# SUSTAINABILITY REPORT 2024



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## SHAPING THE FUTURE OF ENERGY



Quadrise applies its expertise in emulsion chemistry to deliver fuel solutions that lower costs, carbon and emissions for energy intensive industries.

#### LOWER-CARBON, LOWER-EMISSION, LOWER-COST

# **OUR COMPANY**

AIM-quoted Quadrise plc (QED) is a specialist in energy transition technologies. The company applies its expertise in emulsion chemistry to deliver fuel solutions that lower costs, carbon and emissions for energy intensive industries.

Quadrise applies patented emulsion fuel technology, extensive R&D and several decades of expertise to create cleaner and cheaper alternatives to conventional fuel oil and biofuels in the downstream, marine and power generation sectors.

Our MSAR® (Multiphase Superfine Atomised Residue) and bioMSAR™ transition fuels provide a means for the marine sector to meet its decarbonisation goals, whilst reducing fuel costs and extending the life of the existing shipping fleet.

Founded in 2006, Quadrise has worked alongside global technology partner Nouryon to develop our patented oil-inwater emulsion fuels and prove their effectiveness across a range of applications.

Our team of specialists have over 70 years' combined experience in commercialising emulsion fuels, managing projects at major refineries, power plants and on marine vessels worldwide. Our lowcost technology is available for immediate deployment, can be installed in under 12 months and runs on existing fuel oil / biofuel infrastructure, with minimal capital expenditure required.

We are committed to a netzero future and confident of delivering a commerciallycompetitive net-zero emulsion fuel by 2030.

We are shaping the future of energy.



## **CHAIR'S MESSAGE**

The capital-intensive sectors that Quadrise aims to serve cannot always move as quickly as they would like to adopt new technologies, but in shipping, power generation and elsewhere, we have sensed growing urgency and traction in decarbonisation since our last report.

Regulation in the EU is levelling the playing field with carbon pricing, and the Inflation Reduction Act in the US continues to provide powerful economic incentives to advance pragmatic climate technologies. Pressure from shippers and consumers to act faster adds to the sense that decarbonisation of shipping is "going mainstream".

In the face of the incoming tide, many vessel operators have reviewed their decarbonisation plans. Medium-term targets that spawned dual-fuel solutions are starting to interact with the near-term operational imperative of keeping existing vessels and port infrastructure operating and compliant for as long as possible. Those of us who have been wrestling with electric and hybrid car purchase decisions over the last year will recognise some of the dilemmas.

Looking at the wide world of shipping, we expect to see various technologies taking hold in different niches. The use of Quadrise emulsion technology provides practical solutions for the largest ocean-going vessels such as container ships, tankers and bulkers. We have seen a definite uptick in enquiries for our MSAR<sup>®</sup> fuels and bioMSAR<sup>™</sup> biofuels and in interest in the outcome of our long-awaited operational trials with MSC Shipmanagement and Cargill.

MSAR<sup>®</sup> and bioMSAR<sup>™</sup> have been proven at commercial scale and provide steppingstones to a net-zero biofuel solution - bioMSAR<sup>™</sup> Zero for our customers. We have made big strides over the last year and are on track with our product development.

As Quadrise prepares to scaleup, we are further strengthening our governance and board capabilities.

We have recently approved a Gender Equality Policy and are committed to improving our own diversity in the company.

The board has also commenced a search for a Non-Executive Director to augment the skills and expertise on the board with sector-specific experience in shipping. These are some of the steps we are taking to ensure we are equipped to maximise and capture opportunities for rapid growth.

Do please read on for further information.

ANDY MORRISON CHAIR OF THE BOARD



# **CEO'S MESSAGE**

The maritime sector and other energy-intensive industries that Quadrise serves need solutions that lower costs and emissions. These solutions have to be simple and safe to deploy in existing high-value assets that will be in commercial service for the next few decades. There are few - if any - solutions that offer all of these benefits simultaneously in a readily-scalable format.

Quadrise is preparing to play our part in shaping the future of clean fuels, accelerating the transition away from fossil fuels to lowercarbon sources of energy. During the last year we've focused on expanding opportunities for deploying MSAR® and bioMSAR<sup>TM</sup> fuels at commercial scale, as well as positively progressing laboratory and pilot testing of bioMSAR<sup>TM</sup> Zero prototypes that are 100% derived from biomass sources ('B100').

MSAR<sup>®</sup> is a transition solution for the marine industry to improve energy efficiency by up to 9% and immediately reduce greenhouse gases, as well as other pollutants. We are optimistic about the potential of our project with Valkor in Utah as it begins production of ultra-low sulphur heavy oil from its initial pilot wells. The oil can be transformed directly into ultra-low sulphur MSAR® and meet the compliance requirements of the International Maritime Organisation (IMO) without energy-intensive refining. This offers an opportunity to supply cleaner fuel with a lower carbon intensity to domestic and marine markets in USA..

bioMSAR<sup>™</sup> is a biofuel solution which builds on the same core technology as MSAR<sup>®</sup>, and offers a superior alternative to conventional marine biofuel grades.

For our project with MSC, renewable glycerine will be supplied by Cargill as the base biofuel component for bioMSAR<sup>™</sup>. This will be delivered to the MAC<sup>2</sup> terminal in Antwerp, processed into bioMSAR<sup>™</sup> and supplied to the MSC Leandra V, a commercial MSC container vessel, and then to other vessels at scale.





In response to the pressing need for future supply flexibility to meet expected demand, formulations of bioMSAR<sup>™</sup> incorporating fatty acid methyl esters ('FAME') and other biodiesel products and byproducts have also been successfully pilot- and engine-tested in the UK this year.

As the marine sector consumes some 280 million tonnes of oil equivalent per annum today, the choice of biomass feedstock is critical. It needs to be abundant, sustainable, cost-competitive and energy-dense. Here, our technology clearly sets Quadrise apart because of our unique ability to blend liquids that do not naturally mix into a stable emulsion. We are not constrained to using only bio-oils or only water-soluble products.

Over the past year, we have deepened our blending expertise and expanded our portfolio of 2nd generation advanced biofuels and byproducts with an increasing number of biofuel providers. Most recently, we successfully blended biomass-derived products from solvolysis and pyrolysis technology (from Vertoro and BTG Bioliquids respectively) into bioMSAR™, and we are making great progress in delivering a bioMSAR™ Zero product ahead of our 2030 target.

