

# Decarbonization Pathway to zero by or around 2050

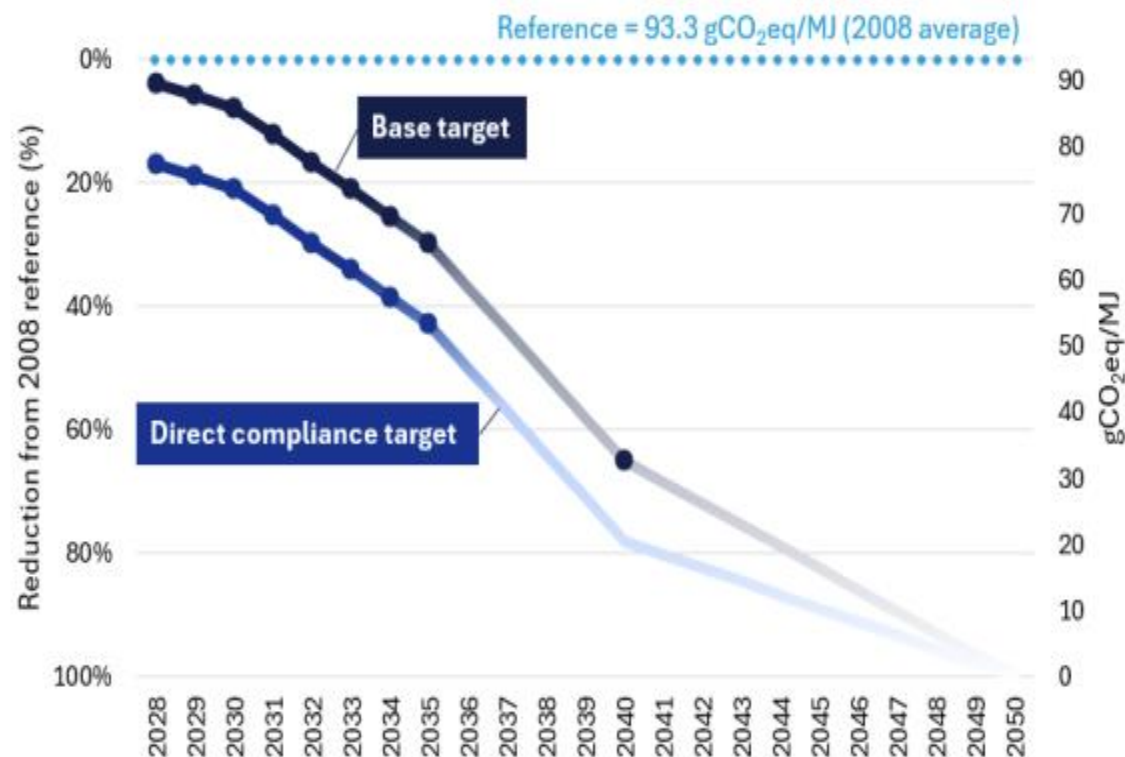
May 14, 2025  
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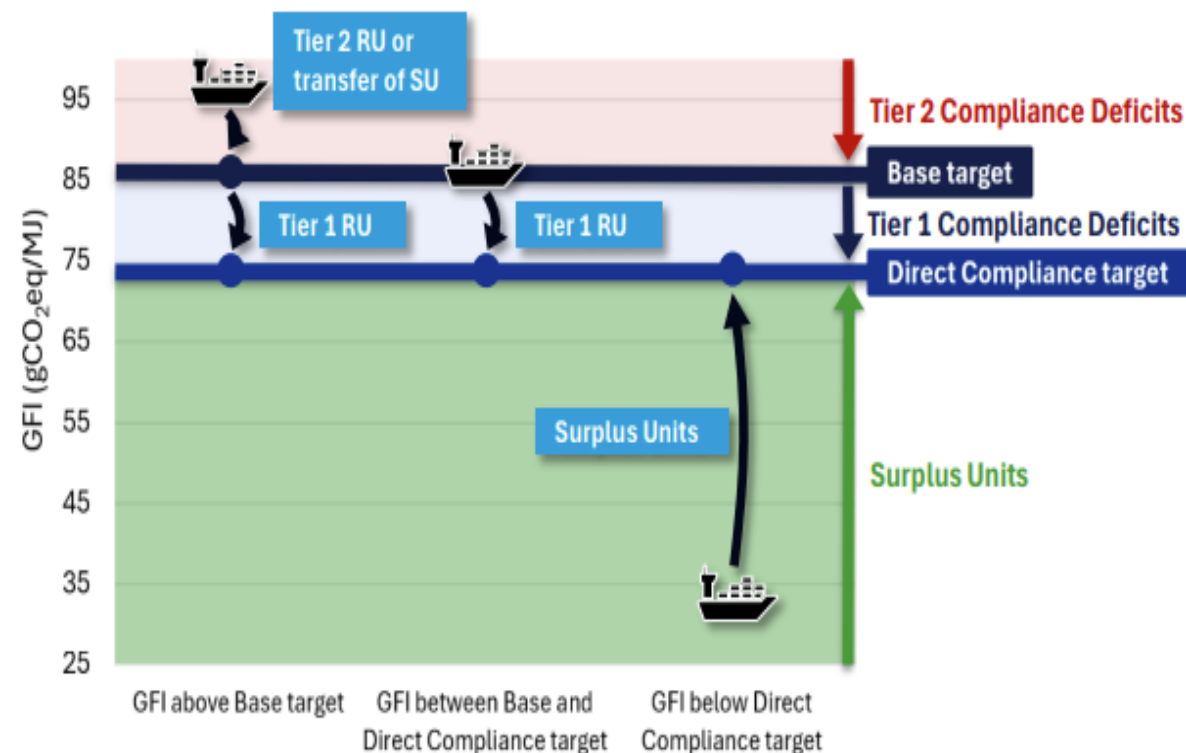
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GHG emissions per unit of energy used on board a ship

