Reverse Auction Mechanisms

Exploring their effectiveness | 23rd April 2026

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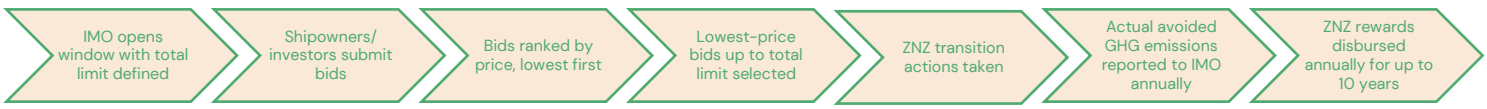
Introduction

It is widely acknowledged that reward mechanisms can accelerate energy transitions and make them more cost-effective, just and equitable.[1] IMarEST emphasises in documents ISWG-GHG 21/2/13 and ISWG-GHG 20/2/27 that the design of such mechanisms is decisive in determining the cost, cost-effectiveness, and therefore impact of the maritime transition on States. Reward mechanism design also significantly informs the development of different fuel pathways. Research and evidence from high- and low-income countries, as well as the IMO's Comprehensive Impact Assessment (CIA) (MEPC 82/INF.8/Add.1) demonstrate that a reverse auction reward mechanism with differentiation offers the best outcomes.

What is the Reverse Auction mechanism being considered for the NZF?

Under a reverse auction mechanism,[2] the IMO would open specific windows with a fixed cap setting the value of available funds, during which shipowners would bid for the exact reward rate that they would require in order to transition to/operate on Zero or Near-Zero fuels and technologies (ZNZs). Once each window closes, all eligible bids would be ranked in order of cost, starting with the lowest, until the value cap is reached. All lowest-cost bids up to the limit would be successful, and each successful bidder would be guaranteed rewards at the agreed rate for a specified number of years (e.g. 10). Rewards would then be received by the bidder annually, based on actual GHG avoided, up to the value specified in the bid.

Unlike an IMO-defined reward, this mechanism is prospective, meaning that shipowners could know the value of their reward before investment. However, unlike the IMO-defined reward, not all eligible applicants are guaranteed to receive rewards, and unsuccessful applicants receive no funds. They may however resubmit to subsequent windows.



[1] E.g. Calcaterra, M., Aleluia Reis, L., Fragkos, P. *et al.* Reducing the cost of capital to finance the energy transition in developing countries. *Nat Energy* **9**, 1241–1251 (2024). https://doi.org/10.1038/s41560-024-01606-7

[2] ISWG-GHG 21/2

Effectiveness and Cost-Effectiveness

The question of finance is at the core of many multilateral decisions. The maritime energy transition is no different: significant investment will be needed over the next decades to renew fleets, upgrade infrastructure, and support ZNZs to reach commercial viability. The proposed reverse-auction mechanism provides certainty for investors on the value of the reward they will receive in advance of capital expenditure, and the predetermined reward period of up to ten years reflects the long-term nature of such investments, creating a strong enabling environment to crowd in investment in all necessary areas of shipping decarbonisation. As many truly sustainable fuels of the future are new or emerging technologies, reverse auctions offer the advantage of obtaining responsive, but competitive, reward pricing from the market.[3]

Capping the total funds available for ZNZ rewards and selecting the lowest-cost bids firstly ensures that sufficient funds remain available for JET-related disbursements as per Regulation 39, and secondly encourages bidders to make their bids as cost-efficient and competitive as possible. Moreover, linking the rewards disbursed to actual tonnes of CO_2eq avoided offers a strong incentive for this ambition to be balanced with realism to avoid the "winner's curse",[4] and to achieve maximum real emissions reductions, leading to stronger transition outcomes.

Reverse auction reward mechanisms have shown success across different geographic contexts and levels of development as "the most cost-effective way of allocating a fixed amount of funds to a set of target technologies".[5] By way of example, 20 Sub-Saharan African countries have conducted reverse auctions for renewable energy projects, which have helped them achieve "record-low" prices for solar PV and wind.[6] The case study boxes below demonstrate the effectiveness of this approach in two distinct contexts.

