European Commission

SUSTAINABLE & SMART
MOBILITY STRATEGY

Maritime decarbonization and fuels in the EU



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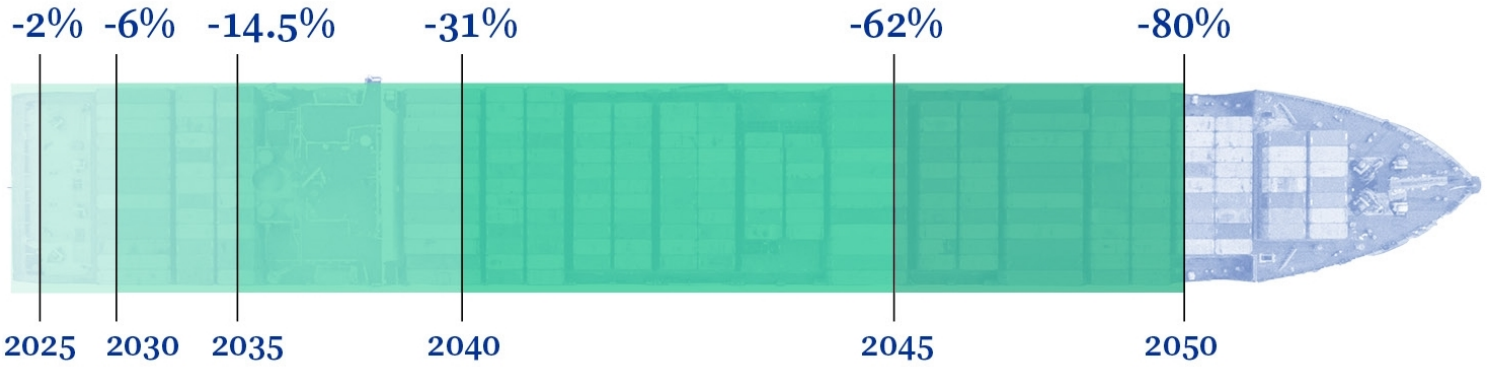
Mobility and Transport

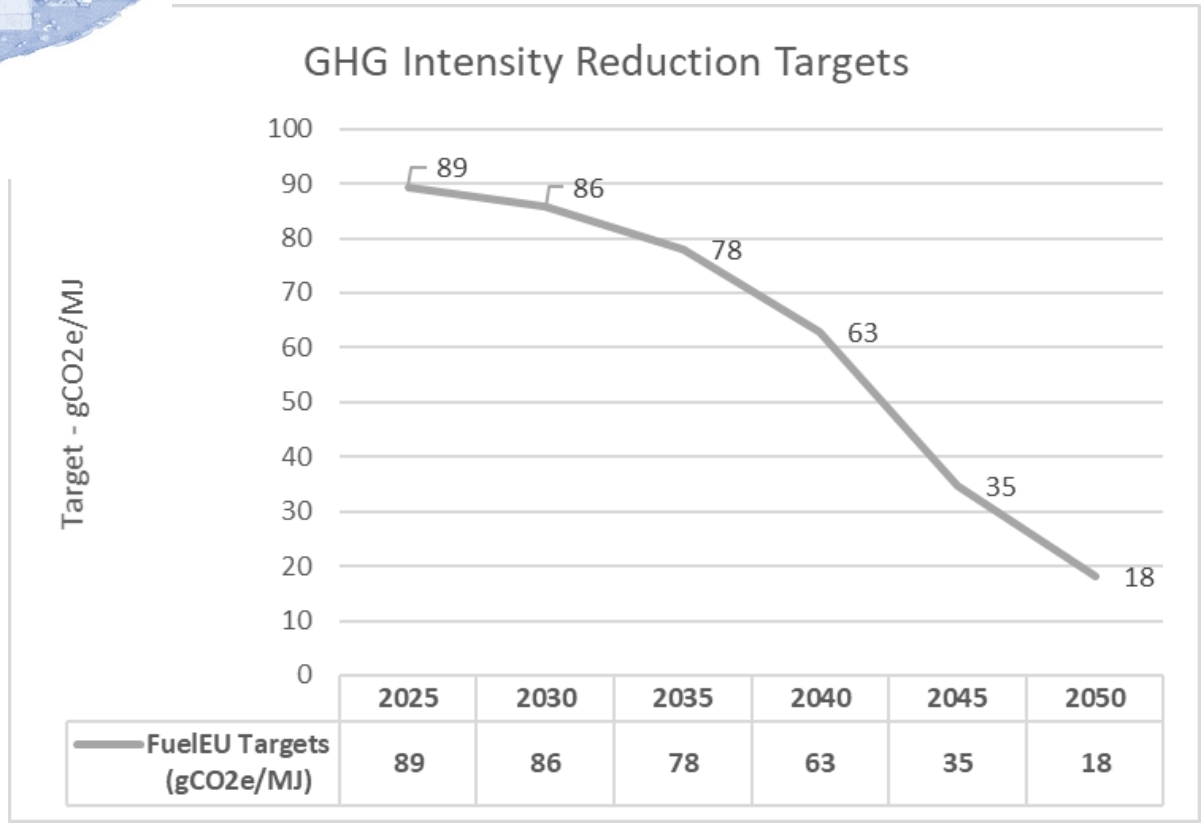
ETS – Extension of the Emission Trading Scheme to maritime transport	• **Carbon tax/ Trading scheme** • **Promote Energy Efficiency and Energy Transition**
AFIR – Alternative Fuels Infrastructure Regulation	• Require EU ports to develop shore-power • Bunkering infrastructure for alternative fuels.
FuelEU Maritime Regulation	• Promote the use of renewable and low-carbon fuels in maritime transport.
Renewable Energy Directive **(RED)**	• Facilitates the availability of renewable and alternative fuels • Sets targets for the use of renewable energy in the transport sector

