

Join our expert-led Webinar on

Navigating FuelEU Maritime

YOUR ROADMAP TO COMPLIANCE



Join our expert-led webinar to understand the compliance steps for the FuelEU Monitoring Plan and FuelEU Maritime regulation.



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Wednesday, 28th August 2024



**10:30 AM CET | 12:30 PM GST
2:00 PM IST | 4:30 PM SGT**



Microsoft Teams

REGISTER NOW >

OUR JOURNEY

10+

Years in
Decarbonization

330+

Airlines under CORSIA,
EU, Swiss, UK ETS

150+

Airports verified
for ACA

2000+

Vessels under
IMO DCS, EU & UK MRV

50+

Team of Subject
Matter Experts

48M+

Metric Tonnes of
CO₂ Verified under THETIS

1500+

IHM Surveys
Conducted

2500+

Vessels under
IHM Maintenance

8+

Collaboration with Carbon
Management Solutions

1st

Independent Verifier
to be accredited by
Smart Freight Centre

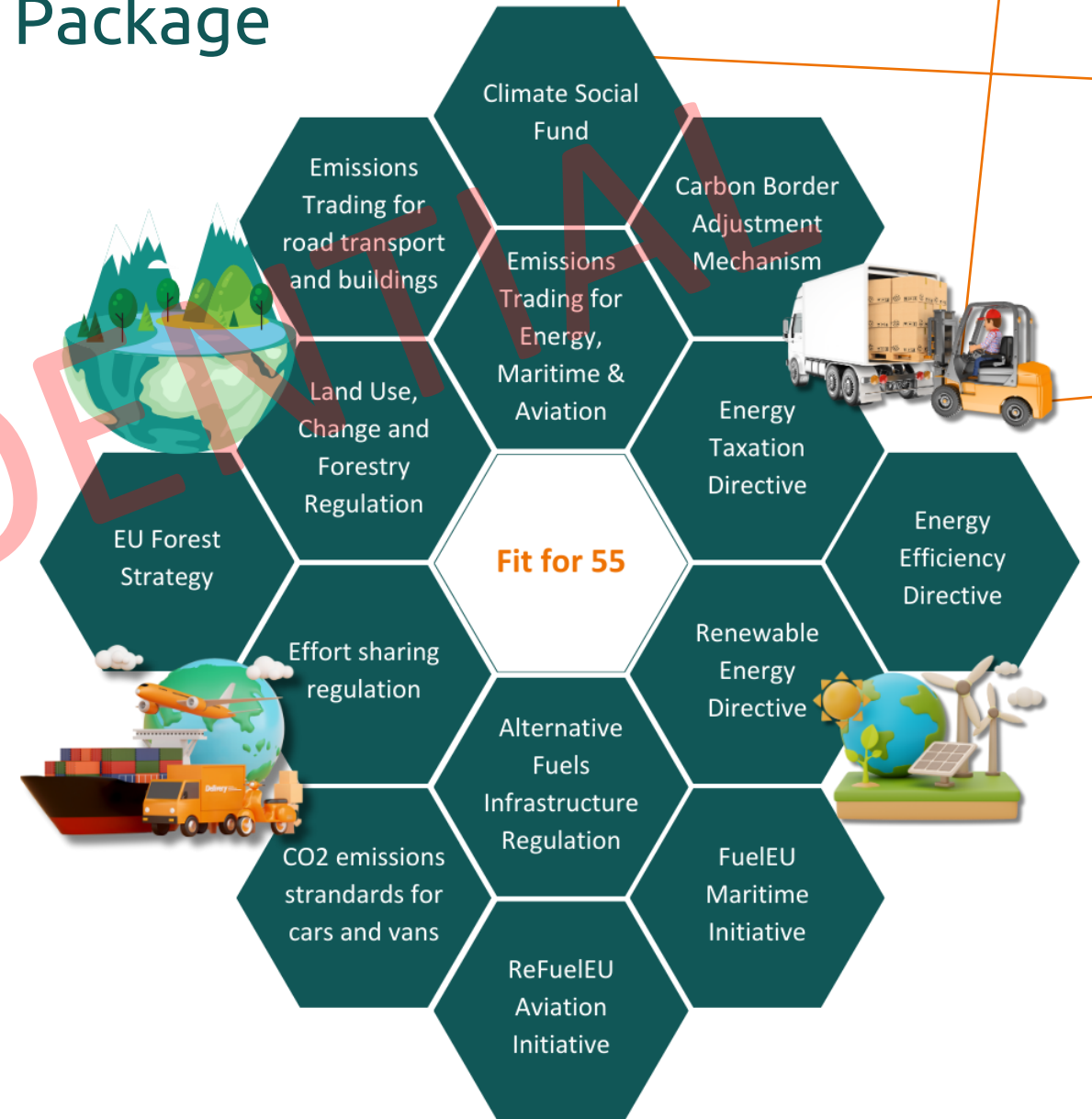
Our Portfolio of Clients - Shipping



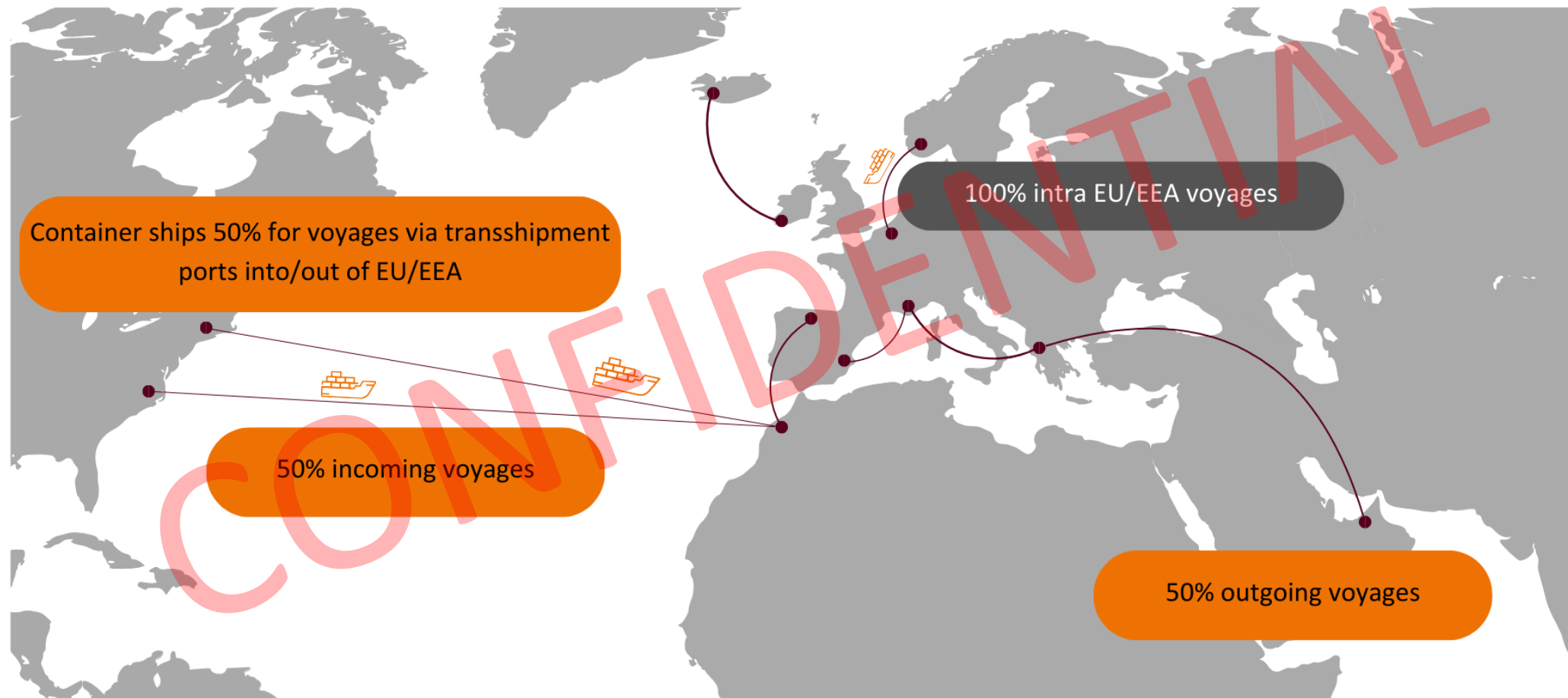
FuelEU Maritime: Part of Fit for 55 Package

Key component of the **Fit for 55** package, designed to *reduce the EU greenhouse gas emissions by at least 55% by 2030 compared to 1990.*

1. **Decarbonization of the Maritime Sector:** accelerate the transition to renewable and low-carbon fuels.
2. **Mandated Fuel Standards:** carbon performance requirements for ships, requiring progressively lower carbon intensity fuels.
3. **Incentivizing Sustainable Fuels:** promotes the development and adoption of sustainable maritime fuels through market demand and encouraging investment.



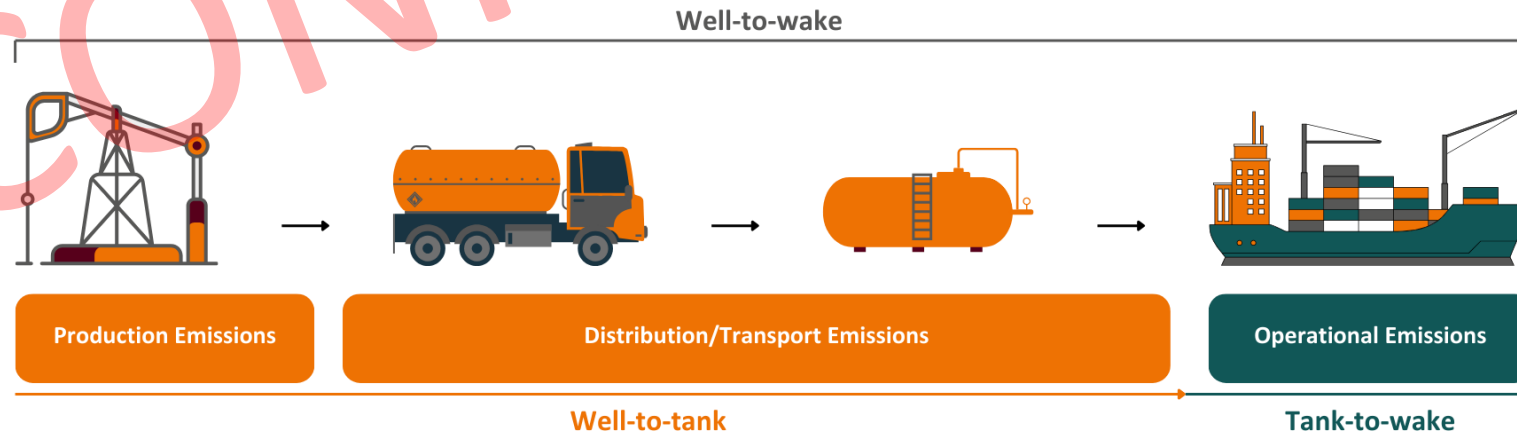
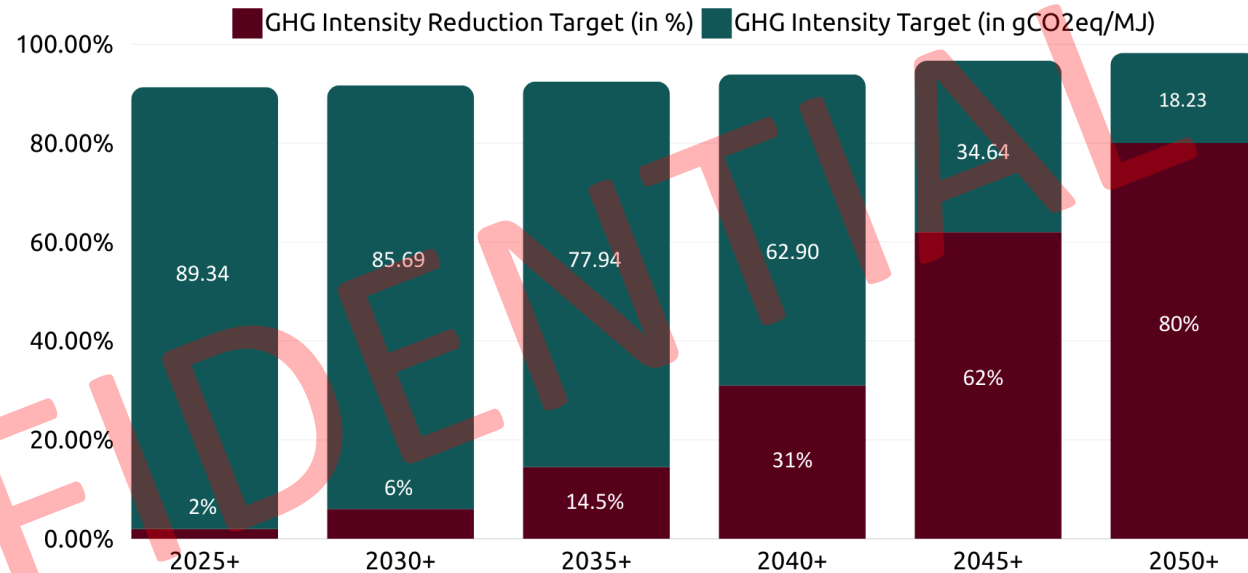
FuelEU Maritime: Scope and Application



