Bunker fuel and ethanol prices

January to September 2026

Ethanol remains an emerging marine fuel, with crop-based ethanol used only in very small quantities in global shipping. Recent bunkering operations have demonstrated its use in ethanol-capable vessels. This note compares ethanol with conventional bunker fuels in Houston, Santos and Rotterdam, representing the US, Brazil and Europe, to assess its price competitiveness on an energy basis.

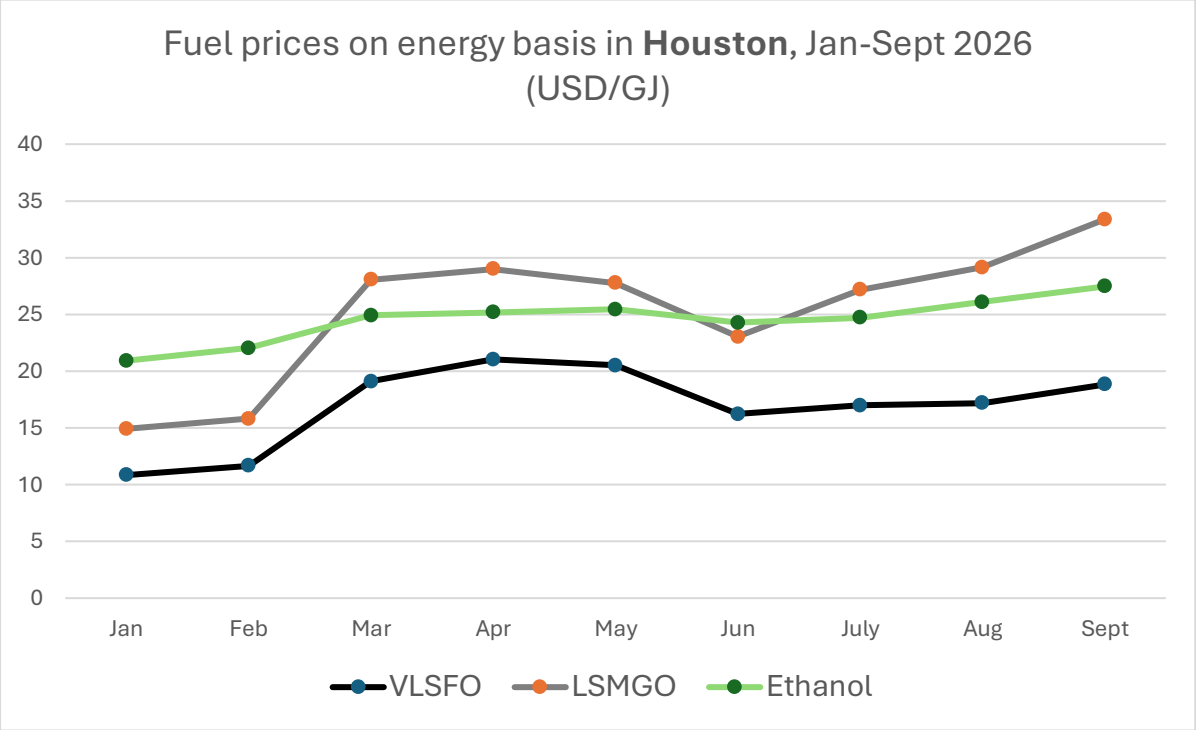
The January to September 2026 comparison shows ethanol below low sulphur marine gas oil (LSMGO) in six of nine months in Houston and, for hydrous ethanol, seven of nine months in Santos. Rotterdam's estimated duty-unpaid ethanol price reached parity with LSMGO in August and September. Very low sulphur fuel oil (VLSFO) remained cheaper than every ethanol series throughout the period. Prices are compared in USD/GJ to account for differences in fuel energy density.

Ethanol is at an early stage of marine deployment. CMA CGM bunkered bioethanol in Santos, Brazil, in July 2026, while Maersk carried out the first U.S. ship-to-ship commercial ethanol bunkering of a deep-sea container vessel in September, and completed a large ethanol bunkering operation in Singapore in October. These operations demonstrate use in ethanol-capable engines, while wider adoption still largely depends on a global regulatory framework under IMO.

Renewable ethanol is sulphur-free and offers substantial lifecycle greenhouse-gas savings compared with conventional marine fuels. Established supply chains across major port regions support its potential as a marine fuel. The price comparisons presented here show that ethanol can be a cost-competitive renewable alternative to LSMGO, particularly in producer-exporter markets.

