INTERNATIONAL MARITIME ORGANIZATION

IMO’s ruleset and policies relevant for the use of methane-based fuels

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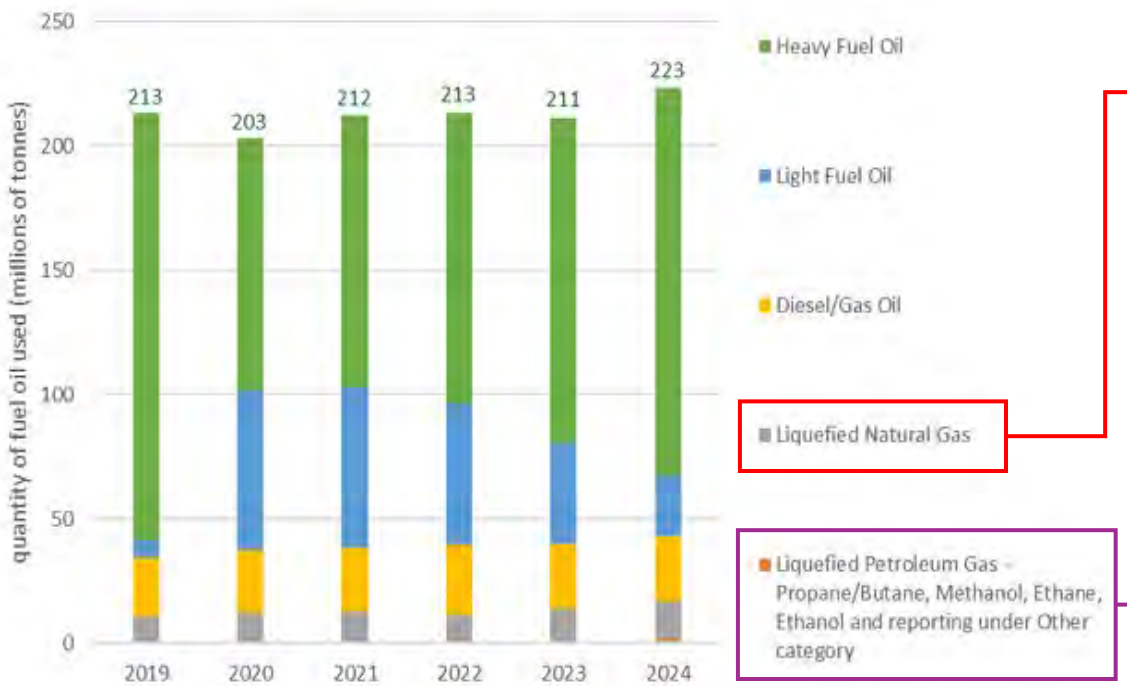
IMO Ship Fuel Oil Consumption reporting

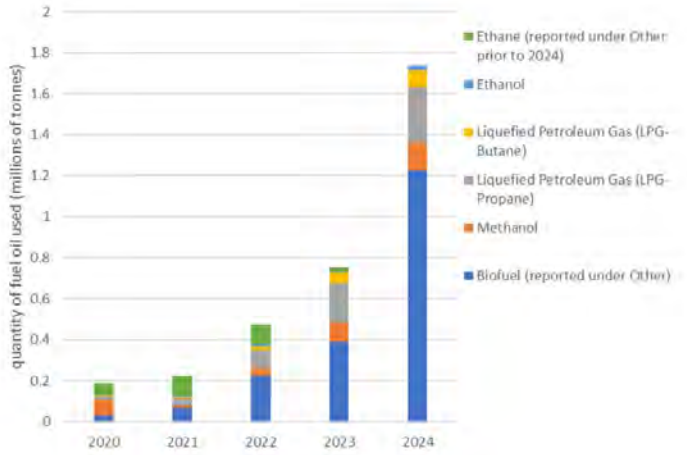


14.9 million tonnes of LNG used in 2024 (12.9 million tonnes in 2023)

- 6.7% of the reported fuel oil in 2024
- +16% year-on-year increase

In the "other" category: 1.2 million tonnes of biofuels used in 2024 (390,846 tonnes in 2023)

- 0.5% of the reported fuel oil in 2024
- +214% year-on-year increase
- Reporting of bio-methane in upcoming years?