Disclaimer: Illustrative note: Exact Scope is EU27 + 3 European Economic Areas + Outermost Regions (Azores, Canary Islands, French Guiana, Guadeloupe, La Réunion, Madeira, Martinique, Mayotte, and Saint Martin)

FuelEU Maritime: Scope and Application

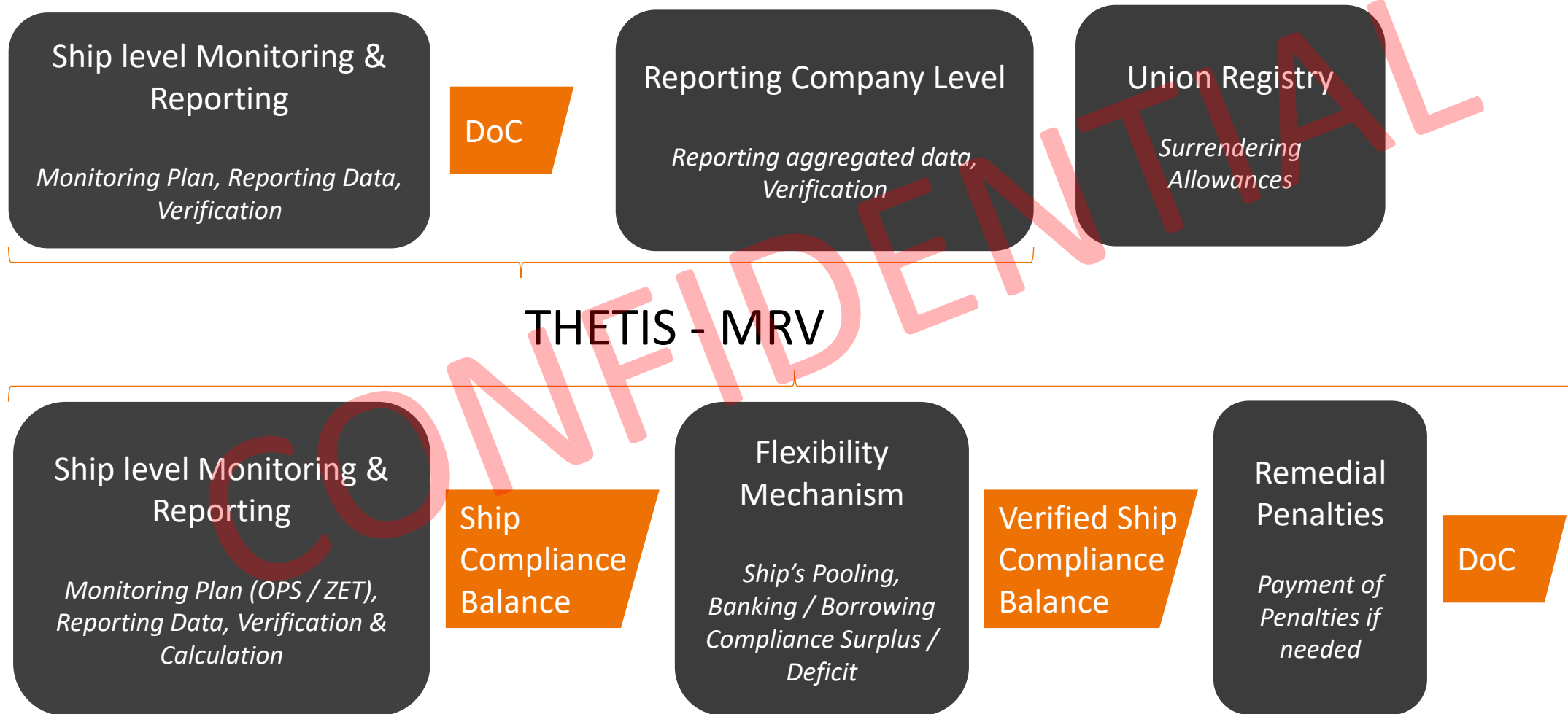
From 2025, FuelEU Maritime will include ships of 5,000 GT and above calling EU Ports, regardless of their flag.



