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NORWEGIAN COASTAL ADMINISTRATION

Status for landstrøm i EUs «Fit for 55»

Landstrømsforum styringsgruppemøte

Einar Bjørshol, seniorrådgiver // Ålesund/Teams, 29.02.2024

– Clean, safe and efficient seaways

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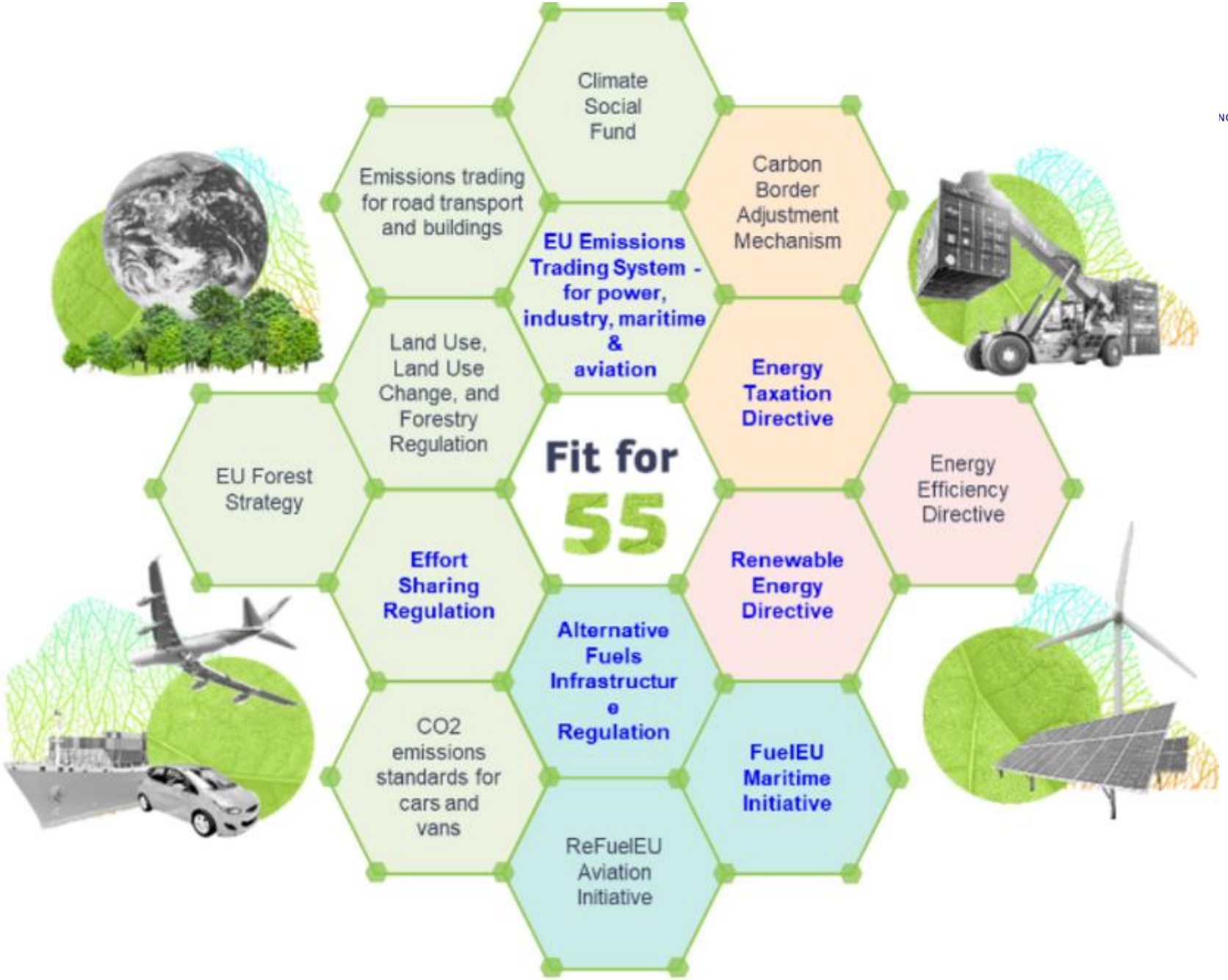

