U.S. CORN ETHANOL IS READY FOR MARITIME FUEL

By **Krista Swanson** · October 28, 2026

The Opportunity: A movement is underway by global shipping companies to power their vessels with a more sustainable and renewable fuel, compared to existing petroleum-based options. U.S. corn ethanol can fuel methanol-capable ships today, is available at scale, and is the lowest-cost alternative fuel option for methanol-capable ships.

The Barrier: The International Maritime Organization has approved a carbon score for Brazil's second-crop corn ethanol but has not yet approved one for U.S. corn ethanol. For the opportunity to be realized, the IMO should recognize a fair carbon score for U.S. corn ethanol, such as the score that the U.S. proposed to IMO in September.

The Next Step: NCGA is working individually and with coalition partners to increase advocacy and ensure the IMO recognizes a fair carbon score for U.S. ethanol. A recognized score is an essential step for U.S.-grown and produced ethanol to access the international maritime market and for U.S. corn farmers to gain a major new source of demand.

- **Why IMO's score matters:** a carbon score measures the greenhouse gas emissions associated with producing and using a fuel. Lower scores indicate lower emissions. IMO sets the rules for international shipping and is developing a system that positions lower-emissions fuels as more financially attractive. Under that framework, fuel buyers would consider both price and carbon score when choosing fuels. A fuel without a recognized carbon score could struggle to compete regardless of its price or availability.

- **Corn ethanol works now.** Ships designed to run on methanol can also run on ethanol without modification. As a result, the growing fleet of methanol-capable ships creates an immediate opportunity for ethanol demand. On September 28, 2026, Maersk demonstrated that capability by bunkering a ship with 100% U.S. corn ethanol in Houston.
- **The immediate market is already large.** If methanol-capable ships currently in service ran fully on ethanol, they could use up to 2 billion gallons a year, equal to roughly 680 million bushels of corn. Existing U.S. ethanol plants have enough unused capacity to supply that demand without building new facilities.
- **Ethanol leads alternative fuels for methanol-capable ships.** In 2026 price snapshots, ethanol cut CO2 at one-half to two-thirds the cost of green methanol (one-third to one-half on IMO's scoring basis). It still costs more than fuel oil, but fair credit for its lower emissions can close that gap.
- **The U.S. has the product advantage; Brazil has the policy head start.** U.S. ethanol is more abundant and was cheaper per gallon on the 2026 price dates compared, but Brazil's score for second-crop corn ethanol (20.8 g/MJ) is already IMO-approved, while the U.S. proposal (35.79 g/MJ) is still under review. On IMO's basis, neither U.S. nor Brazilian corn ethanol is consistently cheaper per metric ton (mt) of CO2 cut. Brazil's lower carbon score works in its favor, while lower U.S. ethanol prices provide an offsetting advantage. As a result, which country has the lower cost per mt of CO2 cut depends on the relative prices at a given point in time. With a recognized carbon score that credits farm practices and plant improvements such as carbon capture, U.S. ethanol can beat Brazil on cost per mt while keeping its product advantage.

Today's methanol-capable fleet (~112 ships) represents the immediate opportunity: about 680 million bushels of corn annually if fueled entirely with ethanol. Ships already on order (~325 ships) and vessels designed to be converted later (~700 ships) could increase that demand many times over. The U.S. has the capacity to begin supplying this market now, and early participation could support further expansions of U.S. ethanol production as maritime demand grows.

THE CORN ECONOMY · U.S. CORN ETHANOL IS READY FOR MARITIME FUEL

ETHANOL DEMAND FROM METHANOL-CAPABLE SHIPS

SHIPS ABLE TO USE ETHANOL	ETHANOL billion gal/yr	CORN billion bu/yr
Methanol-capable ships in service: ~112	2.0	0.68
Plus ships on order: ~325 more	7.7	2.7
Plus methanol-ready ships: ~700 more	20.1	6.9

Source: "U.S. Corn Ethanol is Ready for Maritime Fuel," The Corn Economy, Oct. 27, 2026

NATIONAL CORN GROWERS ASSOCIATION · NCGA.COM

U.S. PORTS CAN SUPPLY ETHANOL TODAY

Houston has moved U.S. ethanol bunkering from possibility to demonstrated capability. Its existing ethanol supply, port infrastructure, and domestic partners show the U.S. can begin serving the maritime market now and expand as demand grows.