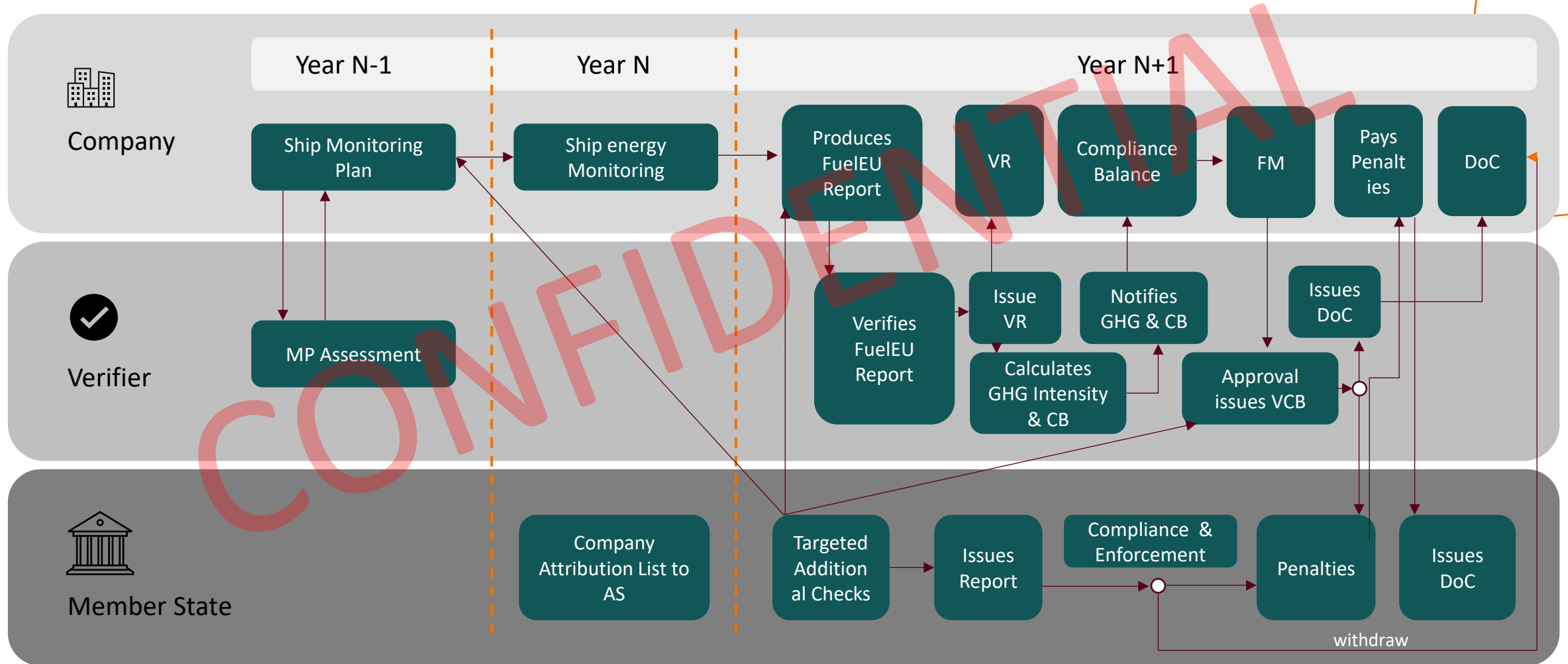
FuelEU Maritime: Timeline

Date	Action
31 August 2024	Submit Monitoring Plan to Verifier
1 January 2025	Start monitoring according to the approved monitoring plan
31 January 2026	Submit FuelEU report to verifier
31 March 2026 and each year onwards	Verify and record the composition of the compliance pool in the FuelEU database, ensuring proper allocation of total pooled compliance to each participating vessel
30 April 2026 and each year onwards	Document any advance compliance surplus and submit formal notification in the FuelEU database of the intention to include the vessel in a compliance pool
30 June 2026 and each year onwards	Payment of possible remedial penalties to Administering Authority and issue of DoC (Verifier to issue DoC in case no remedial penalties)

