



Graphite

As China cuts its graphite production, is the market coping with the undersupply?



Which countries lead the world in graphite production?

China remains the dominant force in graphite, accounting for 65% of the world's graphite reserves in 2017, alongside 35% of its consumption, according to the US Geological Survey.

India trails China as a distant second, producing 170,000 metric tonnes (t) of graphite to China's 780,000t. Brazil and its 95,000t of production stands as the last sizeable graphite producer.

Among the top three graphite-producing countries, both India and Brazil's output remained flat through 2017, while China's output suffered in mid-2017 due to new emission policies.

How have China's new emission policies affected graphite supply?

China has begun taking steps to curb factory emissions as political and public concerns over air pollution and climate change push the government to action. The graphite market suffered under the regulatory crackdown on emissions-heavy markets, hampering operations.

Around the same time, the Chinese government depressed global supply by imposing additional export taxes on graphite in an attempt to build up its stockpile. As a result, in May graphite prices had increased by 40% over the preceding six months.

What is graphite?

Graphite is a flaky form of crystallised carbon that conducts electricity.

Manufactured and sold as natural or synthetic, graphite's conductive properties make it perfect for the production of electrodes. These are essential components in many electrical devices, among them lithium-ion batteries and electric steel furnaces.

For electronic applications, synthetic graphite is preferred, as it is manufactured from hydrocarbons such as petroleum. This process produces high-purity flakes that conduct electricity efficiently.

Has the undersupply of graphite affected steel production?

The graphite undersupply, made worse by a shortage of needle coke used in electrode manufacturing, means steel suppliers are paying premiums for graphite electrodes.

These devices are required in electric arc furnace (EAF) steel manufacturing. Overall, 25% of the world's steel is produced by EAFs.

Other forms of steel processing, such as blast furnaces, also use graphite electrodes, although they are not always required.

How is graphite traded on the open market?

Graphite is not traded on the open market, unlike copper, nickel or gold. Graphite is instead sold directly from mine to end-user via bilateral contracts.

Contracts typically last for one year, although graphite producers keep stocks and client lists in case spot-purchases are required.

Producers who offer low-value, small-flake graphite tend to contract with low-value industrial applications. Companies with consistent proportions of large particles serve the fast-growing electric vehicle market.

How will batteries drive growth in the graphite market?

Two emerging trends will increase graphite demand over the long term. The first is electric cars, which use 10 to 20 times more graphite than lithium in their lithium-ion batteries.

Bloomberg's New Energy Finance forecasts that electric cars will outsell gasoline and diesel cars by 2040.

Edison's Insight:

Larger-size fractions have been widely accepted as the best for use in manufacturing lithium-ion batteries (LiB), a market that is expected to see double-digit growth on the back of the anticipated high growth in the electric vehicle market.

However, our research on the graphite sector sees no definitive evidence for why smaller flake sizes cannot be used in LiB manufacturing processes, as long as purity and consistency of supply are maintained at appropriate levels."

Charles Gibson, Sector Head of Mining, Edison.

The second trend, utility-scale energy storage, is a symptom of the growing renewable energy market, whose inconsistent energy output, especially in wind and solar power, drives a need for batteries that store excess energy for redistribution during unfavourable weather.

Which companies are making gains in the undersupplied graphite market?

Large Chinese graphite companies, including Aoyu Energy, Qingdao Haida Graphite and Hubei Hengda Graphite, are likely reaping the rewards of graphite spot prices following some initial disruption from the new emission policies.

This is also the case for Ceylon Graphite, whose pre-drilling at its K1 facility showed favourable carbon density suggestive of large graphite deposits. And India Graphite is doing well as one of the largest graphite producers outside China, posting record-high share prices in its first quarter.

Ceylon is not alone in developing its graphite production in the expectation of strong demand in the near future.

[Mustang resources recently confirmed high-grade deposits of graphite and vanadium in Mozambique](#), while the [likes of Volt Resources](#), Kibaran Resources and CKR Carbon are also developing African graphite projects.