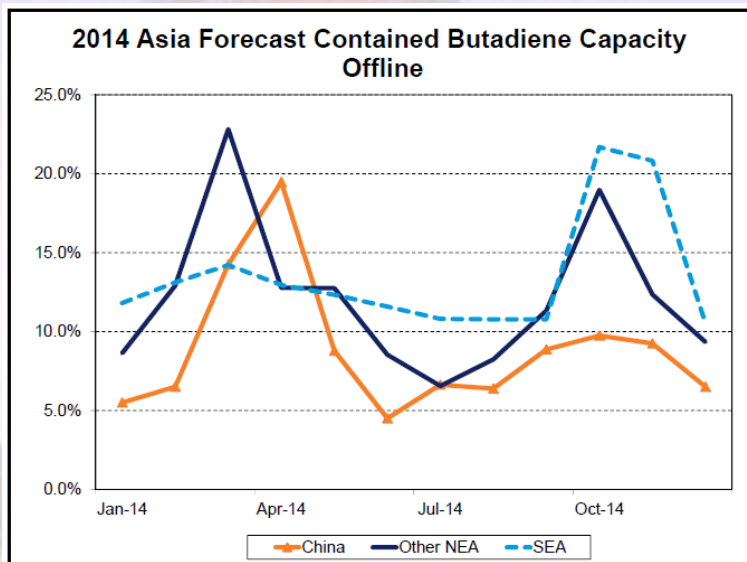
Market analysis

There are typically two peak seasons for ethylene cracker maintenance in the year, spring and fall. This is because labor productivity is higher in these seasons due to the more moderate working conditions. The seasonality of the schedule is evident in the nearby graph, which shows the percent of contained butadiene production capacity, ethylene crackers that will be offline for planned





maintenance. *In the US, 2014 will see a much less active schedule than was the case in 2012 or 2013.* West Europe will be somewhat more active than the US, but still less than



in the past couple of years. The bigger concern will be in Asia, especially in the spring. Asia is a large region, so it is helpful to break it down into smaller groups. This reveals that in the first half of the year, the activity will be focused primarily in Northeast Asia, while Southeast Asia will see a much larger impact in the fall. In China, the impact will be especially

concentrated in the spring. This is important to know because it could drive market behavior.

IHS fundamental view of the market for 2014 is that butadiene demand will increase through the year, more slowly early in the year, with growth increasing as the year passes. This would indicate a gradually tightening market balance causing increasing prices accelerating throughout the year. However, supply side tightness could result in a price increase earlier in the year if demand is strong enough that the decreased supply tightens the market. *IHS base case calls for a smooth price increase that is the result of an expectation that demand will not overwhelm supply early in the year.* This is clearly something that bears watching over the next few months.



Butadiene (building block of HS-SBR and XSBR)

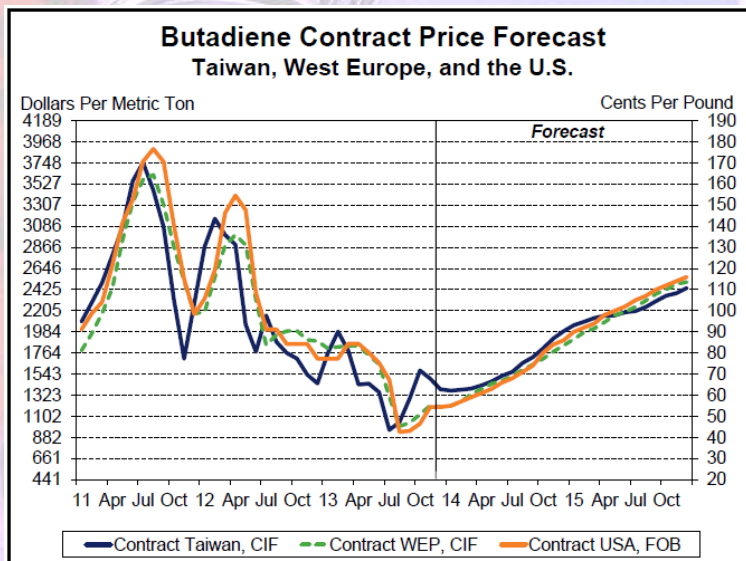
Contract prices

The US butadiene contract price marker posted by IHS Chemical rolled over at 54.4 cents per pound (\$1,199 per ton) for December. The split range this month remains 54 to 56 cents per pound.