- It has been done. On September 28, 2026, POET supplied the ethanol, Kirby Corporation delivered it by barge, and the Port of Houston coordinated the first U.S. ship-to-ship ethanol bunkering of a deep-sea container ship (Maersk, Engine).
- Houston already handles far more ethanol than ships there would need. Its bunker market is estimated at about 4 to 5 million metric tons a year (NLR report; U.S. ports publish little bunkering data). Replacing 10% of that fuel's energy with ethanol would take about 215 to 270 million gallons a year. Houston handled 52% of U.S. ethanol exports in 2025, about 1.1 billion gallons (USDA Grain Transportation Report). That's four to five times the amount needed to supply 10% of the port's bunker fuel, based on the NLR's market estimate (NCGA calculation).

- The U.S. can supply ethanol now and support future growth. About 2 billion gallons of existing unused U.S. capacity could supply today's methanol-capable fleet, with corn available to support increased production. USDA projects 2026/27 corn ending stocks of about 1.85 billion bushels, more than two and a half times the roughly 680 million bushels today's fleet would use in a year. U.S. corn supply with rising trend yield can also support additional ethanol capacity as maritime demand grows. New Orleans and other Gulf ports already export ethanol and could help serve that expanding market.
- Houston is building a track record. Earlier in 2026, the same ship took on 2,000 metric tons of methanol from a Kirby barge in the first U.S. ship-to-ship methanol bunkering (Manifold Times). With the September ethanol bunkering, Houston has now demonstrated that the same infrastructure can handle two alcohol fuels.

Houston shows that ethanol bunkering can work. The next step is to repeat it at scale. The September ethanol volume wasn't disclosed, and the earlier 2,000 mt delivery was methanol. Meanwhile, Brazil is moving too. In July 2026, two months before Houston, about 395 mt of sugarcane ethanol was bunkered in Brazil at Santos in a one-time trial (Ship & Bunker, Argus). Brazil's early progress in securing IMO recognition adds urgency for the U.S. to establish its position before that lead grows.

UNDERSTANDING THE TWO U.S. ETHANOL CARBON SCORES

The same U.S. ethanol can receive different carbon scores depending on the methodology used. Because those scores affect ethanol's competitiveness in maritime fuel markets, this report presents results using both the published NLR estimate and the score recently proposed by the U.S. to IMO.

THE CORN ECONOMY · U.S. CORN ETHANOL IS READY FOR MARITIME FUEL

UNDERSTANDING THE TWO U.S. ETHANOL CARBON SCORES

	PUBLISHED NLR SCORE	U.S. SCORE PROPOSED TO IMO
Score	**51.4 g/MJ**	**35.79 g/MJ**, the highest of three values proposed by the U.S.
Source	Scully et al. (2021), as cited in the NLR report	U.S. submission MEPC 85/7/14 (Sept. 25, 2026), using Argonne's GREET 2024 model
Land-use change	Included	Excluded, as IMO's rules require
Co-products DDGS, corn oil	Handled differently than IMO's method	Emissions split by energy content based on IMO assigning 63% to ethanol, needs confirmation under IMO's final methodology
Data	Review of published studies	2019 national average farm data; industry plant data
Status	Published research estimate	Proposed; under review by IMO's technical group (GESAMP-LCA)

Source: "U.S. Corn Ethanol is Ready for Maritime Fuel," The Corn Economy, Oct. 27, 2026

NATIONAL CORN GROWERS ASSOCIATION · NCGA.COM

Why the report shows both: The NLR score of 51.4 g/MJ is a widely cited published estimate and provides the less favorable case for U.S. ethanol because it includes land-use change. The U.S. proposal of 35.79 g/MJ follows IMO's methodology and is directly comparable with Brazil's approved score of 20.8 g/MJ. Showing both illustrates how the carbon score can change ethanol's competitiveness in the maritime fuel market. Under the IMO method, the farm-practice and carbon-capture reductions shown in the following analysis are illustrative. Published reductions are scaled to about 63%, the share of farm and plant emissions IMO's method assigns to ethanol, and would need to be confirmed under IMO's final methodology.

