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The Iran war has merged conversations about energy security with the low-carbon energy transition as countries and companies look for local sources of energy, including those generated from biomass and domestic waste, as a form of security

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LONG-HAUL TRUCKING FACES DIFFICULT ROAD AWAY FROM DIESEL

By Kiran Jacob

Moving Malaysia's long-haul trucking sector away from diesel will be an arduous task. Diesel remains well-suited to moving heavy loads over long distances, because trucks can refuel quickly and rely on an extensive network of petrol stations.

Industry players say no single alternative can replace diesel across every type of trucking operation. Instead, different technologies will have to be used for different routes and types of work.

ESG speaks to industry players about the alternatives they are pursuing and the barriers slowing wider adoption.

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SWIFT HAULAGE LOOKING AT CHINESE EV TRUCKS



"With an electric truck, you do not have an engine or the same fixed service intervals. It may need scheduled servicing only once a year, so the truck has greater uptime."

Loo, Swift Haulage

Electric trucks are currently best suited to short, fixed and predictable routes, where they can return to a depot for charging. Nevertheless, Swift Haulage Bhd (KL:SWIFT) believes electric trucks will eventually become an industry standard as battery technology improves, vehicle prices fall and charging infrastructure expands.

Swift Haulage is adopting these vehicles to reduce its own emissions and help customers lower the Scope 3 emissions generated from transporting their goods.

Other options such as biofuels are not available in sufficient quantities across the markets where it operates, while hydrogen lacks both a reliable fuel supply

and a refuelling network, says Swift Haulage Group CEO Loo Yong Hui.

The company has committed to stop purchasing new internal-combustion-engine prime movers and trucks from 2030.

The company already operates four electric prime movers on short-haul routes of up to 100km. Three run between Port Klang and the Klang Valley while one operates between Johor Port and Senai.

The company's current electric prime movers cost about RM1.3 million each, or 2.6 times the price of a diesel model.

Loo says Chinese electric prime movers could cost about the same as a Volvo diesel truck, making them substantially cheaper than the European electric models it currently operates.

This is why Swift is testing electric prime movers from three Chinese manufacturers as it searches for a model that can be deployed across a larger part of its fleet. It plans to select one for a wider rollout by the end of 2026 or early 2027.

Loo observes that Chinese manufacturers have concentrated much of their research and development on electric trucks, allowing battery and drivetrain technology to advance quickly.

China accounted for more than 90% of global electric truck sales in 2025, according to the International Energy Agency.

Chinese battery technology is also being used by European manufacturers. For example, Daimler Truck sources lithium-ion batteries from Contemporary Amperex Technology Co Ltd, a Chinese manufacturer of batteries for electric vehicles and energy storage systems, for models including the Mercedes-Benz eActros.

Swift is assessing the trucks' performance, servicing arrangements, spare-parts availability and long-term maintenance support. These factors are important because previous Chinese truck brands struggled to build strong after-sales networks in Malaysia, says Loo.

For now, Swift plans to concentrate electric trucks on short-haul work that current technology can handle. Loo says the group operates about 1,500 prime movers and estimates that roughly one-third could be replaced with electric trucks with the current range.

He says replacing diesel trucks on those routes would free the conventional prime movers for longer journeys where electric trucks remain unsuitable.

Electric trucks also require less frequent servicing because they do not have diesel engines that must be maintained at fixed mileage intervals.

"With an electric truck, you do not have an engine or the same fixed service intervals. It may need scheduled servicing only once a year, so the truck has greater uptime. Most of the other components, such as the brake

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Swift Haulage operates about 1,500 prime movers and estimates that roughly one-third could be replaced with electric trucks using current technology

SWIFT HAULAGE

pads, suspension and shock absorbers, are still similar to those in a diesel truck and can be handled by our own workshops," says Loo.

He says extending electrification beyond short-haul operations will depend on the availability of charging infrastructure. Long-haul electric trucks would require high-capacity chargers at depots and suitable points along major freight routes, supported by sufficiently strong connections to the electricity grid.

"If you look at how China has advanced, Tenaga Nasional Bhd (KL:TENAGA) needs to take a bigger, faster approach to providing power wherever charging infrastructure is needed. The same comment has been made about passenger cars and public chargers. The 2025 target was 10,000 chargers but we are way short. One of the main reasons is Tenaga's delay in providing sufficient power. In China, their Tenaga equivalent is very fast," says Loo.

EXTENDING THE LIFESPAN OF VEHICLES AND REFURBISHING OLD ONES

Freight forwarder Triangle Worldwide Sdn Bhd CEO Marc Zuriel Philip expects alternative fuels and electric trucks capable of long-haul work to remain some distance from widespread commercial use in Malaysia.

Until viable options become available, the company is focusing on improving the efficiency of its existing diesel fleet and extending the life of equipment that can still be used safely.

For instance, as a prime mover ages, its engine can become less fuel-efficient and more costly to maintain.



"When you look at the trailer portion, it is just metal, tyres and wires, all of which can be changed and upgraded. The metal can be fabricated and patched up, the tyres can be changed and the brake wires can be replaced."