Market update

IHS Chemical's marker for the December US butadiene contract price rolled over at 54.4 cents per pound (\$1,199 per ton). This reflects a split settlement with final nominations ranging from 54 to 56 cents per pound. Butadiene supply remains roughly the same as it was a month ago from a domestic perspective. The ethylene industry continues to run at similar operating rates and feedslates. The North American butadiene extraction units also remain on stream. The difference to the overall supply picture is on the import side. Butadiene imports during the summer maintained somewhat surprisingly high levels, especially given the weak demand. However, the tighter balance in Europe due to the fall maintenance schedule and the arbitrage opportunity to Asia together reduced butadiene flow to North America. Year-end inventory management will ensure that this continues in December. *There has been no sign of improvement on the butadiene demand side. Clearly, we are no longer at the bottom of the butadiene market, but the increase has not given consumers sufficient incentive to deviate from their plans to maintain low inventories to meet year-end targets. IHS has seen no support for the position that fundamental demand has changed.*

The current domestic spot market remains generally opaque. *The opportunity to export to Asia has ended with declining prices in the region.* At current levels, the netback to a US butadiene exporter from sales to Asia would be below 50 cents per pound, below the



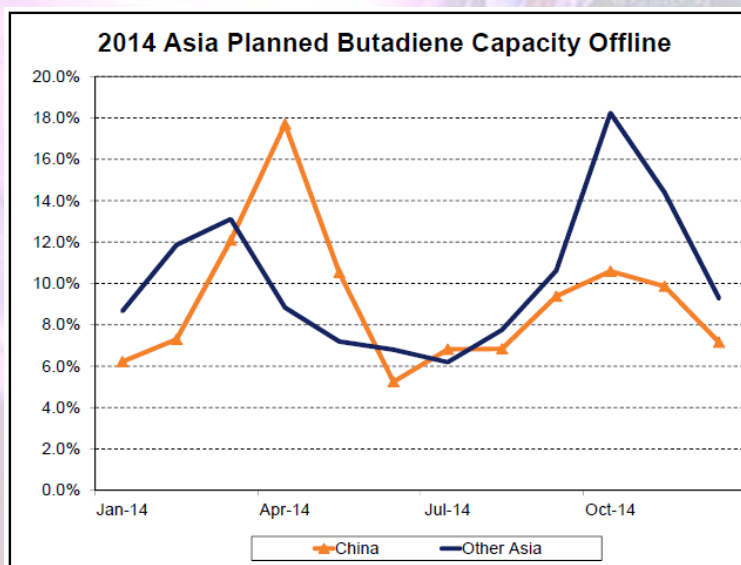
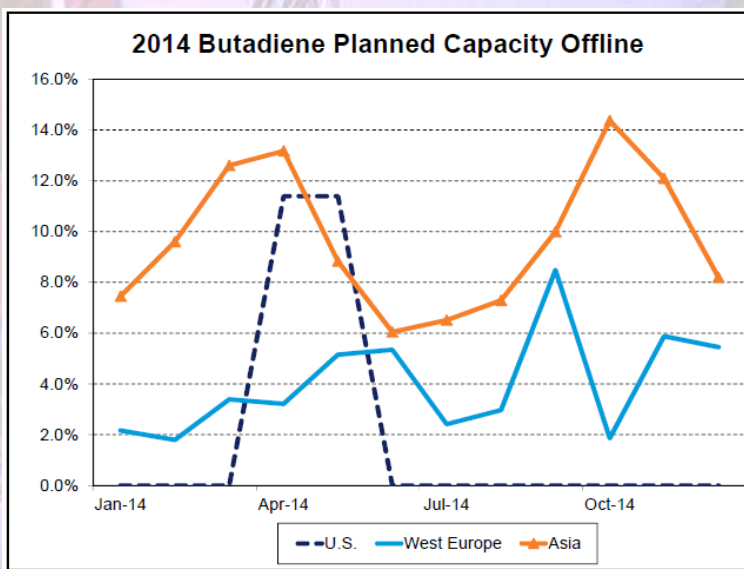


contract marker and well below the average net transaction price. As such, it is unlikely that significant volume will be exported. *The decreasing imports should be sufficient to achieve year-end inventory targets.*