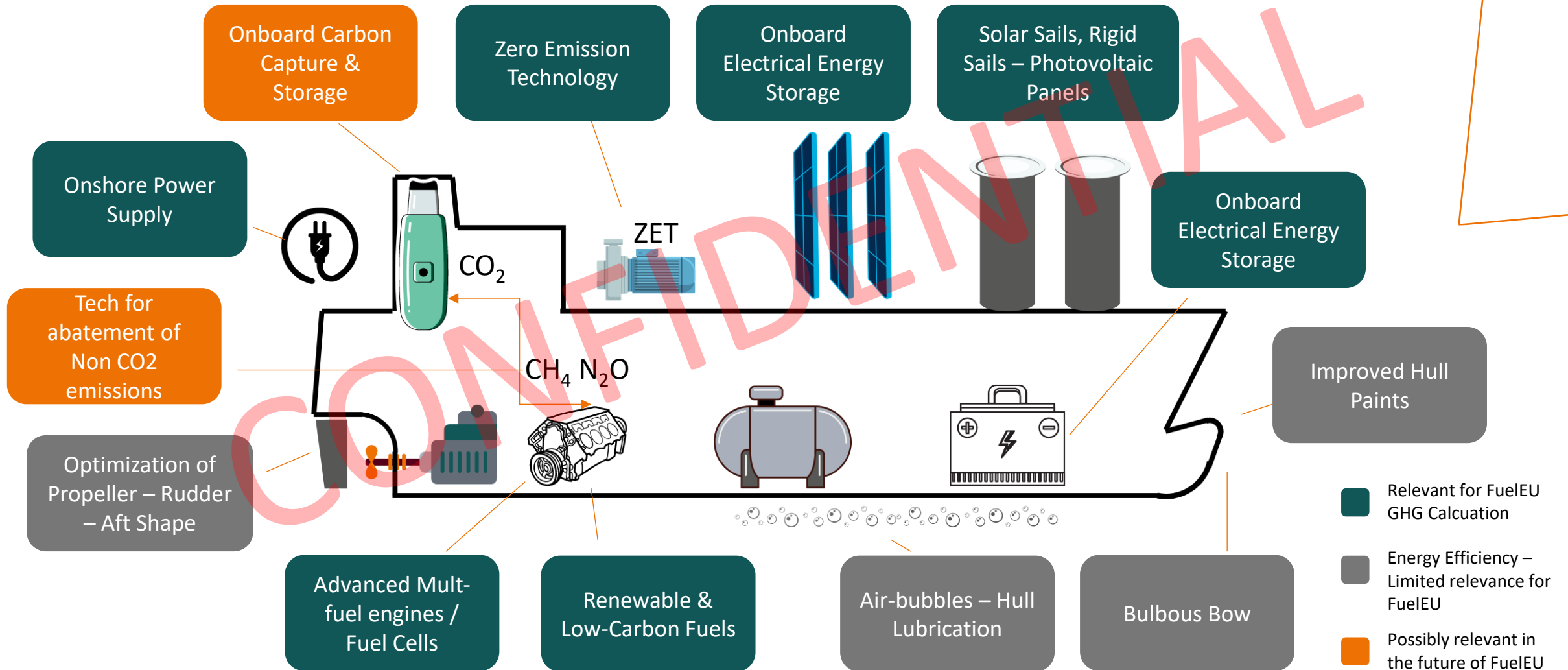
EU MRV / EU ETS & FuelEU Maritime



FuelEU Compliance Process



FuelEU Maritime: Zero Emission Technology



FuelEU Maritime: Wind assisted propulsion

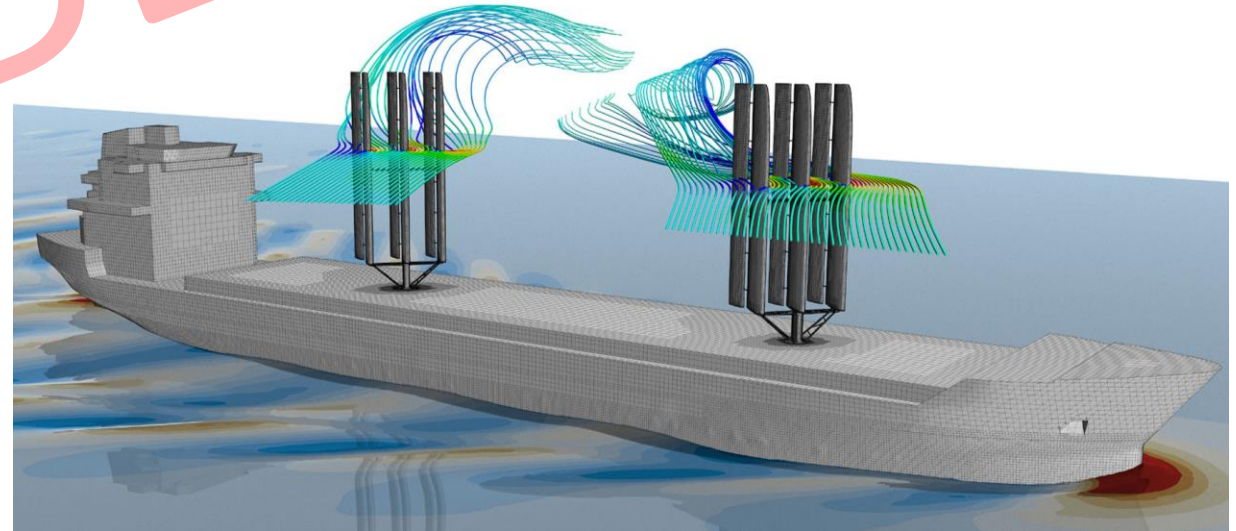
Wind assisted Propulsion is incentivized through a reward factor given in function of installed Wind Power

$$\text{GHG intensity (gCO2e/MJ)} = f_{\text{wind}} \times (\text{WtT} + \text{TtW})$$

P_{wind} : available effective power of the wind assisted propulsion systems.

P_{prop} : propulsion power of the ship

Reward factor (f_{wind})	$P_{\text{wind}} / P_{\text{prop}}$
0.99	0.05
0.97	0.1
0.95	≥ 0.15



FuelEU Maritime: RFNBOs

RFNBOs: RFNBO multiplier of 2 in RWD_i from 2025-2033

Commission will monitor, calculate and publish annually, on the basis of data recorded in the FuelEU database, the share of RFNBO

If RFNBO share in the maritime fuel mix is greater than 1% in 2031, no subtarget

If RFNBO share in the maritime fuel mix is less than 1% in 2031, RFNBO subtarget of 2% will kick in from 2034

FuelEU Maritime: Port Calls - OPS

Onshore Power Supply (OPS) Requirements applies to container & pax ships (>5000 GT)

- When securely moored at berth (ships at anchorage not covered)
- From 1st Jan. 2030: Mandatory in all AFIR ports (all non-AFIR with OPS from 2035)
- Voluntary opt-in option available for Member States for ships at anchorage

Exemptions for

1. Short stays (< 2 hours)
2. Unscheduled port call due to safety
3. Use of Zero Emission Technology
4. Unavailable OPS connection in port
5. Incompatible equipment in port
6. In case of risk to grid stability
7. During emergency
8. When requested by authorities for the purposes of maintenance inspection.

Limit on exemptions 4,5,6 from 1 January 2035, 10% of the port call or to maximum 10 port calls during the reporting period whichever is lower

OPS Penalty = € 1.5 × Total Electrical Power Demand × Total number of hours



FuelEU Maritime: Monitoring Plan

New Sections in the FuelEU Monitoring Plan

- B.4 OPS: Equipment for on-shore power supply
- B.5 Zero-emission Technology: For ships not using OPS
- B.6 Electrical Power Demand: At berth
- B.7 Wind Assisted Propulsion (WASP): Description and usage
- B.8 Updating Procedures: For fuel consumers, OPS, ZET, and WASP
- B.9 Emission Factors: Monitoring and reporting
- C1.6 Monitoring OPS Energy: Procedures
- C1.7 Monitoring ZET Energy: Procedures
- C1.8 Fuel Consumption in Ice: Procedures
- C3.3 Ice Conditions: Entry/exit recording
- C3.4 Time at Sea and Berth: Recording procedures
- D.2,4,5 Fuel Consumption: OPS, ZET, ICE, Time at Sea/Berth
- E.5 Internal Reviews: FuelEU Maritime Data control activities



FuelEU Maritime Penalties

1. Non-Compliance with GHG Intensity Requirements:

Applicability: Penalties are enforced starting 1 January 2025.

Requirement: Companies must adhere to limits on the yearly average GHG intensity of energy used onboard ships.



2. Non-Compliance with RFNBO Subtarget:

Objective: Encourage the use of Renewable Fuels of Non-Biological Origin (RFNBO) in the maritime sector.

Target: 2% RFNBO implementation by 1 January 2034, subject to monitoring results showing less than 1% usage by 2031.

Incentive: From 1 January 2025 to 31 December 2033, energy from RFNBO is counted as double in GHG intensity calculations (reward factor of 2).



3. Non-Compliance with Onshore Power Supply (OPS) Requirements:

Scope: Applies to containerships and passenger ships, with potential extension to other vessel types by Member States.

Implementation Date: Effective from 1 January 2030.

Requirement: Ships must connect to Onshore Power Supply (OPS) infrastructure when berthed at equipped ports.

Exceptions: Penalties may not apply if the OPS infrastructure is unavailable or incompatible with the ship's systems.



