

Technical

A look at trends in synthetic rubber market

By Bill Hyde
IHS Markit

In this decade, market conditions, along with the value chain that includes synthetic rubber and tires, have been extremely volatile. Prices for the IHS Markit SBR 1502 marker in North America have varied in the range from 60 to 250 percent of its January 2010 value between January 2010 and June 2016.

Over the same period, crude oil and natural rubber prices have also exhibited extreme volatility. In spite of the fact that for tire producers much of the volatility over the past couple of years has been beneficial, these market trends can clearly not continue forever.

TECHNICAL NOTEBOOK Edited by Harold Herzlich

It is important for tire producers to understand what is driving current market trends in order to anticipate and prepare for the inflection point when the market trends begin to become unfavorable. To that end, we consider the IHS Markit view of coming trends in base energy, key rubber demand drivers, key rubber cost drivers and natural rubber market dynamics.

Since 2000, global crude oil markets have been characterized by periods of supply surpluses and shortages against a backdrop of relatively consistent overall growth. Of course there have been times such as in 2008 and 2009 when demand growth paused, but in general growth has been relatively constant. Crude oil supply is the dependent variable.

Demand is driven by factors such as economic growth, consumer confidence, etc. Oil prices react to changes in the supply demand relationship, which then causes supply to adjust.

For many years, this supply adjustment was done by OPEC members. In times of tight oil market dynamics the amount of spare production capacity was

Executive summary

Synthetic rubber markets have experienced a great deal of changeover the past few years. Overcapacity, natural rubber market dynamics, falling oil prices and relatively weak demand growth have combined to drive the market trends.

Tire producers have benefited from many of these market dynamics as supply has been available at attractive prices. The important question for tire producers is how long will these good times last?

In this paper we examine the trends that will control synthetic rubber dynamics in the coming years so market players can be prepared for the market changes that inevitably will come.

a critical variable for speculators. In that time, OPEC was able to influence crude oil prices effectively by adjusting production quotas.

More recently, the ability of OPEC influence on oil prices has waned. Increased production from North America, primarily from unconventional sources, such as shale oil or tight oil, made the adjustments required to continue to balance the market unattractive to OPEC.

Instead OPEC made the decision to protect its market share and allow the oil price to fall and remove the high cost producers from the market. Of course, this was a painful course of action for many OPEC members and one not uni-

versally accepted. It resulted in the significant oil price decline in the second half of 2014 and the lower prices that persist to this day.

The high cost producers were assumed to be the unconventional players, primarily in the U.S. It has taken longer than would have been anticipated for the lower prices to drive supply low enough to reduce the surplus. Finally in 2016, North American oil production has fallen relative to OPEC production.

As noted previously, crude oil prices fell precipitously in the second half of 2014. They have continued somewhat lower to the point where the IHS Markit expectation is that the 2016 average will be rough-

ly 54 percent of the 2010 average price on a WTI basis. Other regional oil markers have experienced similar dynamics.

Of course the question is, "What will happen in the future?" It is our view that the supply surplus has dwindled to the point where increasing demand will begin to tighten the market, and prices will begin to increase. This will be a relatively slow process, and even by 2020 average prices will remain below the 2010 average level.

One might be tempted to interpret the data as a smooth transition, but it is not so. In fact, there will be significant volatility along the way. The pattern will be:

1. Increasing demand tightening markets and driving prices higher;
2. Higher prices attracting higher cost producers back into the market;
3. Higher production causing increased surpluses pressuring prices down;
4. Lower prices eventually reducing supply as higher cost production declines; and
5. Tighter market balances will drive prices up again.

As a result, oil price volatility can be expected to be significant around a
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The author

Bill Hyde began his career in 1990 with Union Carbide Corp., where he had various positions that involved engineering, optimization, planning and logistics.

In 2000, he joined Texas Petrochemicals as a business analyst.

Hyde joined CMAI in the Olefins Consulting Practice in 2002. He assumed responsibility for CMAI's Global C4 Olefins and Elastomer Practice in 2006.

In 2011, IHS acquired CMAI, and he was promoted to senior director olefins and elastomers in IHS Chemicals.

He has published a number of papers on the olefins and elastomers industries as well as presented at olefins and elastomers conferences around the world.

Hyde holds a bachelor's and master's degree in chemical engineering from Brigham Young University and a master's from Tulane University.