Market analysis

The planned outages peak in the spring and fall due to labor efficiency considerations. *There is only one scheduled outage in the US that IHS are aware of. It will take place in April and May.* The plan for Europe appears to favor outages in the second half of the year. The outage schedule in Asia shows the classic two outage seasons. As China is such a market driver for butadiene, it is reasonable to break it out from the rest of the region to understand the potential market impact. April will be a big month for planned maintenance in China. The fall schedule is much less significant. While for the rest of Asia, the peak outage schedule will be in the fall. This is good in one respect. Since the outages are somewhat staggered, the overall impact will not be as great as it would have been if China had more activity in the fall.

The real question is what sort of impact the outage schedule might have on the overall 2014 market dynamics. *IHS expects butadiene demand to*



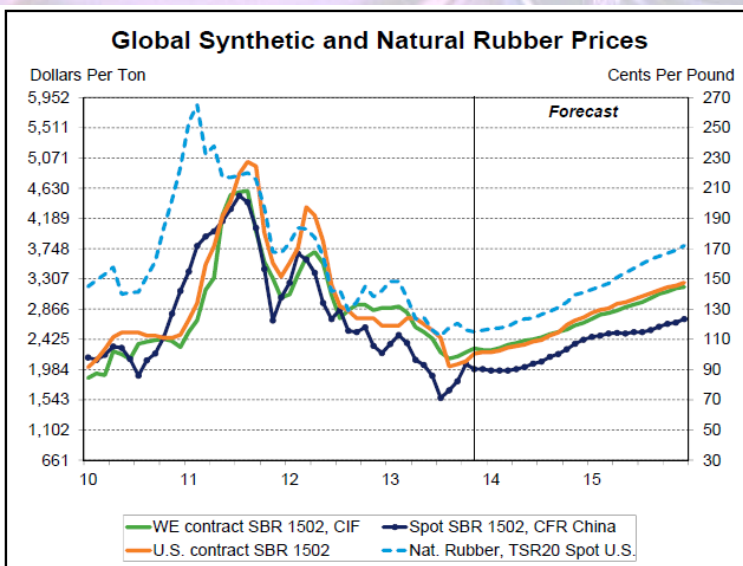


strengthen through the year, so the impact of the spring outages will be less than the fall outages. US butadiene consumers should not have a significant direct impact from their domestic outages for two reasons. First, it is in the spring when demand growth will not have reached its peak. Second, the spring schedule for Europe is relatively weak, so there should be material available for export to the US if needed. In Europe, the consumers should not experience supply shortages due to the planned outages, though there are always logistical hurdles to overcome. The larger impact of the European schedule will be on exports. Consumers in Asia and North America therefore will feel most of the impact. The most troubling aspect of the global outage schedule will occur in the fall. At that time, a significant amount of capacity will be offline in Europe and especially Asia, outside of China. This should also be the time of most rapid demand growth, so there is a distinct possibility that the market will be short and prices could spike during the fall.

Synthetic Rubber

Market update

In the US, synthetic rubber market conditions remain extremely challenging on both sides of the negotiating table. Supply is readily available, partially because producers could increase rates easily at any time, should demand justify the additional production. Adding to this is the increased supply of imports to the market, primarily from Asia. The arbitrage window has always been a significant factor in the US rubber market. However, when demand is soft, it is that much more important. Rubber producers are extremely aware of competition from imports, and as long as the market conditions remain weak, it





behooves rubber suppliers to be aware as well given that any volume lost to imports cannot be easily placed with an alternative customer.