Our unique know-how coupled with our investments in technology solutions for the energy transition are yielding positive results in commercial applications earlier than expected. We look forward to publishing the results of our bioMSAR<sup>™</sup> Zero testing soon, starting commercial testing of bioMSAR<sup>™</sup> with Cargill and MSC, and marketing our lowercarbon MSAR<sup>®</sup> with Valkor across North America. Our commercial demonstration in Morocco, and our partnerships in South East Asia and Panama are also gaining momentum.

We are excited about the year ahead.

JASON MILES CHIEF EXECUTIVE OFFICER

"We successfully blended biomass-derived products from solvolysis and pyrolysis technology into bioMSAR™."

JASON MILES CHIEF EXECUTIVE OFFICER

### **'SOLVOLYSIS' & 'PYROLYSIS'**

Solvolysis and pyrolysis are both chemical processes used to extract biofuels from biomass, but they happen in different ways and under different conditions.

The word **"solvolysis"** comes from "solvent" and "lysis" (meaning breaking down).

It is a chemical reaction where a compound breaks down or decomposes due to the action of a solvent, a liquid that dissolves other substances. The solvent often reacts with the compound, helping it to break apart. The word **"pyrolysis"** comes from "pyro" (meaning fire or heat) and "lysis" (breaking down).

It is the process of breaking down a material using heat without involving oxygen. This occurs at high temperatures and results in the formation of smaller molecules or gases.

In short: Solvolysis = breakdown using a solvent. Pyrolysis = breakdown using heat (without oxygen).



# SHAPING THE FUTURE OF ENERGY

Our technology draws on over 70 years of combined experience in the production and commercialisation of oil-in-water emulsion-based fuels. MSAR<sup>®</sup> and bioMSAR<sup>™</sup> are direct substitutes for fuel oil (also called Heavy Fuel Oil or "HFO") and biofuel respectively.

Our technology has established a strong reputation with market leading companies, and is a potential game changer for oil refiners, and heavy oil producers. It frees up valuable distillates normally used for fuel viscosity control, increasing profitability. This is achieved rapidly and without incurring significant expenditure or costs – which differentiates our technology from alternative upgrading solutions.



dispersing the oil droplets

to sub-micron sizes.

The water phase carries tiny atomised oil droplets, 5-10 microns which are invisible to the human eye.

#### Lower emissions (multiple gases and Particulate Matter)

MSAR<sup>®</sup> and bioMSAR<sup>™</sup> are both water-based fuels. With bioMSAR<sup>™</sup>, some of the fossil content is replaced with renewable glycerine. The superfine dispersion of fuel in the water phase leads to complete combustion. All of the fuel is converted to energy at lower temperature, reducing losses.

NOx emissions are reduced by up to 45%, with no visible black soot. MSAR® delivers up to 9% reduction in carbon dioxide, and bioMSAR™ up to 30%.

Lower cost

MSAR® technology replaces high-value distillates with lower-cost water (even waste water) and <1% of additives, improving a refinery's conversion of a barrel of oil into premium-value products by 10-20%. Compared to fuel oil, MSAR® delivers savings of over 10%.

bioMSAR™ takes this one step further, displacing some of the fossil fuel with renewable glycerine or other renewable components or waste agricultural or forestry products. Compared with biofuel, bioMSAR™ delivers savings over 10%.

#### Safer operations

MSAR<sup>®</sup> and bioMSAR<sup>™</sup> are extremely stable, with storage and handling possible at much lower temperatures than HFO. These characteristics make our products safer for crew to handle and reduce the cost and complexity of heated storage tanks which are required for conventional HFO and some biofuels.

completely, providing near-

perfect energy conversion.

As emulsion fuels, MSAR<sup>®</sup> and bioMSAR<sup>™</sup> both readily disperse in water in the unlikely event of a spill; a characteristic which is beneficial compared with conventional HFO or biofuels.



- Our technology enables clients to achieve **loweremissions**, benefitting the environment and ensuring their ongoing compliance.
- Our **lower-cost** solution redefines the value and potential of existing assets in operation.
- Our emulsion technology is compatible and retrofit-ready for clients' operations, with minimal additional capex.
- Our world-class team and chemistry formulate lower-carbon solutions that enable clients to confidently deliver on their commercial and ESG ambitions.
- Our technology's performance is twenty years validated, so clients can trust it to drive their business.

# ECONOMIC, COMPLIANCE & OPERATIONAL BENEFITS

The imperative to decarbonise has never been clearer or more urgent. FuelEU Maritime, legislation introduced by the European Union, requires ship owners, managers or charterers to accelerate the uptake of renewable and low-carbon fuels in maritime transport, and aims to drastically reduce onboard greenhouse gas (GHG) emissions by 2050.

FuelEU Maritime forms a substantive part of the EU's 'Fit For 55' package to reduce GHG emissions from shipping. FuelEU sets targets to reduce GHG intensity of energy used onboard against a 2020 baseline.

The chart below shows the reductions at 5-year intervals. Measurements are based on reported fuel consumption, including emissions from production to transportation, bunkering and end-use, known as 'well-to-wake' (WTW).

We have analysed the WTW emissions for bioMSAR<sup>™</sup> and compared this to HFO and other biofuels. The renewable component in bioMSAR<sup>™</sup> is glycerine, which can be produced from different types of feedstock, ranging from oil crops like rapeseed, soybean, to animal fats, or preferably waste-based like Used Cooking Oil. Each of these results in different lifecycle emissions due to the differences in cultivating, harvesting, collection, transportation, and processing into glycerine. bioMSAR™ for the MSC trial will incorporate waste-based glycerine, resulting in WTW emissions over 25% lower than HFO.

Today bioMSAR™ delivers compliance to 2040 under FuelEU Maritime, and to 2045 with very minor changes to the blend.



#### Compliance

With 98.8% of the global shipping fleet still reliant on fossil fuels, shipping operators require transition fuel solutions which can quickly and affordably reduce emissions using existing vessels and bunkering infrastructure – the Quadrise solutions respond to this need.

MSAR<sup>®</sup> delivers up to **9%** reduction in greenhouse gas (GHG) emissions.

bioMSAR™ offers over **25%** reduction in GHG emissions.

Both MSAR<sup>®</sup> and bioMSAR<sup>™</sup> reduce NOx (or smog) by up to **45%.** 

MSAR<sup>®</sup> delivers up to **9%** reduction in greenhouse gases (GHG), and bioMSAR<sup>™</sup> offers over **25%** reduction in GHG emissions compared to conventional marine fuels.

