

5 December 2024

Quadrise Plc
("Quadrise" or the "Company")

bioMSAR™ Development Update and Progress towards bioMSAR™ Zero

Quadrise Plc (AIM: QED), the transition technology provider for a cleaner planet, is pleased to confirm positive engine testing results for new bioMSAR™ prototypes, including our first with 100% biofuel, and to provide an update on related biofuel testing with project partners.

The objective of the Company's biofuel development programme is to supply the marine and industrial sectors with sustainable biofuels that are lower in cost, more efficient, safer yet simple to use, and which minimise harmful emissions. Our product development goal is to stay ahead of marine legislation and market requirements with the aim of offering an entirely fossil-free 'bioMSAR Zero™' fuel at commercial scale by 2030, which will future-proof our technology and allow access to new markets.

The recent engine tests were carried out on the Company's 40kW 4-Stroke Cummins diesel engine generator installed at Aquafuel Research Limited using bioMSAR™ formulations prepared and lab tested at the Quadrise Research Facility.

The results confirmed that the Quadrise emulsion technology platform can be used to produce viable non-fossil and low-fossil fuels which lower emissions, improve engine efficiency and reduce fuel costs.

Further testing on biofuel blendstocks and bioMSAR™ prototypes is now planned as Quadrise accelerates progress towards a commercial bioMSAR™ Zero, which we aim to provide to our clients well in advance of our original 2030 target.

Commenting on the update, Jason Miles, Chief Executive Officer of Quadrise, said:

"These hugely encouraging results demonstrate the capability of the Quadrise team and the adaptability of our unique proprietary oil-in-water emulsion chemistry, squarely positioning the Company to address the ongoing decarbonisation of the marine sector.

Our versatile technology mixes both water and oil soluble blendstocks to produce stable biofuels, increasing the opportunity to access abundant waste bio-energy resources that do not have economic higher-value applications. This enables us to customise formulations based on feedstock availability, cost and intended applications around the world.

Quadrise fuels have significantly enhanced performance and lower consumption costs per unit energy consumed. They can be supplied at scale to the marine sector using existing bunkering infrastructure and vessels, helping the sector to meet climate targets whilst extending the operating life of assets, which can be easily converted to our technology.

All of this places Quadrise in a unique position as a transition technology partner, for clients in energy-intensive sectors as well as biofuel suppliers.

Quadrise and our development partners are excited by these results, and we look forward to progressing the testing programme to the next stages, with the intention of launching our first fossil-free bioMSAR Zero™ product at commercial scale well in advance of 2030."

About the latest developments:

bioMSAR™ Zero ("B100") blended using Sustainable Methyl Esters and Glycerine

During the year, Quadrise developed a bioMSAR™ Zero blend which combines 100% sustainable ("second generation") waste-based methyl esters and glycerine as a highly stable emulsion biofuel.

these base methyl esters and glycerine as highly stable emission-reducer.

Methyl esters have been used in fuel blends for several decades and are produced from a diverse range of feedstocks such as natural fats or oils. Methyl esters have properties similar to conventional diesel fuel, making them suitable for use in diesel engines without significant modifications.

Our blend of 'B100' bioMSAR™ Zero is expected to be more cost-effective than equivalent B100 biofuel blends in use today due to the lower price of the biofuel components that we can use and the enhanced engine performance that the fuel delivers.

The Company's Lifecycle Analysis revealed that the blend offers 85% lower carbon dioxide ("CO₂") equivalent emissions compared to conventional marine fuels. This is comparable with the 100% biogenic ("B100") marine fuels that are being used today.

Engine testing results were compared against automotive diesel performance and demonstrated:

- Engine efficiency improvements of 9-10%, reducing fuel consumption costs and emissions.
- Carbon monoxide ("CO") and Nitrogen oxide ("NOx") emission reductions of 93% and 18% respectively, and
- Negligible visible smoke from the exhaust.

Following these positive engine test results, Quadrise intends to scale-up testing of this bioMSAR™ Zero formulation in conjunction with marine project stakeholders and a major diesel engine manufacturer in due course.

bioMSAR™ ("B50") blended using Marine B50 (50% HFO with 50% Methyl Esters)

Following the positive results using a B30 blend announced in December 2023, Quadrise have tested bioMSAR™ formulations combining 67% B50, which is a blend in itself (of 50% methyl esters blended with 50% fuel oil), with 33% water. In comparison to conventional marine fuels, the B50 bioMSAR™ blend offers 39% lower CO₂ equivalent emissions.

In this second phase of Cummins engine testing, B50 MSAR® was compared with diesel with results demonstrating:

- Engine efficiency improvements of 7-8%, reducing fuel consumption costs and CO₂ emissions.
- Carbon monoxide ("CO") and Nitrogen oxide ("NOx") emission reductions of 87% and 29% respectively, with negligible smoke visible from the exhaust.

The latest results are published in more detail on the Quadrise website at: <https://www.quadrise.com/references/biomsar-nextgen>

Related bioMSAR™ Developments

In addition to the methyl esters development program described above, work is progressing positively under our JDA's with BTG Bioliquids BV ("BTL") and Vertoro BV ("Vertoro") on developing bioMSAR™ Zero formulations using BTL's pyrolysis sugars and Vertoro's crude sugar oil™ ("CSO™").

A pilot and engine test programme on bioMSAR™ Zero incorporating CSO™ is currently being planned which will investigate the performance of both premixed and 'blend-on-board' bioMSAR™ Zero with CSO. Upon successful completion, this formulation will then be tested at sea on-board a newly designed prototype motor yacht built for Vertoro by Focus Motor Yachts, with sea-testing expected to commence in Q2 2025.

Quadrise also continue to develop relationships with other suppliers who can provide sustainable bio-feedstocks on a commercial scale for future bioMSAR™ supply.

Further announcements will be made, as appropriate, in due course.

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About Quadrise:

Quadrise is the supplier of MSAR® and bioMSAR™ emulsion technology, fuels and biofuels, providing innovative solutions to lower energy costs, pollution and greenhouse gas emissions today for the global power generation, shipping, industrial and oil industries.

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