

Edge Weekly

Graphjet Technology embarks on capacity expansion to produce 'super materials'

By Liew Jia Teng / The Edge Malaysia

03 Jul 2024, 03:00 pm

This article first appeared in The Edge Malaysia Weekly on June 24, 2024 - June 30, 2024

NASDAQ-listed Graphjet Technology, a Malaysia-based company that has patented the technology to convert palm kernel shells into graphite and graphene, plans to expand its production capacity from just 3,000 tonnes per annum currently to 23,000 by 2027.

Graphite and graphene are said to be the next “super materials” for electric vehicle (EV) batteries and semiconductors.

Graphjet started as a biodiesel producer in Johor but it is now in the midst of relocating to Subang, Selangor, where it will focus on producing graphite and graphene. The plant is expected to commence production as early as this week.

Furthermore, it will expand to Kuantan, Pahang, as well as Nevada, a landlocked state in the western region of the US. The plants in Kuantan and Nevada are expected to be ready within the next two to three years.

“We are currently expanding our production capabilities with a new artificial graphite production facility planned in Nevada and another in Kuantan. The Nevada facility will be strategically located to serve the growing demand in the US, while the Kuantan plant will cater to both local and international markets,” Graphjet co-founder and CEO Aiden Lee Ping Wei tells The Edge in an interview.

The production facility in Subang has an annual capacity of 3,000 tonnes of graphite, with RM300 million allocated for the plant.

As for the Kuantan and Nevada plants, they will each have an annual capacity of 10,000 tonnes of graphite and 60 tonnes of graphene once fully operational. The Kuantan facility is estimated to cost RM400 million to RM450 million, while that in Nevada is expected to cost US\$150 million (RM706.5 million) to US\$200 million.

To fund the expansion, Graphjet could tap the capital markets since it is now a Nasdaq-listed firm, says Lee.

As at March 31, 2024, it had cash of US\$1.146 million and debt of US\$522,000.

After the cost it incurred for its Nasdaq listing, Graphjet is expected to be net cash flow positive by the end of this year, driven by the new factory in Subang. "As more invoices come in and our operations ramp up, we anticipate moving into a more favourable financial position," says Lee.

Graphjet's technology, which is patented in Malaysia, converts palm kernel shells — a by-product of the palm oil industry — into high-quality graphite and graphene, while significantly reducing production costs and environmental impact.

"The industry prospects for graphite and graphene are extremely promising, particularly in the context of the EV and semiconductor industries. Graphite is essential for battery production, and graphene holds the potential for revolutionary applications in electronics," he explains.



ZAHID IZZANI/THI

"The industry prospects for graphite and graphene are extremely promising, particularly in the context of the EV and semiconductor industries." — Lee

Lee points out that the main raw materials used by Graphjet are palm kernel shells, which are abundant in Malaysia and Indonesia. “They are an ideal source for producing graphite and graphene owing to their high carbon content. The conversion process is not only sustainable but also cost-effective.

“The use of palm kernel shells ensures a consistent supply of raw materials, crucial for maintaining high production standards and meeting market demands.”

Graphene is a single layer of carbon atoms arranged in a two-dimensional honeycomb lattice, known for its exceptional strength, electrical conductivity and thermal properties.

“Its applications extend to semiconductors, sensors and conductive materials. In the semiconductor industry, graphene is gaining traction for its potential to replace silicon in transistors due to its superior electrical properties.

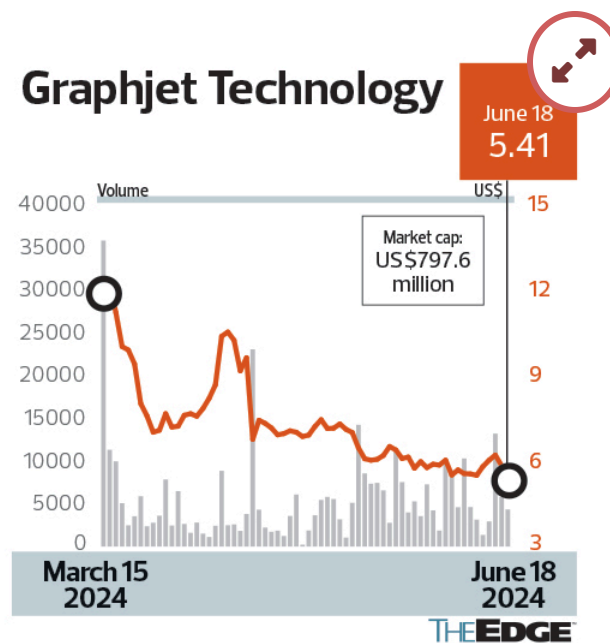
“Graphene’s exceptional properties make it a promising material for next-generation semiconductors, potentially revolutionising the industry by offering faster, more efficient and smaller electronic devices,” Lee explains.