The inherent water within MSAR<sup>®</sup> and bioMSAR<sup>™</sup> also reduces the temperature of combustion, which reduces NOx gases (or smog) by up to **45%**<sup>\*</sup>, and efficient combustion also reduces harmful black soot emissions.

These benefits enable fuel users to manage their energy transition pathway in a commercially-viable and responsible manner.

#### Easy fuel adaptability

MSAR<sup>®</sup> and bioMSAR<sup>™</sup> fuels are built to utilise the same fuel infrastructure as conventional fuels, and are built upon the same core Quadrise emulsion technology.

Therefore they offer unmatched flexibility to the users, allowing them to adapt to various operational requirements and market conditions whilst retaining critical infrastructure.

With the development of bioMSAR™ Zero, our expanding fuel portfolio provides fuel users with the choice to tailor the optimal fuel solution to remain compliant whilst maintaining operational efficiency and resilience.

MSAR<sup>®</sup> and bioMSAR™ fuels are **built to utilise the same fuel infrastructure** as conventional fuels.

#### **Cost efficiency**

Our advanced emulsion chemistry converts low-value blendstocks into high-value fuels, lowering energy costs for users typically by 10%.

MSAR<sup>®</sup> and bioMSAR™ deliver **5-10%** increased engine efficiency.

Over and above this, MSAR® and bioMSAR™ deliver 5-10% increased engine efficiency, and therefore lower fuel consumption compared to conventional marine fuels and biofuels.

#### Maximises asset value & life

Our solutions are enginecompatible and require minimal upgrade investment. This is critical for the capital-intensive sectors that we serve.

MSAR<sup>®</sup> and bioMSAR<sup>™</sup> allow asset owners to prolong asset life and maintain operational efficiency whilst still meeting the requirements of complex regulations and customer expectations.



#### For users of Quadrise emulsion technology and Blend-on-Board

#### **Boosts production margins**

Our innovative emulsion chemistry turns low-value crude and biomass-derived products and byproducts into high-value fuels, maximising every barrel to its full potential.

MSAR<sup>®</sup> unlocks a potential **\$150 million** annual uplift for a typical refinery.

MSAR<sup>®</sup> boosts production margins for the downstream oil sector by up to 20%, **unlocking a potential \$150** million annual uplift for a typical refinery.

#### Payback within 1 year

Our modular MSAR® and bioMSAR™ manufacturing units are designed for swift installation and low capital expenditure.

Refiners who adopt Quadrise emulsion technology achieve **accelerated payback in under 12 months** and significant payback returns at least 5 times quicker than current alternatives.

Accelerated payback in under 12 months.

#### Future-proofed

Our advanced emulsion technology offers refiners exceptional flexibility. By blending fuel droplets to just 5-10 microns, smaller than the diameter of a human hair, we achieve a level of adaptability that few can match.

Fuel droplets blended to size **5-10 microns.** 

We customise formulations based on available feedstocks, refinery crude diet and other ingredients to produce a range of fuels that are all compatible with each other.

### STIMULATING SUPPLY AROUND MARINE BUNKERING HUBS

Our project portfolio has been developed to address the Company's strategy of creating supply and demand points for our technology and fuels in key geographical locations for the marine industry and other energy-intensive sectors.



#### Decarbonising Shipping: MSC Shipmanagement

The shipping sector is now at the forefront of the energy transition, with shipping operators such as MSC and their customers leading the way.

Our flagship project with MSC Shipmanagement, which operates the largest shipping container fleet in the world, will demonstrate that Quadrise can play an important role in the decarbonisation of shipping by reducing emissions and costs.

The project covers trials of MSAR<sup>®</sup> and bioMSAR<sup>™</sup> fuels on board an operationally active MSC container vessel ahead of commercial supply to MSC upon successful trial completion. The fuels for the trial will be produced using a Quadrise Multifuel Manufacturing Unit ('MMU') and associated equipment, which will be installed at the MAC<sup>2</sup> terminal in Antwerp, Belgium.

Our fuels will then be produced using blendstocks supplied by Cargill NV, who will also be responsible for bunkering operations to supply the fuels to the MSC vessel for marine approvals.

Our future Antwerp facility creates opportunities to supply other forwardthinking shipping companies and industrial users in North West Europe.

#### Industrial Consumers: OCP Morocco

In line with our strategy to decarbonise shipping, we are exploring opportunities in parallel to supply MSAR<sup>®</sup> and bioMSAR<sup>™</sup> to MSC and others from a Mediterranean hub.

OCP S.A. ('OCP') is a major international manufacturing and mining group in Morocco and a major energy consumer for thermal applications that is looking to reduce their costs and emissions.

Following a successful industrial demonstration test of MSAR® and bioMSAR™ at one of OCP's major industrial sites in November 2023, OCP signed a new agreement in May 2024 to complete a



longer-term 30 day paid trial at their main Jorf Lasfar site as a precursor to commercial supply.

In parallel, under a Letter of Intent with OCP, Quadrise has opened discussions with candidate suppliers for longterm commercial fuel supply to Morocco following successful completion of the Jorf trial.

#### Upstream Supply to Local Users & Marine: Valkor USA

The project with Valkor targets the production and supply of ultra-low sulphur MSAR® and bioMSAR™ from extra-heavy oil from the Asphalt Ridge in Utah (with several billion barrels of oil reserves in place) directly

into the marine, power and industrial sectors. The properties of Valkor's treated heavy oil will enable MSAR<sup>®</sup> or bioMSAR<sup>™</sup> derived from it to comply with International Maritime Organisation regulations without the need for costly and carbon intensive oil refining or scrubbing, providing highly marketable lower carbon, ultra-low sulphur marine fuel for the North American ports of Los Angeles and the Gulf Coast.

#### Other Projects & Hubs: Panama & Southeast Asia

The expansion of availability of MSAR<sup>®</sup> and bioMSAR<sup>™</sup> into other major marine hubs, such as Southeast Asia and the Panama Canal, is seen by the Board as being vital to the future scaling of the Company's business. Our project in Southeast Asia is a refinery-refuelling project with an oil refinery situated near to bulk oil storage, offering future opportunities to supply Singapore, the world's largest bunker hub.

In Panama, we are working with Sparkle Power who owns a 50MW diesel power plant running on fuel oil. Sparkle are interested in a commercial test to demonstrate MSAR® and bioMSAR™ can lower generating costs and emissions. This project is expected to stimulate other demand in Panama, Honduras and the Americas.