Hyde



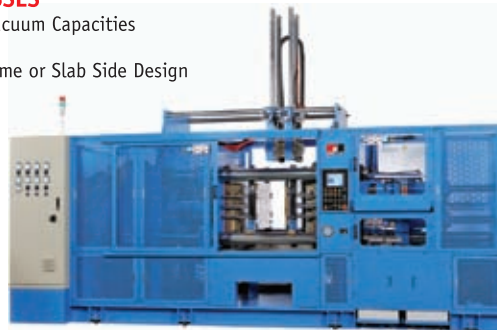
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generally increasing average. The average price will increase as the incremental supply required to meet market demand becomes higher cost.

Key rubber demand drivers

The dominant end use for synthetic rubber is production of tires. Many other synthetic rubber applications such as belts, hoses and gaskets also are driven by trends in the automotive markets.

Therefore, key rubber demand drivers are automotive production for the OE tire market and miles driven for the replacement tire market.

Automotive production

According to the IHS Markit Automotive Group, in 2015 a little more than 65 percent of the world's automotive production was in China, the EU, the U.S. and Japan. Other significant producers included South Korea, India, Mexico, Brazil, Canada, and Thailand; however none of these smaller producers has more than a 5 percent share of the global market. Automotive production growth has been incredibly volatile over the past few years.

Some of this is the result of market recovery from the recession and is not indicative of longer term demand trends. The U.S. and Japan saw some especially

strong growth early in the decade but have since fallen back to much lower growth rates.

Looking forward, global automotive production growth is forecast to settle down in the 2-4 percent per year range, though expected weakness in the U.S. in 2017 will pull the global average slightly below the range.

The larger manufacturers in the developed world, the U.S., the EU and Japan will see much slower to marginally negative growth over the period. Even China will see weaker than historical growth. As a result, tire and rubber demand will not get much support from the OE market segment.

Miles driven

In the developed world, demand for replacement tires is much larger than into the OE sector. Our rule of thumb is that replacement tire demand is roughly three times the size of OE demand.

Since the developed world is also the largest tire market, trends in the replacement tire market drive the industry. While there has been concern about tire aging, primarily tires only wear while they are being driven. Trends in vehicle miles driven are important indicators of overall tire, and by extension, synthetic rubber demand.

According to analysis done by the IHS Markit Energy Group, during the recession and early years of recovery, 2007-12, global vehicle miles driven only increased

by a total of a little more than 10 percent.

Making matters worse, miles driven in major portions of the developed world, including the U.S., Western Europe and Japan, were actually lower in 2012 than they were in 2007.

Looking forward, the overall miles driven picture is not a positive story for tire and rubber demand. In Europe and Japan, miles driven will remain below

the 2007 level through 2020.

In the U.S., which climbed back above the 2007 level in 2015, growth will be slow. Global growth will be driven by China and other developing countries. Not all of the developing countries will grow rapidly.

In fact some, such as Brazil, have significant economic difficulties, which will pre-

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Fig. 3. North America oil production trend.

