



## ZEMBA Round 1 Tender Results | Frequently Asked Questions

### 1. Who won the first ZEMBA tender?

Hapag-Lloyd is the winner of ZEMBA's inaugural tender process. In 2025 and 2026, Hapag-Lloyd will deploy over 1 billion million twenty-foot equivalent units (TEU)-miles using exclusively waste-based biomethane, resulting in at least 82,000 metric tonnes CO<sub>2</sub>e emissions avoided. This fuel will be delivered through the European gas grid on a mass balance basis compliant with the European Union's Renewable Energy Directive II and is expected to reach a 93.5% reduction in CO<sub>2</sub>e emissions over low-sulfur fuel oil (LSFO).

### 2. What criteria were used in evaluating bids?

ZEMBA's Request for Proposals (RfP) sought bids for shipping services, from individual carriers or consortiums, that were able to achieve at least a 90% reduction in greenhouse gas emissions compared to traditional fossil fuels on a lifecycle basis. To be eligible for consideration, bidders needed to be able to meet ZEMBA's aggregated volume total of 1.15 billion TEU-miles per year on ocean-going vessels powered by zero-emission fuels, with deployment starting in 2025. The primary criteria that shaped ZEMBA's evaluation of bids received were: compliance with ZEMBA's [Zero-Emission \(ZE\) Fuels Definition](#) and [Lifecycle Assessment \(LCA\) Guidelines](#), ability to meet ZEMBA's target volume, deployment timeline, transoceanic route, and price.

### 3. Why is the winning bid not an e-fuel?

The only bids ZEMBA received that were commercially mature enough to meet its 90% emissions reduction threshold, aggregated volume target, and 2025 deployment timeline relied on biogenic feedstocks. The market for e-fuels is unfortunately still nascent. Fortunately, there are several promising projects and technologies on the horizon, which may be commercially viable for subsequent tenders.

### 4. Will the biomethane sourced for this deal compete with food supplies, degrade forests, or have other negative land use impacts?

No, ZEMBA's approach effectively removes this risk by design. The biomethane used in this deal will be exclusively waste based, with a mix of feedstocks including landfill waste, dairy and swine manure, and organic waste, which will be blended to meet the specific carbon intensity threshold required by ZEMBA's [ZE Fuels Definition](#). This fuel is compliant with ZEMBA's [LCA Guidelines](#), which require fuels to be certified according to rigorous, third-party certification schemes that are compliant with current European Union (EU) regulations including the EU Renewable Energy Directive, or RED II.

**5. How does biomethane meet ZEMBA’s 90% emission reduction threshold?**

The use of manure as a feedstock results in avoided emissions consistent with this fuel reaching ZEMBA’s defined emissions reduction threshold. This approach is acceptable under the certification that will be held by the fuel producer. Independent bodies have also found that biomethane from manure can reach a carbon intensity as low as -200 gCO<sub>2</sub>e/MJ.

**6. Has ZEMBA accounted for methane slip?**

ZEMBA’s [LCA Guidelines](#) require the use of FuelEU or IMO methane slip factors in the carbon intensity calculation. The ZEMBA team conducted a sensitivity analysis on the carbon intensity impacts of varying methane slip assumptions, which shows compliance with the 90% emissions reductions threshold with either set of default factors, as well as near-compliance when using the methane slip factors recommended by the [ICCT FUMES](#) report released in February 2024. The results of this analysis are reflected in the table below.

Organization	Emission Factor (gCO <sub>2</sub> e/TEU-nm)	% Emission reduction from baseline (excluding pilot fuel)
FuelEU Default	4.07	94.0%
IMO Default	4.30	93.7%
ICCT FUMES Recommended	6.887	89.9%

**7. What happens if the deployed fuel does not meet the 90% emissions reduction threshold?**

It is very unlikely that the deployed fuel will not be able to meet ZEMBA’s emission reduction threshold. Due to the blended nature of the biomethane being sourced for this deal, the supplier can very tightly control the final carbon intensity of the delivered fuel by adjusting the blend ratios, resulting in a guaranteed maximum carbon intensity aligned with ZEMBA’s requirements. However, if ultimately the fuel provider cannot meet the carbon intensity specified, there are remedies in place.

