# Powering Malaysia's OGSE Industry with Bioenergy: A Strategic Path to a Greener Future

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## Introduction: The Crossroads of Energy Transition

The oil and gas industry is at a critical juncture, facing pressure from global decarbonisation goals and more demanding stakeholders. While this has contributed to lower financial returns, it also presents a significant opportunity for those willing to embrace new energy sources such as biofuels and hydroelectric power.[1] While other renewable sources like solar and hydro are foundational for grid-scale electricity generation, bioenergy offers a distinct advantage as a pragmatic "bridge fuel".[2]

*Bioenergy provides a versatile, dispatchable energy solution that can directly address sectors and applications where electrification is either not yet viable or prohibitively expensive, making it particularly relevant to the oil & gas services and equipment (OGSE) industry whose operations often involve heavy machinery and maritime transport.*[2]

To fully appreciate this strategic opportunity, it is essential to define the core components of bioenergy. At its root, bioenergy is renewable energy derived from biomass: any organic material from plants and animals.[3] This biomass can be converted into several forms of fuel:

- **Biofuels** are liquid fuels used for transportation, with common examples including ethanol, biodiesel, and renewable diesel.[4] Notably, advanced biofuels, derived from waste oils and residues, are critical for ensuring minimal impact on land use and food prices.[5] In Malaysia, biodiesel accounts for the largest share of biofuel production in Malaysia, driven by the country's abundant feedstock availability.[6]

- **Biogas**, a gaseous biofuel, is produced when organic material decomposes in anaerobic conditions.[7] It can be processed to produce pipeline-quality Renewable Natural Gas (RNG), which serves as a lower-carbon replacement for traditional natural gas.[7]

The Malaysian OGSE industry is in a unique position to embark on this transition. By leveraging its existing assets, infrastructure and skilled workforce, the industry can become a vital player in the energy transition. This strategic push is underpinned by national initiatives such as the National Biomass Action Plan (2023-2030), which aims to generate significant economic value and new jobs through sustainable practices, including converting palm biomass into fuel pellets and bio-based products for export and co-firing.[8]

This article will demonstrate that the skills and capabilities that have made the OGSE sector successful in the past are not obsolete; they are the very tools required to build a resilient and prosperous future in the bioenergy economy.

## The Strategic Case for Bioenergy Integration

The OGSE industry's pivot towards bioenergy is a logical extension of its core competencies, offering a low-cost, high-impact pathway for decarbonisation by leveraging on existing skills that are transferrable.[7] A significant advantage of bioenergy is its compatibility with existing fossil fuel infrastructure, which can be retrofitted or repurposed at a fraction of the cost of building new facilities.[9] For example, existing oil refineries with hydrotreating units can be revamped to produce renewable diesel and Sustainable Aviation Fuel (SAF) from bio-oils and waste feedstocks.[10]

The viability of this strategic pivot has already been demonstrated by international energy giants. TotalEnergies successfully converted its 80-year-old La Mède refinery in France into a world-class biorefinery capable of producing 500,000 metric tons of hydrotreated vegetable oil (HVO)-type biodiesel per year, creating 250 jobs and integrating a circular processing chain to convert waste into biogas and fertiliser.[11]

Similarly, **Shell** is actively enabling this transition for others by licensing its "Shell Renewable Refining Process" which allows refiners to process 100% bio-feedstocks into profitable renewable diesel and SAF.[12]

*This global shift signals a critical market re-alignment and a strategic necessity for the Malaysian OGSE sector to future-proof business models and attract capital in an increasingly ESG-focused financial landscape.*

The OGSE industry's role in the bioenergy economy is not confined to a single function but rather spans the entire value chain. The competencies that have long defined the industry—from project management and process engineering to logistics and asset maintenance—are directly transferable to the bioenergy space.