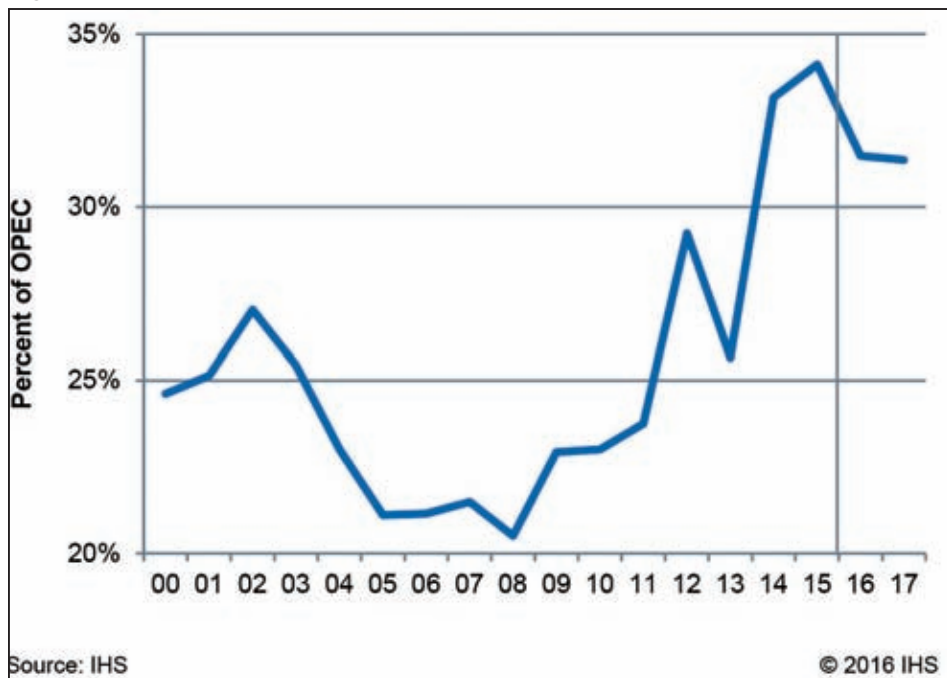


Fig. 1. Historical price trends.

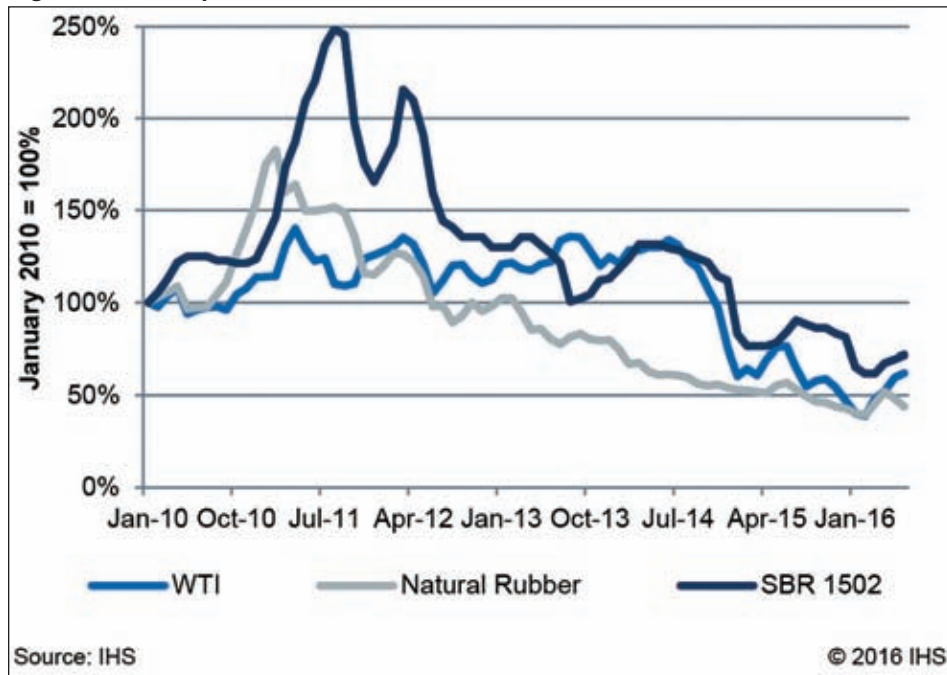


Fig. 5. Auto production growth rates.



Fig. 4. Crude oil price trend.