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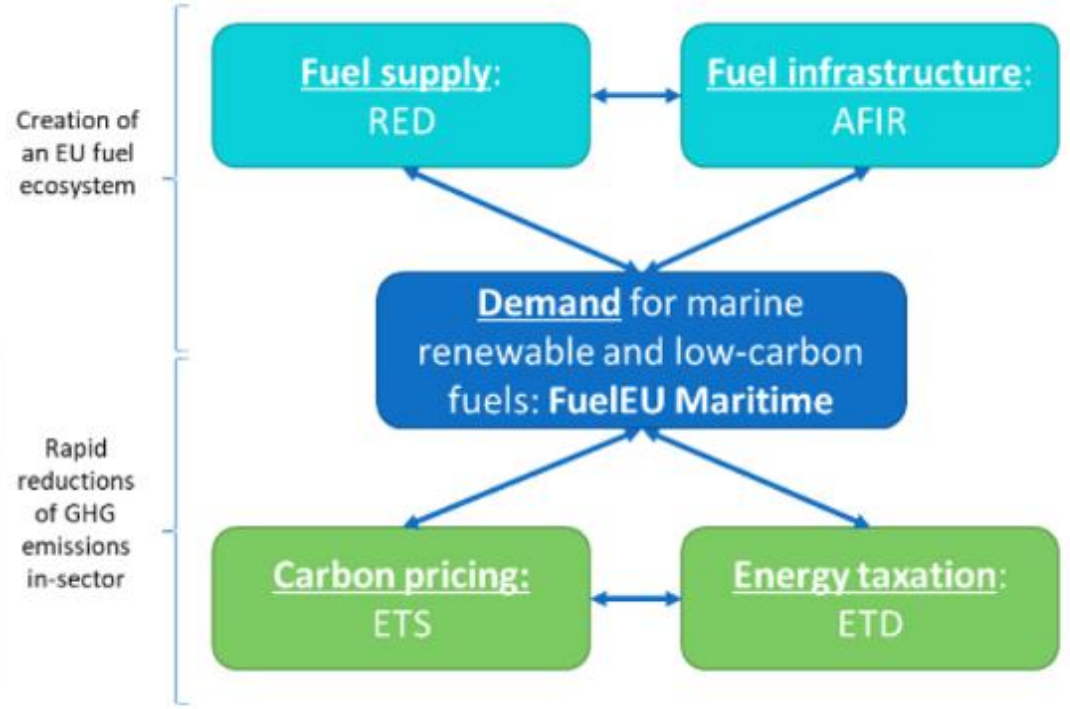
Fit for 55 - Maritime



Complementary FuelEU – ETS – AFIR - ETD

- ETS promotes energy savings while FuelEU addresses **fuel technology**.
- FuelEU addresses fuel demand, RED fuel supply and AFIR fuel distribution
- Taxation levels for renewable and low-carbon fuels and for electricity at berth are consistent with FuelEU goals.

