

From Oilfields to Hydrogen Hubs: Rethinking OGSE's Role in Malaysia's Energy Future

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Context: Malaysia's Oil & Gas Services and Equipment (OGSE) sector is uniquely positioned to support the hydrogen economy—not by abandoning its roots, but by **repositioning existing assets, skills, and infrastructure** to serve the emerging hydrogen value chain.

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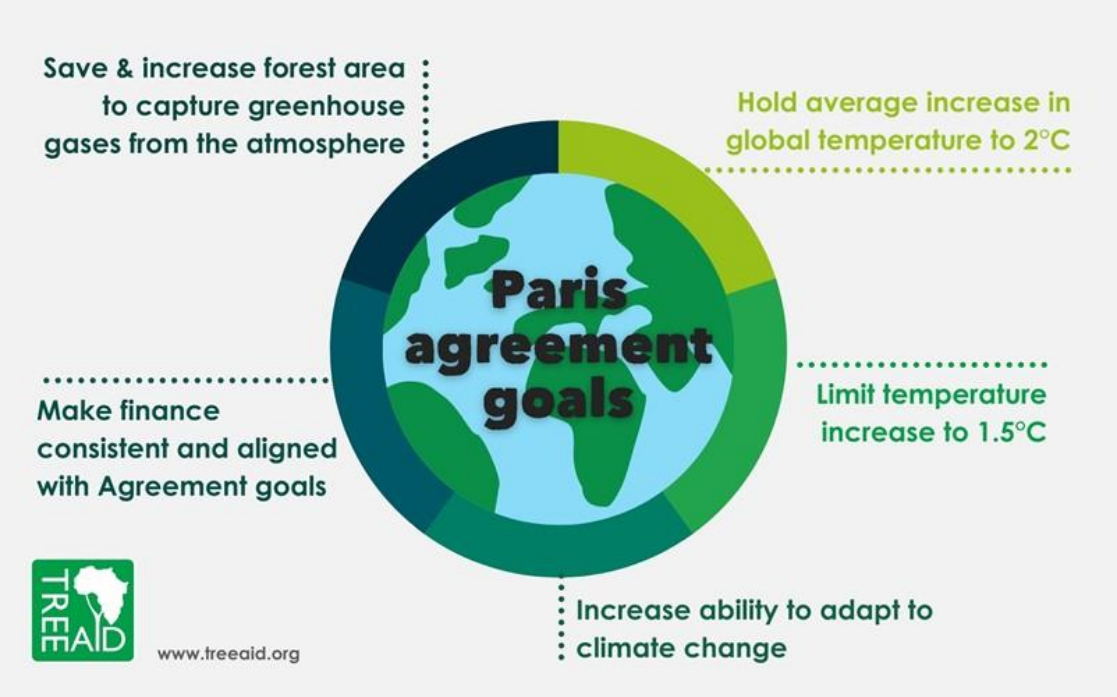
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1. HYDROGEN TECHNOLOGY & ECONOMY: WHY IT MATTERS

Over the past decade, hydrogen has been making headlines, attracting far more attention than it ever did as just an element on the periodic table. The goal now is no longer about getting an A in chemistry, but one that surpasses it. A decarbonisation strategy. As long as the world keeps spinning, we'll need energy to power our homes, get us where we need to go, and make the things we need and want every day. The need is constant. But here's the problem: it comes at a cost. And it's not just us paying for it now. Future generations are likely to bear an even heavier burden, no thanks to emissions.

Therefore, the Paris Agreement came into picture. As nations rally to cut emissions and meet net-zero targets, hydrogen has emerged as a versatile energy carrier with the potential to decarbonise some of the hardest-to-abate sectors, think heavy industry, long-haul transport, and power generation. But for hydrogen to truly move the needle, countries need more than just ambition; they need strategy, resources, and infrastructure.

Figure 1.0. Paris agreement goals



Note. From *Tree Aid, n.d., https://www.treeaid.org/blogs-updates/paris-climate-agreement/?srsltid=AfmBOop5Wbh32hQxoBcos4gKZek9UNlKp5yrAngr0Bv_OGllPtxzghuM*

Malaysia is one of the most highly developed country in the Southeast Asia region. The economy is expected to triple in size over the next three decades with its population to rise to over 40 million people. Consequently, Malaysia's primary energy supply in Malaysia is set to increase by 60% over the same period[1].

With this in mind, Malaysia had chosen to tap its considerable renewable energy resource potential to provide affordable and local alternatives to fossil fuels, an approach outlined in policies and roadmaps such as the National Energy Policy (Dasar Tenaga Negara - DTN) and National Energy Transition Roadmap (NETR).

