METHANOL INSTITUTE

UNLOCKING INVESTMENT FOR NET-ZERO SHIPPING

Reward Methodologies for Zero and Near-Zero Emission Solutions

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Introduction

The adoption and acceptance of the **Net Zero Framework will be a significant milestone for scaling GHG reduction pathways** and will provide **critical initial incentive**. At the same time, developing a robust zero and near zero (ZNZ) reward methodology will be vital to **unlock the investment needed for large-scale ZNZ capacity development and uptake by the global fleet**. The design of the reward methodology will have a great impact on the investability of the ZNZ value chain.

This paper proposes **two methodologies, a multiplier and a feebate**, that the Methanol Institute (MI) believes fulfil both the key requirements of the Organization for ZNZ reward methodologies, while also creating optimal ZNZ investment conditions.

The Net Zero Framework (NZF), as set out in the draft amendments to Chapter 5 of Annex VI of the MARPOL Convention featured in Circular Letter 5005, are viewed by MI as an opportunity to be grasped. Therefore, **MI is strongly in favour of the adoption of the NZF at MEPC ES.2** and regards it as vital to the achievement of IMO's goal for international shipping to reach net zero by or around, i.e. close to 2050 as per its 2023 Revised GHG strategy. Moreover, it will help provide the **regulatory certainty** that the entire value chain needs to **unlock and accelerate the investments** across the globe needed to reach net zero.

Zero and Near Zero (ZNZ) fuels, technologies and energy sources will be indispensable to the achievement of the net zero target. Therefore, increasing **ZNZ production scale and global availability is a prerequisite** to the achievement of IMO's climate targets.

Regulation 39.2 of the draft text of the NZF stipulates that vessels may receive Rewards for the ZNZs used and, Regulation 39.3 specifies that no later than 1 March 2027 and every five years thereafter the Committee shall define the reward and methodology to determine the reward. This paper offers considerations for the guidelines the Organization will develop on the ZNZ reward methodology.

Investability: The Key to Scaling ZNZ Deployment

The adoption and acceptance of the **Net Zero Framework will be a significant milestone for scaling GHG reduction** pathways and will provide **critical initial incentive**. At the same time, developing a **robust ZNZ reward methodology will be vital to unlock the investment** needed for global-scale ZNZ capacity development. An appropriately structured reward methodology is necessary to create **investment confidence** and must take into consideration the balanced needs of IMO stakeholders including ZNZ producers, ship operators, Member states, and the Organization's administrators.

Investment confidence is essential at all stages of the value chain. The uptake of ZNZs will require investment in new vessels and retrofitting of existing ones. However, MI underlines that such investments will only be successful if there is a corresponding level of investment in ZNZ production and global ZNZ distribution infrastructure. Also, investment confidence is as important for the ZNZ supply chain as it is for vessels. Therefore, while only ships may receive ZNZ rewards, the investment signal of an effective ZNZ reward methodology can create vital confidence for all parts of the ZNZ value chain.

Though the exact requirements for investment for each type and variety of ZNZ may vary, the level of investment required to bring any of them to global scale and availability should be anticipated to be similarly large.

The precursor to global scale ZNZ investment is confidence, specifically confidence that a production asset's business case is likely to remain viable over its many years of planning, construction and operation. That confidence, which is indispensable to project success, can be drawn from several elements, chief among which is a **regulatory framework that is stable and predictable over a longer term**. The further into the future there is clarity about the ZNZ reward methodology, the more it will enable supply of ZNZs to the maritime market at the lowest price. Conversely, the lack of long-term clarity is likely to result in higher cost ZNZs and many ZNZ projects not coming to fruition.

The following provide further detail on the importance of longer term ZNZ reward methodology clarity:

- A ZNZ production facility may require 1-2 years of development and engineering followed by 3-4 years of construction. During this time the facility will be pre-revenue, making clarity on the ZNZ reward methodology for the years after production commences all the more important.
- Long-term ZNZ offtake agreements can provide shipping companies with the supply certainty that can simplify fleet operations, as well as facilitating fleet renewal planning. For ZNZ producers long-term offtake agreements are often a critical element in securing investment for new production facilities. Such long-term agreements are more difficult to reach without corresponding long-term clarity on the ZNZ reward methodology.

In view of the foregoing, MI believes **clarity on the ZNZ reward methodology extending around ten years into the future would be consistent with securing confidence for ZNZ investment**.