IMO regulations on air pollution relevant for methane-based fuels

- For methane-based fuels, relevant MARPOL Annex VI requirements apply
  - **Reg.13 (NO_x)**: Tier I, II, III emission limits for marine diesel engines above 130KW, including gas-fuelled engines. For dual-fuel engines: Tier II (liquid fuel only) and Tier III (gas fuel with pilot fuel) (detailed guidance in MEPC.1/Circ.854)
  - **Reg.14 (SO_x)**: LNG = sulphur-free
  - **Reg.18 (Fuel quality)**: Bunker Delivery Note (incl. flash point since 2024), fuel oil sampling, recording, etc. apply

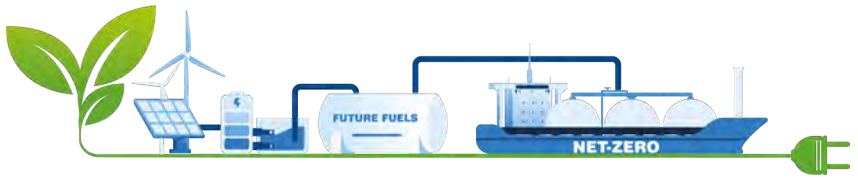
Use of methane-based fuels under EEDI and CII regulations

- The use of methane-based fuels improves ships performance under both the Energy Efficiency Design Index (**EEDI**) for new ships and the operational carbon intensity indicator (**CII**) rating system
  - C_F factor for LNG set out in the EEDI calculation guidelines = 2.750 t-CO_2/t-Fuel
  - Tank-to-Wake only

- For **gas carriers**, boil-off gas consumed on board can be used to provide fuel consumption values for CII calculation

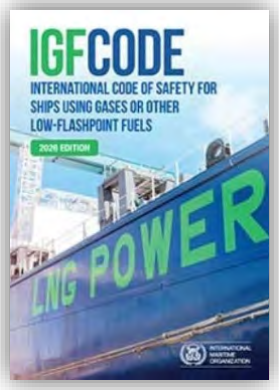
IMO framework for lifecycle GHG emissions assessment of methane-based fuels

- **LCA Guidelines -** provide a general methodology for the assessment of GHG emissions of all marine fuels, including methane-based fuels, on a well-to-wake (WtW) basis, supporting future GHG reduction measures
- WtT and TtW **default emission factors**: scientific review by **GESAMP-LCA WG** (including using statistical approaches to determine global default WtT emission factors for relevant fossil fuel pathways such as LNG)
- Ongoing development of draft guidelines on **sustainable fuel certification schemes (SFCS)** and draft guidelines on the **fuel lifecycle label (FLL)**
- Ongoing discussions on **avoided emissions =>** compatibility with attributional approach in the LCA Guidelines?
- Measurement and verification of **methane emissions**, incl. methane slip. Guidelines adopted by MEPC 84:
  - **2026 Guidelines for test-bed and onboard measurements** of methane (CH_4) and/or nitrous oxide (N_2O) emissions from marine diesel engines => building upon NTC 2008 practices
  - Guidelines for **engine load monitoring (ELM)** and calculation of emission values (ELM Guidelines)
  - Guidelines for **continuous emission monitoring systems (CEMS)**

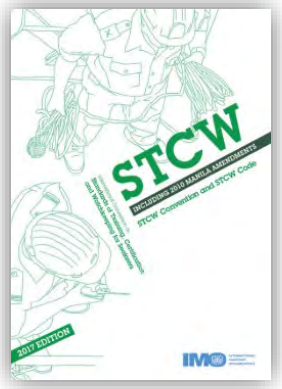


IMO safety requirements for methane-based fuels

- IGF Code: International Code of Safety for Ships using Gases or other Low-flashpoint Fuels
  - Applies to **all low-flashpoint fuels**, including LNG and bio-methane
  - **Well-established requirements** for arrangement, installation, control and monitoring of machinery, equipment and systems using low-flashpoint fuels => minimize risks to ships, crew and the environment
  - **Latest amendments** (entered into force on 1 January 2026) strengthen requirements on, e.g. bunkering manifold connections, pressure relief valve design, and structural fire protection



- STCW Convention and Code related to low-flashpoint fuels
  - Regulation V/3 and Section A-V/3: **Mandatory minimum requirements** for the training and qualifications of master, officers, ratings and other personnel on ships subject to the IGF Code
  - Basic and advanced training requirements cover the characteristics and physical properties of fuels, operation of fuel systems, bunkering , firefighting, emergency response, etc.
  - Ongoing **comprehensive review of the STCW Convention and Code**
  - **IMO model courses 7.13 and 7.14** on the Basic and Advanced training for masters, officers, ratings and other personnel on ships subject to the IGF Code