https://www.zerocarbonshipping.com/news/fueleu-maritime/

Maritime transport in EU ETS

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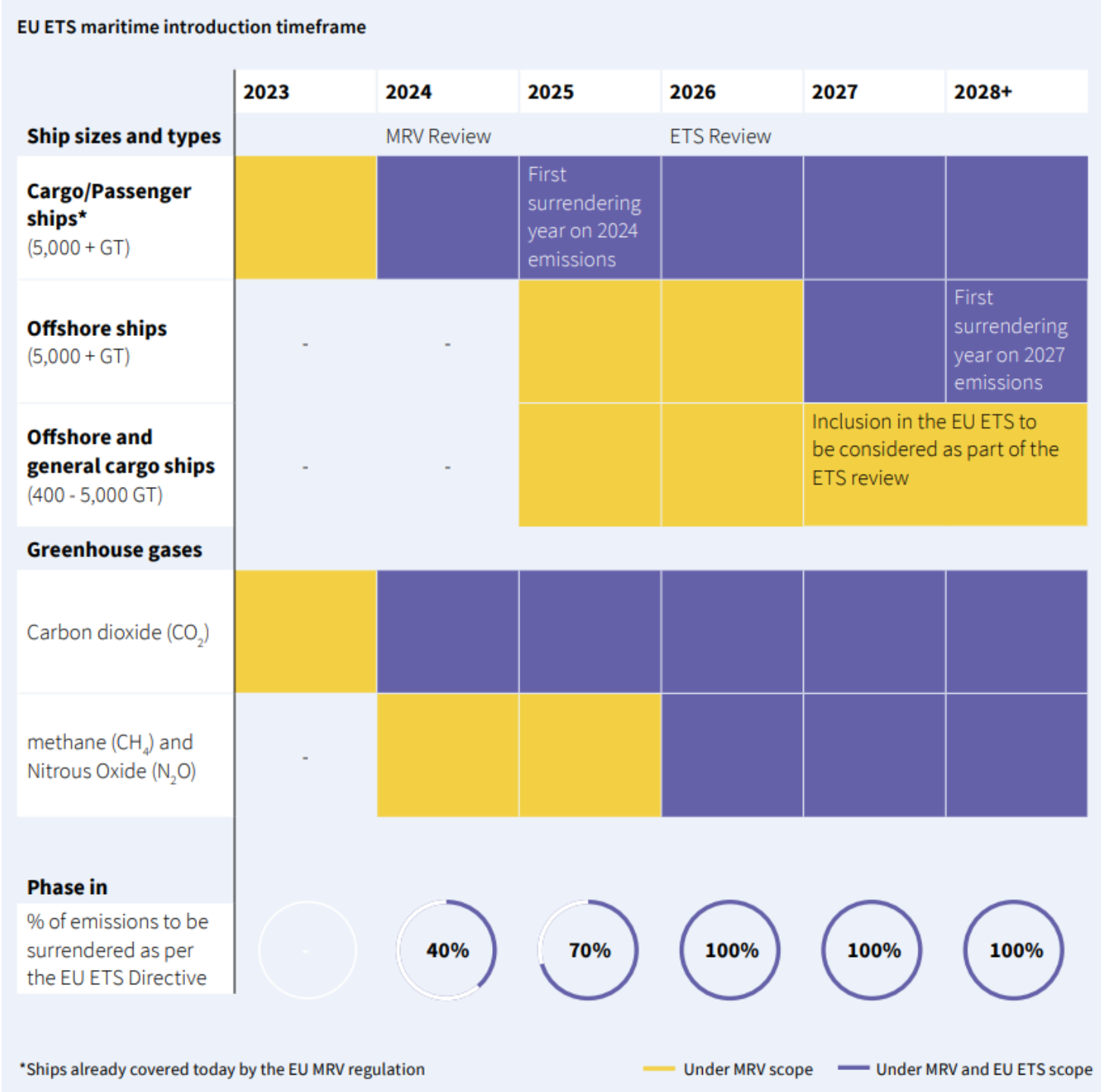

https://maritime.lr.org/fit-for-55-report

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AFIR: EU/EEA-wide requirements

	Proposal	Final
Ports	TEN-T ports	TEN-T ports
Port stay	>= 2 hours	>= 2 hours
Ship size	> 5 000 GT	> 5 000 GT
Ship types	Container, passenger (incl. cruise)	Container, passenger (incl. cruise)
No. arrivals	Container: > 50 Ro-pax: > 40 Other pax (incl. cruise): > 25	Container**: > 100** Ro-pax: > 40 Other pax (incl. cruise): > 25
Specification	**«At berth»**	**«Moored at the quayside»**
Energy	**«**[Ports] have **sufficient shore-side power output** to meet at least 90 % of that demand.»	*provide […] shore-side electricity supply for at least **90% of the total number of port calls***

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AFIR Annex II Technical specifications

5. Technical specifications for electricity supply for maritime transport and inland navigation

5.1. Shore-side electricity supply for seagoing ships, including the design, installation and testing of the systems, shall comply at least with the technical specifications of standard IEC/IEEE 80005-1:2019/AMD1:2022 for high-voltage shore connections.