Marc, Triangle Worldwide

Its trailer, however, has no engine and its metal frame can be repaired or reinforced. The worn tyres, wiring, brakes and other components can also be replaced.

Triangle is therefore buying used trailers and refurbishing them rather than automatically sending them for scrap. Marc says scrapping a trailer carries its own environmental cost because the metal must be cut up, transported and smelted for recycling, consuming energy and generating further emissions.

"The prime mover portion, yes, you want the older machines to go. I completely support it. But when you look at the trailer portion, it is just metal, tyres and wires, all of which can be changed and upgraded. The metal can be fabricated and patched up, the tyres can be changed and the brake wires can be replaced. At Triangle, we are buying many older trailers and bringing them back to life," he says.

He wants the government to distinguish trailers from prime movers by encouraging operators to replace ageing prime movers, whose engines become less fuel-efficient over time, while incentivising them to recondition and continue using older trailers.

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RENEWABLE DIESEL AN IMMEDIATE
OPTION FOR EXISTING FLEET



“Malaysia has the opportunity to produce these products for the same price as it imports them today from the Middle East. It has the opportunity to produce them domestically, gain independence and create a lot of value within the country.”

Furler, Synhelion

Renewable diesel such as hydrotreated vegetable oil (HVO) has properties similar to fossil diesel and can be used in approved engines without modifying the truck. It can replace fossil diesel entirely or be blended with it while using existing storage and refuelling infrastructure.

This makes it a practical near-term option for routes where battery-electric trucks remain constrained by weight, range and charging requirements while hydrogen lacks the necessary fuel supply and refuelling network.

“Renewable drop-in fuels are an immediate and a long-term solution. They are not merely a stop-gap or bridging solution; they are a critical, long-term pillar for supporting the shift away from fossil fuels, particularly in sectors that cannot be easily electrified,” says Koh Sing Liang, head of renewable fuel sales for Asia-Pacific

at Neste, a global producer of renewable diesel and sustainable aviation fuel (SAF).

“For heavy-duty, long-haul and hard-to-abate sectors such as long-haul aviation, maritime and long-distance trucking, liquid fuels remain essential due to their superior energy density.”

However, this remains out of reach for many logistics operators because renewable fuels are not yet available in sufficient quantities or at commercially workable prices.

For instance, Swift Haulage CEO Loo Yong Hui says it cannot obtain sufficient biofuel supplies across its regional operations while Triangle Worldwide CEO Marc Zuriel Phillip says commercially viable alternatives are still not widely available to transporters.

Malaysia, on the other hand, is hoping to narrow the production gap through investments in new biorefineries.

EcoCeres Renewable Fuels Sdn Bhd’s facility in Pasir Gudang, Johor, was commissioned in October 2025 and officially launched in January 2026. It can produce SAF, HVO and renewable naphtha, with a combined maximum production capacity of 420,000 tonnes a year. Naphtha is used to manufacture plastics and other synthetic materials.

Another plant is being developed at the Pengerang Integrated Complex in Johor by Pengerang Biorefinery Sdn Bhd, a joint venture between Petroliaam Nasional Bhd (PETRONAS), Italy’s Enilive SpA and Japan’s Euglena Co Ltd.

The plant will be able to process up to 650,000 tonnes of renewable feedstock a year into SAF, HVO and bio-naphtha. Operations are targeted to begin in the second half of 2028.



Synhelion's
proprietary
thermal energy
storage and
thermochemical
reactor at
plant DAWN

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Another renewable-fuels company exploring opportunities in Malaysia is Switzerland-based Synhelion.

Synhelion produces synthetic fuels from agricultural or other biological waste and renewable electricity. The resulting synthetic crude oil can be refined into diesel, jet fuel and petrol that meet conventional specifications and can be used in existing vehicles and fuel infrastructure.

“What we do is produce sustainable synthetic fuels that meet the standards of today’s fossil fuels so that we can drop them into the existing infrastructure. We produce diesel according to today’s specifications, as well as jet fuel and gasoline, which can be used directly in today’s cars, trucks and ships. We call them drop-in fuels because no modification is needed. This allows an impact from day one and a gradual ramp-up of production and impact,” says Synhelion co-founder and co-CEO Philipp Furler.

Furler says Malaysia offers perfect conditions for the technology because it has abundant agricultural waste, renewable-energy potential and an established oil, gas and refining industry.

“The best locations for us are those with plenty of biomaterials, and Malaysia and Southeast Asia are absolutely perfect. We also need renewable electricity to process it, which is available in the region. Southeast Asia, including Malaysia, is therefore among the best places in the world to produce these fuels,” says Furler.

“We do not use used cooking oil or animal fats. We use agricultural waste. In Malaysia, for example, this can be waste from palm oil production, manure, straw or anything else from the agricultural sector that can be converted into biogas.”

Synhelion has operated its industrial demonstration plant, Dawn, in Germany for about two years. It plans to scale the technology to a 30,000-tonne modular plant over the next four to five years before replicating the design in other markets.

The company is active in Singapore and Indonesia and is exploring potential projects in Malaysia. It is targeting its first Southeast Asian plants around 2030.

