Energy transition and the refining sector

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Carbon pricing and the cost of refining

Refineries and crackers are among the largest emitters of greenhouse gases in Singapore. The carbon tax, introduced on 1 January 2019, applies to facilities that directly emit at least 25,000 tonnes of carbon dioxide equivalent a year. The rate was S$5 per tonne from 2019 to 2023 and rose to S$25 in 2024 and S$45 in 2026 and 2027. The government aims to reach S$50 to S$80 by 2030. Since 2024 companies may offset up to five per cent of their taxable emissions with eligible international carbon credits.[1] The legal basis is the Carbon Pricing Act 2018.[2]

The tax creates a difficult balance for an export refining centre. Singapore's refineries compete with plants in countries that impose no comparable carbon price. A high tax could therefore move production elsewhere without reducing global emissions. The government has therefore created a transition framework for emissions-intensive, trade-exposed companies. It grants transitory allowances that cover part of their emissions, based on efficiency benchmarks and decarbonisation

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plans. New investments do not qualify. The framework seeks to reward efficiency while preserving the incentive to reduce emissions, a compromise that Chapter II of Part K places in the context of carbon markets.

The economics of the sector have shifted accordingly. A refinery that once competed mainly on scale, integration and location must now also compete on its carbon intensity. Aster is installing solar panels at its Bukom and Jurong Island sites and plans a gas-fired power plant capable of burning hydrogen, with a final investment decision expected by 2029.[3] ExxonMobil announced in September 2025 that it had started what it called a first-of-its-kind technology in Singapore.[4] Such projects suggest that the incumbents expect their Singapore sites to remain in operation for decades, provided that they can reduce emissions per barrel.

Renewable fuels and sustainable aviation fuel

The most visible change in Singapore's refining industry has come from renewable fuels. Neste, the Finnish refiner, set up a plant in Tuas in 2010 that produces renewable diesel and jet fuel from waste fats and oils. After an expansion that began in early 2019, new operations started in April 2023 and raised total annual capacity to 2.6 million tonnes, of which up to one million tonnes can be sustainable aviation fuel.[5] The Economic Development Board describes Singapore on this basis as the world's largest producer of sustainable aviation fuel by capacity.

Demand policy supports the supply. Singapore requires departing flights to uplift at least one per cent sustainable aviation fuel from 2026, rising to three to five per cent by 2030.[6] The purchase of the fuel is financed through a levy on departing passengers and cargo.[7] For the oil hub, the policy creates a new product that must be priced, stored, blended and traded. Price reporting agencies already publish assessments for renewable diesel and sustainable aviation fuel in Asia, and the mechanisms of Singapore's oil market may in time be extended to these new fuels.

The scale of the transition should not be overstated. Singapore's crude refineries will continue to process far larger volumes of fossil oil for many years. The government's planning for Jurong Island combines both elements: it aims to increase the output of

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sustainable products while reducing emissions from the existing plants.[8] The pace at which Asian demand for oil products peaks will decide how quickly the balance shifts.

The refinery as a strategic asset

The Hormuz crisis of 2026 changed the debate about refining in Singapore. During the years of overcapacity before the crisis, refineries in Singapore were often seen as old export plants that would lose out to new refineries in China, India and the Middle East. When the flow of crude and products from the Gulf was interrupted, the refineries, the tanks of Jurong Island and the cavern stocks of the Banyan Basin became strategic assets again. Gulf oil exports fell from about 25 million barrels per day before the war to around 10 million by mid-March 2026. Preliminary estimates of late October 2026 put flows through the strait at about 82 per cent of pre-war levels.[9]

The crisis also showed how much partners in the region rely on Singapore's refineries. In April 2026 the prime ministers of Singapore and Australia agreed to ensure the flow of essential supplies, including diesel and liquefied natural gas, at a time when Singapore supplied more than half of Australia's petrol imports.[10] The agreement reflected the dependence of several countries in the region on products refined or stored in Singapore. The episode illustrated Ong Eng Tong's description of Singapore as a swing refinery for the region. It also showed the limits of that role, since Singapore's own refineries depend on crude from the same Gulf whose exports were interrupted. Chapter V of Part K considers the geopolitical implications for Singapore's position between the great powers, while Chapter IV of Part H examines the sanctions dimension of the oil trade.

The lessons for the transition are ambiguous. On one view, the crisis confirmed that refining capacity close to consumers is a form of insurance worth paying for, even if it is not always profitable. On another, it strengthened the case for reducing dependence on imported oil altogether. Singapore, which imports all its energy, has an interest in both: in keeping its refineries and stocks as a buffer and in developing alternatives that reduce its exposure to supply shocks from distant chokepoints.

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Notes

1. National Climate Change Secretariat, "Carbon Tax" (nccs.gov.sg, accessed November 2026): carbon tax implemented "on 1 January 2019"; facilities emitting at least 25,000 tCO2e a year are covered; S$5 per tonne in 2019–2023, S$25 in 2024, S$45 in 2026 and 2027, S$50–80 by 2030; offset of up to 5 per cent of taxable emissions with eligible international carbon credits from 2024; transition framework for emissions-intensive, trade-exposed sectors with transitory allowances based on efficiency benchmarks and decarbonisation plans, "limited to only a portion of companies' emissions"; "New investments will not qualify for the transition framework." ↩
2. Carbon Pricing Act 2018 (No. 23 of 2018). ↩
3. "Aster eyes completion of Singapore refinery and berth works in H2 2026", *Baird Maritime* (Reuters), 5 February 2026: Aster is "installing solar panels at its Bukom and Jurong Island sites"; gas-fired plant able to burn hydrogen, "final investment decision on a $150 million project" expected by 2029. ↩
4. ExxonMobil, "Singapore" (corporate.exxonmobil.com, accessed November 2026): about 3,500 employees; over S$30 billion in fixed asset investments; more than 130 years in Singapore; refinery fully integrated with the Singapore Chemical Plant; news headline of September 2025, "ExxonMobil starts first-of-its-kind technology in Singapore". ↩
5. Neste, "Singapore" production site page (neste.com, accessed November 2026): "was set up in Tuas in 2010"; "The construction of the Singapore Expansion Project started at the beginning of 2019"; "operations started in April 2023"; "total production capacity to 2.6 million tons annually", of which "up to 1 million tons of sustainable aviation fuel". ↩
6. Economic Development Board, "Energy and Chemicals" (edb.gov.sg, accessed November 2026): at least "one per cent SAF" from 2026, rising to 3–5 per cent by 2030; Singapore the "world's largest producer of sustainable aviation fuel", with capacity of "up to one million tonnes per year". ↩

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7. Civil Aviation Authority of Singapore, Singapore Sustainable Air Hub Blueprint, February 2024, and subsequent announcements on the SAF levy for flights departing from 2026. ↩

8. Ministry of Trade and Industry, "Sustainable Jurong Island" (press release, October 2021): targets to reduce carbon emissions and to increase output from sustainable products by 2030 and 2050. ↩

9. Wikipedia, "2026 Strait of Hormuz crisis" (accessed November 2026), as cited above in the subsection on crude benchmarks. ↩

10. "Australia, Singapore leaders pledge closer energy ties to tackle global supply shock", *The Standard* (Hong Kong, Reuters), 10 April 2026: Lawrence Wong and Anthony Albanese agreed to ensure the flow of essential supplies, including diesel and LNG; Singapore supplied 54.7 per cent of Australia's petrol imports (NRMA, late March); Singapore's refineries "have cut output after crude supplies were disrupted by the closure of the Strait of Hormuz". ↩

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