5.2. Plugs, socket-outlets and ship couplers for high-voltage shore connection shall comply at least with the technical specification of standard IEC 62613-1:2019.

5.3. Shore-side electricity supply for inland waterway vessels shall comply at least with the standard EN 15869-2:2019 or standard EN 16840:2017 depending on energy requirements.

5.4. Technical specifications for shore-side battery recharging points for maritime vessels, featuring interconnectivity and system interoperability for maritime vessels.

5.5. Technical specifications for shore-side battery recharging points for inland navigation vessels, featuring interconnectivity and system interoperability for inland navigation vessels.

5.6. Technical specifications for vessel-to-port grid communication interfaces in automated on-shore power supply (OPS) and battery recharging systems for maritime vessels.

5.7. Technical specifications for vessel-to-port grid communication interfaces in automated on-shore power supply (OPS) and battery recharging systems for inland navigation vessels.

5.8. If technically feasible, technical specifications for battery swapping and recharging at onshore stations for inland navigation vessels.

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FuelEU Maritime: Zero Emission at Berth

- Container, pax (incl. cruise) (> 5 000 GT) moored at the quayside in a port of call (>= 2 hours)
- 1.1.2030: «shall connect to OPS [in AFIR ports] and use it for all its electrical power demand at berth»
- 1.1.2035: «where the quay is equipped with available OPS» (opt-in for Member States from 2030)
- Ships at anchorage not covered, but voluntary opt-in provision for Member States
- Exemptions:
  - «Unavailability of OPS connection points»
  - «Shore installation at the port is not compatible with the on-board on-shore power equipment», cf. AFIR Annex II Tech. spec.
- Penalty for non-compliance: 1.50 EUR x Hours in port x «established total electric power demand of the ship at berth»
  - Highest value (kW), incl. hotel and cargo handling workloads

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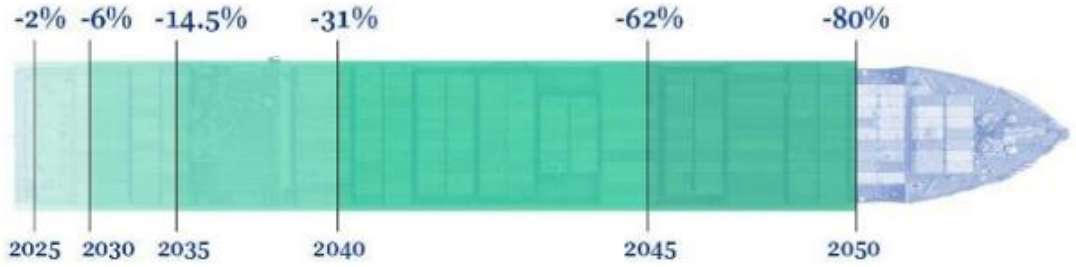
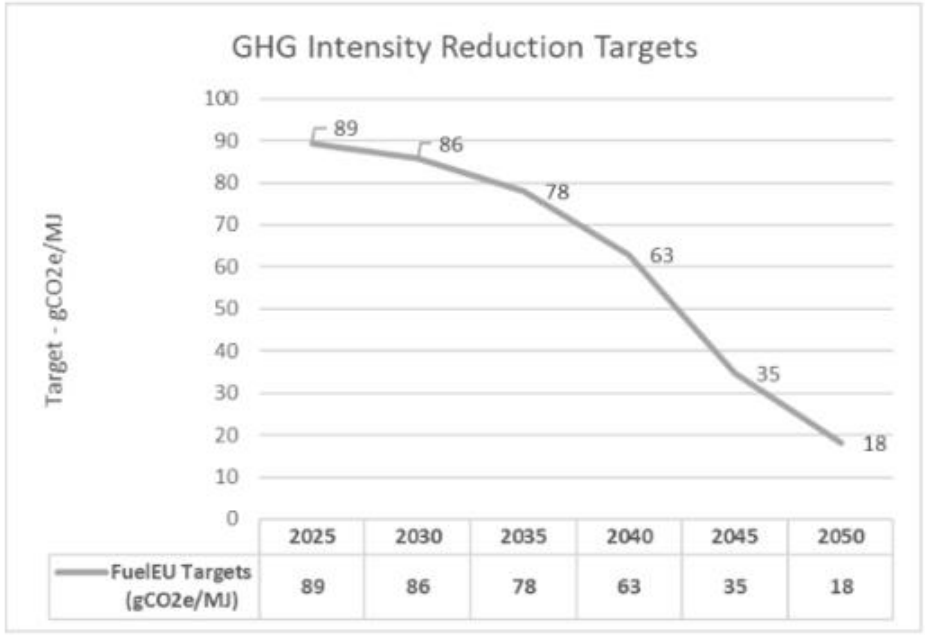
FuelEU Maritime GHG Intensity Targets