Critical Success Factors for Effective ZNZ Rewards

Aspects of the ZNZ reward methodology of key importance to the Organization are considered to include the following:

A. **The ZNZ rewards methodology must be effective in incentivizing ZNZ uptake in a transparent and predictable manner across a range of GHG intensities** whilst avoiding unintended consequences. The upper bound of that range will be 19gCO2e/MJ, the ZNZ threshold for the initial period until 31 December 2034 and thereafter not greater than 14.0 gCO2eq/MJ, as per Regulation 39 of the NZF. A lower bound should be kept undefined as ZNZs with negative GHG intensities must be anticipated and included.

B. It is appreciated that **the solvency of the Net Zero Fund will be a primary concern** of the Member States, as will be the ability of the fund to **effectively reward both ZNZ usage and support for a Just and Equitable Transition (JET)**.

C. ZNZs shall include technologies, fuels and energy sources, which means a broad range of pathways that can contribute to reaching net zero should be anticipated. That points to the importance of the **ZNZ reward methodology being flexible and fair**; to be able to incentivize ZNZ usage on a technology neutral basis.

D. The **ZNZ reward methodology should be minimally burdensome** for the Organization, flag states, port states and shipping companies from an administrative perspective. Similarly, it is preferable for methodologies to require a minimum of disbursement transactions from the Net Zero Fund.

MI believes that all these objectives can be met through the correct design of the ZNZ reward methodology.

Investibility Tests for Evaluating Reward Methodologies

Many different methodologies for ZNZ Rewards have been discussed in the maritime community and MI has assessed many of them for investability. Considering investability is a prerequisite for delivering ZNZs at scale, it is MI's view that only ZNZ reward methodologies that meet the following tests can incentivize the level of ZNZ investment needed to ensure the targets of IMOs' GHG Strategy are reached:

A. The methodology must be structured in a way that **incentivizes the development and uptake of sustainable ZNZs that can meet the future energy demand of international shipping.** The cornerstone of the methodology is to make the production of ZNZs investible and bankable, thereby providing the long-term certainty that fuel producers, investors, and financial institutions need to commit capital at scale.

B. The methodology must **ensure ZNZ competitiveness with non-ZNZ alternatives**.

C. The methodology must **incentivize ZNZ investment from the earliest possible point**.
D. The methodologies must **provide a long-term known benefit**. As discussed in paragraph 8, the 'benefit longevity' must extend beyond the construction period of ZNZ production facility to cover contracted offtake tenors. This will create a framework for suppliers to deliver at a known discount over the period of scaling-up of ZNZ production (building additional plants), thus enabling future production at the lowest possible cost.

MI believes it may be preferable for the **ZNZ reward methodology to be self-actuating until at least the 2032** ZNZ reward definition. In other words, the methodology should deliver its benefits without requiring intervention from the organization, thereby avoiding the significant cash flow delays—potentially lasting several months— that would be associated with ZNZ reward disbursements from the Net Zero Fund. Such a cash flow delay may require external financing which could be infeasible for some shipping companies. In addition, this approach would provide the Organization with more time to establish the IMO Fund to support JET needs, evaluate the availability of funds for ZNZ rewards, and organise the practicalities of disbursements for that purpose.

Building on its extensive experience across the methanol value chain, MI proposes two ZNZ reward methodologies each of which can deliver on the above criteria and enable the large-scale deployment of ZNZ technologies, fuels and energy sources for shipping: 1) **a multiplier methodology**, and 2**) a feebate methodology**.

Multiplier Approach: Enhancing ZNZ Uptake and Investment

MI believes that a multiplier-based ZNZ reward methodology has the potential to both incentivize ZNZ usage and build investment confidence, thereby addressing the critical success factors and the investibility tests outlined in the two previous headings. Multipliers could be developed based either on the ZNZ energy used by a vessel or on the GHG emissions avoided through the use of ZNZs. The former approach is simpler; a factor MI considers to be a benefit in itself and is the focus of this paper.

The core of the multiplier ZNZ reward methodology is to **apply a multiplier to the energy represented by ZNZs in the denominator of the attained annual GFI equation** from Regulation 33.2 of the draft NZF such that:

$$GFI_{attained\_multiplier} = \frac{\sum_{j=1}^{J} EI_j \times Energy_j}{Energy_{total\_non-znz} + (C \times Energy_{total\_znz})}$$

Where:

$GFI_{attained\_multiplier}$ is the attained annual GFI of a ship in a given year after the multiplier for its use of ZNZs has been applied;

j is the fuel type;

J is the total number of fuels, including any ZNZ fuels, used during the reporting period, as reported to the IMO Ship Fuel Oil Consumption Database;

EI_j, expressed in gCO2eq/MJ, is the GHG intensity, expressed on a well-to-wake basis of a fuel type j, calculated taking into account the guidelines developed by the Organization;

$Energy_j$, expressed in MJ, refers to the energy consumption of fuel type j by the ship in the reporting period;

$Energy_{total\_non-znz}$, expressed in MJ, refers to the total amount of non-ZNZ energy used by the ship in the reporting period;

$Energy_{total\_znz}$, expressed in MJ, refers to the total amount of ZNZ energy used by the ship in the reporting period including but not limited to ZNZ fuels, electricity delivered from the shore power, and zero-emission energy sources, such as wind propulsion and solar power; and

C is the ZNZ multiplier to be determined by the Committee.

