

ZEMBA RfP Attachment A

ZEMBA Zero Emissions Fuels Definition

Context

The RfP includes ZEMBA's definition of Zero Emissions Fuels. To support Respondents in identifying compliant fuels, please also see the additional details below the main definition, which is copied again here in bold for ease of reference. Please note that ZEMBA may adjust this definition under future RfPs as the market for alternative maritime fuels grows and more options become available.

Definition

“Zero Emission” fuels have the potential to achieve GHG (CO₂, CH₄ and N₂O) emission reductions equal to or greater than 90% when compared to the reference fuel (LSFO-R). The methodology for the calculation of the Well-to Wake “WtW” GHG emissions life-cycle assessment (LCA) value will be based on the IMO LCA Guidelines¹ and is further explained in ZEMBA RfP Attachment B. The units will be gCO₂(eq)/MJ of fuel.

- Reference fuel:
 - Low Sulfur Fuel Oil of pure residual type (LSFO-R) such as Heavy Fuel Oil (HFO) or Light Fuel Oil (LFO) (RM grades based on ISO 8217:2017) with sulfur levels S>0.5%
 - The Well-to-Wake (WtW) baseline emission factor is 92.36 g CO₂(eq) / MJ (LCV = 40200 kJ / kg)²
- LCA values must reflect 100-year Global Warming Potential (GWP 100) and be expressed in CO₂ equivalent units in accordance with the 5th Assessment Report of the Intergovernmental Panel on Climate Change (IPCC).
- Geological sequestration of CO₂ captured at a processing unit in the supply chain processing the fuel's raw materials and finished fuel products can be deducted from the LCA value of the fuel up to a value of zero, as long as all other fuel requirements are met.
- GHG emissions from Pilot fuel in Main Engines and Diesel Generators will not be included in the LCA value.
- Emissions from onboard electricity generation and transportation and distribution must be included in the submitted total LCA value as well as submitted in disaggregated form. Given challenges in securing zero emission fuel at this time, the treatment of these emissions will be considered after proposals have been received and evaluated.

“Zero Emission” fuels shall be derived from sustainable and/or waste, residual, or byproduct feedstock sources including hydrogen and captured CO₂. Fuel suppliers must be certified to a relevant sustainability standard by an independent certification body accredited to one of the following sustainability standard holders: the Roundtable on Sustainable Biomaterials (RSB), the International Sustainability and Carbon Certification (ISCC) or another standard holder recognized by the European Commission.

- CO₂ used as a feedstock may be sourced from direct air capture (DAC), biogenic sources, or industrial sources. If sourced from industrial or biogenic sources, the source facility may not also claim the CO₂ as reductions. In a future RfP, ZEMBA may elect to disallow industrially sourced CO₂.

¹ Contained in IMO Resolution MEPC376(80) and further explained in ZEMBA RfP Attachment B

² **Reference:** document *IMO MEPC 80/7/4, Annex I* with title “Draft guidelines on lifecycle intensity of marine fuels” – upcoming *Resolution MEPC 376(80)*.

- Example standards include RSB Global and ISCC Plus. If in doubt, please contact ZEMBA to confirm whether a fuel sustainability certification meets this criterion.

“Zero Emission” fuels, including any relevant feedstocks (e.g. hydrogen), shall be produced using renewable energy or another non-fossil, low-carbon energy source.

- Renewable energy may be obtained via Virtual Power Purchase Agreements (VPPAs) or Renewable Energy Certificates (RECs). ZEMBA does not require assessment of the “additionality” of the energy sources used pursuant to this RfP. In a future RfP, however, ZEMBA may elect to place additional restrictions on the sourcing of renewable energy and its attributes.
- Some sustainability certification standards may place additional sourcing requirements on renewable energy, which must be followed in order to achieve those certifications.

“Zero Emission” fuels must be sufficiently scalable to make a meaningful contribution to the decarbonization of the maritime shipping industry as determined by ZEMBA and must have safety concerns addressed.

- No clarifications required.