- **General targets**: Establishes limits on the annual average GHG intensity of the energy used on-board. **Reference value: 91.16 g CO_2eq/MJ**.

- Ref Value:
  - Calculated based on 2020 MRV fleet data
  - LNG fuelled fleet considered
  - Fuel Mix as per MRV reported fuel consumption



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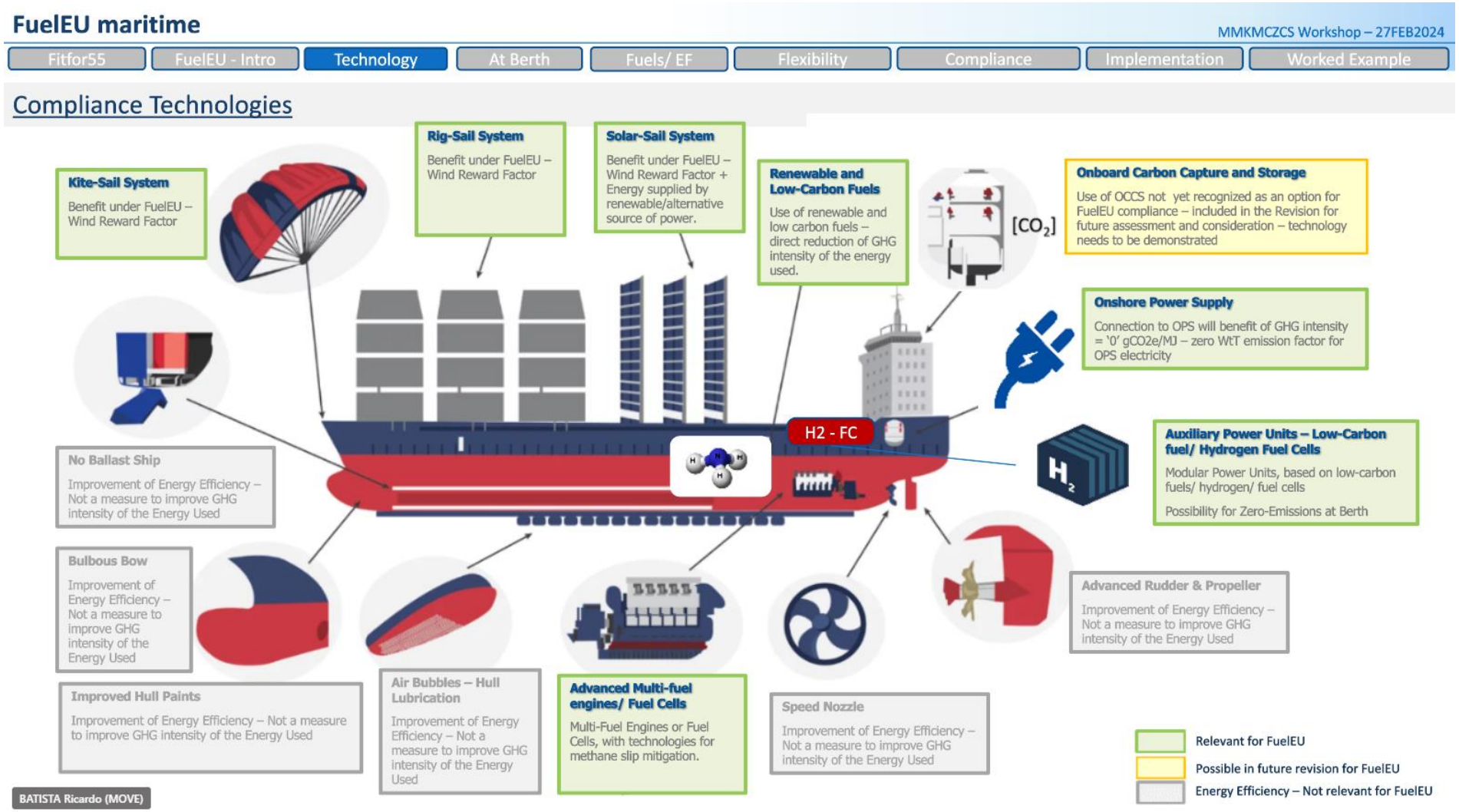
FuelEU Maritime Compliance Technologies