FuelEU Maritime Penalty Formulas

Aspect	Equation
Penalty	$= \frac{GHG_{Target} - GHG_{Actual}}{GHG_{Actual}} \times Energy_{per\ fuel\ type} \times \frac{2400 \left[\frac{\text{€}}{VLSFO\ mT_{eq}} \right]}{41000 \left[MJ\ VLSFO\ mT_{eq} \right]}$
Penalty (RFNBO)	$= \frac{CB_{RFNBO}}{41,000} \times P_d$
OPS Penalty	$\text{€ } 1.5 \times \text{Total Electrical Power Demand} \times \text{Total number of hours}$
GHG Intensity $\left[\frac{gCO_{2eq}}{MJ} \right]$	$= f_{wind} \times (W_t T + T_t W)$
$W_t T$	$= \frac{\sum_i^{n\ fuel} M_i \times CO_{2eq\ WtT,i} \times LCV_i + \sum_k^c E_k \times CO_{2eq\ electricity,k}}{\sum_i^{n\ fuel} M_i \times LCV_i \times RWD_i + \sum_k^c E_k}$
$T_t W$	$\frac{\sum_i^{n\ fuel} \sum_j^{m\ engine} M_{i,j} \times \left[\left(1 - \frac{1}{100} C_{slip\ j} \right) \times (CO_{2eq\ TtW,i,j}) + \left(\frac{1}{100} C_{slip\ j} \times CO_{2eq\ TtW,slip,i,j} \right) \right]}{\sum_i^{n\ fuel} M_i \times LCV_i \times RWD_i + \sum_k^c E_k}$
f_{wind}	$= \frac{P_{wind}}{P_{prop}}$

FuelEU Maritime Penalty Example

For the Reporting Period **2025**, Let us take an example of a containership with **100% voyages inside the EU**, consuming **13,700 MT HFO** and **1,600 MT MDO** per annum for understanding the **potential penalties** for FuelEU Maritime.

$$GHG\ Intensity \left[\frac{gCO_{2eq}}{MJ} \right] = f_{wind} \times (W_tT + T_tW)$$

$$W_tT = \frac{\sum_i^{n\ fuel} M_i \times CO_{2eq\ WtT,i} \times LCV_i + \sum_k^c E_k \times CO_{2eq\ electricity,k}}{\sum_i^{n\ fuel} M_i \times LCV_i \times RWD_i + \sum_k^c E_k}$$

$$\frac{13,700,000,000 \times 13.500 \times 0.0405 + 1,600,000,000 \times 14.400 \times 0.0427}{13,700,000,000 \times 0.0405 \times 1.0 + 1,600,000,000 \times 0.0427 \times 1.0} = 13.59$$

$$T_tW = \frac{\sum_i^{n\ fuel} \sum_j^{m\ engine} M_{i,j} \times \left[\left(1 - \frac{1}{100} C_{slip\ j} \right) \times (CO_{2eq\ TtW,i,j}) + \left(\frac{1}{100} C_{slip\ j} \times CO_{2eq\ TtW,slip,i,j} \right) \right]}{\sum_i^{n\ fuel} M_i \times LCV_i \times RWD_i + \sum_k^c E_k}$$

$$\frac{13,700,000,000 \times 3.163 + 1,600,000,000 \times 3.255}{13,700,000,000 \times 0.0405 \times 1.0 + 1,600,000,000 \times 0.0427 \times 1.0} = 77.89$$

GWP _{CO2}	1
GWP _{CH4}	28
GWP _{N2O}	265

Main			Aux		
Fuel Type	HFO		Fuel Type	MDO	
Fuel Consumption	13,700	MT per year	Fuel Consumption	1,600	MT per year
Well-to Tank			Well-to Tank		
CO _{2eq}	13.500	gCO _{2eq} /MJ	CO _{2eq}	14.400	gCO _{2eq} /MJ
LCV	0.0405	MJ/gFuel	LCV	0.0427	MJ/gFuel
RWD	1.0		RWD	1.0	

Main			Aux		
Fuel Type	HFO		Fuel Type	MDO	
Fuel Consumption	13,700	MT per year	Fuel Consumption	1,600	MT per year
CO _{2eq} WtT	13.500	gCO _{2eq} /MJ	CO _{2eq} WtT	14.400	gCO _{2eq} /MJ
LCV	0.0405	MJ/gFuel	LCV	0.0427	MJ/gFuel
Tank to Wake			Tank to Wake		
CO _{2eq} TtW	3.163	gCO _{2eq} /gFuel	CO _{2eq} TtW	3.255	gCO _{2eq} /gFuel
Cf (CO ₂)	3.1140	gCO ₂ /gFuel	Cf (CO ₂)	3.2060	gCO ₂ /gFuel
Cf (CH ₄)	0.00005	gCH ₄ /gFuel	Cf (CH ₄)	0.00005	gCH ₄ /gFuel
Cf (N ₂ O)	0.00018	gN ₂ O/gFuel	Cf (N ₂ O)	0.00018	gN ₂ O/gFuel

FuelEU Maritime Penalty Example

$$\begin{aligned}
 \text{Penalty} &= \frac{GHG_{\text{Target}} - GHG_{\text{Actual}}}{GHG_{\text{Actual}}} \times \text{Energy}_{\text{per fuel type}} \times \frac{2400 \left[\frac{\text{€}}{\text{VLSFO mT}_{\text{eq}}} \right]}{41000 \left[\text{MJ VLSFO mT}_{\text{eq}} \right]} \\
 &= \left| \frac{89.34 - 91.49}{91.49} \right| \times (13,700,000,000 \times 0.0405 + 1,600,000,000 \times 0.0427) \times \frac{2400}{41,000} = \text{€ } 860,439
 \end{aligned}$$

$$\text{Compliance balance [gCO}_{2\text{eq}}] = (GHGIE_{\text{Target}} - GHGIE_{\text{Actual}}) \times \sum_i^{n_{\text{fuel}}} M_i \times LCV_i + \sum_k^c E_k$$

$$= (89.34 - 91.49) \times 13,700,000,000 \times 0.0405 + 16,00,000,000 \times 0.0427 = - 1,344,899,344$$

OPS Penalty = € 1.5 × Total Electrical Power Demand × Total number of hours
(Starting 1 January 2030 for Container & passenger ships)

$$\text{OPS Penalty} = \text{€ } 1.5 \times 500 \text{ kW} \times 30 \text{ h} = \text{€}22,500$$

Flexibility Mechanism: Pooling

Ships may form compliance pools, aggregating their balances to achieve individual vessel compliance, irrespective of ownership across multiple companies.

