Figures from Countdown newsletter
Energy efficiency and the IMO Net-Zero Framework

Countdown to IMO NZF
2026

Mærsk Mc-Kinney Møller Center
for Zero Carbon Shipping

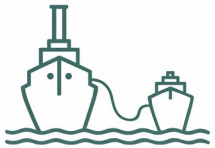
Four different drivers to reduce emissions from shipping

Fig 1

Energy efficiency

Energy input diversity

Different energy sources for the same demand

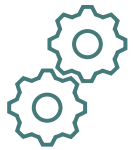


Examples

- Wind propulsion
- Direct electrification
- Biofuels

Improved energy conversion

More useful energy from the same energy input



Examples

- Waste heat recovery
- Shaft generator
- Engine maintenance
- Improved converters

Reduced energy demand

Less energy required for the same transport work

Examples

- Speed optimization
- Weather routing
- Hull retrofit
- Anti-fouling

Economy of scale

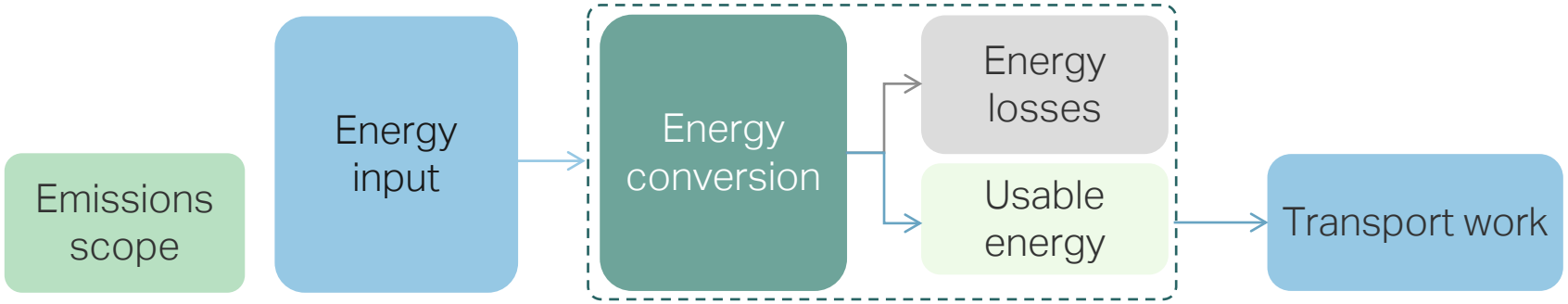
More transport work per unit of energy

Example

A single 15,000 TEU ship from Singapore to Rotterdam consumes less fuel per TEU than three 5,000 TEU ships

Comparing the GFS and CII: goals, emissions scope, and energy flow

Fig 2



GFS (IMO NZF)	Primary goal: Reduce the annual GHG intensity	*WTW*	*MJ of energy* $\frac{gCO_2e}{MJ}$	Assesses emissions per unit of **energy input,** irrespective of transport output
IMO CII	Primary goal: Reduce the annual carbon intensity	*WTW**	*Tonnes of fuel* $\frac{Tonne\ CO_2}{Tonne\ of\ fuel}$	Assesses emissions per unit of **both energy input and transport output** ⟷