ETHANOL OFFERS THE LOWEST-COST PATH FOR METHANOL-CAPABLE SHIPS

Ethanol already offers the lowest cost among alternative fuel options for methanol-capable ships, but it needs fair credit for its lower emissions to compete with fuel oil. Because fuels contain different amounts of energy and reduce emissions by different amounts, the comparison focuses on one common measure: the cost of reducing one mt of CO2 compared with conventional ship fuel (VLSFO). Lower values indicate a more cost-effective fuel.

THE CORN ECONOMY · U.S. CORN ETHANOL IS READY FOR MARITIME FUEL

ETHANOL OFFERS THE LOWEST-COST PATH FOR METHANOL-CAPABLE SHIPS

FUEL $ per mt of CO_2 cut vs. VLSFO	Cost to cut 1 metric ton of CO_2 vs. conventional ship fuel			
	JUNE 2026		OCT 2026	
	NLR score (51.4)	U.S. IMO proposal (35.8)	NLR score (51.4)	U.S. IMO proposal (35.8)
U.S. corn ethanol, baseline	$178	$130	$252	$183
U.S. corn ethanol, farm practices	$131	$111	$185	$157
U.S. corn ethanol, carbon capture	$104	$98	$147	$138
U.S. corn ethanol, farm practices + carbon capture	**$86**	**$87**	**$121**	**$123**
Brazil second-crop corn ethanol (approved 20.8)	$124		$188	
Green methanol	$388			

Farm practices: *15 g/MJ cut (NLR score), about 9.5 g/MJ (IMO basis).* **Carbon capture:** *30 g/MJ (NLR score), about 19 g/MJ (IMO basis); IMO-basis values are illustrative.*

Prices: *June, NLR report; October, average of USGBC Oct 7, 14 and 21, 2026 weekly reports; green methanol, Methanex biomethanol contract price.*

Source: "U.S. Corn Ethanol is Ready for Maritime Fuel," The Corn Economy, Oct. 27, 2026

NATIONAL CORN GROWERS ASSOCIATION · NCGA.COM

- **Ethanol costs less than green methanol:** Ethanol is already the more affordable alternative fuel option for methanol-capable ships. In June, U.S. ethanol was $133/mt cheaper than fossil (gray) methanol for the same energy as 1 mt of fuel oil. Its cost per mt of CO2 cut was less than half that of green methanol in June and about two-thirds as much in October (about one-third and one-half on IMO's basis).
- **Ethanol vs. Fuel Oil:** Ethanol's cost relative to fuel oil increased between June and October as ethanol rose from about $1.99 to $2.21 per gallon, while fuel oil remained near $730-$745/mt. This raised ethanol's cost per mt of CO2 cut but ethanol remained well below green methanol's cost.
- **The carbon score matters most.** A fair carbon score, paired with a credit for lower emissions, can make U.S. ethanol competitive with fuel oil, and every point reduced lowers its cost per mt of CO2 cut. With the NLR score, at October prices, a 15 g/MJ farm-level reduction lowers that cost from $252 to about $185/mt, about the same as Brazil's $188/mt. A reduction of about 33 g/MJ through farm practices and carbon capture would also bring U.S. ethanol below IMO's near-zero threshold. On IMO's basis, the gap to the threshold is about 17 g/MJ (from 35.79).

Current price comparisons position ethanol as the most cost-effective alternative fuel for methanol-capable ships. A fair carbon score that recognizes farm practices and carbon capture can strengthen that advantage and allow U.S. ethanol to compete with fuel oil as well.

THE U.S. HAS THE PRODUCT ADVANTAGE; BRAZIL HAS THE POLICY LEAD

Today, the U.S. has greater ethanol production, larger export capacity, and lower ethanol prices. Brazil's advantage is that its corn ethanol already has an IMO-approved carbon score. In September, the U.S. proposed its own score (35.79 g/MJ), which is under review. Fuel buyers would consider both price and carbon score when choosing fuels.