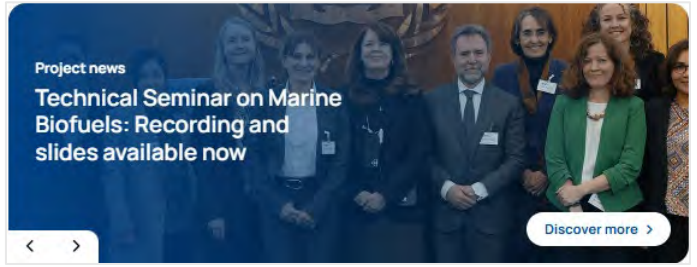


IMO liability and compensation regimes with respect to alternative fuels

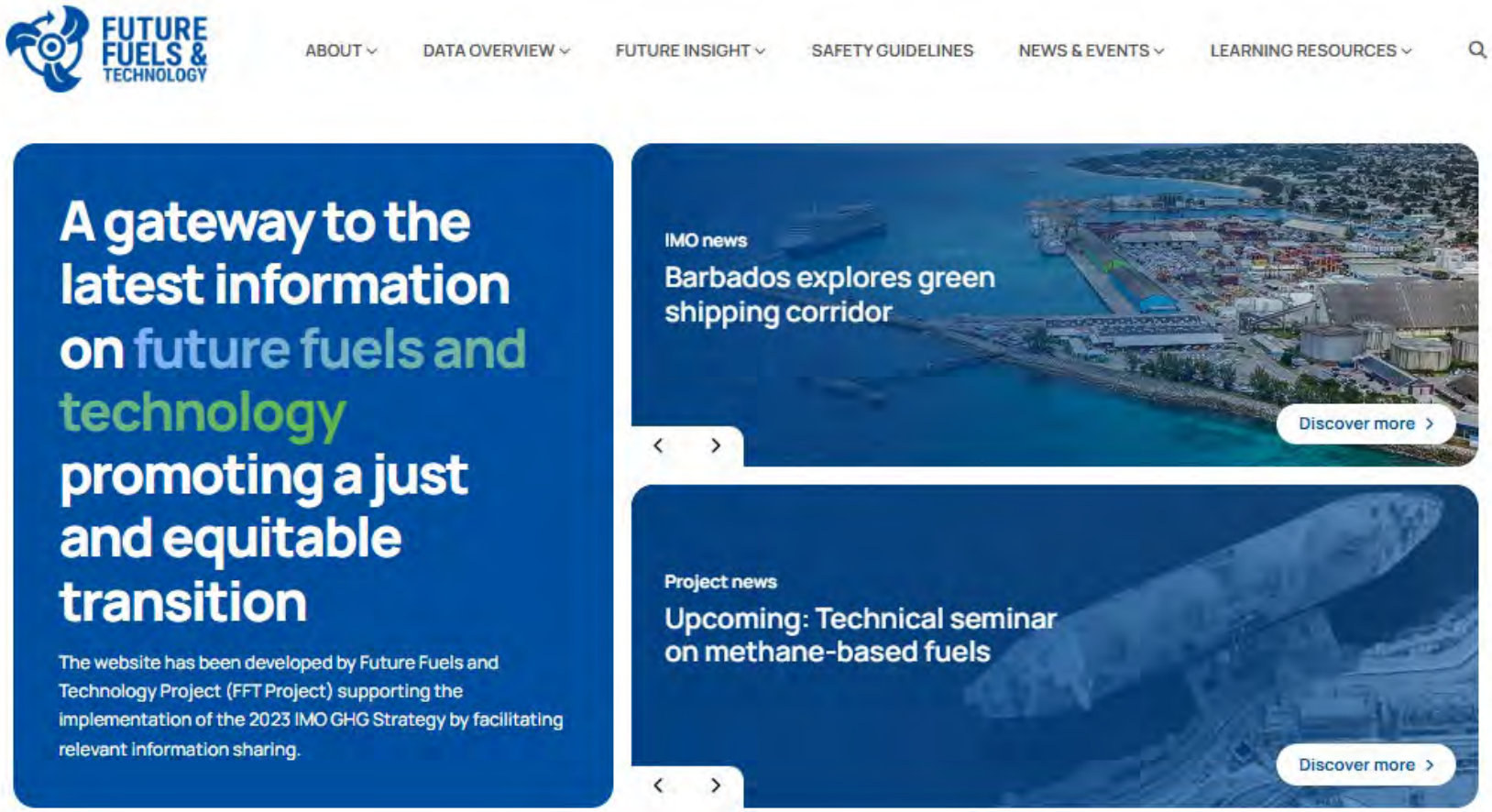
- LEG 113 (April 2026) agreed that a regulatory gap exists regarding liability and compensation for incidents involving alternative fuels used for ship propulsion/operation
- CLC and Bunkers Convention cover spills of persistent oil. HNS Convention may apply => but would cover LNG as cargo only
- Initiation of work to **ensure that liability and compensation regimes adequately address certain risks associated with alternative fuels**, including LNG, ammonia, hydrogen, or biofuels
- Intersessional correspondence group established => reporting to LEG 114 (Spring 2027)

IMO FFT project technical seminars

- 1st Seminar: Onboard Carbon Capture and Storage (Sep 2025)
- 2nd Seminar: Energy Transition of Shipping at Hong Kong Maritime Week (Nov 2025)
- 3rd Seminar: Biofuels (Feb 2026)
- **4th Seminar: Methane-based Fuels (May 2026)**
- 5th Seminar: Tentative Topic - Ammonia (Sep 2026)
- 6th, 7th Seminar: To be continued



IMO Future Fuels and Technology Project (FFT)



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Thank you.

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