South Africa

South Africa has a population of 54 million people, is Africa's second-largest economy and home to its largest power grid. However, most of this electricity is generated from coal and the grid is dominated by a single state-owned electricity company.

In 2011, South Africa launched its first Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) to facilitate competitive and private investment into utility-scale and grid-connected renewable energy generation. A total of 390 bids were received over four reverse auction bidding windows between 2011 and 2015. Of these, 92 were successful, totalling ZAR 193 billion (USD 20.5 billion) and 6,328 MW of power generation. The significant positive response to early bidding windows led to the MW allocation being increased for subsequent windows. The windows differentiated between renewable technologies.

Competition drastically reduced prices over the bidding windows with the cost of solar PV and wind in the final window dropping below average electricity price, and far below that of new coal power stations. The programme supported the National Development Plan's interim target of adding 7 GW of operational renewable energy generation capacity by 2020, and advances towards the long-term target of adding 17.8 GW from renewable energy by 2030.

Source: IRENA (2018) Renewable energy auctions: Cases from sub-Saharan Africa, International Renewable Energy Agency, Abu Dhabi.

[3] ISWG-GHG 20/2/27 (IMarEST)
[4] Ibid
[5] ISWG-GHG 21/2/13 (IMarEST)
[6] Africa Energy Portal: https://africa-energy-portal.org/reports/renewable-energy-auctions-cases-sub-saharan-africa

United Kingdom

The United Kingdom has a population of 70 million people and is the world's sixth largest economy.[7] Approximately half of its energy comes from renewables, with only 6% from fossil fuels, and the rest from biomass or nuclear.[8]

In 2025, the UK government launched AR7, the seventh round of reverse auction for offshore wind. Contracts were awarded to 12 projects across the country, up to a total added capacity of 8.4GW – a new record, and sufficient energy to power 12 million homes. These contracts unlocked £22 billion in private investment and created around 7,000 new green jobs.[9]

The results of this auction show that offshore wind is now cheaper to build and operate than new gas by some 40%, both lowering and stabilising electricity prices. It also supports the advancement of floating offshore wind, an emerging renewable technology.

Fuel Pathways

Across the range of fuel pathways under consideration in the LCA framework, there is a high degree of variation of current price, current market readiness/availability, long-term scalability, and sustainability. The pathways currently available commercially, and those with lower price points, are neither the most sustainable, nor have the highest potential for long-term scalability. A fixed-rate reward would exclusively benefit fuel pathways with the current lowest cost of marginal abatement.[10] A reverse auction with a long period of reward rate certainty and differentiation is the mechanism best able to support current least cost ZNZs as well as pathways which have a high current cost of marginal abatement and/or remain a distance away from commercial availability.[11]

Therefore, reverse auction mechanisms are more favourable to the development of long-run scalable ZNZs such as green hydrogen-derived fuels, wind and solar PV, and avoids the risk of locking in pathways such as biofuels which are currently high-availability, low-cost options that may meet the GFI thresholds, but are less sustainable or scalable in the long-term.[12]

What about Differentiation?

Differentiating between ZNZ types/fuel pathways is a separate question under discussion at the IMO. However, there are interactions with with reward mechanism design with respect to determining cost-efficiency. Research indicates that differentiation in conjunction with a reverse auction is the best mechanism to incentivise investment, accelerate development of long-term scalable ZNZs, and optimise the cost-efficiency of the maritime energy transition.

Conclusion

Reverse auction mechansims have benefits in accelerating cost-effective energy transitions, thereby reducing negative impacts on States, and in supporting the development of long-term scalable fuel pathways. Therefore, reverse auctions can be a key means to support the implementatin of the NZF and policy makers should consider this option.

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[7] Countries by gdp 2026 — World Rankings | WorldFacts

[8] National Grid Live – UK Electricity Generation & Carbon Intensity

[9] https://www.gov.uk/government/news/record-breaking-auction-for-offshore-wind-secured-to-take-back-control-of-britains-energy

[10] ISWG-GHG 21/2/13 (IMarEST)

[11] Ibid

[12] More information on different shipping fuels and technologies can be found at Alternative fuels - Opportunity Green