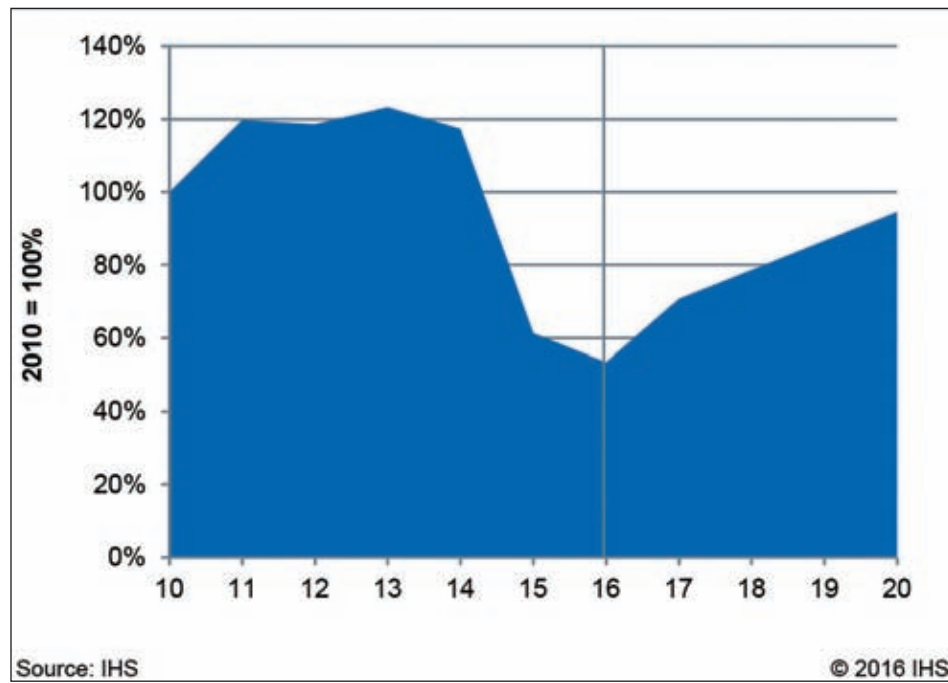
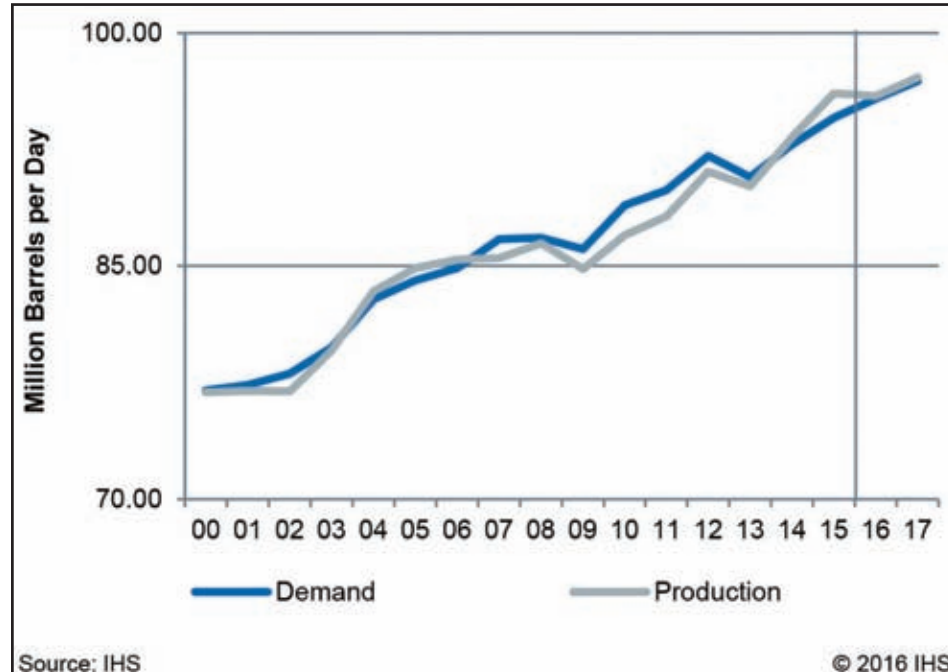


Fig. 2. Global oil supply and demand trends.



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vent a rapid increase in miles driven. China will provide much of the global growth. As such, China will also provide much of the global growth in the tire market.

Key rubber cost drivers

The most important commodity synthetic rubbers for the tire producers are various grades of styrene butadiene rubber (SBR) and polybutadiene rubber (PBR). The raw materials for these rubbers, butadiene and styrene, are their key cost drivers.

Butadiene

Butadiene is an interesting commodity because its feedstock is a coproduct of ethylene production while its derivatives are commodities. This introduces an element of risk into the market.

Butadiene feedstock availability is entirely a function of trends in the ethylene markets that are not necessarily aligned with trends in the rubber markets. This has caused significant issues for rubber markets in the past as butadiene supply has been tight and costly.

More recently, the combination of increased butadiene feedstock production and slower demand growth has brought global butadiene market conditions into

a much more comfortable balance than was seen earlier this decade.

The addition of on purpose butadiene production capacity in China, while not economical at the present time, will ensure that the market supply is sufficient to meet anticipated demand in the near to medium term.

When global butadiene demand increases to the point that lower cost coproduct sources are exhausted, supply will still be available to the market. While we do not expect this to be a significant market factor until early in the next decade, the safety net is already in place.

Styrene

Global styrene markets have experienced slow demand growth over the first half of this decade. Over the period, average annual demand growth has been less than 1 percent per year. The largest styrene derivatives, polystyrene (PS) and expanded polystyrene (EPS) have experienced significant competition from competing materials, especially in the packaging sector.

