

Argus White Paper

Benzene forward pricing – hedging risk in a volatile market

Benzene pricing is volatile even by the standards of other oil derived products. Producers and consumers of benzene and derivatives are faced with unpredictable profitability and cash flow. Uncertainty makes forward planning difficult.

Different factors drive volatility:

- Benzene is largely a co-product of different manufacturing processes. “On-purpose” production is limited. Supply is erratic and dependent on external factors.
- Benzene is used in different product chains with a wide range of applications, some of which are seasonal.
- Benzene is in short supply in the US and west European markets, necessitating large inter-regional movements from Asia to meet demand.
- Fluctuations in gasoline prices are reflected in the value of toluene and mixed xylenes, the source of marginal benzene production.

Benzene prices over the past 12 years have fluctuated between \$240/t and \$1,500/t. Spot and monthly contract prices have at times diverged by \$300/t or more. The average monthly differential between benzene and naphtha has varied between \$720/t and -\$40/t, based on Argus data.

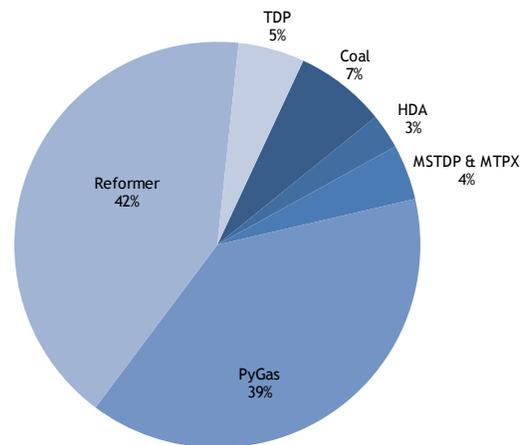
Consumers of benzene and derivatives are likely to want to consider carefully how to manage their exposure to this high degree of volatility when offering forward prices for their products.

Supply and demand factors drive short term pricing and are heavily influenced by regional imbalances. The correlation of benzene pricing to raw material costs is inconsistent.

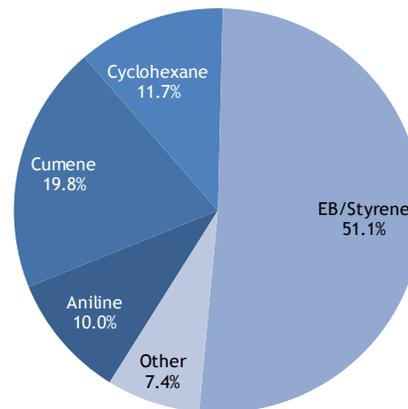
Physical benzene prices are generally fixed only one or two months forward, yet consumers of benzene and derivatives can frequently be obliged to fix prices for finished products for periods of six months or more. Many consumers can carry a significant degree of financial exposure.

In other commodity markets, risk management services have evolved to enable companies to lock in costs and protect profit margins. Argus is working with CME Group to offer similar options for producers and consumers of benzene.