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CASE 1: HFO + MDO / Intra-EU

Summary

Fossil
Bio
E-fuels
Natural gas

GHG Intensity Calc

WtT		7,42E+09	gCO2e
TtWi		4,26E+10	gCO2e
WtW		5,00E+10	gCO2e
WtTi		1,36E+01	gCO2e/MJ
TtWi		7,80E+01	gCO2e/MJ
f_wind			
GHGi		**91,62**	gCO2e/MJ

Fail 2025

Year	% Reduction	GHGIEtarget
2025	2	89,34
2030	6	85,69
2035	14,5	77,94
2040	31	62,90
2045	62	34,64
2050	80	18,23

https://www.zerocarbonshipping.com/news/fueleu-maritime/

Summary Data

- Containership > 5,000GT/ Intra-EU Voyages
- 12,000 tons HFO + 1400 tons MDO = 546 million MJ
- Assumed Aux Fuel Consumption (FC) ≈ 10% Total Fuel Consumption
- Typical conventional oil-based installation

Compliance

$$CB = (GHG_{i,target} - GHG_{i,actual}) \times Energy_{total}$$

$$FuelEU\ Penalty = \frac{|CB|}{GHG_{i,actual} \times 41000} \times 2400$$

Compliance Balance Calculation

Year	CB (gCO2e)	CB (tCO2e)
2025	-1,25E+09	-1247,41
2030	-3,24E+09	-3237,55
2035	-7,47E+09	-7466,58
2040	-1,57E+10	-15675,87
2045	-3,11E+10	-31099,40
2050	-4,01E+10	-40054,99