**8. Will the biomethane sourced for this deal be third-party certified?**

Yes, as specified in ZEMBA’s [LCA Guidelines](#), all qualifying bids were required to procure fuel from suppliers certified to a relevant sustainability standard by an independent, third-party certification body accredited to a standard holder recognized by the European Commission. The biomethane Hapag-Lloyd will source for this service will hold an International Sustainability and Carbon Certification (ISCC EU) certification, which meets the legal requirements in the EU’s Renewable Energy Directive (RED II) and covers additional ecological and social requirements. Requiring this kind of third-party certification ensures that the chosen fuel provider submits accurate information on an ongoing basis and shows the fuel provider meets the widely

accepted and standardized parameters of the EU RED II, which increases credibility and is a crucial pillar of ZEMBA's verification process.

### **9. Why was pilot fuel not considered in scope for ZEMBA's ZE Fuels Definition?**

In this initial go-to-market exercise, ZEMBA sought to balance high ambition with pragmatism, therefore the focus was on fuels associated with the primary propulsion of oceangoing vessels, and excluded pilot fuels from the [ZE Fuels Definition](#) and [LCA Guidelines](#) for the first tender. ZEMBA anticipates including pilot fuel for future rounds as ambition will ramp up over time.

### **10. Where will the biomethane for this deal be deployed?**

Compliant with current EU regulation (EU RED II), the waste-based biomethane associated with this deal will be delivered to the European gas grid on a mass balance basis. The ZEMBA team considered the possibility of delivering the fuel directly to a vessel, but doing so would have incurred both higher costs and greater emissions to transport the fuel. Mass balance, when properly implemented, is a high-integrity mechanism for tracking environmental attributes and a widely accepted chain-of-custody model in both regulatory programs and the voluntary market.

### **11. Will this tender support the buildout of additional fossil liquefied natural gas (LNG) infrastructure or vessel newbuilds?**

No new LNG-related infrastructure or vessel reconstruction is needed to deploy the services associated with this bid. If anything, this deal illuminates a pathway for ocean carriers to make more sustainable use of existing infrastructure, keeping in mind that biomethane will be in high demand across sectors in the years ahead and the maritime sector will therefore need to quickly accelerate a transition to fuels that no longer rely on biogenic feedstocks. This is another reason why ZEMBA will adjust its next tender specifications to explicitly target e-fuels.

### **12. What is the difference between this biomethane service and biodiesel offerings that companies can contract for directly from individual carriers?**

ZEMBA has not identified biodiesel offerings that achieve comparable reductions for an entire voyage (an emissions reductions threshold of 93.5% over LSFO). On a voyage decarbonization basis, biodiesel is limited by engine manufacturer limitations on blend proportions. For example, if biodiesel can only be blended up to 50%, the limit of emissions reductions for that voyage will be somewhat less than 50% as well, whereas biomethane has the capacity to decarbonize almost an entire voyage because the biomethane and fossil-LNG molecules are interchangeable. Additionally, some [projections](#) show that advanced biodiesel has an even greater scalability challenge than biomethane given its reliance on waste bio-oils (as opposed to biogas). It is widely accepted that biomethane alone cannot sufficiently scale to meet all maritime decarbonization needs in the decades to come, and e-fuels are urgently needed in significant quantities, this will be an important fuel for immediate decarbonization of the existing

LNG fleet. It is also worth noting that biomethane results in significantly lower local air pollution than biodiesel, which is important for portside communities.

### **13. Will ZEMBA members' physical freight be transported on the Rotterdam-Singapore route?**

Not necessarily. The ability to decouple physical freight movement from willingness to pay a premium for transparent, verified emissions reductions is essential to accelerate the energy transition in this sector, and was a key tenant of the design of this RfP. ZEMBA's goal is to support the creation of a transparent, nonprofit maritime book and claim system to allow suppliers to book and members to credibly claim emissions reductions associated with this deal.

### **14. Which book and claim system and registry is ZEMBA planning to use?**

A number of ZEMBA members and carriers are working with the Maersk Mc-Kinney Møller Center for Zero Carbon Shipping and RMI on the development of a first nonprofit maritime book and claim (MBC) system with the goal to use the MBC system to book and claim the emissions reductions from ZEMBA's first tender. ZEMBA will endorse the use of a specific registry (or set of registries) that upon completion are deemed to follow best practices and deliver the necessary functionality to execute the ZEMBA transaction.

### **15. How will the emissions reductions associated with this deal be verified?**

ZEMBA's technical team developed a three-step carbon intensity validation and assurance structure to provide confidence to members about the credibility of emissions avoided through this deal. First, an internal team of experts conducted a rigorous bid validation process, including validating assumptions and supporting numbers, replicating calculations, conducting direct discussions with the fuel supplier and reviewing sample Proof of Sustainability documentation, validating methane slip emissions using default factors, and benchmarking bid numbers against existing data.