# BIOMSAR<sup>™</sup> AS A SOLUTION FOR DECARBONISATION OF SHIPPING

Preparations for the long-awaited commercial trial of our MSAR® and bioMSAR™ fuels on board the MSC Leandra V are now in progress. Our equipment and modular technology takes 3-4 months to install and is compatible with existing fuel oil and biofuel infrastructure, resulting in a low cost solution for supply of large fuel deliveries of 1000 tons or more. Under a signed agreement with Cargill and MAC2, MSAR<sup>®</sup> and bioMSAR<sup>™</sup> will be manufactured at the MAC2 terminal in Antwerp, Belgium and supplied to power the MSC vessel for a duration of 4000 hours whilst in commercial service.

The simple production process is as follows:

- HFO is shipped to the MAC<sup>2</sup> site via barge, before any impurities are removed using purifiers before being fed into our proprietary multifuel manufacturing unit ('MMU').
- 2 For bioMSAR™ production, glycerine provided by Cargill is transported to the MAC<sup>2</sup> site by road, and stored in tanks before being piped into the MMU.
- **3** Water is piped to the MMU and added to the purified HFO.
- Special additives provided by our long-term chemical technology partner Nouryon are included in the water phase to stabilise the emulsion for longterm storage and transport, and to promote complete combustion.
- 5 The mixture is then processed in the MMU to produce a highly stable oil-inwater emulsion with enhanced fuel properties. MSAR® and bioMSAR™ can be made interchangeably and are compatible with each other.
- 6 The MSAR® and bioMSAR™ are then stored before being shipped by barge to the trial vessel, the MSC Leandra V.



This strategic collaboration with MSC and Cargill is a pivotal inflection point for Quadrise, positioning us to accelerate our transformative decarbonisation strategy for the shipping sector, while simultaneously establishing a scalable revenue model based on our proprietary emulsion chemistry and technology.

Having already secured an interim Letter of No Objection (LONO) for MSAR® from Wärtsilä for their 2S Flex 96 engine, we are confident that our bioMSAR™ fuel – which has properties very similar to those of MSAR® – will be successfully tested on the same vessel, and achieve a full LONO which will then be applicable to a wider range of Flex engine models.

The table below illustrates the size of the prize. The total addressable market for our fuel is 12,000 vessels globally, which is approximately 40% of global installed diesel engine power capacity (in MW), and 11% of the global fleet by vessel count, since these vessels tend to be larger in size.

Each MMU operating at full capacity can produce up to 250,000 tonnes p.a. fuel oil equivalent of MSAR® and/or bioMSAR<sup>™</sup>, generating \$16m in revenue for Quadrise and saving our clients 197,000 tonnes p.a. in CO<sub>2</sub> emissions. This has a real financial impact; each vessel of this type in EU waters would potentially avoid \$800,000 of EU ETS penalties per year.

Once the LONO is secured, Quadrise is able to access the market of over 400 vessels currently fitted with similar sized Wärtsilä Flex engines.

This is the starting point for our accelerated growth.



384

96,000

All vessels with similar Wärtsilä Flex engines

**12,000** Total Addressable Market 140,000

### **ENVIRONMENTAL** PROGRESS TOWARDS A NET-ZERO BIOFUEL

### **MSAR**<sup>®</sup>

MSAR®, our oil-in-water emulsion fuel has been tested with leading players across multiple sectors, and proven to deliver up to 9% CO2 reduction compared with conventional HFO in marine diesel engines.

### BioMSAR

bioMSAR<sup>™</sup> builds on our original MSAR<sup>®</sup> product, using the same technology to blend both oil or water soluble biofuels. Our standard bioMSAR<sup>™</sup> formulation with 40% renewable glycerine delivers up to 30% reduction in GHG emissions compared to HFO. Future options exist for blending up to 70% glycerine or other biofuels to reduce GHGs by over 50% thus making bioMSAR<sup>™</sup> a compliant fuel potentially up to 2045 to meet FuelEU Maritime Reduction Factors.. bioMSAR<sup>™</sup> has been tested on 4-stroke engines at independent test facilities, ahead of the MSC vessel trial to obtain Wärtsilä's approval for use on large 2-stroke engines.



We are progressing well in our efforts to develop a commercially-viable net-zero biofuel the goal to deliver a commercially viable 'bioMSAR™ Zero' fuel using 100% biofuels (B100) by 2030. Several blendstocks have been shortlisted and partnerships developed with companies owning unique or advantaged technologies, or access to the blendstocks.

In the chart below, the blue line shows the FuelEU Maritime Reduction Factor (as per the chart on page 10), against the reduction achievable by each of our fuel products. This shows the longevity of our products and our ability to provide credible transition solutions.



#### Reduction in CO<sub>2</sub> compared to marine fuels, and FuelEU legislation timing

\* including < 1% additives

Quadrise has established a proven process for the development of emulsion fuels, from initial proof-of-concept blend testing to fullscale commercial roll-out. This development process adopts best practice that balances innovation with rigorous validation.

Our approach has resulted in successful vessel trials with MSAR® and is set to achieve the same with bioMSAR™. Our zero-carbon fuel, bioMSAR™ Zero, is also progressing through the product development funnel towards future commercialisation.

Our approach adopts a series of tests starting from the simplest and most cost-effective, to the most rigorous and intensive. Each stage is designed to establish if there is sufficient scientific basis to progress to the next, therefore weeding out weaker candidates.

In this section, we explain how our development process works and what the stages of the funnel mean. We also refer to a framework called Technology Readiness Level (TRL) which is commonly used in organisations that are focused on scientific technology development and deployment, such as ISO (International Organisation for Standardisation) and the European Union's 'Horizon' funding programme. The lowest level of TRL1 refers to scientific research and the highest level of TRL 9 refers to operational launch. Reference to TRL levels makes it possible to compare the maturity of different types of technologies, and makes it clear how far advanced our solutions are compared to other alternatives.

#### Clear objectives and market alignment

The development of bioMSAR<sup>™</sup> began with a deep understanding of the challenges in energy-intensive sectors and the impact of changing regulations. The Quadrise team undertook a comprehensive evaluation of potential bio-components that would deliver on performance criteria which are important for end-users and suppliers.

This involved desktop research to identify components that met important technical,

economic and environmental criteria:

- high in calorific value (so they will burn);
- abundant (to service the potential global demand),
- not currently used as a fuel in the transport industry (so they should be cheaper), and
- considered a waste product (important for carbon reduction assessments).

As an outcome of this TRL 1-2 stage, glycerine was identified as an excellent candidate blend stock. It is a byproduct from the manufacture of biodiesel and has very low WtW CO<sub>2</sub> emissions. It is available globally at commercially-competitive prices, which is critical for adoption. Glycerine is also watersoluble. With our patented oil-in-water emulsion technology, Quadrise is able to combine glycerine and oil-based fuels, something that no one else can do.