This has not prevented producers from adding capacity, especially in Northeast Asia. Northeast Asia is a large net importer of styrene, so much of the new production capacity will displace imports.

Overall, market conditions for styrene will remain relatively stable. Operating rates will increase later in the decade as capacity additions will be significantly

lower than demand growth. However, the current relatively low operating rates mean that even with higher utilization, upward pressure on prices and margins will be minimal.

Synthetic rubber cost trends

Not surprisingly, commodity synthetic rubber raw material costs have fallen dramatically from their peak in 2011. SBR costs have not fallen as far as PBR because styrene prices have not fallen as far as butadiene prices.

However, the overall trends are very similar. In 2015 and 2016 to date, PBR raw material costs averaged roughly 60 percent lower than in 2010. Of course the most important factor is what will happen in the future.

As described previously, styrene market dynamics are expected to keep prices relatively constant in the near to medium term. Butadiene prices are expected to increase with naphtha price, or effectively with crude oil prices.

The net impact is that SBR and PBR raw material costs will increase, but at a much slower pace than they fell between 2011 and 2015. By 2020, IHS Markit expects these costs to remain at roughly 80 percent of their 2010 value.

Market players have told us repeatedly over the years that, within reasonable limits, they would prefer prices to be stable at a slightly higher level than extremely volatile at a lower level. Our outlook should be encouraging to those with that view.

Natural rubber market dynamics

Synthetic rubber costs are only one component of the price. In recent years, dynamics in the natural rubber markets have played a significant role in determining synthetic rubber prices.

There is enough substitution possible between natural and synthetic rubber globally that the two prices generally cannot move too far apart. Natural rubber prices are largely set by commodities traders on exchanges in Asia, so it is important for synthetic rubber consumers to understand those market trends as well.

Natural rubber markets are more complicated than typical commodity markets. Demand is relatively straight forward. As with synthetic rubber, the majority of natural rubber demand goes into tires.

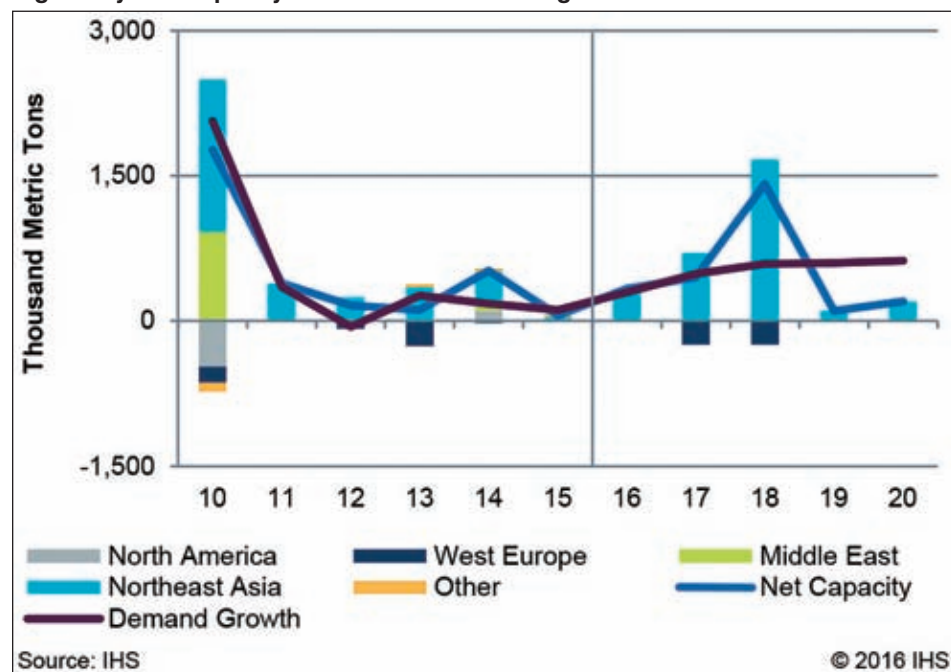
The larger the tire, the higher its ratio of natural to synthetic rubber. Therefore, the most important consumer of natural rubber is truck tire production. Demand for truck tires is dependent on volumes of goods shipped, which varies with GDP.

Natural rubber supply is the complicated side of the equation for two primary reasons. First, there is a lag of roughly six years between initial planting and first harvest. This means an available supply is a strong function of market conditions at least six years ago. Second, a dominant percentage of natural rubber is produced in South Asia.