Global benzene production sources, 2015

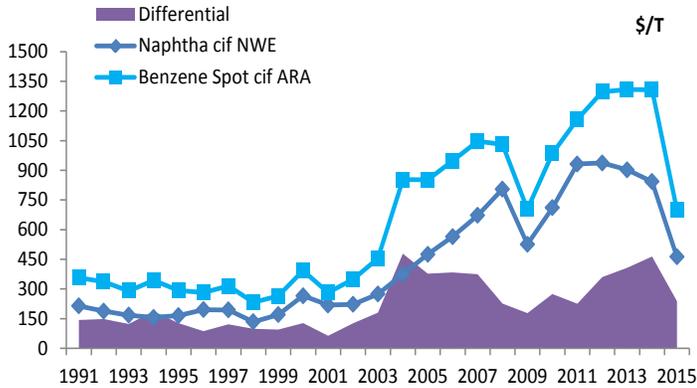


Global benzene consumption sources, 2015

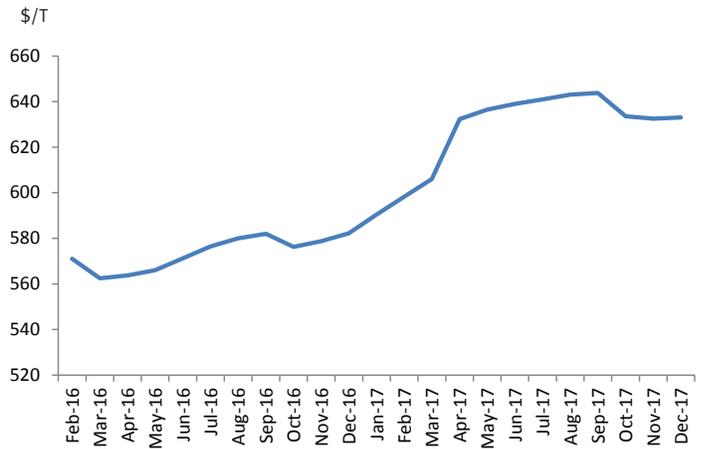


Source: Argus Media

25 years average spot benzene and naphtha prices

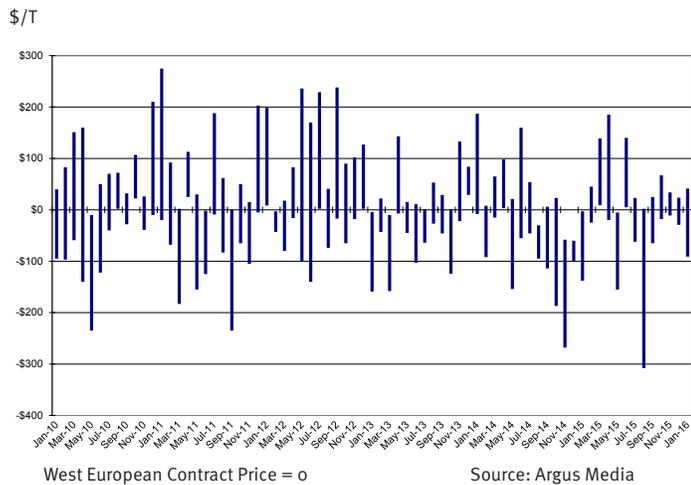


Benzene forward price curve



Source: Argus Media

Price volatility: Western Europe monthly benzene spot price



Argus/CME risk management services

There are two main instruments that can be used by producers and customers to manage risk.

Futures

In 2015 CME Group's NYMEX exchange introduced benzene futures, which are cash settled based on the trade month average against the Argus DeWitt's price assessments. This enables customers to be able to lock in prices and margins up to a year ahead.

Swaps were the pre-cursor to futures prior to the onset of the banking crisis but following this point, much of the commodity markets have become much more comfortable with the trading of futures at the exchanges.

A future is a standardised contract for the purchase and sale of financial instruments or physical commodities for future delivery on a regulated commodity futures exchange. In the case of benzene, this allows a floating (or market) price to be exchanged for a fixed price over a specified period of time. Consumers and producers can lock in a fixed price through an agreement with a counterparty prepared to take the risk, and the opportunity, of the floating price. The counterparty may be a trader, broker, financial house or another market participant.

Argus' daily price reports provide the necessary data to settle the floating price element of a contract. Futures have become the default trading mechanism for oil and gas markets, but have so far had only limited use for petrochemicals, outside of North America where a few contracts have already been listed with varying degree of success.

The future is a derivatives transaction, separate from the physical trades which underlie the delivery of a commodity or derivative to a consumer. The difference between the fixed price and the floating price is settled between the counter-parties through a financial transaction at an agreed date. CME Group offers facilities to make settlements through its online platforms, reducing counter-party risk.

Forward curves

Argus has now developed a benzene forward curve, which gives insight into prices up to two years ahead and can be used as a guide to the fixed price element of the future contract. The forward curve can be used as an indication of current market expectations of how benzene prices will change over time.

The forward curve uses a combination of recent physical benzene prices and existing forward prices for oil, naphtha and gasoline to calculate a theoretical monthly average price up to two years forward. The curve is updated on a daily basis using Argus' data for the different pricing elements.

Further development

Swaps were the mainstay of many global commodity markets for decades and are a useful tool for managing risk. With the advent of large scale clearing and in light of regulatory changes, many of the swaps have been adjusted and re-listed by the exchanges as futures products. If you would like to find out more about how you can manage your risk and lock in profit and cost margins, help is available. New markets can be unnerving but can also be full of opportunity.

For more information, please contact Peter Willcox on +44 (0) 20 7199 8402 or email peter.willcox@argusmedia.com