#### Iterative development cycles

Lab testing: The first stage of bioMSAR™ testing involved obtaining samples from prospective suppliers and formulating labscale emulsions at Quadrise Research Facility (QRF). The goal of this testing was to produce several kilogrammes of an emulsion fuel that remained both statically and dynamically stable. This is equivalent to TRL 3-5.

Static stability is important when fuel is stored in a tank for long durations. At QRF, the new emulsion fuel is kept as still as possible for a number of weeks or months, to simulate the storage conditions in an operational environment where fuel could be stored in tanks for some time. The emulsion is regularly checked for signs of phase separation (known as "creaming").

Dynamic stability is also checked to ensure that the emulsion does not separate out when moved from storage tanks to the ship, and when being pumped into the engine. Our dynamic stability testing protocols were validated during MSAR® development with Maersk and Wärtsilä. This test is critical to give clients confidence that the fuel which is delivered from the supplier's storage tanks will be what is burned in the engines. When both static and dynamic stability are confirmed through lab-scale testing, the product is deemed viable for the next phase.

Small scale engine testing: Following successful lab-scale testing with renewable glycerine, bioMSAR<sup>™</sup> was manufactured in larger quantities using our pilot mill and tested in our 40kW Cummins diesel engine. Testing was done in partnership with Aquafuel Research Ltd who have experience in running electrical generators on biofuels. This early-stage technology demonstration brought our technology to the TRL 6 stage, providing engine efficiency data and validating that glycerine was compatible with our core emulsion technology.

Large scale engine testing: The third stage of testing was to run the fuel on VTT's Wärtsilä 4S 32-bore engine, equivalent to TRL 7 stage. This test provided data on what changes would be required to an engine's fuel injection controls, and it also confirmed the engine efficiency results from the previous Cummins smallscale engine tests. Wear and optical combustion chamber tests carried out in collaboration with Wärtsilä proved that bioMSAR<sup>™</sup> was compatible with traditional engine parts and metallurgy, allowing Quadrise to prepare for the final stage: seagoing vessel trials.

Vessel trial: In Q1 2025, bioMSAR™ with glycerine will reach the stage of TRL 8-9 through a trial of 4000 hours on the MSC Leandra V whilst in operation on the open ocean. This process involves regular engine inspections throughout. Once the vessel trial is concluded, a letter of no obligation (LONO) will be issued by Wärtsilä, enabling Quadrise to begin full-scale commercial roll out.

This structured development pathway, first established with MSAR<sup>®</sup> and now bioMSAR<sup>™</sup>, paves the way for our existing development and future commercialisation of bioMSAR<sup>™</sup> Zero, a fossil-free, net-zero emulsion biofuel.

The knowledge and experience accumulated from this work adds value by deepening our expertise in emulsion fuels, and supports our patent development and technology licensing business.

We have expanded our search for biocomponents that deliver substantial WtW CO<sub>2</sub> savings that are suited to our emulsification technology. Shortlisted candidates such as Vertoro's CSO<sup>TM</sup>, BTG Bioliquid's pyrolytic sugars and various biodiesel and bio-oil streams containing methyl esters have undergone successful lab-testing.

In November 2023, Quadrise tested bioMSAR<sup>™</sup> blends including up to 40% CSO<sup>™</sup> as a replacement for renewable glycerine, achieving engine efficiency increases of up to 7% and significantly reduced NOx and CO<sub>2</sub> when compared to conventional road diesel. Similarly, bioMSAR<sup>™</sup> formulations were tested incorporating B30 (a mixture of fuel oil and 30% methyl ester), which showed equally impressive engine efficiency and emission improvements, as well as reducing WtW CO2 emissions by 40% versus conventional heavy fuel oil.

Over the past twelve months, further testing confirmed emulsion stability incorporating B50 and B100 methyl ester blends, the latter becoming the first bioMSAR<sup>™</sup> Zero prototype. When compared to conventional road diesel, our formulation for bioMSAR<sup>™</sup> Zero demonstrated over 9% engine efficiency improvement, a remarkable 93% reduction in carbon monoxide (CO), and lower NOx emissions. These results highlight the incredible progress made by our R&D team which places us ahead of our 2030 schedule to deliver a commercially viable net zero fuel.

We continue to expand our large database of experimental results. There has been a marked increase in interest from producers of residual bio-waste streams in Quadrise and our technology. We have a deep understanding of potential bio-components that may become abundant, cheap and carbon-reducing in the future, and are engaging with experts in this area.



### FUTURE BIOMSAR™ BLENDSTOCKS

#### Lignocellulosic Biomass is

the most abundantly available raw material on Earth for the production of biofuels. It is composed of two kinds of carbohydrate polymers: cellulose and hemicellulose, and an aromatic-rich polymer called lignin.

Lignocellulosic biomass can be broadly classified as virgin biomass, waste biomass, and energy crops. Virgin biomass includes plants, and energy crops are those that provide high yields of lignocellulosic biomass. Waste biomass is produced as a low value byproduct of various industrial sectors such as agriculture, forestry and paper/pulp sectors. The Well-to-Wake GHG profile is low or nearzero for waste biomass.

Whilst the lignin is hydrophobic (it repels water), the cellulosic sugars (C5 or C6 based) are water soluble and therefore suitable for our oilin-water emulsion fuel formulations. The cellulosic sugar products have few competing commercial fuel outlets today that offer a more attractive return.

Today the producing sites for lignocellulosic biomass and by-products are currently small-scale when compared with the potential demand from the marine sector. Quadrise has a joint development agreement with Vertoro BV, who are partnered with Maersk to supply methanol-soluble lignin products using patented solvolysis technology, with the residual Crude Sugar Oils (CSO) available for other applications.

Testing to-date with a Vertoro CSO proxy has shown a high level of stability in bioMSAR<sup>™</sup>. Once concentrated it has similar physical and calorific properties as glycerine and we are optimistic about incorporating CSO into formulations for future bioMSAR<sup>™</sup> and bioMSAR<sup>™</sup> Zero products.

bioMSAR<sup>™</sup> formulations with CSO have been tested in our Cummins engine. The CSO bioMSAR<sup>™</sup> results have shown similar performance to glycerine, with improved emissions and engine performance compared to diesel, and corresponding GHG emissions reductions. The next step is to test the CSO bioMSAR<sup>™</sup> on a high compression engine at an independent test facility.