THE CORN ECONOMY · U.S. CORN ETHANOL IS READY FOR MARITIME FUEL

THE U.S. HAS THE PRODUCT ADVANTAGE; BRAZIL HAS THE POLICY LEAD

	UNITED STATES	BRAZIL
Ethanol production, 2026 billion gallons	16.9	10.9 2.8 from corn
Ethanol exports, 2025 billion gallons	2.2	0.45
Spare corn ethanol capacity billion gallons, approximate	2.0	1.5
Export price USGBC Oct. 7–21, 2026 average	$2.21/gal Houston	$2.46/gal Santos
IMO carbon score	35.79 g/MJ Proposed Sept. 2026, under review	20.8 g/MJ Second-crop corn

Source: "U.S. Corn Ethanol is Ready for Maritime Fuel," The Corn Economy, Oct. 27, 2026

NATIONAL CORN GROWERS ASSOCIATION · NCGA.COM

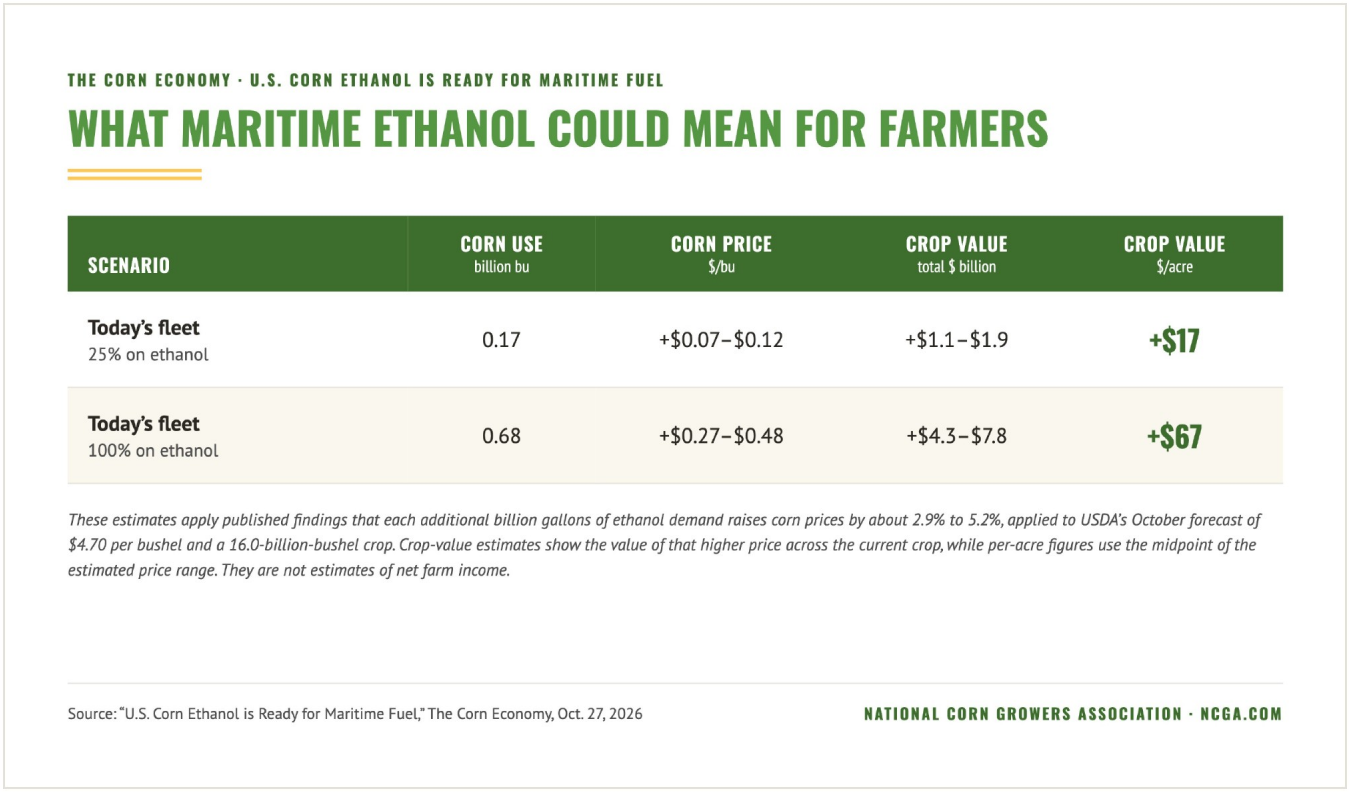
- **Why the score matters:** Brazil's approved carbon score can offset much of its price disadvantage. That's why IMO recognition of a U.S. score matters. Without it, the market may place more value on Brazil's approved carbon score advantage than on lower ethanol prices in the U.S. Brazil's approved score is about 30 g/MJ lower than the NLR U.S. ethanol score of 51.4 g/MJ. At October prices, that score advantage is worth about $0.62 per gallon, more than twice Brazil's $0.25-per-gallon price disadvantage. Using the score the U.S. proposed to IMO (35.79 g/MJ) reduces the value of Brazil's score advantage to about $0.22 per gallon, less than Brazil's $0.25 price disadvantage. At October prices, U.S. ethanol would therefore cost slightly less per mt of CO2 cut if its proposed score were approved. That edge depends on prices: U.S. ethanol comes out ahead when Brazil's price premium is larger than the value of its score advantage (about 14 to 24 cents per gallon on the dates compared), and Brazil comes out ahead when the premium is smaller.