FuelEU Maritime

GHG Intensity Target



- **General targets**: Establishes limits on the annual average GHG intensity of the energy used on-board.
- Ref Value:
  - Calculated based on 2020 MRV fleet data
  - Fuel Mix as per MRV reported fuel consumption



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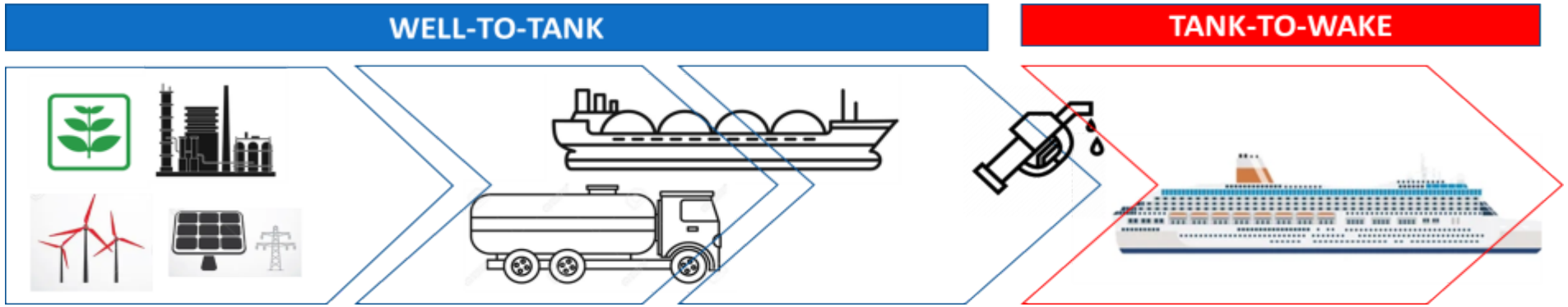
FuelEU Maritime

Scope

- **Scope:** Ships above 5000 GT, EU ports, regardless of flag,100 % intra-EU traffic + 50% extra-EU,
- **Exemptions:** Small islands < 200,000 residents; PSO connections between island MS and another MS and between an island and the mainland of the same MS; outermost regions; transhipment ports; ice class ships and ships navigating in ice.
- **GHGs:** The inclusion of CO2, CH4 (methane) and N2O (nitrogen dioxide) on a full well-to-wake calculation allows fair comparison of fuels.