Second, to comply with ZEMBA's [LCA Guidelines](#), the winning bidder will be required to source fuel that is certified to a third-party certification scheme recognized in the EU (also described above). This process will ensure that all monitoring procedures, assumptions, calculations, and data accuracy associated with the final carbon intensity will be verified by a third-party sustainability certifier under the standards of a sustainability certification scheme (ISCC EU). ZEMBA relies on the best-in-class certification processes in existing fuel certification schemes to verify the fuel carbon intensity.

Third, through the negotiation of the model contract to be used in the bilateral contracting process directly between the winning bidder and ZEMBA members, the ZEMBA team has developed a bespoke assurance framework which a classification society will use to verify the information around fuel consumption and cargo transported on a regular basis during the contract period.

## **16. How does ZEMBA's tender interact with current and forthcoming regulations?**

ZEMBA requires regulatory additionality to all other maritime-specific regulatory obligations, including the forthcoming FuelEU Maritime regulations and any other maritime fuel blending mandates. Any winner of a ZEMBA tender will need to agree, as has been done in this case, that the fuel deployed and emissions avoided through the ZEMBA deal are above and beyond the actions carriers must take to meet current and forthcoming regulatory obligations, which is reflected in the contract template associated with this deal.

## **17. What policy insights can be gleaned from ZEMBA's first tender?**

The results from ZEMBA's tender process can provide real-world insights to inform the development of ambitious global decarbonization policy, including by the International Maritime Organization (IMO), the global regulatory body for shipping. In the coming months, the Aspen Institute, through Cargo Owners for Zero Emission Vessels (coZEV) will convey lessons learned from ZEMBA's tender process to support the IMO's development of robust lifecycle assessment guidelines and mid-term measures that can close the cost gap for scalable ZE fuels and accelerate their production and deployment. It is essential to create credible, transparent measures that provide sector-wide certainty, verifiable greenhouse gas emissions reductions, and a more level playing field for climate leaders across the value chain. These results offer an opening for conversations with policymakers about what policy shifts are needed to lead to increasingly more ambitious results into the future.

## **18. Will ZEMBA members be able to count emissions reductions associated with ZEMBA investments toward targets set through the Science Based Targets Initiative?**

Yes, as of April 9, 2024, the Board of Trustees of the Science Based Targets Initiative ([SBTi](#)) announced its intention to allow environmental attribute certificates for abatement purposes to count toward companies' Scope 3 emissions targets. This announcement provides much greater certainty to first movers investing in zero-emission shipping services through ZEMBA that their investments will count toward their science-based targets. As part of its ongoing standard revision process and following a series of consultations with stakeholders across the value chain, SBTi plans to issue a first draft of basic rules, thresholds, and guardrails for the potential use of environmental attribute certificates for abatement purposes of Scope 3 emissions by July 2024.

## **19. Why is the contract period 2 years rather than 3 years as previously announced?**

While ZEMBA is pleased to embark on a deal that enables our members to achieve very high near-term emissions reductions, ZEMBA views biomethane, even exclusively waste-based biomethane, as having scalability challenges in the long run. Therefore, ZEMBA wants to support the maturation of markets for e-fuels and additional zero-emission propulsion alternatives. Shortening the timeframe for this deal enables ZEMBA to reserve 2027 demand for the subsequent procurement round, which will launch later this year. This will allow ZEMBA

members to choose from a wider variety of sustainable maritime fuels for 2027 onward and gives e-fuel producers and ocean carriers a longer lead-time to prepare for e-fuel deployment in response to the second tender, ideally resulting in more and stronger bids that include e-fuels.

**20. How do the outcomes of this tender support the development of scalable zero-emission fuels of the future?**

With the launch of its inaugural tender in 2023 ZEMBA set the highest global standard for procurement of greenhouse gas emissions reduction for deep-sea transport, and will continue to increase ambition over time. In doing so, ZEMBA is demonstrating to all actors in the value chain that best-in-class standards for fuel certification, service verification, pricing transparency, and high-integrity processes to ensure credibility of claims are indeed attainable now. ZEMBA's collective procurement sends an important demand signal and allows freight buyers that are newer to maritime decarbonization to confidently invest in a robust and verified shipping decarbonization service, which helps amplify this demand signal.

Most importantly, ZEMBA has demonstrated that the process of aggregating freight buyer demand and going to market through an open competitive process works. This initial success sets the stage for continuous refinement in subsequent tenders so that ZEMBA can continue to push the boundaries of what is technically and economically possible in maritime decarbonization over time.