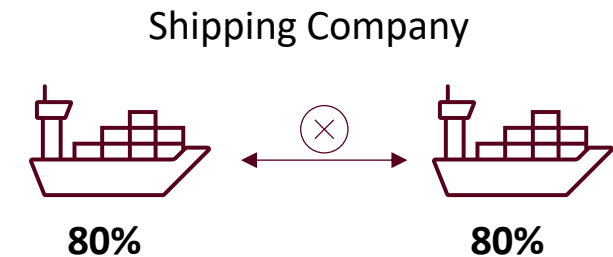
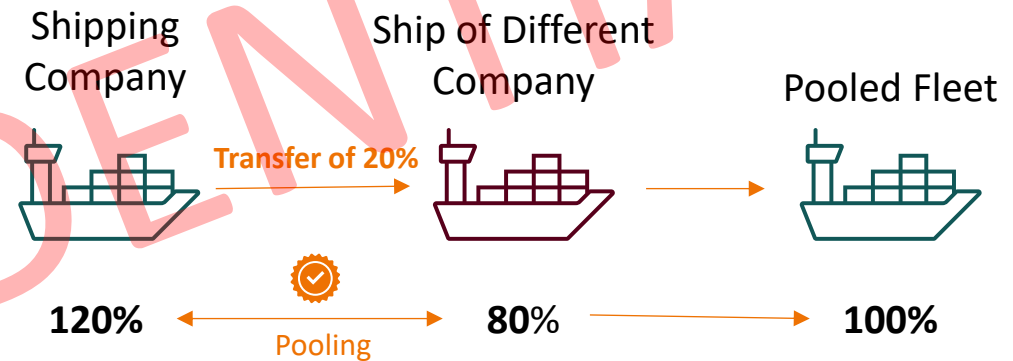
Total pooled compliance is **positive**

The ship which has a compliance deficit is compliant after the allocation of the pooled compliance

The ship which had a compliance surplus does not have a compliance deficit after the allocation of the pooled compliance

Total pooled compliance **have to be positive** (100% for two ships)

A ship which had a compliance deficit cannot have a higher compliance deficit after allocation of the pooled compliance



Treatment of Blends in Biofuel

Energy Contribution: Renewable and low-carbon fuels can contribute up to 50% of the energy used during international voyages, as per FuelEU Article 10.

Regulatory Scope: Energy contribution is subject to limits set by FuelEU Maritime Article 2(1)(d).

Applicability: Covers voyages to/from EU outermost regions (Article 2(4)).

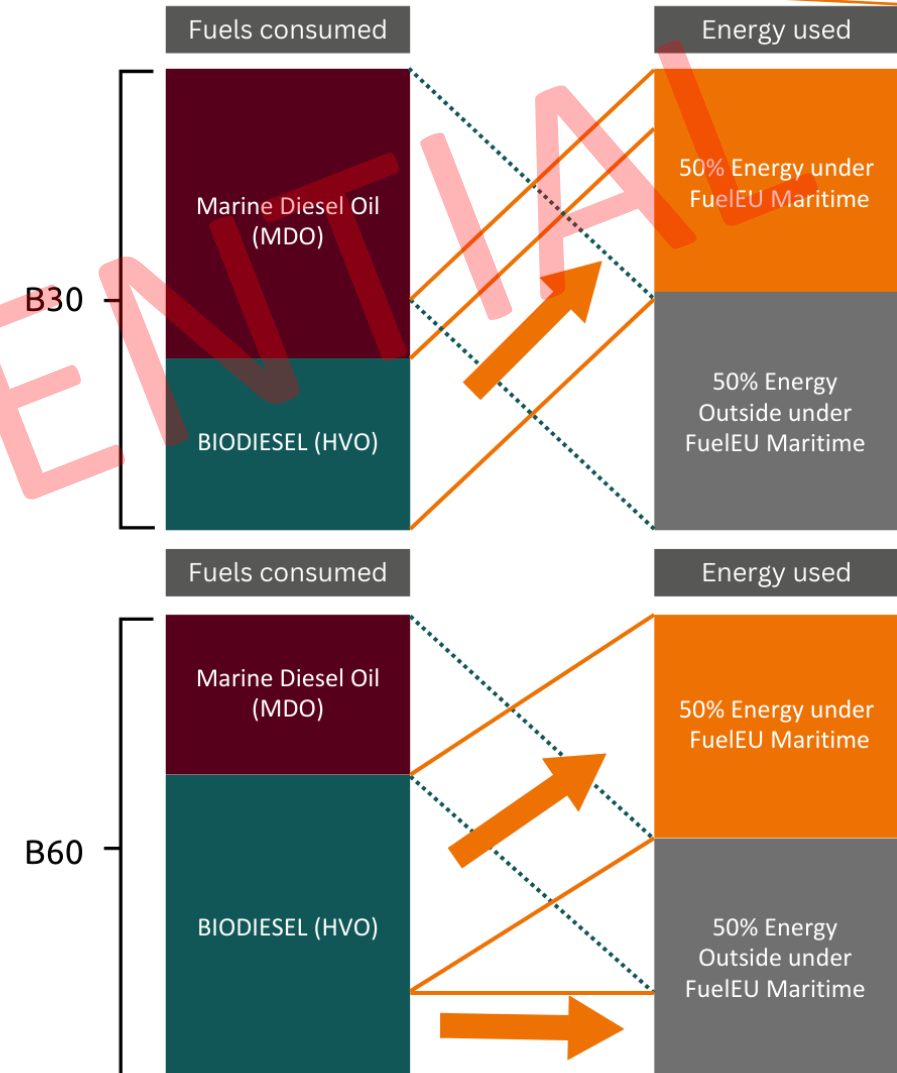
Reporting: Energy usage is reported per voyage; GHG intensity is calculated annually based on total energy used.

Examples:

B30 (30% biodiesel): Entire biodiesel fraction contributes to the energy used.

B60 (60% biodiesel): Part of the biodiesel fraction contributes, within regulatory energy limits.

Figure: Illustrate energy contributions for B30 and B60 use cases.