Eligibility of Renewable and Low-Carbon Fuels

(Biofuels):

- **Sustainability** and GHG saving criteria - **RED Article 29**
- No "**food-and-feed**" crop Biofuels

(RFNBOs and Recycled Carbon Fuels):

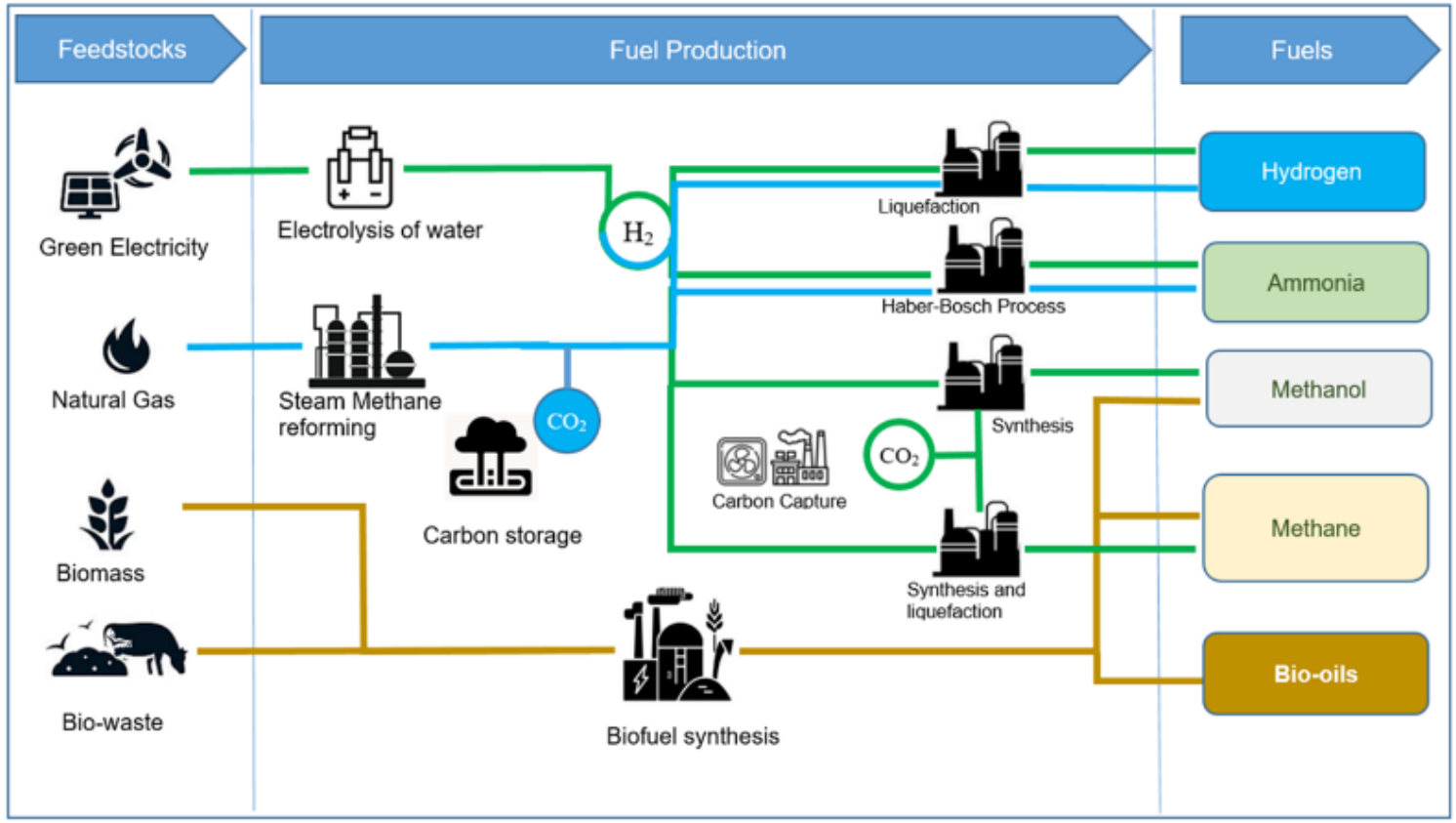
- GHG saving threshold - **RED Article 27(2)**

(Low-Carbon Synthetic Fuels):

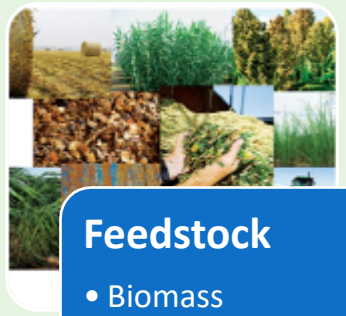
Revised (recast) **Gas Directive**

Fuels not meeting criteria treated as fossil fuels

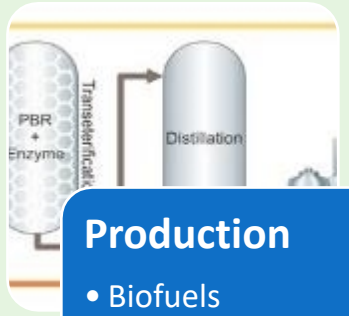
Several Pathways possible:



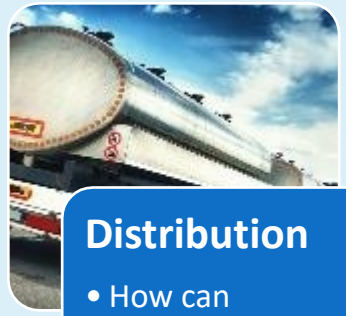
GHG/Sustainability Fuel Certification



Feedstock
- Biomass
- Renewable



Production
- Biofuels
- RFNBOs
- Low-Carbon Synthetic Fuels



Distribution
- How can distribution be considered (should be at all?)

Blending
(Blending with fossil fuels will be the predominant case)

Bunkering
(How to include Bunkering in the Certification of the Fuel)

RED Certification – Proof of Sustainability

FuelEU – GHG Fuel Certification

- **GHG Fuel Certification –** Essential for level playingfield
- Fuel Certificate – to be **submitted together with BDN**
- Need to include **GHG savings for each fuel product** supply
- Blends need to provide relevant information to **ALL parts blended**
- **Book & Claim** not possible under FuelEU
- Fuel Certification for Bunkering **outside EU – OK**! – Fuel Certification Companies

ISO TC8/SC25 : recommendations

Working Group 'New Technologies'

- **>>> OPS standard for low voltage electricity.**
- **>>> Ports : Standardization for the different uses.**
- **>>> WASP : methodology for continuous monitoring and recording of energy used for propulsion.**
- **>>> Batteries : on-board testing standards**

Working Group 'Alternative Fuels'

>>> Fuel specifications for ammonia, hydrogen, biofuels and blends,

>>> Bunkering procedures for ammonia, hydrogen, biofuels and blends

Working Group 'Maritime GHG Assessment & Documentation'

>>> Continuous Emissions Monitoring System onboard ships for GHG (applicable to tank to wake CO2, CH4, and N2O emissions).

>>> Interface for CO2 accounting from carbon capture (on board sequestration and use/sequestration on land).

>>>Revision of ISO 8178 (emission test cycles)0

Alternative fuels - Fuel specifications

EXISTING

LNG /liquefied methane

- **ISO 23306:2020**

IGF code and existing interim guidelines for methanol/ethanol and LPG.
Guidelines for ammonia and hydrogen under development.

MISSING :

No marine standard available for fuel specification for:

- **Methanol (under development: ISO/AWI/CD 6583 "Specification of methanol as a fuel for marine applications")**
- **Ethanol**
- **Ammonia**
- **Hydrogen (available product specification ISO 14687:2019 "Hydrogen fuel quality – Product specification“, but not specifically for maritime)**
- **DME**
- **Biodiesel, HVO, FT-Diesel (if not covered by ISO8217)**
- **Fuel blends (fossil/bio/synthetic) limitations for engine operations (needs to involved CIMAC)**

Alternative fuels - Bunkering standards

EXISTING

LNG /liquefied methane :

- **ISO20519 (>AFIR – specifications for bunkering)**
- **ISO18683 (safety and risk ass. for bunkering),**
- **ISO 21593:2019 (dry disconnect/connect couplings),**

Missing :

- **Methanol * (under development: ISO/AWI 22120 Ships and marine technology)**
- **Ethanol,**
- **Ammonia ***
- **Hydrogen ***
- **DME,**
- **FT Diesel**

* Technical specifications for refuelling points and bunkering to be developed by ESO for **gaseous hydrogen (DDL End 2026), liquified hydrogen (DDL end 2028), ammonia (end 2027), methanol (end 2024)**

Assessment & Documentation

EXISTING

- MRV and DCS
- Count EU emission > ISO (EN ISO 14083 – 2023)
- RED certification
- IMO LCA guidelines
- IMO certification scheme (under development)

MISSING

- Accounting of CO2 from carbon capture on board and sequestration or use on land (production of other products/fuels).
- Revision of ISO 8178 (emission test cycles) in the context of certification of engine for non-CO2 tank to wake emission (methane and N2O)
- Energy Management System specifically for shipping companies (like ISO 50001).
- Continuous Emissions Monitoring System onboard ships for GHG (applicable to tank to wake CO2, CH4, and N2O emissions).

Thank you