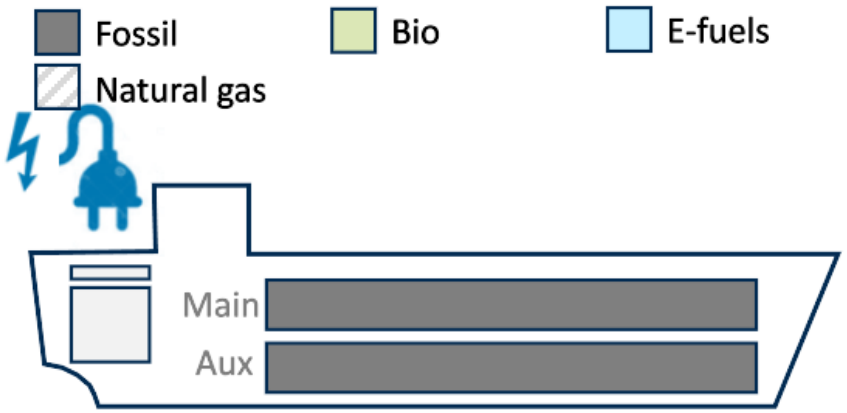
FuelEU Penalty

Year	CB (gCO2e)	FuelEU Penalty
2025	-1,25E+09	796.959,55 €
2030	-3,24E+09	2.068.434,57 €
2035	-7,47E+09	4.770.318,99 €
2040	-1,57E+10	10.015.153,45 €
2045	-3,11E+10	19.869.084,86 €
2050	-4,01E+10	25.590.722,46 €

- **Compliance Balance negative for all years.**
- **FuelEU Penalty 2025 close to 800k€**
- **If fuel consumption is doubled, achieved GHG intensity is still the same, but compliance balance and penalty would be doubled**
- **If instead she did only extra EU, then only 50% of the energy is in scope, compliance balance and penalty would be halved**

CASE 2: HFO + MDO / OPS / Intra-EU

Summary



GHG Intensity Calc

WtT		7,18E+09	gCO2e
TtWi		4,13E+10	gCO2e
WtW		4,85E+10	gCO2e
WtTi		1,31E+01	gCO2e/MJ
TtWi		7,56E+01	gCO2e/MJ
f_wind			
GHGi		**88,79**	gCO2e/MJ

Year	% Reduction	GHGIEtarget
2025	2	89,34
2030	6	85,69
2035	14,5	77,94
2040	31	62,90
2045	62	34,64
2050	80	18,23

Pass 2025

Fail ≥2030

https://www.zerocarbonshipping.com/news/fueleu-maritime/

Summary Data

- Containership > 5,000GT/ Intra-EU Voyages
- 12,000 tons HFO + 1000 tons MDO = 546 million MJ
- 400 tonnes MDO replaced by OPS electricity supply at berth (4,74E+06 kWh)
- Typical conventional oil-based installation

Compliance

$$CB = (GHG_{i,target} - GHG_{i,actual}) \times Energy_{total}$$

$$FuelEU\ Penalty = \frac{|CB|}{GHG_{i,actual} \times 41000} \times 2400$$

Compliance Balance Calculation

Year	CB (gCO2e)	CB (tCO2e)
2025	3,01E+08	300,58
2030	-1,69E+09	-1689,55
2035	-5,92E+09	-5918,58
2040	-1,41E+10	-14127,88
2045	-2,96E+10	-29551,40
2050	-3,85E+10	-38507,00

FuelEU Penalty

Year	CB (gCO2e)	FuelEU Penalty
2025	3,01E+08	No Penalty
2030	-1,69E+09	1.113.921,30 €
2035	-5,92E+09	3.902.118,09 €
2040	-1,41E+10	9.314.500,09 €
2045	-2,96E+10	19.483.217,80 €
2050	-3,85E+10	25.387.634,53 €

If this ship doubled her fuel consumption, achieved GHG intensity is still the same, but compliance balance and penalty would be doubled

If instead she did only extra EU, then only 50% of the energy is in scope, compliance balance and penalty would be halved