$$GFI_{attained} = \frac{\sum_{j=1}^J EI_j \times Energy_j}{Energy_{total}}$$



Year	2028	2029	2030	2031	2032	2033	2034	2035	...	2040
Base	4%	6%	8%	12.4%	16.8%	21.2%	25.6%	30%		65%
Direct	17%	19%	21%	25.4%	29.8%	34.2%	38.6%	43%		-



Initial prices on Remedial Units, 2028 to 2030:

- Tier 1 RU: US\$ 100 per tonne of CO<sub>2</sub>eq
- Tier 2 RU: US\$ 380 per tonne of CO<sub>2</sub>eq

To be reviewed and adjusted from 2031

# Use of IMO Net-Zero Fund

- The amount of annual revenue is expected to 10 to 15 Billion USD/year
- Part of the revenues are to be used as reward for use of ZNZs but not defined how much be given (to be determined by March 1, 2027)
- ZNZs which can receive reward is below **19 gCO<sub>2</sub>/MJ** (until end of 2034), then (from 2035) below **14 gCO<sub>2</sub>/MJ** (reviewed every 5 years)

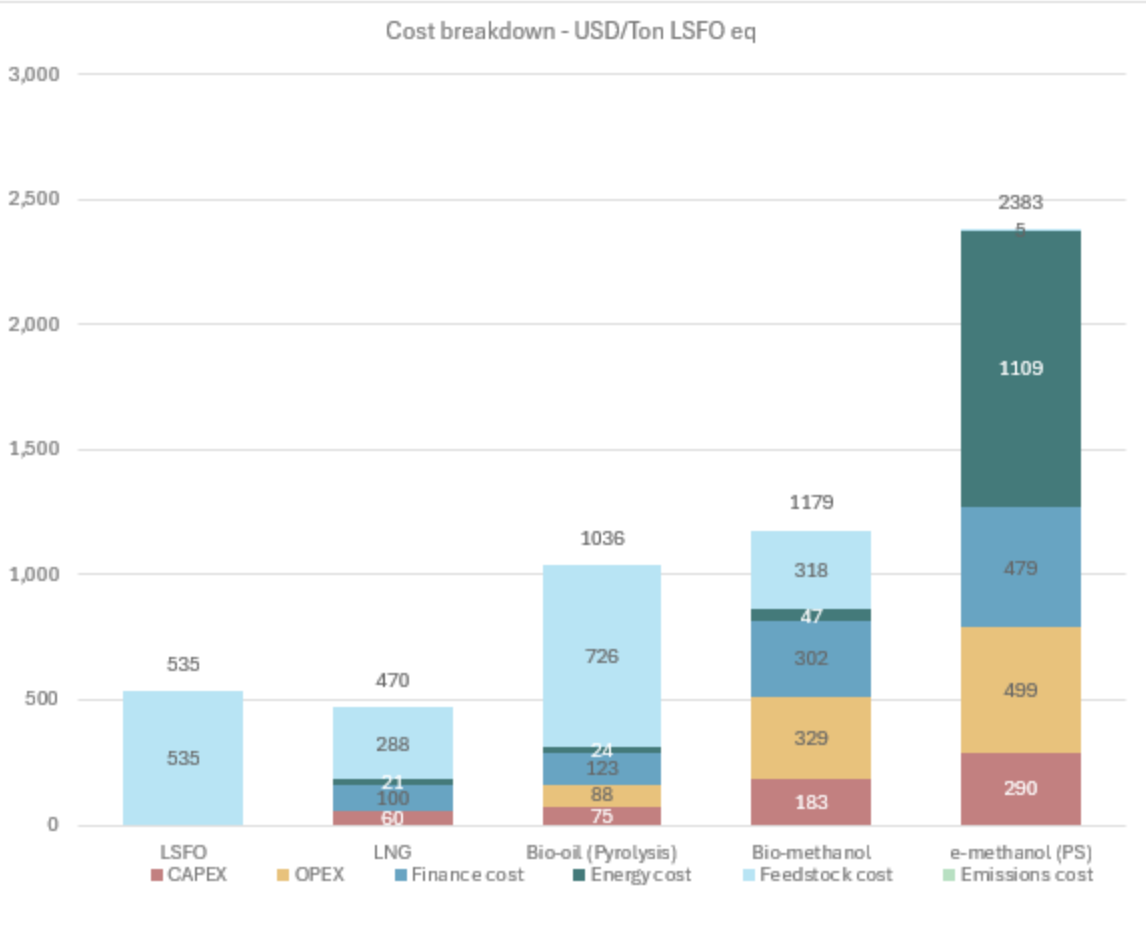
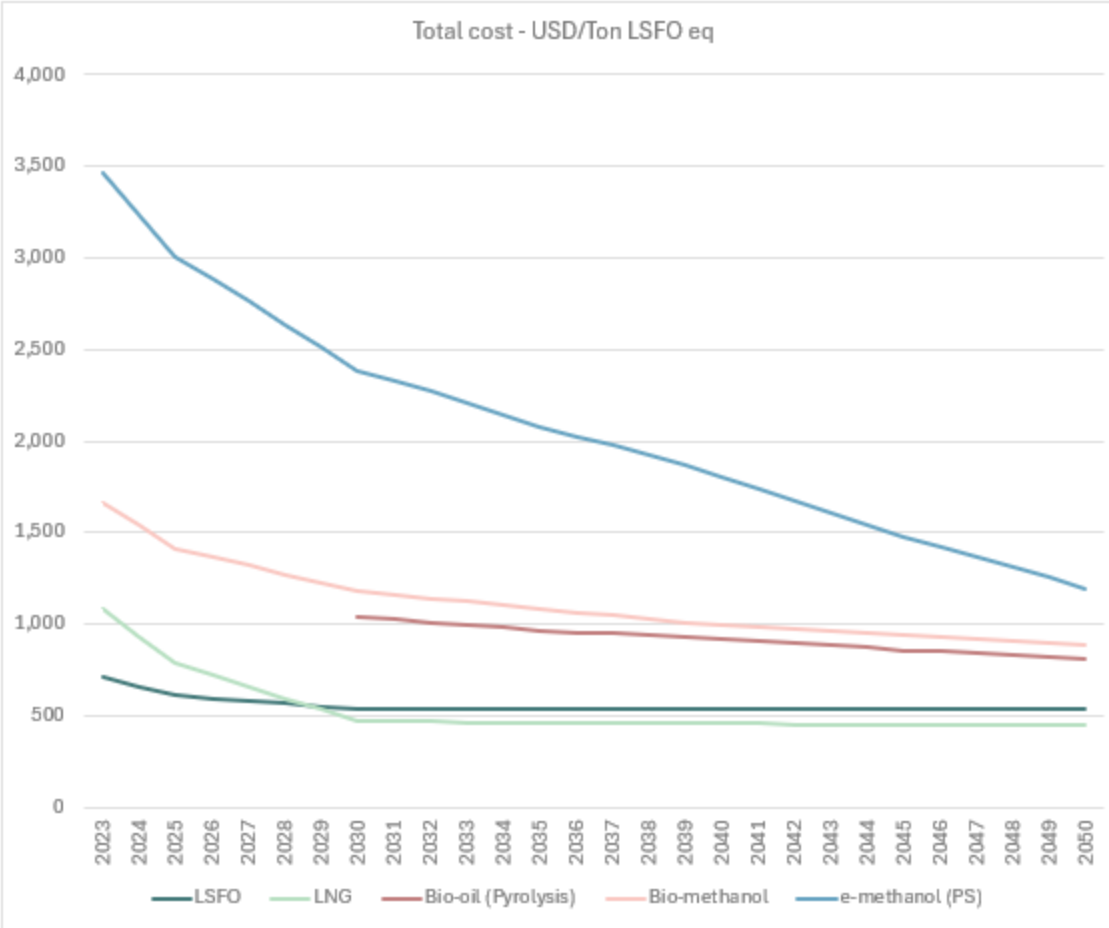
LSFO	94.2 gCO <sub>2</sub> /MJ
Bio Diesel	33 gCO <sub>2</sub> /MJ (IMO defined maximum value)
<b>Bio Diesel(UCO)</b>	<b>15 gCO<sub>2</sub>/MJ (Used Cooking Oil)</b>
Blue Ammonia	83 gCO <sub>2</sub> /MJ
<b>Green Ammonia</b>	<b>17 gCO<sub>2</sub>/MJ</b>
Blue Methanol	69.1 gCO <sub>2</sub> /MJ
<b>Bio Methanol</b>	<b>9 gCO<sub>2</sub>/MJ</b>
<b>Green Methanol</b>	<b>3 gCO<sub>2</sub>/MJ</b>