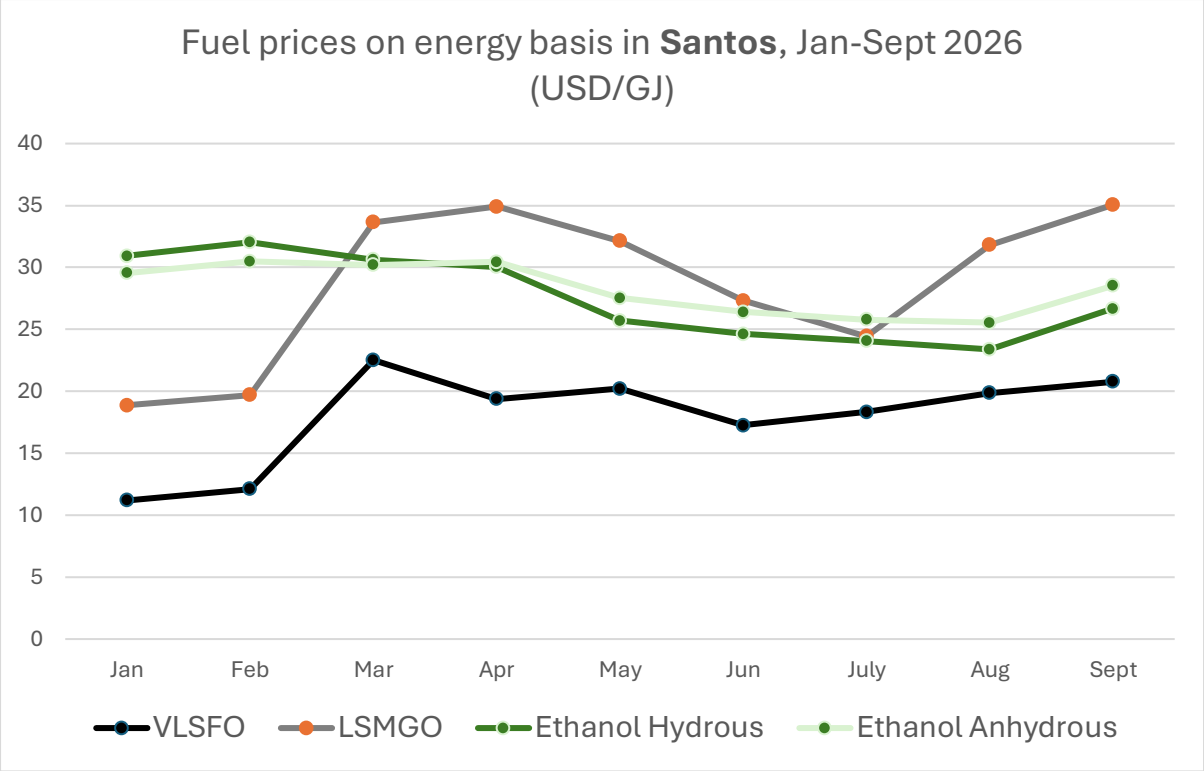
Very Low Sulphur Fuel Oil (VLSFO) remains shipping's principal conventional bunker fuel, accounting for around half of marine fuel volumes. It is the standard 0.5%-sulphur fuel used for main propulsion by most ocean-going vessels without scrubbers. Marine Gas Oil / Low Sulphur Marine Gas Oil (MGO/LSMGO) represents approximately a seventh of total marine fuel consumption and is primarily used in Emission Control Areas, as well as by smaller and specialized vessels and during port, auxiliary and manoeuvring operations.

Houston combines a major maritime and energy hub with access to the established U.S. ethanol supply chain. Ethanol was below LSMGO from March to May and from July to September. In September, ethanol cost USD 27.5/GJ against USD 33.4/GJ for LSMGO, a discount of USD 5.9/GJ, or 17.7%. VLSFO remained lower at USD 18.8/GJ.



Source: Murex ethanol; Netco / Eco-Energy bunker fuels; CEA calculations.