- **What it means:** With the NLR score, Brazil's lower approved carbon score more than offsets its higher price. With the score the U.S. proposed to IMO, it's a close race, and the advantage shifts as prices change. For example, Brazil had the lower cost on four of the seven 2026 price dates compared, and the U.S. on three. U.S. ethanol cost less per gallon on every date compared. Over the longer term, U.S. ethanol has usually been cheaper per gallon than Brazil's on about 78% of trading days since 2008 (USGBC data). Because U.S. ethanol is cheaper per gallon, further score reductions, including from farm practices, would strengthen its position if IMO recognizes them.
- **What farm practices add.** Approval of a U.S. carbon score is the first step. Additional reductions from farm practices and plant improvements could further strengthen ethanol's competitive position. Corn farming accounts for about half of U.S. ethanol's carbon score, giving farmers the largest opportunity to reduce it. Practices recognized in USDA's carbon calculator, such as cover crops, no-till, and nitrogen management, can lower the score. Modeling estimates that cover crops alone can reduce it by about 15 g/MJ in some regions (EcoEngineers for RFA). On the seven 2026 price dates compared, a farm-level reduction of about 13 to 24 g/MJ would allow baseline U.S. ethanol to match Brazil's cost per mt of CO2 cut using the NLR score. On IMO's basis, the reduction needed is much smaller: none on three of the seven dates and at most about 9 g/MJ on the others. When combined with plant-level improvements such as carbon capture, U.S. ethanol pulls well ahead ($121 vs. $188/mt). But those advantages only strengthen the U.S. position if IMO recognizes the farm practices that produce them.
- **Brazil is moving quickly to expand production and secure recognition for additional fuels.** About 33 new Brazilian corn ethanol plants are seeking approval, and Brazil is also pursuing IMO scores for its sugarcane ethanol and biodiesel. The U.S. has the stronger product position today, but Brazil is working to expand both production and the range of fuels recognized by IMO. Continued delay would give Brazil more time to narrow the U.S. advantage and establish itself in the maritime market.

The U.S. doesn't need to catch Brazil on supply or price. It needs IMO to adopt the U.S. proposed score and credit the farm practices and plant-level improvements that lower it. Securing that score now would help U.S. ethanol establish a foothold while the maritime market is still developing. Delay gives Brazil more time to convert its policy lead and expanding production into lasting market relationships and infrastructure.

WHAT MARITIME ETHANOL COULD MEAN FOR FARMERS

Maritime ethanol demand could benefit corn farmers even at relatively low levels of adoption. If 25% of the fuel used by today's methanol-capable fleet came from U.S. ethanol, the added corn demand could raise corn prices by about $0.07 to $0.12 per bushel. If the current fleet ran fully on U.S. ethanol, the estimated increase would grow to about $0.27 to $0.48 per bushel.