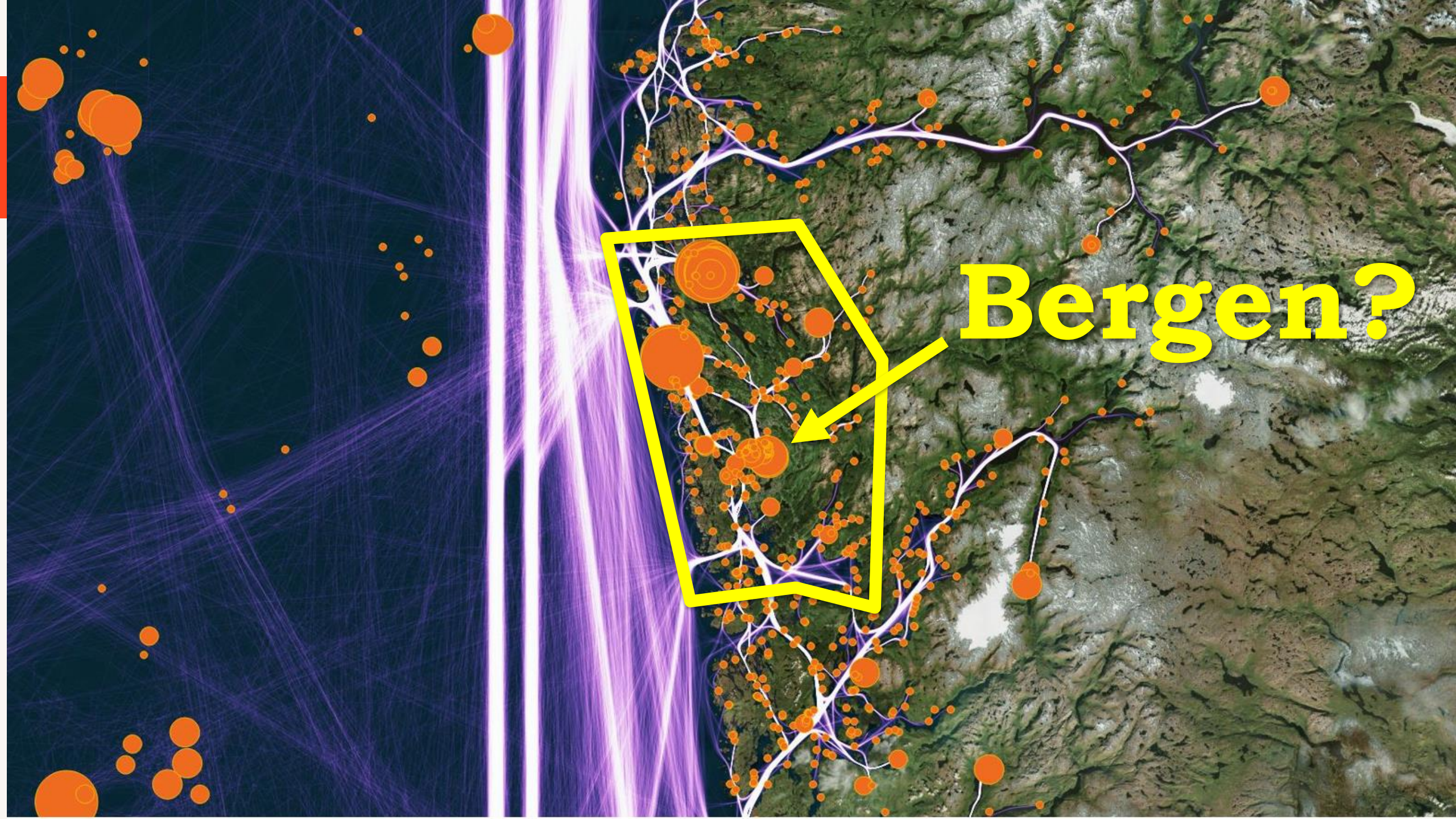
Trans-European Transport Network (TEN-T)

- Criteriae for ports:
  - 1 % (0,1 %) of goods total in EU/EEC
  - 1 % (0,1 %) of pax total in EU/EEC
  - Periphery (> 200 km from nearest TEN-T port)
- Core (comprehensive) network to be completed by 2030 (2050)

https://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/map/maps.html

TEN-T and Norway's port infrastructure

- 16 TEN-T ports (2 Core, 14 Comprehensive)
- 650 ISPS port facilities
- 3 900 AIS-based locations (quays and port facilities)


Bergen?

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Thank you for your attention

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