In parallel to Vertoro, Quadrise is working with suppliers of similar cellulosic sugar products from other sources in Europe and the USA

#### Wood Pyrolysis Oil (WPO),

similar to lignin, is derived

from wood or woody biomass. Through the application of heat, the organic materials are chemically broken down into gases, liquid bio-oils and solid char. WPO is one of the products produced through this process.

Previous research has shown WPO successfully combusting in engines, however the product is sensitive to polymerisation issues where relatively small molecules combine into large chains or networks of molecules, especially when blending, and corrosion issues related to high acidity.

Further processing of pyrolysis oils is possible, to produce lignin products and pyrolytic sugars - the latter are similar in principle to crude sugars derived from biomass. There is currently no competing demand for pyrolysis sugars in other transportation sectors.

Quadrise is currently working with BTG Bioliquids BV (BTL), whose technology produces pyrolysis oils and sugars from biomass. After successful lab testing at QRF using bioMSAR™ with about 20% of BTL's pyrolysis sugars, the first phase of engine testing commenced in Q4 2024 BTL and Quadrise are collaborating with potential partners who can utilise BTL's technology to supply these sugars for inclusion in bioMSAR™ on a commercial scale.

#### Tyre Pyrolysis Oil (TPO) is

produced from waste tyres, and is a dark brown liquid that is already used as a fuel in industrial furnaces and compression-ignition engines. TPO has a lower availability today than WPO but it can be upgraded into clean fuels in the future.

Today, there is little competition from the road transportation sector but there is a potential higher value application for TPO in chemicals. bioMSAR™ has been produced in the laboratory incorporating TPO. The bioMSAR™ emulsion was stable for over 21 days, and further optimisation is possible in the future.

### **Methyl Esters** are produced from a diverse range of

feedstocks, all of which are relatively abundant. Methyl Esters have been used in fuel blends for several decades.

Testing on bioMSAR<sup>™</sup> blends incorporating renewable glycerine and Methyl Esters has accelerated significantly over the past year with improved efficiencies and better emissions obtained in engine tests with 'B30' and 'B50' bioMSAR blends containing both FAME and glycerine.

Our first 'B100' bioMSAR Zero emulsion completely replaces the fossil fuel component of bioMSAR™ with waste-based Methyl Esters. Engine testing has shown remarkable results: 85% lower carbon dioxide (CO<sub>2</sub>) emissions, 93% lower carbon monoxide (CO), 18% lower NOx and 9-10% better diesel engine efficiency, with negligible visible smoke from the exhaust.

#### **Straight Vegetable Oil (SVO)**

is a pure plant oil, commonly derived from vegetable sources and plant crops such as soybean, sunflower and canola. These are cheaper than FAME or UCOME as there is less processing involved, and they are produced on a relatively large scale compared to other bio components.

There is low demand for SVO as a fuel component today due to its natural physical properties such as high viscosity and low atomisation. However, we expect that these will be improved when SVO is blended using Quadrise technology. Testing is planned for 2025.

**Bio-ethanol** is an alcohol produced from a variety of feedstocks, including foodcrops such as sugarcane and waste biomass residues like corn stover.



The fermentation process converts these biomasses (that are rich in sugars, starch and cellulose) into bio-ethanol which has significantly lower well-to-wake CO<sub>2</sub> emissions versus fossil fuels, especially for "second generation ethanol" (also known as cellulosic ethanol).



The low flash point of ethanol is a concern for adoption by the marine sector, which has a minimum limit of 60°C for conventional marine fuels.

There is significant opportunity in the marine sector for an ethanol-based emulsion fuel as off-take from producers is expected to be challenged in the future due to electrification of the road transport sector.

We are currently testing ethanol in our emulsion fuels and have reached up to 8% using our standard bioMSAR™ formulation.

**Bio-methanol** (also known as Renewable methanol or Green methanol), is an alcohol produced from biomass like agricultural residues or municipal solid waste. Therefore, it provides considerable Well-to-Wake GHG emission savings and has beneficial fuel properties. Biomethanol is gaining interest as a sustainable feedstock for various chemical processes, and production is projected to increase.

We shortlisted and tested biomethanol as a component for bioMSAR™ Zero, reaching up to a level of 2% in the formulation.

Hydrothermal Liquefaction (HTL) Bio-oil can be produced from a broad range of biomass sources as it is not limited by the need for a dry feedstock, and so aqueous waste streams such as sewage sludge can be turned into a usable oil. Currently, most HTL plants use woody biomass as their feedstock due to its low cost and relative abundance in comparison with other waste streams.

Under high temperatures and pressures, the biomass feedstock is reacted with a catalyst and broken down. Very quickly, the monomers begin to repolymerise, eventually forming a bio-oil.

HTL produces char as a byproduct which can act as a carbon-sink, lowering its wellto-wake emissions significantly.

HTL bio-oil has a high calorific value which makes it an attractive prospect for inclusion into a bioMSAR™ formulation.

Quadrise is currently exploring partnerships with companies who can provide HTL bio-oil samples for testing.

**Bio-lactic Acid** is lactic acid produced using green pathways, often involving micro-organisms or fermentation processes. It is shortlisted as a potential component but has been halted due to limited availability at this time.

# STREAMLINED ENERGY & CARBON REPORTING (SECR)

Quadrise continues to voluntarily disclose our energy use and carbon emissions in line with the Companies (Directors' Report) and Limited Liabilities Partnerships (Energy and Carbon Report) Regulations 2018 (the 2019 regulations).

We report our annual emissions in tonnes of carbon dioxide equivalent ( $tCO_2e$ ), accounting for all activities that we are responsible for, including combustion of gas; consumption of fuel for the purposes of transport; and purchase of electricity, heat, steam, or cooling by Quadrise for our own use.

The emissions cover the 'Kyoto' gases, carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), nitrogen trifluoride (NF<sub>3</sub>) and sulphur hexafluoride (SF<sub>6</sub>). Consistent with the approach taken the previous year, we calculated our Scope 1 & 2 carbon footprint for the financial year 2023/24 through an international advisory consultancy.

All Scope 3 emissions have been excluded from this footprint. We will incorporate the assessment of Scope 3 emissions when the use of our technology and products becomes a material contributor to our overall carbon footprint.