This begins with feedstock sourcing and logistics, where OGSE firms can apply their extensive supply chain expertise to manage fragmented biomass supplies.[13] The design and construction of new bioenergy facilities, such as biofuel storage, biorefineries and biogas plants, require the same high-level Engineering, Procurement, and Construction (EPC) capabilities as traditional oil and gas projects.[12]

Additionally, the industry's strong fabrication capabilities are essential for producing specialised equipment, such as turbines and boilers for solid biomass conversion.[15] Finally, as with any industrial asset, bioenergy facilities require long-term Operational & Maintenance (O&M) support, which OGSE firms are well-equipped to provide based on their deep experience.[14]

By systematically mapping their existing capabilities to these new areas, OGSE companies can see that the energy transition is not a threat to their business model but a pathway to expanding it.

## New Frontiers and Business Opportunities in Bioenergy for OGSE

The strategic case for bioenergy translates into tangible business opportunities for the OGSE industry, creating new markets and services. The industry's engineering, fabrication and logistics capabilities are the foundation for a wide range of new business lines, from manufacturing specialised bioenergy equipment to retrofitting existing infrastructure for biofuel production.[9]

*The shift to bioenergy also creates a demand for a new, specialised logistics network, which OGSE firms are uniquely equipped to solve by designing, building and operating supply chains for feedstocks such as agricultural residues and municipal waste.[13]*

Malaysian companies have already made this venture into a commercial reality, providing a powerful testament to the OGSE industry's adaptability and foresight.

**Wasco Berhad**, a Malaysian energy solutions provider which has established itself on the global stage, strategically embraced the bioenergy space 30 years ago.[15] **Wasco** is a market leader in the fabrication of steam biomass turbines and boilers for the agro-based industry through its wholly owned subsidiary, **Wasco Greenergy Berhad**. The company's joint venture with Shinko for steam turbines has secured a 70% market share in biomass applications, demonstrating a direct and successful link between traditional OGSE fabrication expertise and the bioenergy sector.[15] In June 2025, **Wasco** announced its plan to independently list **Wasco Greenergy Berhad**, a move aimed at unlocking greater growth opportunities.[16]

Similarly, **Dialog Group Berhad**, a prominent player in the midstream sector, is another prime example of diversification by leveraging its core asset base: storage and logistics infrastructure. The group is investing heavily in new facilities designed for the storage of renewable fuels, with a recent expansion at its Tanjung Langsat terminal adding 150,000 m³ of storage for products like SAF and Hydrotreated Vegetable Oils (HVO).[17]

These investments directly support the transition by providing the critical logistical backbone for the emerging biofuel economy, reinforcing the idea that existing assets and expertise are highly valuable in the new energy landscape.

## Practical Applications for Bioenergy within OGSE Operations

Beyond external business opportunities, bioenergy offers a practical pathway for OGSE companies to decarbonise their own operations. By integrating biofuels into their facilities and operational fleets, firms can reduce their emissions, align with corporate sustainability goals and demonstrate a tangible commitment to the energy transition.

OGSE companies can leverage bioenergy to meet their own energy needs. Biogas, for example, can be produced from the anaerobic decomposition of organic waste from industrial processes or nearby agricultural operations.[7] This gas can then be used to generate heat and power for facilities, offering a carbon-neutral and cost-effective alternative to traditional fossil fuels.[3] This self-sufficiency reduces reliance on grid electricity or diesel generators and provides a tangible reduction in operational carbon footprint.

The marine sector is a significant part of the OGSE industry, with offshore support vessels (OSV) and cargo ships playing a vital role in operations.

*The global marine biofuel market is projected to grow from USD3.94 billion to USD7.99 billion between 2024 and 2034, a compound annual growth rate (CAGR) of 7.3%.18 Maritime biodiesel and renewable biodiesel demand could exceed 140Mt of fuel oil equivalent by 2028.[6]*

The appeal of marine biofuels, particularly blends of Fatty Acid Methyl Ester (FAME) biodiesel, is their "drop-in" capability, meaning they can be used in existing marine engines with little to no modification.[2] This avoids the high capital expenditure associated with transitioning to other alternative fuels. Malaysian company **MISC Berhad** is actively involved in this transition, having pledged to achieve Net-Zero GHG emissions for its shipping operations by 2050.[20]

The "drop-in" benefit of biofuels also extends to heavy machinery. Most modern diesel engines can operate on biodiesel blends of up to B20 with similar fuel consumption, horsepower, and torque to conventional diesel.[21] The use of these blends offers an immediate and significant reduction in particulate matter, hydrocarbon and carbon monoxide emissions.[22]

While operational nuances exist, such as the need for materials compatibility and a risk of filter clogging due to the solvent effect of the biofuel, these challenges create a new business opportunity for OGSE companies with strong Operations and Maintenance (O&M) capabilities.[22]

## Navigating Challenges and Driving Solutions for the Adoption of Bioenergy

While the bioenergy sector presents a compelling strategic opportunity, its full-scale adoption faces several key barriers. Addressing these challenges requires a concerted effort from the private sector, government and academia.