- Part of the revenues are to be used to support just and equitable transition of for SIDs and LDCs (related to maritime industry only?)

Region	Electricity cost	Emissions cost	Emissions scope	Cost unit	Year (for stacked bar chart)
Asia	Low	0	WTW	USD/Ton LSFO eq	2030

Comments:
Red cells can be changed

Fuel selector	Fuel 1	Fuel 2	Fuel 3	Fuel 4	Fuel 5
Fuel	LSFO	LNG	Bio-oil (Pyrolysis)	Bio-methanol	e-methanol (PS)

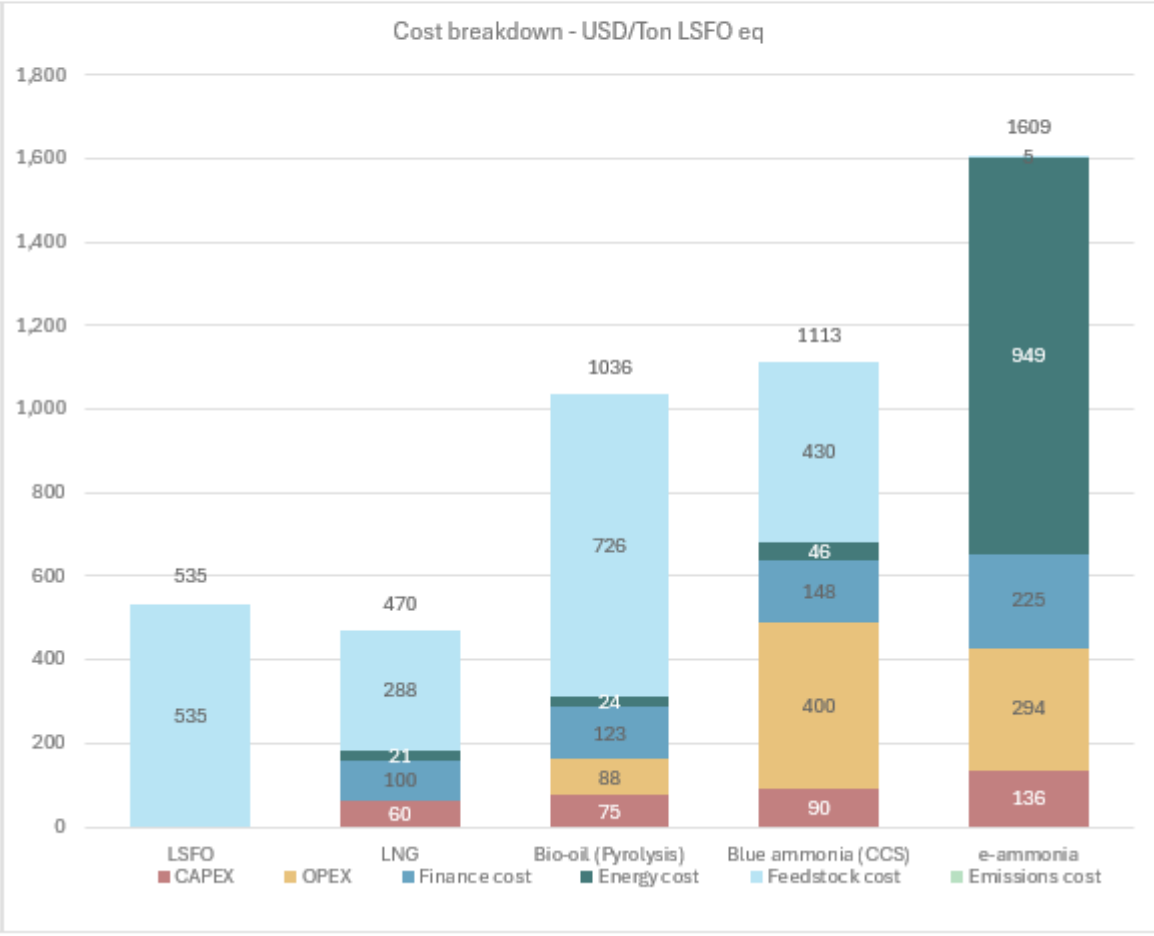
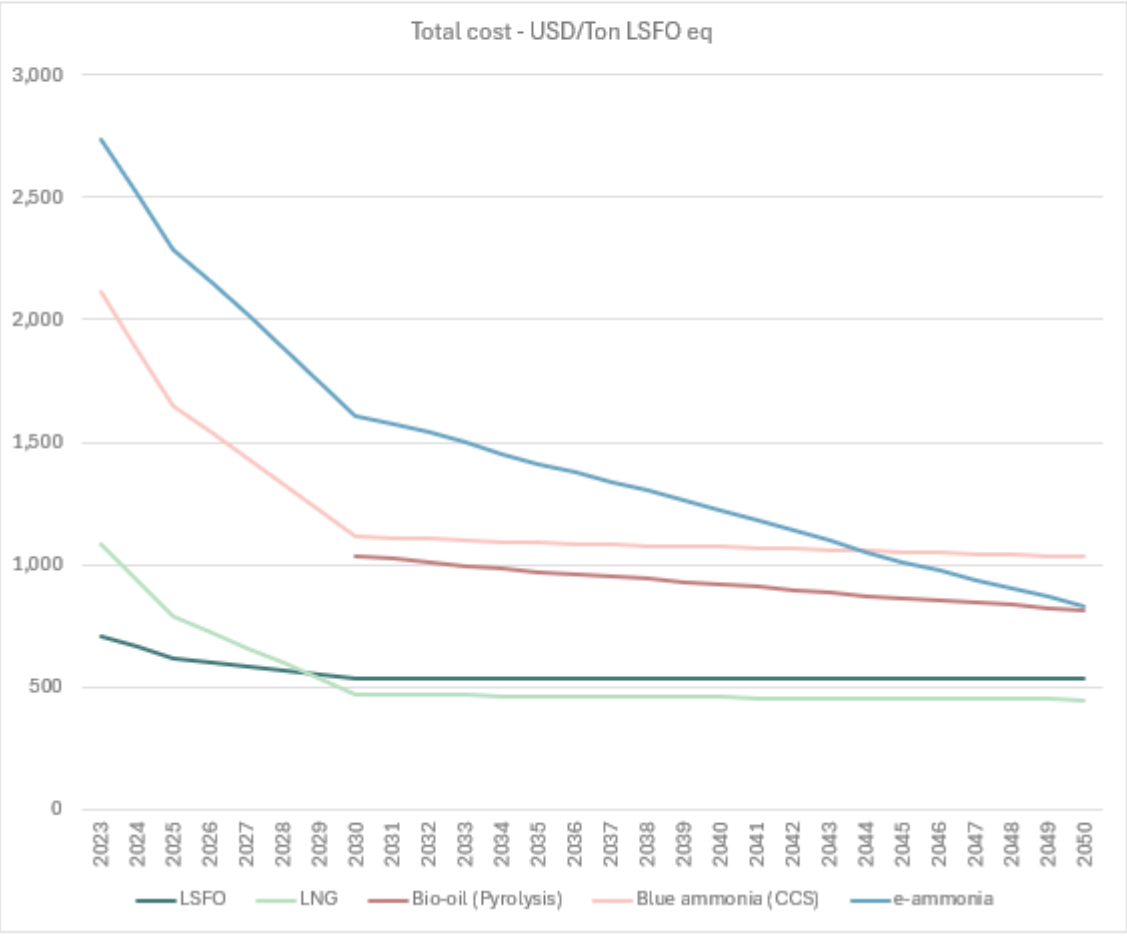