THE CORN ECONOMY · U.S. CORN ETHANOL IS READY FOR MARITIME FUEL

WHAT MARITIME ETHANOL COULD MEAN FOR FARMERS

SCENARIO	CORN USE billion bu	CORN PRICE $/bu	CROP VALUE total $ billion	CROP VALUE $/acre
Today's fleet 25% on ethanol	0.17	+$0.07–$0.12	+$1.1–$1.9	**+$17**
Today's fleet 100% on ethanol	0.68	+$0.27–$0.48	+$4.3–$7.8	**+$67**

These estimates apply published findings that each additional billion gallons of ethanol demand raises corn prices by about 2.9% to 5.2%, applied to USDA's October forecast of $4.70 per bushel and a 16.0-billion-bushel crop. Crop-value estimates show the value of that higher price across the current crop, while per-acre figures use the midpoint of the estimated price range. They are not estimates of net farm income.

Source: "U.S. Corn Ethanol is Ready for Maritime Fuel," The Corn Economy, Oct. 27, 2026

NATIONAL CORN GROWERS ASSOCIATION · NCGA.COM

For farmers, the estimated benefit ranges from roughly $17 per acre under a partial-adoption scenario to about $67 per acre if today's methanol-capable fleet ran entirely on ethanol.

These estimates apply published findings that each additional billion gallons of ethanol demand raises corn prices by about 2.9% to 5.2%. We apply that to USDA's October forecast of $4.70 per bushel and a 16.0-billion-bushel crop. Crop-value estimates show the value of that higher price across the current crop, while per-acre figures use the midpoint of the estimated price range. They are not estimates of net farm income.

The opportunity does not depend on full fleet adoption to benefit farmers. Even partial use of ethanol in ships already operating today could create new corn demand and add value across the crop. Establishing U.S. ethanol in the market now would create a foundation for larger gains as the methanol-capable fleet and maritime ethanol use expand.

ENGAGEMENT IS NEEDED NOW

The maritime fuel market is being built now, not years from now. The U.S. enters that market with abundant ethanol supplies, proven export infrastructure, competitive prices, and significant potential for additional emissions reductions. Recognition of a U.S. carbon score would allow U.S. ethanol to compete on those strengths while the market is still taking shape and help establish a foundation for future demand growth. Delays risk allowing competitors to establish market relationships, infrastructure, and policy advantages before U.S. ethanol fully enters the market.

SOURCES

- NLR, Evaluation of Ethanol Use in Marine Shipping (2026)
- USDA AMS, Grain Transportation Report, March 5, 2026 (Houston share of ethanol exports)
- USDA AMS, Grain Transportation Report, Oct 8, 2026 (Maersk Houston bunkering)
- USDA FAS, Brazil Biofuels Annual, Sept 2026
- DatamarNews, IMO clears Brazilian corn ethanol, May 2026
- USGBC Ethanol Market and Pricing Data select 2026 dates: June 3, June 10, June 24, Sept 30, Oct 7, Oct 14, Oct 21
- USDA WASDE, Oct 9, 2026; EIA STEO, Oct 2026; Iowa State CARD, Historical Ethanol Operating Margins
- Thompson et al., PLOS ONE (2023); Condon, Klemick and Wolverton, Impacts of ethanol policy on corn prices: A review and meta-analysis of recent evidence, Food Policy 51, 2015.
- U.S. submission on the IMO Net-Zero Framework (Seatrade Maritime, Mar 2026)
- United States, MEPC 85/7/14, Well-to-tank and tank-to-wake proposed default emission factors for the United States corn-based ethanol production submission to the GESAMP-LCA WG, Sept 25, 2026
- Scully et al., Carbon intensity of corn ethanol in the United States: state of the science, Environmental Research Letters 16(4), 2021.
- Methanex, Methanol Pricing, European contract price, biomethanol, Q4 2026 (visited 10/16/2026)
- Reuters, IMO definition of Brazil corn ethanol carbon footprint a landmark step, producers say, June 15, 2026
- EcoEngineers for RFA, Farm-Level Carbon Intensity Improvements and the IRA, May 2024
- USDA FAS, 2025 U.S. Ethanol Exports Reach Second Consecutive Record High
- DatamarNews, Ethanol and sugar drive Brazilian agribusiness, Feb 2, 2026