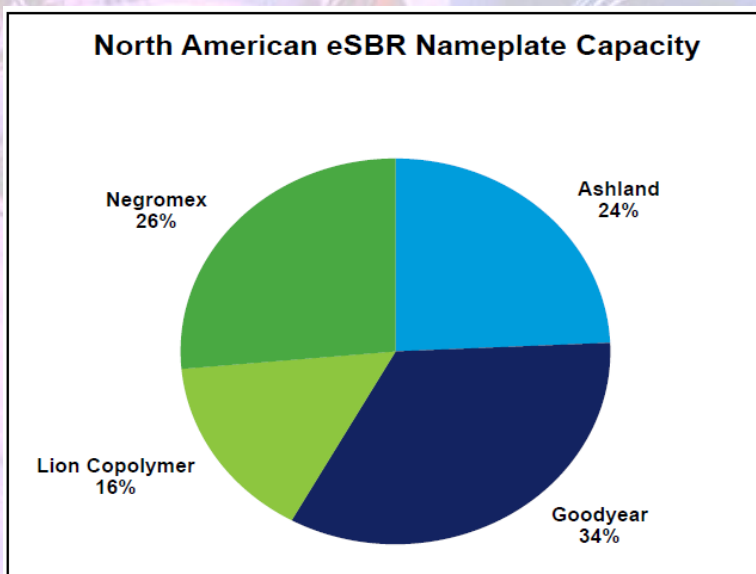
Fundamental rubber demand was somewhat weaker in November than it was in October. The outlook for December is for further weakening. This is exactly what would be expected at this time of year, especially given the overall weakness of the market. The market is currently focused on ending the year with reasonable inventory levels and cautiously preparing for better times in 2014.

IHS Chemical's posting for the November medium buyer negotiated SBR 1502 price increased to the 101 to 104 cents per pound range. The IHS Chemical posting for SBR 1712 continues to reflect a large differential. The price also increased to the 84.5 to 87.5 cents per pound range.

Market Analysis

Lion Copolymer announced its intention to temporarily idle its SBR production facility in Baton Rouge, Louisiana by early February 2014. IHS presents their view of the impact of this move on the North American eSBR balance.

In their analysis, IHS takes the most extreme position and assume that the plant will not restart. It is important to note that the company position is that the duration of the closure has not been determined. IHS has no information to indicate otherwise. However, for the purpose of this analysis, it seems prudent to assume the worst case.



In North America, there are currently four eSBR producers: Ashland, Goodyear, Lion Copolymer and Negromex. Goodyear produces primarily, though not exclusively, to supply its internal demand. The three others supply the bulk of the merchant market as



well as exports throughout the Americas, and when economics allow, the rest of the world. Lion Copolymer has roughly 16% of the region's eSBR production capacity. It is located in Baton Rouge, Louisiana, next to the ExxonMobil Refinery and Petrochemical Complex. As such, ExxonMobil supplies the vast majority of the butadiene to Lion either through its own sales or by exchanges with other butadiene producers. It is easiest to think of the impact of this outage in terms of the impact on customers and suppliers separately.

As IHS has described many times, the eSBR market is the most commoditized of the synthetic rubber markets. The various grades of eSBR are fairly standard and consumers can generally buy from multiple suppliers. In North America, many of them do. So the impact to the market of a Lion closure would need to be understood in terms of overall supply. In other words, is there enough spare capacity to make up for the lost volume. ***It is IHS understanding that the average operating rate of eSBR producers in North America is in the low 70% range. So a capacity reduction of 16% could be made up from existing production capacity.*** This does not mean that there will not be an impact on the market though. In the short term, new commercial agreements will have to be negotiated. However, over the long term, the reduction of the spare capacity will have a market impact. Synthetic rubber plants, especially the older units that are in North America, do have reliability concerns. In the past, when one supplier had unplanned difficulties, it was often possible to obtain volume from another supplier. This will be more difficult with less surplus production capacity. The surplus supply would have to be sourced from offshore, most likely Asia, which would mean that delivery times would be much longer. So rubber consumers will have to decide how much supply risk they can tolerate. The way to mitigate the risk would be to increase inventory of either rubber or finished goods to the point where offshore supply could compensate for domestic uncertainty. However, this is not without cost.