<i>Disclosure for the period July 2023 - June 2024</i>		Current reporting year 2023/24 UK & Offshore	Previous reporting year 2022/23 UK & Offshore	% Change
Total energy consumption used to calculate emissions	kWh	42,232	49,586	15% 🔻
Emissions from activities for which the company own or control including combustion of fuel & operation of facilities (Scope 1)	tCO2e	0.56	3.06	82% 🔻
Emissions from purchased electricity (Scope 2, location-based)	tCO <sub>2</sub> e	8.12	6.91	18% 🔺
Emissions from purchased electricity (Scope 2, market-based)	tCO <sub>2</sub> e	3.15	2.48	27% 🔺
Total gross tCO2e based on above (location-based)	tCO <sub>2</sub> e	8.68	9.97	13% 🔻
Total gross tCO2e based on above (market-based)	tCO2e	3.70	5.53	33% 🔻
Intensity ratio: gross tCO2e / FTE (location-based)	tCO2e/ FTE	0.96	1.11	13% 🔻

All upstream emissions (well-to-tank (WTT)) from Scope 1 and Scope 2 activities, including emissions associated with transmission and distribution (T&D) losses in grid electricity distribution, have also been excluded.

Our emissions have been calculated using the operational control reporting boundary and in accordance with the requirements of:

- 'Greenhouse Gas (GHG) Protocol Corporate Accounting and Reporting Standard' (revised version) (WRI & WBCSD, 2001); and
- 'Environmental reporting guidelines: Including Streamlined Energy and Carbon Reporting and Greenhouse Gas Reporting' (DEFRA & BEIS, 2019).

We operate two sites in the United Kingdom; one office located at 10 Arthur Street, London, EC4R 9AY, and one laboratory at 8 Faraday Close, Clacton-on-Sea, Essex, CO15 4TR (Quadrise Research Facility, QRF). Due to our small size and our pre-revenue status, we do not have full control over the choices of energy used at our London office, however we are using 100% renewable power backed by REGOs (Renewable Guarantees of Origin) at QRF. The impact of using renewable electricity is not considered under the location-based method of the SECR, which takes an average emissions intensity of the grid in the UK. The market-based method reflects emissions from electricity that Quadrise has purposefully chosen.

We are reporting our emissions intensity in  $tCO_2e$  per Full Time Employee (FTE). This intensity metric decreased by 13% between 2022/23 and 2023/24, meaning that less carbon is being emitted per full time employee. We maintained 9 FTEs in both financial years. The main driver behind the 13% decrease is our lower consumption of natural gas in 2023/24 compared to 2022/23 and the associated emissions.



### ALIGNMENT TO UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS (UN SDG)

At Quadrise, sustainability is at the heart of our business strategy and operations. We are committed to making a positive impact on the world by aligning our efforts with the United Nations Sustainable Development Goals (UN SDGs). Our dedication to these goals underscores our responsibility to drive change in energy, innovation, infrastructure, and more. Our work directly relates to advancing the following UN SDG targets.

## SUSTAINABLE DEVELOPMENT GOALS



#### Affordable & Clean Energy

Quadrise is actively contributing to SDG 7 by developing clean and sustainable energy solutions. Our MSAR<sup>®</sup> and bioMSAR<sup>™</sup> technology converts heavy hydrocarbon feedstocks, waste or lower-grade products and biofuels into enhanced low-emission fuels, reducing GHG emissions and improving energy efficiency. Through our innovation, we are increasing the share of renewable and clean energy sources in the global energy mix. We aim to substantially increase the share of renewable energy in the global energy mix.



#### **Decent Work and Economic Growth**

Our commitment to SDG 8 is evident in our approach to employment and economic growth. We provide opportunities for skills development, training, and meaningful work for our employees. By fostering a diverse and inclusive work environment, we contribute to creating decent jobs and promoting sustainable economic growth within the communities where we operate. We endeavour to promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all.



#### Industry, Innovation and infrastructure

Quadrise embraces innovation as a cornerstone of our business model. By continuously investing in research and development, we aim to enhance the technological capabilities of the energy industry. Our MSAR® and bioMSAR™ technology is a testament to our commitment, offering an innovative solution that bridges traditional fossil fuels with environmental sustainability. We aim to enhance scientific research, upgrade the technological capabilities of industrial sectors, and encourage innovation.



#### **Sustainable Cities & Communities**

Our efforts align with SDG 11 through our focus on sustainable infrastructure. By providing a cleaner alternative to traditional fuels, our technology contributes to air quality improvement by reducing pollutants that result in harmful smog and particulate matter. This is especially pronounced in urban areas that are in close proximity to industrial activity or transportation hubs where diesel or fuel oil are still used. Quadrise plc is dedicated to making cities more resilient and sustainable for present and future generations.

#### **Responsible Production & Consumption**

We are committed to responsible consumption and production through our MSAR® and bioMSAR™ technology. By transforming heavy residues, oils and biofuels into cleaner fuels, we reduce waste and promote efficient use of natural resources. We are dedicated to minimising the environmental impact of energy production and consumption. We aim to contribute to the efficient use of natural resources by developing a net-zero fuel by 2030.

#### **Climate Action**

Addressing climate change is central to our purpose and mission. Our lowemission fuel solutions contribute to mitigating climate-related risks. By lowering greenhouse gas emissions, Quadrise plc plays a role in building resilience against climate-related challenges and driving the transition to a more sustainable energy landscape. Our technologies directly contribute to reducing GHG emissions across multiple sectors.

#### Life Below Water and Life on Land

Our commitment extends to preserving biodiversity and ecosystems on both land and in water. MSAR® and bioMSAR™ fuels readily disperse in water, a characteristic which is different to conventional HFO or biofuels. Our fuels already comprise microscopic fuel droplets dispersed in water. In the unlikely event of a spill, our fuels naturally disperse below the surface of the water without requiring chemical dispersants and is less toxic to the environment. The absence of a slick on the water surface is beneficial as the emulsion spill is then governed by slower-moving tides and is therefore easier to contain. This characteristic of our fuel contributes to mitigating negative impacts on oceans and forests.

#### Peace, Justice and Strong Institutions

Our commitment to ethical conduct and responsible business practices supports SDG 16. We voluntarily adopt the UK Corporate Governance code, placing us in the top tier of AIM companies. We adhere to principles of transparency, integrity, and accountability in our operations, ensuring that our business contributes to peaceful and inclusive societies while upholding the rule of law.