In one of the 31 action plans laid out in the DTN, hydrogen is given the spotlight based on its domestic use and export potential in Malaysia and is one of the six energy transition levers outlined in NETR. With abundant natural gas and renewable resources including solar, hydropower, and bioenergy, with a combined potential of 290 GW across Peninsular Malaysia, Sabah and Sarawak, Malaysia is well-positioned to competitively produce low-carbon hydrogen. This includes blue hydrogen, which integrates carbon capture to reduce emissions, and green hydrogen, derived entirely from renewable energy sources.

To translate this potential into tangible outcomes, Malaysia has laid out a clear strategic direction for hydrogen development at both the national and state levels. The Hydrogen Economy and Technology Roadmap (HETR) sets out a long-term strategy to develop a robust and dynamic hydrogen ecosystem in Malaysia.

2. HYDROGEN'S ASSET NEEDS: A NATURAL FIT FOR OGSE

With Malaysia's oil and gas production expected to decline by 2030, it is timely for OGSE companies to explore opportunities in adjacent energy sectors such as hydrogen. In today's rapidly evolving energy landscape, the principles of resilience, robustness, and sustainability must guide long-term strategies. Research shows that hydrogen and carbon capture and storage (CCS) are among the fastest-growing segments for energy investment globally by 2030, with Asia emerging as a key driver of this trend[2].

[1] Malaysia Energy Transition Outlook, IRENA, 2023
[2] Rystad Energy Research and Analysis, 2024

Malaysia is well-positioned to capitalise on this momentum. The country's substantial downstream infrastructure and hard-to-abate industrial sectors present significant opportunities for hydrogen to play a role in emissions reduction. For OGSE players, this represents more than a new market, it is a strategic head start. Many of their core capabilities in Engineering, Procurement, Construction, Installation & Commissioning (EPCIC), fabrication, and asset maintenance are highly transferrable to hydrogen projects. With some adaptation and upskilling, particularly in materials science and hydrogen-specific safety protocols, the transition is not only feasible, it's already underway.

OGSE companies' expertise in designing and maintaining high-pressure gas pipelines, compressors, and storage systems can be readily adapted to support hydrogen infrastructure, with adjustments to accommodate hydrogen's unique properties, such as its low density and the tendency to cause material embrittlement in certain metals. Similarly, existing safety and risk management practices, including gas leak detection and containment methods, can be modified to meet hydrogen-specific standards.

Figure 2.0: One of the infrastructures at Segamat regional office, which also houses the PETRONAS Gas Control Centre (PGCC)



Note. From *Starpicks.* 2025, *The Star, https://www.thestar.com.my/news/nation/2025/08/29/beyond-the-pipeline-the-unseen-standards-behind-gas-safety-in-msia*

This evolving capability is already evident in both global and local examples. Technip Energies, a spin-off from oil and gas giant TechnipFMC, is actively diversifying into hydrogen engineering. Locally, major players are following similar trajectories: Gentari, PETRONAS' clean energy arm has made hydrogen a strategic priority, targeting both domestic use and regional export. SEDC Energy in Sarawak partnered with local OGSE company, ICE Petroleum for the development of Rembus hydrogen plant with the latter taking up the engineering, procurement, construction, installation and commissioning (EPCIC) work[3], demonstrating that local expertise is already being mobilised for the hydrogen economy while the PETRONAS–ENEOS clean hydrogen pilot project in Terengganu[4] exemplifies cross-border collaboration in energy transition initiatives. These developments affirm that the OGSE sector is not starting from scratch, it is building on a legacy of technical excellence and project execution. With the right policy signals, skills development, and collaboration, OGSE players can be pivotal in accelerating Malaysia's hydrogen journey and securing their place in the energy systems of the future.

Figure 3.0: Artist's impression of the Rembus Depot in Kota Samarahan.



Note. From *Sarawak Metro Facebook page, 2024,* https://dayakdaily.com/rembus-h2-plant-targets-producing-1825-tonnes-of-hydrogen-annually-to-power-kuchings-transport-revolution/

[3] Hydrexia and ICE SEDCE Hydrogen Form Joint Venture for Hydrogen Development, 2024
[4] PETRONAS Partners ENEOS for First Commercial Scale Hydrogen-To-MCH Project, 2022

3. CLOSING THE GAP: UNDERSTANDING THE CHALLENGES AND OPPORTUNITIES

Despite the growing global momentum behind hydrogen, the path to a thriving hydrogen economy is not without its hurdles. One of the most pressing challenges lies in the absence of dedicated hydrogen legislation. In many countries, hydrogen continues to be governed under general energy or gas laws that fail to account for its unique properties, such as its storage requirements, flammability, and role as both a fuel and feedstock. This regulatory gap creates ambiguity, complicates investment decisions, delays permitting and licensing processes, and limits insurance coverage for hydrogen-related infrastructure[5].