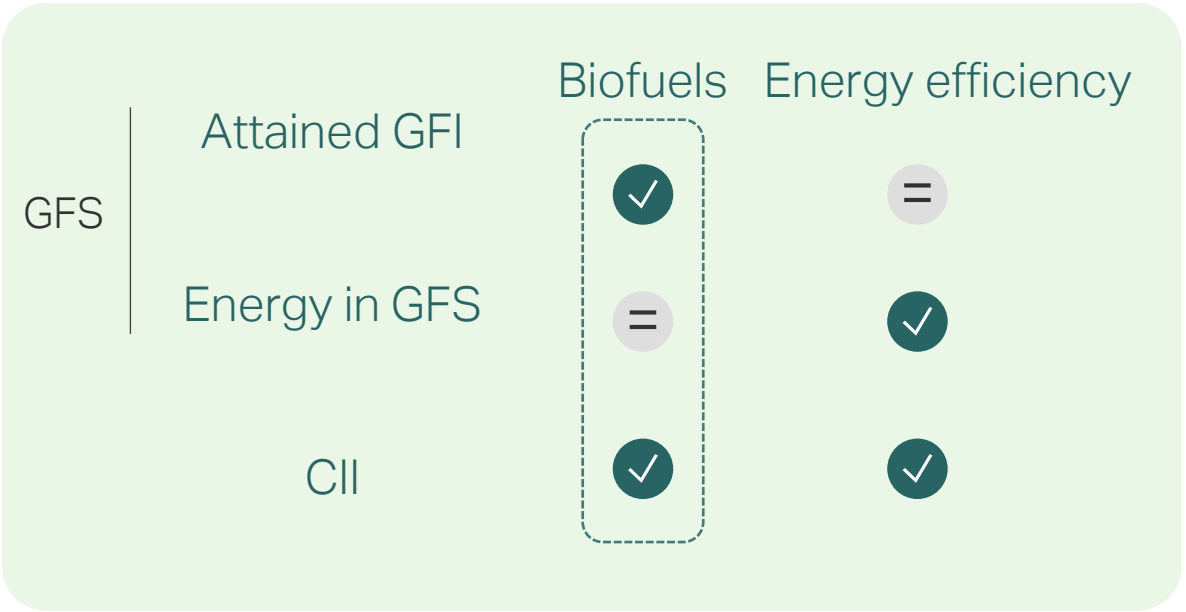
DWT.nm
GT.nm

*Only for biofuels. Since introduction of MEPC.1/Circ. 905

A change of metric can shift the CII and GFS from overlap to synergies

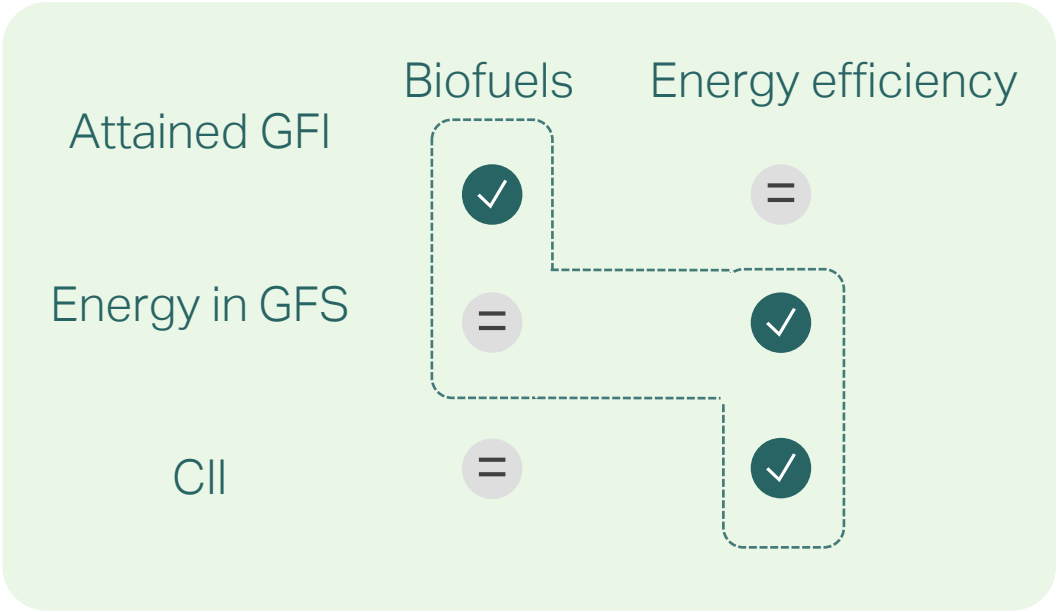
Fig 3

CII as-is *or* Option 3
WTW scope



One action (switch to biofuels) achieves dual compliance

CII with Options 1 or 2
Energy or TTW scope



Actions (fuel switch + energy efficiency) are complementary

✓ Improves compliance = Unchanged