Furler adds that building a domestic renewable fuels industry could also reduce Malaysia’s reliance on imported oil and retain more economic value within the country.

“Malaysia has the opportunity to produce these products for the same price as it imports them today from the Middle East. It has the opportunity to produce them domestically, gain independence and create a lot of value within the country,” he says.

“The money used to buy these products from other regions flows almost entirely out of the country. If you produce them domestically, you create jobs, create value and gain greater independence.”

3

CONNECTING FEEDSTOCK PROVIDERS, OPERATORS AND OFFTAKERS



“In Malaysia, we see people who have feedstock, such as used cooking oil and residual palm oil, but they do not have the technical capability. They are more like oil collectors or agricultural producers, so they do not know how to build a plant to produce fuels. This is a new business model and a new industry for them.”

Mai, Axens

Wider adoption will require Malaysia to build an ecosystem capable of taking renewable fuel projects from raw material to commercial production and sale.

Mai Phuong Do, managing director of French technology licensor Axens’ regional operations centre in Malaysia, says the country already has many of the ingredients needed to develop a renewable fuels industry but the participants remain fragmented.

“In Malaysia, we see people who have feedstock, such as used cooking oil and residual palm oil, but they do not have the technical capability. They are more like oil collectors or agricultural producers, so they do not know how to build a plant to produce fuels. This is a new business model and a new industry for them,” says Mai.

“We also see companies such as PETRONAS that have the capability to build plants and are conducting many feasibility studies with us, screening different types of biofuel feedstock, including algae and other diverse sources. However, they cannot build many plants at the same time, so many projects remain at an early stage.”

The value chain has to be established, says Mai, where feedstock providers are connected to technology licensors and offtakers, such as airlines, transport operators and maritime companies.

Axens licenses and designs the processes used by project developers to convert renewable raw materials into fuels that meet the required specifications.

Its technologies include the “vegan” process for producing hydrotreated vegetable oil (HVO), sustainable aviation fuel (SAF) and cellulosic ethanol. These include methods such as alcohol-to-jet and gasification pathways that convert plant-based waste and other forms of solid biomass into liquid fuels.

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DEDICATED CORRIDORS FOR HYDROGEN



"The transition will not happen overnight. It will require a phased approach built around dedicated freight corridors rather than a scattered, nationwide rollout."

Leroux, Air Liquide Malaysia

In Canada, an early-stage proposal aims to test whether a hydrogen freight network can expand in step with truck demand, without requiring large refuelling stations from the outset.

Alan Kneisz, a hydrogen industry adviser with more than 15 years of experience in hydrogen and fuel cells, wants to build around 10 small stations along the Trans-Canada Highway, the country's main cross-country road route. Each new station would initially serve four to eight heavy trucks. Canada currently has about 10 hydrogen stations across the country.

The highway's main cross-country route stretches 7,821km from Victoria, British Columbia, to St John's, Newfoundland and Labrador.

The approach is intended to solve the problem where fleet operators are unlikely to buy hydrogen trucks without reliable places to refuel. On the flip side, station developers cannot justify building large facilities until enough trucks are on the road.

Starting with smaller stations and a limited number of fleet users would allow truck demand and refuelling capacity to grow together.

"Like anything in the energy transition, we have to be a little bit smart about how we deploy the systems. A lot of people were looking at these massive networks. I think the reality is that we start small and get people used to it," says Kneisz.

The stations would produce hydrogen on site, avoiding the difficulty and cost of transporting it over long distances. Their production and refuelling capacity could then be expanded as demand grows.

Kneisz is also examining whether hydrogen stations could share grid connections with large electric-vehicle charging facilities. When the chargers are not using the full capacity of the connection, such as at night, the spare power could be used to produce hydrogen. The fuel would then be stored and supplied to trucks during the day.

He says the same approach could be applied along a north-south freight corridor in Peninsular Malaysia, serving a combination of hydrogen-combustion and fuel-cell trucks. Government support would initially be needed to help lower the cost of the stations and fuel.



AIR LIQUIDE MALAYSIA

Air Liquide's investments in Malaysia are mainly on industrial gas plants and pipeline networks. It is still assessing the potential for future hydrogen supply chain and transport applications.

Air Liquide Malaysia managing director Bertrand Leroux says hydrogen trucking in Malaysia should be introduced through dedicated freight corridors rather than a scattered nationwide rollout.

"When we look at the landscape in Malaysia today, we have to acknowledge that hydrogen for mobility is still at a very early stage. There is currently no active hydrogen refuelling infrastructure for long-distance commercial freight," says Leroux.

"The transition will not happen overnight. It will require a phased approach built around dedicated freight corridors rather than a scattered, nationwide rollout. We see that hydrogen-internal combustion engine trucks will likely enter the market first. They have a lower upfront capital cost than fuel cell electric vehicles and are robust enough for harsh environments and should build the critical mass of hydrogen demand needed to justify large-scale refuelling stations."

Air Liquide has delivered more than 260 hydrogen refuelling stations worldwide. In Malaysia, its local investments remain focused on industrial gas plants and pipeline networks serving existing industrial customers while it assesses future hydrogen supply chains and transport applications.



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