Source: fuel cost calculator v1.1 by MMMCZ

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Fuel	LSFO	LNG	Bio-oil (Pyrolysis)	Blue ammonia (CCS)	e-ammonia



Source: fuel cost calculator v1.1 by MMCZ

- Availability and cost of ZNZs for international shipping
- Could shipping demand encourage investment for fuel production? International shipping is just 3% of global GHG emission
- Limited capacity of ship building – dominant production capacity in China
- When break even point of using fossil fuel + penalty and zero emission ship + green fuel comes?
- Who will ultimately pay cost of decarbonization? Should IMO work as money collection and distribution mechanism for SIDs and LDCs? What is the role of UNFCCC?
- Ship owner and operator relationship. IMO regulation is for “a ship” but fuel is supplied by operator.
- Decision based on life cycle total cost of ships life (25years) including ships cost and fuel may encourage to build zero emission ships earlier, but usually time charter arrangement is not that long.



海に学び、人を紡ぎ、未来を織りなす



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SUSTAINABLE  
DEVELOPMENT  
GOALS



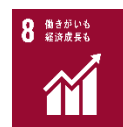
4 質の高い教育を  
みんなに



5 ジェンダー平等を  
実現しよう



7 エネルギーをみんなに  
そしてクリーンに



8 働きがいも  
経済成長も



9 産業と技術革新の  
基盤をつくろう



10 人や国の不平等  
をなくそう



11 住み続けられる  
まちづくりを



12 つくる責任  
つかう責任



13 気候変動に  
具体的な対策を



14 海の豊かさを  
守ろう



17 パートナリシップで  
目標を達成しよう

私たちは持続可能な開発目標（SDG s）を支援しています。

#### 免責事項

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