A multiplier-based reward methodology can create a compelling incentive for ZNZ usage by **increasing the compliance value of each unit of the ZNZ** by the multiplier chosen by the Committee. This **enhanced value can make ZNZs economically attractive thereby strengthening the investment case for new ZNZ production**.

The multiplier methodology is illustrated by the following example:

Consider a vessel consuming 9,500 tonnes of fuel oil equivalent in 2030 when the base GHG Fuel Intensity (GFI) target is 85.8 gCO2eq/MJ.

If the vessel consumes 9,000 tonnes VLSFO at 95.48gCO2eq/MJ and 1000 tonnes of ZNZ methanol at 10gCO2eq/MJ, its attained GHG fuel intensity, $GFI_{attained,}$ will be 91.00gCO2eq/MJ. If a multiplier of 3 is applied using the formula from paragraph 13, the $GFI_{attained\_multiplier}$ will be 82.37gCO2eq/MJ

In this example a multiplier of 3 will improve the vessel's GFI from a point that is considerably short of meeting the base GFI target to a point between the base GFI target and the direct compliance target (73.7 gCO2eq/MJ in 2030), thereby creating a significant incentive for ZNZ uptake.

The multiplier in such a reward methodology could be adjusted at specified intervals, such as annually, providing the Committee with a means to 'fine tune' the methodology to take account of the progression of annual GFI target reductions and the evolution of ZNZ uptake. At the same time, this structure would offer long-term clarity to support ZNZ investment planning. In such a case, a specific ZNZ reward multiplier could be set for each year within an initial period, tentatively ending no sooner than 31 December 2034 (when the ZNZ threshold changes), and preferably extending until 31 December 2037.

As per Regulation 39.3 of the NZF draft text, the Committee shall define the methodology to determine the ZNZ reward no later than 1 March 2027, and every five years thereafter. Therefore, the first review of the multiplier would take place no later than 1 March 2032 (1 March 2027 + 5 years) to apply for the period starting 1 January 2035 (or, preferably, from 1 January 2038).

If the Committee would **consider adjusting the multiplier on a periodic basis**, publishing a schedule of applicable multipliers by no later than 1 March 2027 for an initial period, preferably **covering 10 years**, would be a step toward meeting the longevity aspect in paragraph 10D.

A **grandfathering provision for the ZNZ reward multiplier** would provide a means to maximize the longevity test for ZNZ investments, especially in the initial years of the NZF. With a grandfathering provision, the **multiplier would be fixed for an extended period** under certain conditions. That would mitigate the risk of multiplier reduction eroding project economics by providing clarity on the multiplier's benefit over a longer term.

For example, a vessel could be granted the option to maintain, for an extended period, the ZNZ reward multiplier applicable on the date of signing a multi-year ZNZ supply agreement. The grandfathering period could correspond to the term of the agreement or cover up to 10 years of purchases of the ZNZ, whichever elapses sooner.

Feebate Approach: Driving Adoption Through Cost-Effective Incentives

MI believes that a 'Feebate' ZNZ reward methodology also has the potential to support investment confidence and incentivize ZNZ usage while maintaining the critical success factors.

The **functioning of the feebate ZNZ reward methodology** could be as follows:

A. **Each vessel's ZNZ reward is calculated annually, based on the total verified use of ZNZs and the reward rate** set by the Committee. The reward amount could reflect emissions reductions achieved relative to the baseline of 93.3gCO2eq/MJ; however, the feebate methodology is adaptable and can work with any method of calculating the reward amount.
B. **The verified ZNZ reward amount can be used to offset part of the vessel's Tier 1 fee obligations**. The reward is not paid out directly but deducted from the vessel's own Tier 1 compliance costs.
C. **If a vessel consumes such a substantial share of ZNZ fuels/technologies that it generates Surplus Units** and hence does not generate Tier 1 Remedial Units, the **ZNZ reward amount can be transferred to another vessel** and used to offset part of the Tier 1 fee obligations of that vessel. The **same principle would apply to vessels that generate Tier 1 Redial Units**, but whose ZNZ consumption would make them eligible for a reward amount that exceeds the Tier 1 fees to be paid by the vessel.
D. The Committee may consider **implementing a cap** such that vessels can only deduct up to [X]% (cap to be determined by the Committee) of their Tier 1 fees through the feebate methodology. This measure would help ensure the replenishment of the Net Zero Fund for JET purposes.
E. Because the feebate reduces fees owed, it **eliminates the need for external disbursement**. Vessels could apply the rebate in real time during the compliance cycle, avoiding delays.
F. If the verified reward amount exceeds the deductible limit, the **unused portion could be banked for future periods or forfeited**, depending on final regulatory design.
G. The first feebates could apply to Tier 1 fees due for the 2028 compliance year, providing vessels early visibility and time to plan.