In that area, more than 80 percent of

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Fig. 8. Styrene capacity additions and demand growth.



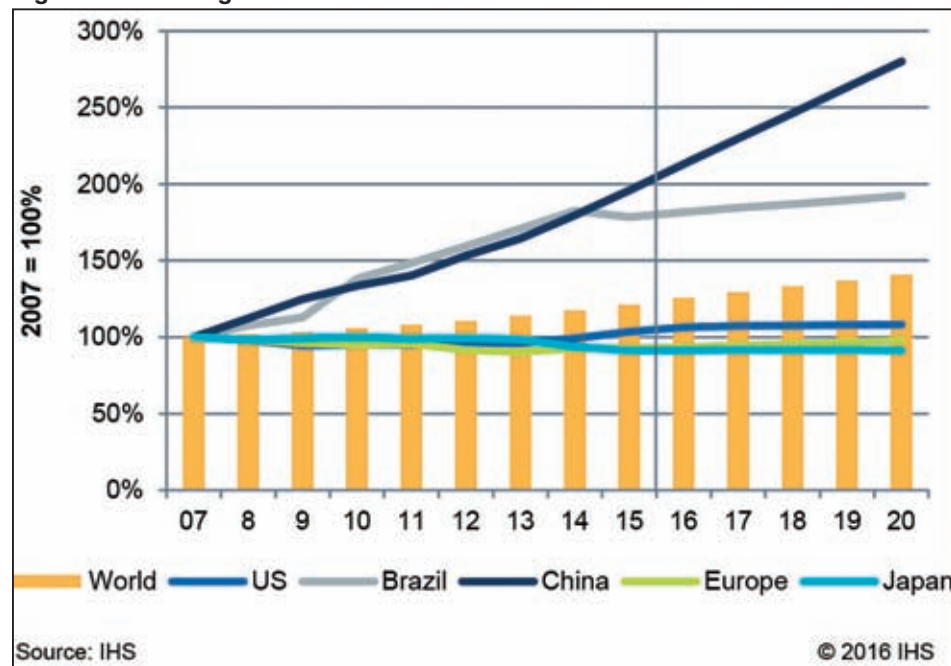
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Fig. 9. Trends in commodity synthetic rubber raw material.



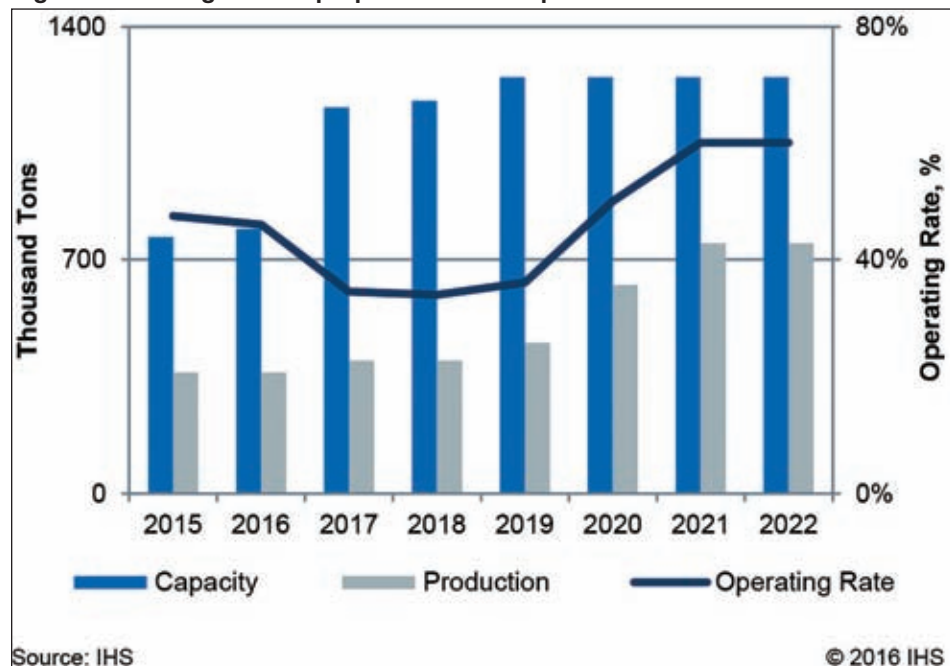
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Fig. 6. Trends in light vehicle miles driven.



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Fig. 7. Trends in global on purpose butadiene production.



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