Despite the cost-saving benefits of repurposing existing infrastructure, the initial capital expenditure for new biorefineries can be substantial, which can deter potential investors.[9] A critical challenge is also ensuring a consistent and sustainable supply of feedstock.

The industry is currently reliant on a limited pool of conventional feedstocks; and scaling up production requires diversification into non-food sources like waste and agricultural residues.[5] Furthermore, the lack of clear, long-term policy frameworks creates investment risk from unpredictable changes in regulations.[23]

Overcoming these hurdles requires a collaborative approach that focuses on de-risking investments and fostering a supportive ecosystem. Collaborative initiatives like Public-Private Partnerships (PPPs) are essential for bridging the gap between research and commercialisation. Government agencies have a proven track record of de-risking new technologies by funding integrated biorefineries at pilot and demonstration scales, which can significantly reduce investor concerns with new technology risks.[23]

*OGSE firms must also continue to invest in R&D to optimise bioenergy processes, which includes finding ways to utilise all components of a feedstock and developing high-value co-products that can enhance profitability.*[25]

The goal is to make biofuels more economically competitive with petroleum-based fuels.

Lastly, a stable and predictable regulatory environment is paramount for attracting long-term investment. Policymakers must establish clear and consistent frameworks that include rigorous sustainability criteria and regulatory measures like mandates and financial incentives.[5]

It is also important to acknowledge and address the legitimate criticisms of bioenergy. Concerns about its scalability, potential for land-use conflicts and reliance on other resources are valid.[26] However, the strategic integration of bioenergy with existing oil and gas infrastructure offers a pragmatic counterpoint.

By focusing on waste and residue-based feedstocks and leveraging the industry's existing expertise, the OGSE industry can mitigate these concerns and position bioenergy as a practical and necessary transition fuel.[5] The OGSE industry's unique position allows it to help shape the energy ecosystem, not just by adopting new technologies but by actively engaging in policy advocacy and collaboration.

## A Call to Action for a Resilient Future

The analysis presented in this article underscores a central truth:

*The OGSE industry is at a crossroads, where the global push for decarbonisation is an immediate, strategic imperative.*

Bioenergy, with its unique "drop-in" compatibility and synergies with existing infrastructure, offers a pragmatic and profitable pathway for this transition. The industry’s competencies in

engineering, fabrication, and logistics are the very assets that will drive its future growth in a changing world.

Both OGSE100 companies, **Wasco** and **Dialog,** are already showcasing the viability of bioenergy, highlighting that this strategic shift is evolving from concept to commercial reality.[26] Realising its full potential will likely depend on continued investment in R&D to improve process efficiency, the development of strategic public-private partnerships to support commercialisation and the presence of clear, consistent policy frameworks that encourage long-term industry participation.

Malaysia Petroleum Resources Corporation (MPRC) has established the framework to facilitate this strategic shift through its **Growth Beyond OGSE** initiative, a core element in the Mid-Term Review of the National OGSE Industry Blueprint 2021-2030.[28]

*The initiative is intended to support OGSE companies in diversifying into adjacent sectors such as renewables and carbon capture, utilisation and storage (CCUS) by leveraging transferable skills and capabilities.*[28]

This effort complements broader national strategies, including the National Energy Transition Roadmap (NETR) and the New Industrial Master Plan (NIMP2030), both of which aim to advance Malaysia's net-zero aspiration by 2050 while enhancing industry competitiveness and long-term value creation.

Within this context, MPRC's programmes provide a platform for the OGSE sector to align with the nation's sustainable and resilient growth trajectory, positioning it as a potential catalyst in Malaysia's broader transition agenda.[29]

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