The feebate methodology can be illustrated by two examples:

Consider a vessel consuming 20,000 tonnes of Fuel Oil Equivalent (FOe) energy in 2030. If the vessel consumes 95% VLSFO at 95.48gCO2eq/MJ and 5% ZNZ at 10gCO2eq/MJ, its attained GFI will be 91.21gCO2eq/MJ. Because the attained GFI of the vessel is above the Base GFI and Direct Compliance targets, the vessel must pay Tier 1 fees of 975 kUSD. The 5% ZNZ, or 1,000 tonnes FOe of ZNZ generates CO2eq reductions vs the GFI reference of ca. 3,349 tonnes. If the reward rate is 100 USD/tCO2eq, the vessel is eligible for a reward of ca. 335 kUSD. With the feebate model, the vessel would subtract that value from the Tier 1 fees due and only pay 995-335 = 660 k USD Tier 1 fees.

Because of the infrastructure and assets required for consuming ZNZ fuels, it would, in many cases, be more economically and operationally efficient to consume a large share of ZNZ on one vessel instead of a small share of ZNZ on many vessels. Therefore, consider a group of 10 vessels consuming 20,000 tonnes FOe each in 2030. 1 of the vessels consumes 100% ZNZ and the rest consume 100% VLSFO. The group of 9 VLSFO vessels are required to pay a Tier 1 fee of 975 kUSD each for a total of 8,775 kUSD. The vessel consuming 100% ZNZ fuels generates CO2eq savings of ca. 68,306 tonnes vs. the GFI reference. With a reward rate of 100 USD/tCO2eq, the ZNZ vessel is eligible for a reward of ca. 6,831 kUSD. In the feebate model, the ZNZ vessel could be permitted to transfer its reward to the 9 VLSFO vessels allowing them to deduct the reward from their total Tier 1 fees due, and hence instead pay 8,775 kUSD minus 6,831 kUSD, resulting in 1,944 kUSD. As noted above, the share of fees that can be deducted from the total Tier 1 fees due could be subject to a cap.

The rationale for using the feebate mechanism for Tier 1 is to **leverage the stability of the revenue from Tier 1 and to accelerate the uptake of ZNZ fuels**, without undermining the Fund's ability to plan. A feebate would "recycle" a ***part*** of the income from Tier 1 (depending on the cap determined by the Committee) back to those using the ZNZs. Because Tier 1 demand is relatively stable, **the inflow to the Fund remains highly predictable**. Consequently, the feebate amount can be calibrated to ensure the Fund's net predictable income stays within a safe planning margin – both for commitments to other/additional ZNZ rewards and JET funding. Limiting the feebate to Tier 1 fee reductions also ensures that all vessels remain incentivized to at least meet the GFI base targets, regardless of the use of ZNZs by some vessels.

The feebate reward methodology offers a number of advantages that make it both robust and effective. First, it **secures the solvency of the IMO Net Zero Fund**, as rewards are directly tied to the fees paid into the system. The approach is fully self-funded: companies receive rewards through deductions from their own Tier 1 fees, without requiring any cash transfers from the Fund itself. This design ensures high certainty, since companies gain advance visibility on the financial value of ZNZ rewards. It is also effective from day one of the NZF entering into force and provides bankability to fuel producers that can start investments immediately – allowing the reward methodology to contribute to the 2023 strategy target of reaching 5-10% ZNZs by 2030.

The methodology also **provides immediate cost relief**, as rebates are applied directly against fees owed, eliminating delays in realizing the benefit. By scaling rewards based on fuel type and technology, it supports the most impactful and scalable decarbonization pathway while allowing for differentiation and a level playing field among solutions.

The multiplier and feebate methodologies are not mutually exclusive and either could be combined with another supplementary reward methodology with funds from the paid Tier 2 fees and remaining Tier 1 fees paid by vessels not eligible to receive Tier 1 rebates.