Graphite, on the other hand, is composed of many layers of graphene stacked together and is used extensively as an anode material in lithium-ion batteries.

“The quality and consistency of graphite are crucial for the performance and safety of EV batteries,” he stresses.

SPAC listing on Nasdaq

Graphjet was founded in 2019 by Lee and his three partners — chairman Lim Hooi Beng, executive director Jay Aw and chief technology officer Liu Yu —



initially focusing on converting palm kernel shells into biofuel.

During the production process, it was discovered that the waste materials had high carbon content, leading to further research and the eventual shift towards producing graphite and graphene. This pivot was driven by the potential of these materials in green technologies, particularly in EV batteries and semiconductors.

“All of us have experience in converting agricultural waste into valuable products, and we have been laying the groundwork for Graphjet’s innovative approach to graphite and graphene production,” says Lee.

In 2022, Graphjet proposed a merger with Energem Corp, a special purpose acquisition company (SPAC), to facilitate its public listing on the Nasdaq. This move allowed Graphjet to leverage Energem’s resources and expedite the listing process. On March 15 this year, Graphjet successfully listed on Nasdaq, with a pro forma enterprise value of around US\$1.49 billion.

Today, the four partners own a stake of about 10% to 20% each in Graphjet, giving them a collective shareholding of around 70%. The remaining shares are owned by individual and institutional investors.

At the closing price of US\$5.41 last Tuesday, Graphjet had a market capitalisation of US\$797.6 million (about RM3.752 billion).

Lee believes Graphjet is a growth stock with “significant potential”, as investors can expect to see operational focus and long-term growth from the company. “Our primary focus is on expanding our manufacturing operations, delivering products to customers and enhancing our market presence.

“With the completion of our production facilities and increasing demand for sustainable materials, we anticipate strong growth in the coming years. The fundamentals of the company are robust, and as we continue to execute our strategy, we expect the share price to reflect the company’s true value.”

When asked about Graphjet’s rationale of listing via a SPAC on Nasdaq, instead of going for an initial public offering (IPO) on Bursa Malaysia, Lee says the US market offers more substantial fundraising opportunities that are essential for

scaling the company's operations and meeting the growing demand for sustainable graphite and graphene.

Moreover, listing on Nasdaq provides the company with greater visibility and access to international investors, aligning with Graphjet's strategy of expanding its market presence in the US, Japan and Europe.

"While Bursa Malaysia was considered, the strategic benefits of a Nasdaq listing ultimately aligned better with Graphjet's long-term growth objectives. However, we remain open to dual-listing opportunities in the future," says Lee.

Converting waste to valuable materials

Graphjet's new production facilities in Nevada and Kuantan will significantly boost its capacity. "We anticipate substantial revenue growth as we commence full-scale operations and meet the increasing demand from key markets in the US, Japan and Europe," says Lee.

He adds that Graphjet's focus on converting agricultural waste into valuable materials not only addresses critical supply needs, but also aligns with global sustainability goals.

"As we continue to expand and innovate, we are confident in our ability to create long-term value for our stakeholders and contribute to a greener, more sustainable future," he continues.

Lee sees Graphjet as being on "the cusp of significant growth", as the group aims to achieve an annual revenue of between RM200 million and RM300 million within the next two to three years. It has yet to generate revenue from its operations,



Graphene is known for its exceptional strength, electrical conductivity and thermal properties

according to its financial statements ended March 31, 2024, filed with the US Securities and Exchange Commission.

“We expect a net margin of around 15%, driven by increasing demand for graphite and graphene, particularly in the EV and semiconductor industries, whose surging demand is creating vast opportunities for our growth,” he reiterates.

It is learnt that the global graphite market was valued at about US\$17.5 billion in 2021 and is expected to grow significantly due to the increasing demand for EVs and renewable energy storage solutions.

“The global graphene market, though smaller, is expanding rapidly with applications in various high-tech industries. While specific market share data for Graphjet is not publicly available, our company is positioned as a key player due to our innovative and sustainable production methods,” says Lee.

Save by [subscribing](#) to us for your print and/or digital copy.

P/S: The Edge is also available on [Apple's App Store](#) and [Android's Google Play](#).