Even when regulatory clarity is achieved, economics remain a major barrier. While green hydrogen is the most sustainable pathway, it is also the most expensive. Production costs currently range between USD2.50 to 6 per kg[6], making it significantly more costly than blue hydrogen or conventional hydrogen from natural gas. The high capital expenditure and the fact that electricity alone accounts for up to 75% of the total cost of green hydrogen[7] make it a less attractive option without financial support, economies of scale, or technology breakthroughs.

Beyond production, the hydrogen value chain must be supported by stable demand. A hydrogen project cannot succeed in isolation; it requires off-takers ranging from domestic industries, transportation fleets, or export markets to absorb the hydrogen produced. Without this assurance of long-term demand, investments in infrastructure and production become risky. This creates a chicken-and-egg dilemma that can stall progress if not addressed through coordinated policy and market mechanisms.

These challenges, from regulatory uncertainty and high production costs to the lack of demand certainty underscore the need for a comprehensive and coordinated approach to developing Malaysia's hydrogen economy. Addressing them will require more than isolated efforts. However, these barriers must not be seen as roadblocks, but as areas where targeted interventions can unlock significant opportunities. The following strategic enablers and

[5] Global Hydrogen Review, 2024
[6] Insights into Decision-Making for Offshore Green Hydrogen Infrastructure Developments, 2023
[7] Green hydrogen: creating an 'electricity first' energy landscape, 2024

recommendations outline how Malaysia can overcome these hurdles and position its OGSE industry at the forefront of a hydrogen-powered future.

4. STRATEGIC ENABLERS AND RECOMMENDATIONS

To unlock the potential of Malaysia's hydrogen economy, it is essential to focus on practical enablers that can drive a just, resilient, and inclusive energy transition. These enablers should not be seen as abstract ideals, but as actionable levers that must work in unison to ensure Malaysia's OGSE industry can thrive.

First, targeted financial incentives are essential to improve commercial viability, particularly in the early stages. Tax credits, grants, and access to green financing can help offset the high capital costs associated with green hydrogen production and infrastructure deployment. In this regard, MPRC strongly supports the government's RM2 billion seed funding under the National Energy Transition Facility[8], which adopts a catalytic blended finance model to de-risk early-stage investments and accelerate project bankability.

Secondly, demand stimulation must be addressed proactively. Without predictable offtake, the hydrogen value chain cannot mature. The creation of regional hydrogen export corridors and the establishment of long-term off-taker frameworks to provide revenue certainty and attract infrastructure investments are imperative for this.

[8] Govt to Allocate Rm2 Bln for National Energy Transition Facility, 2023

Figure 4.0: Collaboration between Hydrexia and Sarawak Economic Development Corporation (SEDC) Energy exporting the first maritime export of solid-state hydrogen



Note. From *Hydrexia LinkedIn post, 2025, https://www.linkedin.com/posts/hydrexia_hydrexia-hydrogen-hydrogentransport-activity-7387109965989146624-bh0p*

Third, innovation must be nurtured to ensure cost competitiveness and technology readiness. Through the OGSE Technology Network (OGTEN)[9], MPRC facilitates partnerships between OGSE companies, research institutions, and technology providers to accelerate the development and localisation of technologies including hydrogen. These collaborations will be critical in advancing Malaysia's technical capability and building intellectual property in emerging clean energy domains.

Finally, diversifying into adjacent energy sector remains a strategic priority. Through the Growth Beyond OGSE[10] initiative, MPRC promotes industry diversification into clean energy and hydrogen-related services, while the OGSE Strategic Partnership[11] initiative offers pathways for OGSE firms to scale globally and participate in high-impact transition projects. These programmes are supported by targeted upskilling and reskilling efforts to ensure the OGSE workforce remains future-ready.

[9] National OGSE Industry Blueprint 2021-2030 Mid-Term Review, 2025
[10] National OGSE Industry Blueprint 2021-2030 Mid-Term Review, 2025
[11] National OGSE Industry Blueprint 2021-2030 Mid-Term Review, 2025

In summary, Malaysia's hydrogen journey cannot succeed in silos. It must be built on an integrated foundation of policy, finance, demand, innovation, and people. The OGSE industry is well-positioned to diversify into hydrogen, leveraging its existing capabilities to play a vital role in advancing national decarbonisation goals and positioning Malaysia as a leader in the regional clean energy landscape.

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