Emissions Dashboard Demo



Assessment Year:
Select Year

Operator:
ALL





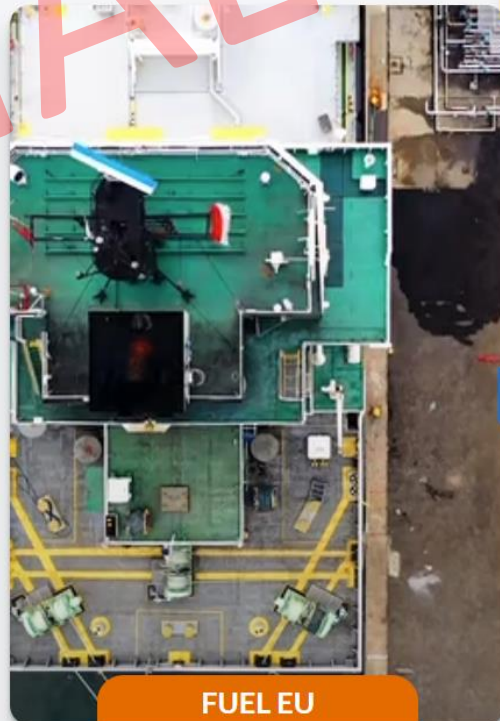
CII



Verification



EU ETS



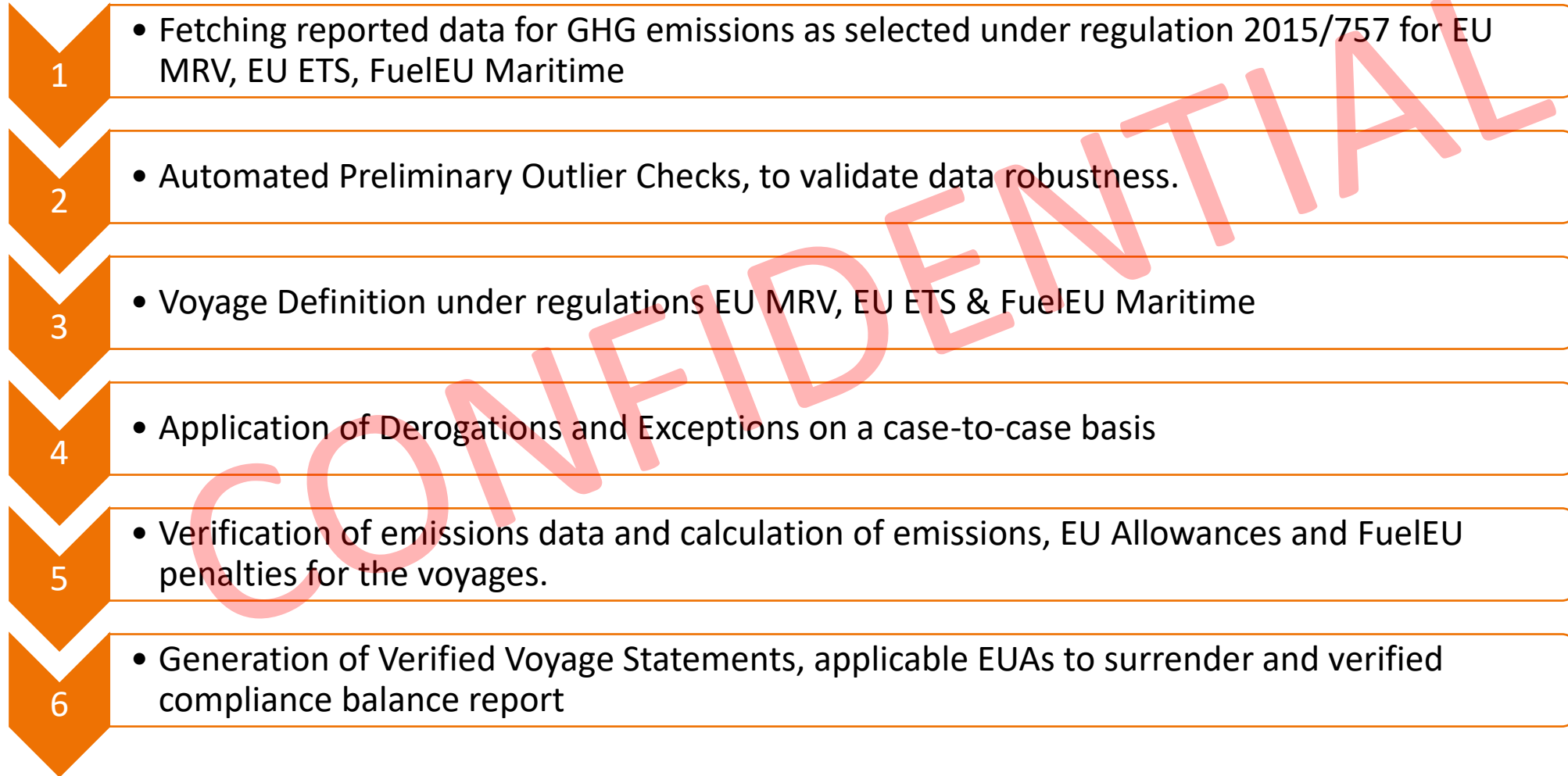
FUEL EU

Quiz Question

What is the minimum number of ships required to create a pool under the flexibility mechanism of FuelEU Maritime

- a) 1
- b) 2
- c) 10
- d) 50

Normec Verifavia Capability



FuelEU Maritime & EU ETS Training

To ensure compliance with the latest **FuelEU Maritime** and **EU ETS** regulations, it is imperative that your operations team is trained on upcoming regulations. Normec Verifavia will be conducting technical trainings in **October and November 2024** to cover:

1. **Compliance Requirements:** Thorough understanding of regulatory obligations.
2. **Voyage Definitions:** Detailed guidance on correctly defining and documenting voyages.
3. **GHG Emission Factors:** Understanding the calculation and application of GHG emission factors as required by the regulations.
4. **Technologies in Scope:** Overview of technologies included in the regulatory framework and their impact on compliance.



Submit your training requests for FuelEU Maritime & EU ETS by emailing us at:

contact.verifavia@normecgroup.com

Thank you

Contact Us at
contact.verifavia@normecgroup.com

Visit our website
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