#### Partnership for the Goals

Climate change is a global challenge – one that can only be tackled through concerted effort across governments, corporations and society. Therefore, collaboration is a cornerstone of our approach to sustainability. Quadrise is an active member of the UK Chamber of Shipping (UK CoS) and International Bunker Industry Association (IBIA), working together to drive innovation, share knowledge, and create solutions that address decarbonisation of shipping. Our emulsion technology enables the combination of different blendstocks from multiple suppliers, and we leverage this flexibility in partnership with clients to customise solutions that will support their commercial, operational and sustainability goals. Through meaningful partnerships, Quadrise amplifies the impact of our efforts in alignment with all UN SDGs.











## SOCIAL

At Quadrise, our commitment to sustainability goes beyond environmental considerations; it extends to our dedication to employees, local communities and the broader social fabric.

As part of our Environmental, Social, and Governance (ESG) initiatives, we emphasise the 'S'– social responsibility – by fostering a supportive work environment, respecting our suppliers, and upholding ethical standards.

In this report, we showcase our commitment to employees highlighting our efforts to create a positive impact.

### Personal & professional development

Our employees are the driving force behind all our operations. We prioritise their well-being through various initiatives that promote professional growth, health, and work-life balance. We invest in development programs including Health & Safety training at our research facility QRF, and to enhance skills and career opportunities, ensuring that our team remains empowered and adaptable in a rapidly evolving industry.

#### We recognise that our success is deeply intertwined with the well-being of our employees and the communities where we operate.

#### **Physical & mental wellbeing**

The health and safety of our employees, contractors, and stakeholders are of paramount importance. We adhere to rigorous safety standards by following stringent CSR and HSEQ procedures.

Our clients' projects are usually located in industrial environments and the goal is to prevent accidents and incidents, promoting the physical and mental wellbeing of everyone associated with our operations. Our employees have the benefit of full health insurance which includes support for mental health.



Operational Consultant Kevin Smith; Senior Technician Louis Stagg

#### **Inclusive culture**

We strive to foster an environment where every employee feels valued and respected, contributing to a culture of innovation and collaboration. Our culture enables flexi-working, enabling our staff to balance their personal and professional lives. We strive to build a workforce that reflects the societies in which we operate.

The recruitment of young talent underscores the value we place on fresh

"I've worked with Jason and emulsion fuels over the last 30 years, heading up our Research facility where we design and build the process equipment and support teams needed to test our fuels at commercial scale globally. The development and launch of bioMSAR™ was a real team effort, it's a great fuel for the future!"

> BERNARD JOHNSTON HEAD OF OPERATIONS

perspectives, our commitment to innovation and the development of future leaders within the organisation.

We are committed to retaining talent from a wide range of age groups, fostering intergenerational collaboration, and we provide equal opportunities for candidates regardless of age, gender or ethnicity. During the past year, the Board has formalised our commitment to inclusivity through the approval and publication of our Gender Equality Policy.

We recognise there is a gender skew both within the sector and specifically in our company. Our Gender Equality Policy is unambiguous about our intention and commitment to ensure that recruitment processes encourage the

Research

Facility

"I'm a new recruit to Quadrise, joining Bernard's team in Essex over the summer. I've been fascinated with engines from an early age, which has led to my love of motorsports and a career testing and servicing industrial engines and moving machinery. The technician role at Quadrise has been great so far, the team and training are second to none and I'm already working on the testing of new bioMSAR™ formulations on our Cummins engine at Aquafuel."

#### LOUIS STAGG OPERATIONS TECHNICIAN

widest possible consideration from talented individuals regardless of gender.

Bernard Johnston and Louis Stagg at QRF.

# GOVERNANCE

Strong governance practices are the foundation of our sustainability journey. Our commitment to governance responsibility is reflected in our corporate structure, ethical conduct, and risk management.

#### **Code of conduct & ethics**

We maintain a robust code of conduct and ethics that governs the behaviour of all employees, from the leadership team to every staff member, to ensure the highest ethical standards are upheld.

Since admission to trading on AIM in 2006, Quadrise has voluntarily adopted the **UK Corporate Governance** Code (the 'Code'), that establishes standards for good corporate governance in accordance with five clear principles of board leadership, effectiveness, accountability, appropriate remuneration and good relations with shareholders. Companies which adhere to the Code must set out how they comply, or explain instances of non-compliance. Our disclosures under the Code are on our website: https://www.quadrise.com/ investor-relations/corporategovernance/

#### **Risk management**

Our rigorous risk management practices include identifying, assessing, and mitigating risks that could impact our business and stakeholders. This proactive approach safeguards our long-term sustainability.

#### **Policies and practices**

Quadrise maintains a comprehensive suite of policies and practices appropriate for our size and stage of development, including policies on Health, Safety and Environment (HSE) and a Sustainable Travel policy. Each of these is reviewed and signed off by at least one nominated Executive or Non-executive Director with appropriate subject matter expertise.

#### Shareholder engagement

Quadrise actively engages with our shareholders, seeking their input and feedback to improve our governance practices and align our strategies with shareholder interests. As an AIM quoted Company we are always required to announce any material information via RNS. However, our goal is to ensure that all our shareholders, whether retail, institutional or our longstanding high net worth shareholders are as informed as possible through our regular use of online presentation and Q&A sessions, our social media channels and TV interviews. During the past year, we increased our communications especially through more deliberate use of social media to ensure that Quadrise project activities and our views on key aspects of the energy transition are publicised.

In April 2024 the Company announced that it had raised gross proceeds of £2.5 million via a placing of new ordinary shares in the Company and subsequent Open Offer to qualifying shareholders at an issue price of 1.25 pence per share. Our ability to raise funds in a challenging market demonstrates that current and new investors have confidence in the commercial potential of our technologies.

### Transparency and accountability

We maintain transparency in our financial reporting and operations, holding ourselves accountable to our shareholders, regulatory authorities, and the public.

### Compliance and regulatory adherence

We comply with all relevant laws and regulations in the jurisdictions where we operate, ensuring that our actions are not only ethical but also legally sound.

### Board independence and expertise

Our board of directors consists of highly qualified individuals from diverse backgrounds, ensuring independent oversight of our operations and informed decision-making.

### BUSINESS MODEL AND STRATEGY

Everything we do at Quadrise is to deliver our purpose. We only grow when our energy transition technologies are adopted in the market. In that sense, our incentives are perfectly aligned with ESG goals.

As we mature, our intent is to also incorporate ESG into our selection criteria for projects, suppliers and partners. Our commitment to reducing the GHG footprint of our products and activities will be embedded into our corporate targets which form the basis of our remuneration today and in the future.

Ultimate accountability for ESG matters rests with the Board of Quadrise plc; with each committee considering ESG as part of its deliberations. The Board fully embraces the importance of ESG in delivering value to our stakeholders.







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