

# FGR attracts Middle East investment support for Kainos Tech development

## Highlights

- FGR and UAE based EMDAD sign MOU to promote hydrodynamic cavitation technology and attract investment to develop a pilot-scale reactor
- The process technology will convert petroleum feedstock to battery grade graphite, graphene and hydrogen
- Strategic partner EMDAD has four decades of experience working alongside key Middle East energy players, with a focus on technology driven and sustainability solutions

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First Graphene Limited (ASX: FGR; “First Graphene” or “the Company”) is pleased to announce it has signed a binding Memorandum of Understanding (MOU) with Abu Dhabi-headquartered integrated services provider EMDAD Group (EMDAD).

The MOU brings the parties together to collaboratively develop and provide a proposal to fund, design, build and commission a small scale, hydrodynamic cavitation reactor using First Graphene’s Kainos Technology. The proposal will ultimately lead to the commissioning of a reactor that will convert petroleum feedstock from oil producers to battery grade graphite, graphene and hydrogen.

## Background

FGR acquired patents to Hydrodynamic Cavitation Technology – known as Kainos Technology – in October 2021 following a successful partnership with UK-based research and development group, Kainos Innovation Limited.

A UK Government Sustainable Innovation Grant received by the partnership progressed R&D that confirmed Kainos Technology directly converts low-cost hydrocarbon feedstocks to graphene materials and hydrogen gas.

Since acquiring the patents, First Graphene has been pursuing commercialisation of the technology through application to the oil and gas sector, where its ability to generate alternative energy sources as well as synthetic graphitic materials will assist the industry’s transition goals.

## **MOU terms to expand investment in technology development**

A stated outcome is that the parties will jointly develop and submit a proposal to Abu Dhabi's State-owned oil company to fund the design, build and commissioning of a small-scale mobile reactor. EMDAD has been providing integrated upstream and downstream technology solutions to the UAE oil sector for more than 40 years, with a growing focus on minimising environmental impact and helping companies work towards net zero ambitions.

Among its clients are some of the world's most prominent oil producers and service providers including Eni, Abu Dhabi National Oil Company (ADNOC), Dolphin Energy, SLB (formerly Schlumberger), Baker Hughes, Sharjah National Oil Corporation, TotalEnergies UAE, Dubai Petroleum, Bunduq Oil Company, Oxy, Wintershall Dea and Weatherford International.

## **Kainos Technology to be incorporated into reactor**

First Graphene will incorporate its Kainos Technology into the planning and delivery of a pilot reactor.

Previous research and testing conducted by FGR at the Graphene Engineering and Innovation Centre (GEIC) in Manchester, supported by the UK Government through Innovate UK, successfully demonstrated hydrodynamic cavitation technology can efficiently produce graphitic materials and green hydrogen in a single step process.

The technology has the unique advantage of producing battery-grade materials using a thermodynamically favourable process, with "clean hydrogen" as a useful by-product.

## **Providing two-fold decarbonisation solutions**

First Graphene's Kainos Technology can be used at oil refineries where suitable feedstocks and petroleum engineering capabilities are readily available, and products can be captured for downstream use. Its application to oil refining processes generates hydrogen, which can be used as a clean energy source that can be re-integrated into the refining process.

The process also produces high quality synthetic graphene and graphite materials, which are in high demand for their use in battery anodes and coated cathodes.

According to market research published by Markets and Markets, lithium-ion battery anode markets will be worth US\$21 billion by 2026 growing at CAGR of 19.9%, driven primarily by rising demand for battery and plug-in hybrid electric vehicles. The largest market for lithium-ion battery anode is anticipated to be Asia Pacific, where demand is growing strongly due to increased industrial application of lithium-ion batteries along with innovation and technology advances in anode materials.

**First Graphene Managing Director and CEO Michael Bell said:**

*“We acquired Kainos Technology knowing there were industries of enormous and growing scale to benefit from its application – the energy and electric vehicle sectors among them. EMDAD’s reach into the Middle Eastern and global energy market is immense, as is the growing demand for synthetic graphitic materials essential to assisting the energy transition.*

*Having a strategic partner like EMDAD come on board with a scope to develop and trial a pilot reactor will allow FGR to flex its IP muscle and provide a strong demonstration of the opportunity oil producers have to reduce their carbon footprint. Bringing Kainos Technology to life and assisting decarbonisation efforts through hydrogen and graphitic material production will attract more investment in technology development.”*

**EMDAD Director of Agencies Sujeendran said:**

*“EMDAD is excited to partner with First Graphene for its innovative Kainos Technology development that could help the UAE in achieving environmental, sustainability and decarbonisation goals.”*

**This release has been approved for release by the board**

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**About First Graphene Ltd (ASX: FGR)**

*First Graphene Limited is focused on the development of advanced materials to help industry improve. The Company is a leading supplier of graphitic materials and product formulations with a specific commercial focus on large, high-growth global markets including cement and concrete; composites and plastics; coatings, adhesives, silicones and elastomers (CASE); and energy storage applications.*

*One of the key outcomes these advanced materials offer is the reduction of carbon dioxide emissions, whether directly through a reduction in output of these harmful greenhouse gases or lower energy usage requirements in manufacturing, or indirectly due to enhanced performance characteristics and extending the usable life of products.*

*First Graphene has a robust manufacturing platform based on captive and abundant supply of high-purity raw materials, and readily scalable technologies to meet growing market demand. As well as being the world’s leading supplier of its own high performance PureGRAPH® graphene product range, the Company works with multiple industry partners around the world as a supplier of graphitic materials and partner to research, develop, test and facilitate the commercial marketing of a wide range of sector-specific chemical solutions.*

*First Graphene Ltd is publicly listed in Australia (ASX:FGR) and has a primary manufacturing base in Henderson, near Perth, WA. The company is incorporated in the UK as First Graphene (UK) Ltd and is a Tier 1 partner at the Graphene Engineering and Innovation Centre (GEIC), Manchester, UK, where it has a strong marketing and R&D capability.*

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