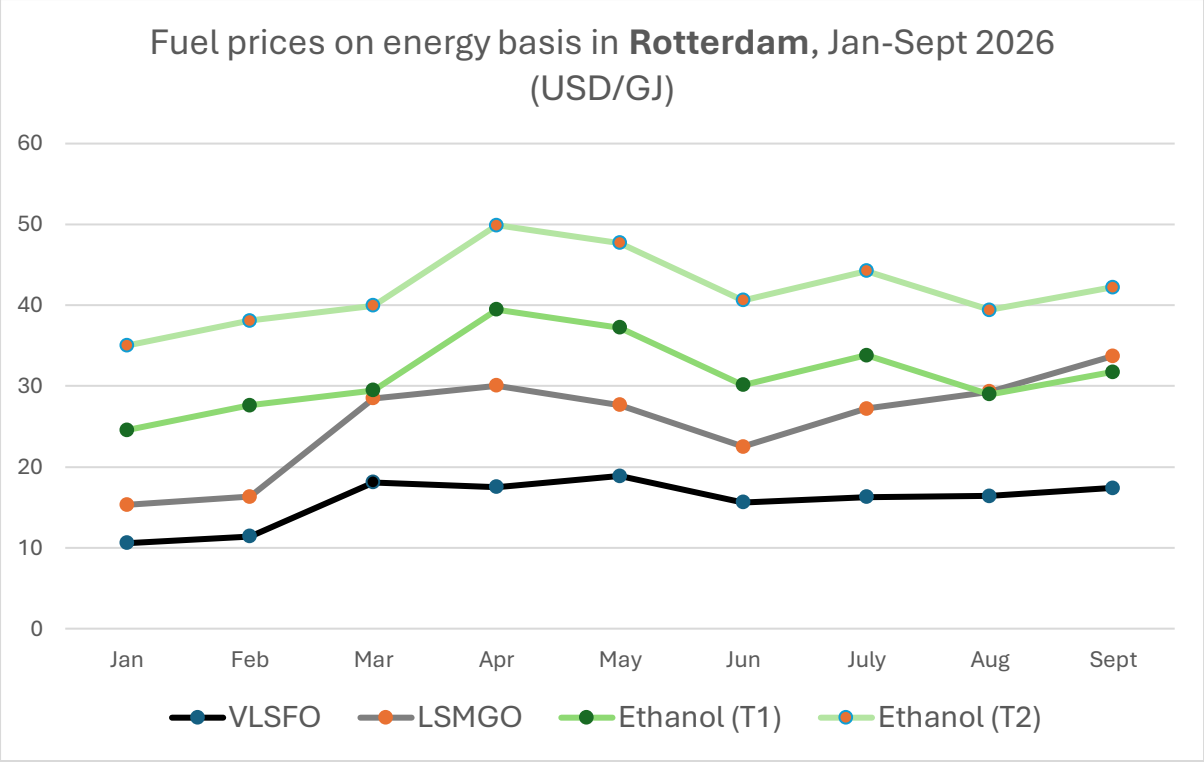
Santos provides the Brazilian producer-exporter benchmark and separates hydrous and anhydrous ethanol. With grade-specific heating values, hydrous ethanol was below LSMGO from March through September; anhydrous ethanol was below it from March to June and in August and September. In September, hydrous and anhydrous ethanol were USD 26.7/GJ and USD 28.5/GJ, respectively, against USD 35.1/GJ for LSMGO. Their discounts were USD 8.4/GJ and USD 6.5/GJ. VLSFO remained lower at USD 20.8/GJ. Hydrous ethanol's lower price per tonne does not always mean a lower price per GJ: it was more expensive than anhydrous ethanol on an energy basis from January to March.



Source: USGBC ethanol; Netco / Eco-Energy bunker fuels; CEA calculations.

Rotterdam prices1 provide the European import-hub benchmark. The estimated duty-unpaid T1 ethanol price was USD 29/GJ in August and USD 31.8/GJ in September, below LSMGO by USD 0.3/GJ and USD 2/GJ. The quoted duty-paid T2 ethanol price remained above LSMGO throughout the period and stood at USD 42.2/GJ in September, versus USD 33.7/GJ for LSMGO. VLSFO was USD 17.4/GJ. The apparent parity therefore depends on the duty treatment assumed for ethanol.

[1] T1 is estimated from the quoted T2 price using the duty of EUR 192/m^3, exchange rate of USD 1.16/EUR and density of 0.789 t/m^3. This subtracts USD 282/t, or USD 10.5/GJ. T1 is a modelled duty-unpaid proxy; actual treatment depends on the supply arrangement.



Source: Murex ethanol; Netco / Eco-Energy bunker fuels; CEA calculations.

Petroleum supply disruptions and shipping chokepoints expose bunker markets to geopolitical risk. An established ethanol supply chain gives shipping an additional fuel option. The extended series shows that ethanol's competitiveness against LSMGO continued beyond the first half of the year. In Houston, the ethanol discount widened from USD 2.5/GJ in July to USD 5.9/GJ in September. Santos anhydrous ethanol carried a small premium of USD 1.3/GJ in July, then returned to discounts of USD 6.3/GJ in August and USD 6.5/GJ in September. Rotterdam's estimated T1 series crossed below LSMGO in August.

VLSFO remains the lower-cost fuel benchmark in all three hubs. In September, ethanol's premium over VLSFO was USD 8.6/GJ in Houston, USD 5.9/GJ for hydrous and USD 7.8/GJ for anhydrous ethanol in Santos, and USD 14.4/GJ for estimated T1 ethanol in Rotterdam. The commercial opportunity is therefore strongest against LSMGO, particularly in producer-exporter markets; the data do not show general price parity with VLSFO.

Future greenhouse-gas pricing could further change the comparison for ethanol with verified lower lifecycle emissions. The IMO's proposed Net-Zero Framework combines a fuel-intensity standard with GHG pricing and compliance units; adoption discussions were adjourned until December 2026. These measures are not included in the prices shown here. Any compliance advantage will depend on the rules adopted and the certified emissions intensity of the ethanol supplied. The comparison excludes engine efficiency, bunkering costs and carbon compliance costs.

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