IHS fundamental assumption, supported by the previous paragraph, is that eSBR production in North America is not likely to decrease significantly as a result of a Lion shutdown. Therefore, the impact on the butadiene market will mostly be felt in higher logistics costs. Louisiana is net long on butadiene. Producers there are not connected by pipeline to consumers outside the state because the distances are too great to make it economically viable. So the loss of butadiene consumption in that state is likely to be compensated for by increased production in Texas and Mexico and will require moving butadiene to Texas or Mexico. The incremental material will have to be shipped by rail,



barge, or tanker, all of which are much more expensive than a short pipeline across the fence to a neighboring plant. So *on the increment, the feedstock cost of eSBR production will increase.*

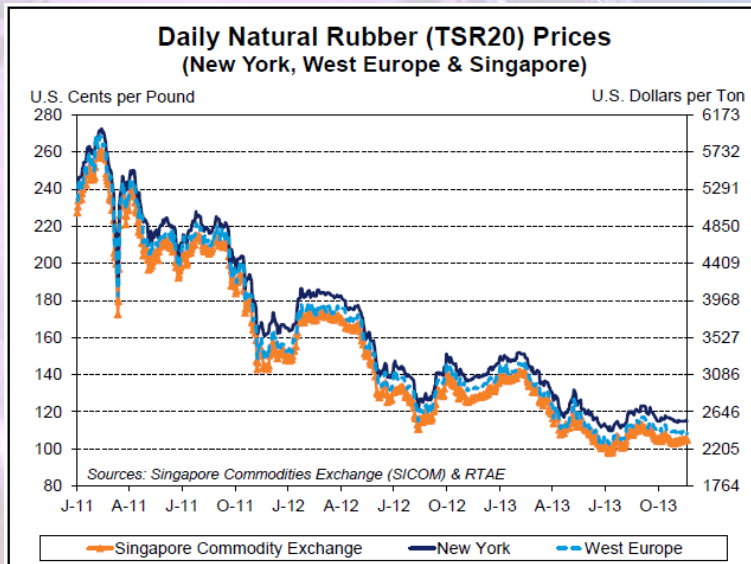
Overall, the issues caused by a Lion Copolymer shutdown can be managed by the market. However, it will increase the supply risk to consumers and increase the marginal cost of raw materials to the overall market. This of course assumes that the butadiene formerly consumed by Lion is sold exclusively to another eSBR producer. There are other butadiene derivatives produced in North America. If some of the butadiene formerly supplied to Lion is sold to one of them, the impact is compounded as eSBR production decreases and imports are required to be a larger part of the supply chain. A possible offset to this outcome would be increased imports of butadiene, but the cost of importing butadiene is higher than the cost of importing eSBR, so the overall market economics would be better served by importing the rubber.

Natural Rubber

Market Update

Natural rubber prices decreased slightly in November with the monthly SICOM average falling by just over half a cent from October to \$1.05 per pound (\$2,306 per ton). Daily futures on the SICOM traded between \$1.03 and \$1.06 per pound for the month. Current price levels are around 20-25 cents per pound lower than during the same month last year.

Natural rubber prices have been affected by slower growth in the major economies, with a key ingredient being the slowdown of growth in the Chinese economy relative to previous years. China consumes roughly one third of the world's natural rubber. Prices have been fairly stable for the past





several months as global crude oil prices have eased for the most part. As shown in the graph Daily Natural Rubber (TSR20) Prices, prices have decreased since the beginning of last year and currently sit over \$1.50 per pound lower than the record highs seen in early 2011. Prices in New York and West Europe also decreased this month, averaging \$1.15 and \$1.09 per pound, respectively.

TOCOM natural rubber futures were mostly flat in November, ending the month just \$2 per ton lower than the October closing price. The November RSS3 contract closed at \$2,519 per ton. **Monthly prices on the TOCOM through May 2014 increased from last month**, ranging from \$2,622 to \$2,802 per ton, an increase of roughly \$100 per ton from October. TSR20 futures on the SICOM closed at \$2,306 per ton for November, a decrease of \$13 per ton from the October contract price. **SICOM TSR20 futures prices through May 2014 moved higher**, ranging from \$2,330 to \$2,361 per ton, around \$50 per ton higher than the futures strip at the end of October. TSR20 prices in New York were around one cent lower than October, averaging \$1.15 per pound. **IHS Chemical forecasts that U.S. TSR20 prices will move slightly higher in the coming months**, averaging just below \$1.16 per pound in December.