Singapore's green fuel levy: A step forward but harder work awaits

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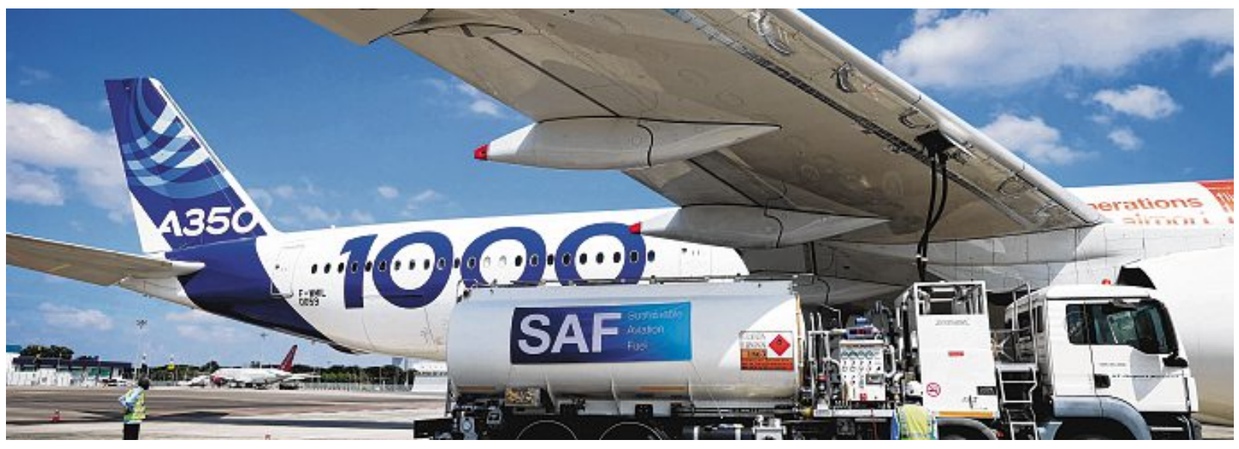
By Zhang Weina, Michael Alexander, Fanny Xueqi Or, Jiaxin Zhang and Feimo Zhang

THE recently passed bill to impose a levy on passengers of all departing flights from Singapore marks a turning point in the country's efforts to decarbonise its transport sector.

The levy, which will fund the procurement and use of sustainable aviation fuel, signals Singapore's intention to adopt cleaner fuels in the transportation sector despite the higher prices of such fuel. Proceeds will go into a fund managed by the Civil Aviation Authority of Singapore, which will help airlines offset some costs of adopting sustainable fuel blends.

From 2026, all departing flights must use at least 1 per cent sustainable fuel, and are expected to increase usage to 3 to 5 per cent by 2030. Given the limited regional supply and high prices of such fuel, the levy will help to level the playing field by supporting airlines through the transition.



From 2026, all flights departing from Singapore must use at least 1% sustainable aviation fuel.
PHOTO: BT FILE

A good start, but not enough

This new levy is an encouraging move. It sends a strong policy signal and ensures that decarbonisation costs are shared more equitably between consumers and industry.

But it also represents just one side of the equation. To make low-carbon fuel a lasting part of the energy mix, Singapore must now focus on building up the supply side – supporting the producers who can deliver such fuel sustainably and at scale.

Without targeted support for biofuel producers, the country risks becoming dependent on imported sustainable aviation fuel indefinitely, exposing itself to global price swings and supply disruptions.

How can biofuel producers become sustainable?

Biofuels remain a critical pillar of the energy transition. They strengthen energy security while helping to decarbonise sectors where electrification alone cannot yet reach.

They are particularly vital for hard-to-abate industries such as aviation, shipping and heavy road transport, where technologies such as hydrogen and electrification are yet to mature.

The recent White Paper from the Sustainable and Green Finance Institute at NUS (SGFIN), *Sustainable Business in Biofuels*, highlights several opportunities for both biofuel suppliers and policymakers to strengthen producers' business resilience.

The biofuel industry's long-term sustainability depends on whether producers can overcome key challenges such as financing, technological innovation and policy support.

Financing the missing middle: Unlike mature renewable sectors such as solar or wind, biofuels have not benefitted from the same cost declines or scale efficiencies. The International Renewable Energy Agency indicated that the levelised cost of energy for biofuels has remained stagnant at about US$0.09 a kilowatt-hour over the past 15 years, even as solar and wind costs have plunged by 90 and 70 per cent, respectively.

The reason lies in the capital-intensive nature of biofuel projects. Refinery construction, feedstock collection and refining technologies all require heavy upfront investment – often too risky for private financiers.

At the research and development (R&D) and pilot phases, venture capital plays a catalytic role. But as companies scale, concessional debt and corporate investments still dominate – accounting for nearly three-quarters of total financing at maturity. This shows that public or quasi-public capital remains indispensable for de-risking private participation.

Building business resilience through circularity: Beyond financing, biofuel producers need business models that can withstand cost volatility and feedstock fluctuations. SGFIN's research points to circular business models as a promising way forward.

By turning waste into resources, producers can diversify revenue streams and reduce operating costs.

For example, they can collect tipping fees from agricultural waste, sell surplus heat or electricity generated during refining, or reuse by-products such as biochar as fertilisers or catalysts.

Such circular practices create a self-reinforcing system in which waste becomes value, improving profitability while enhancing environmental sustainability.

In short, sustainability and commercial viability can coexist – but only if producers receive support through the early, most difficult stages of scaling up.

Incentivising R&D and innovation: Technology remains another bottleneck. Advanced biofuels made from waste, algae or genetically modified feedstocks are more sustainable but also more complex to produce.

Direct support, such as R&D grants or production credits, could help unlock innovation. Financial instruments that hedge against feedstock price swings would also give investors more certainty.

Providing supply-side support: While countries such as the US and Brazil have provided substantial subsidies for biofuel producers, Singapore has so far focused mainly on demand-side measures such as mandates and levies.

That may need to change. Introducing supply-side incentives could reduce production costs and business risks, which in turn would attract more private investors and stimulate local and regional production capacity from biofuel producers headquartered in Singapore.

Going beyond Singapore

The sustainable aviation fuel levy is a meaningful first step. It demonstrates the country's commitment and lays the foundation for cleaner fuels in aviation.

While Singapore remains a relatively small player in biofuel production, it sits at the heart of a region rich in biomass and agricultural residues. Across Asean, the potential for sustainable feedstocks is vast, from agricultural waste in Indonesia and Malaysia to sugarcane bagasse in Thailand and rice husks in Vietnam.

This presents a strategic opportunity for regional collaboration. Singapore could act as a convener – working with Asean policymakers to harmonise standards, strengthen supply chains and build a cross-border biofuel market.

Such cooperation would not only boost regional energy security but also reinforce Singapore's role as a trusted hub for sustainable finance, technology innovation and international trade.

Given the limited regional supply and high prices of such fuel, the levy will help to level the playing field by supporting airlines through the transition.

All writers are from the Sustainable and Green Finance Institute (SGFIN), National University of Singapore. Zhang Weina, an associate professor of finance, is deputy director. Michael Alexander, Fanny Xueqi Or, and Jiaxin Zhang are research analysts. Feimo Zhang is a research associate.