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Editorial: Opportunities and challenges of EU ETS to the global marine industry

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Editorial on the Research Topic
Opportunities and challenges of EU ETS to the global marine industry

Introduction

Greenhouse gas (GHG) pollution is a globally recognized challenge. The transition of GHG emission reduction from an initiative to a legally binding commitment can be traced back to the enactment of the Kyoto Protocol in 2005. Governments worldwide have successively adopted market-based measures (MBMs) as a framework for effectively addressing GHG emissions. The European Union's (EU) Emissions Trading System (EU ETS), centred on setting total emission limits and trading emission allowances, has expanded its coverage, increased auction shares and refined regulatory standards since its pilot operation in 2005, becoming the world's largest carbon emission trading market.

On May 16, 2023, the EU officially announced the legislative reform to include the shipping industry in the EU ETS, marking another significant step in the transportation sector following aviation in terms of greenhouse gas emission reduction. In particular, the shipping industry, heavily reliant on the combustion of fossil fuels, has faced considerable environmental criticism in recent years (Wang et al., 2023). The Fourth International Maritime Organization (IMO) Greenhouse Gas Study also highlighted this Research Topic. Therefore, the use of MBMs to regulate GHG emissions in the shipping industry was an inevitable outcome, and the EU's brunt will undoubtedly open up a new horizon in the global marine industry.

This Research Topic aimed to assist various maritime stakeholders and policymakers, including shipowners, shipping companies, port operators, and governmental bodies, in analyzing opportunities and challenges arising under the new circumstances. In total, five papers are included, discussing the influence of the EU ETS on the maritime industry from multiple perspectives.

GHG emission reduction policy for marine industry

The current carbon emission trading policies are primarily presented in the form of vessels within the ETS scope paying for their emissions by purchasing carbon allowances. Considering the principle of total quantity control in the EU ETS, rational allocation of quotas can address competitive differences amongst enterprises and mitigate the economic effect of carbon pricing on end consumers. Regarding this Research Topic, Hu et al. took into account the numerous stakeholders in maritime activities and delved into the carbon emission quota allocation problem using historical, baseline and hybrid methods based on the business proportion of shipping companies in EU routes. They also proposed fair allocation of the maritime carbon emission trading in accordance with the optimal allocation of the Pareto.

Most developing countries are still relatively unfamiliar with the operational rules of the carbon trading market, and aligning with the new structure of the maritime market after inclusion in the EU ETS is inseparable from the support of regulatory policies. Jiang et al. proposed a carbon emission calculation method based on emission factors using transportation time and costs to construct a generalized transportation utility function. They also employed a logit model to analyze the influence of subsidy policies on transportation, thus assessing the effect of government subsidies on carbon reduction.

Additionally, Wang et al. incorporated carbon emission factors into the accessibility measurement of port drayage systems to analyze the carbon emission characteristics of these systems. This model can be used for feasibility analysis and macro planning of port collection and distribution systems.

Freight market and predictive analysis

The emergence of carbon emission costs will undoubtedly increase the transportation costs for maritime operators, indicating an increase in freight prices. Accordingly, relevant forecasting technologies are needed to timely capture market trends and make corresponding strategic adjustments. Tu et al. utilized Deep Neural Networks (DNN), CatBoost regression models and robust regression models to create an analytical and predictive framework for forecasting the China Containerized Freight Index (CCFI), which objectively reflects China's shipping freight market. This technology has substantial practical value for the analysis of China's maritime market post-inclusion in the EU ETS.

Risk avoidance in the maritime carbon market

Although the regulation and maintenance of carbon trading markets have gained considerable experience in other industries due to some unique characteristics of the maritime market, conflicts and disputes (such as issues with who pays the carbon fees for ships and inconsistencies in review standards) may still arise. To address these potential legal disputes, Wang et al. suggested the incorporation of public purpose and exception clauses in the preamble of international investment agreements and including specific obligations of foreign investors and the regulatory powers of host countries at the drafting stage to avoid the potential risks of the new EU directive in global maritime disputes.

Summary and prospect

In conclusion, this Research Topic elucidated the opportunities and challenges in policy, economy and law brought about by the inclusion of the shipping industry in the EU ETS, providing a range of technical and theoretical support for addressing related issues. The following aspects are provided as issues of concern for the future:

1) Assessment of the EU ETS from a global perspective. Although the EU ETS is a regional system, its effects extend globally. Solely focusing on localized analysis is insufficient and cannot comprehensively evaluate its benefits for maritime shipping.
2) Reconsideration of the issue of shipping network design. Although the EU has strictly regulated the levy of carbon fees at transshipment ports within 300 nautical miles of domestic ports to prevent carbon leakage, improving the existing shipping network within the EU's charging scope could still potentially enhance shipping companies' profits, This possibility has also been mentioned in the study by Wang et al. (2021).
3) Conducting focused research on the feasibility of wind-assisted propulsion technologies. The EU ETS will significantly incentivize wind-assisted technologies (Cariou et al., 2021).Therefore, research on emission reduction technologies should be expanded, rather than being limited solely to the choice of speed or fuel.

Author contributions

XL: Writing – original draft, Investigation. SZ: Writing – original draft, Funding acquisition, Supervision, Writing – review & editing. XZ: Conceptualization, Formal Analysis, Writing – original draft. JC: Conceptualization, Formal Analysis, Investigation, Resources, Supervision, Writing – review & editing. LD: Data curation, Funding acquisition, Resources, Writing – review & editing.

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Conflict of interest

LD was employed by Guangzhou Port Group Co., Ltd.

The remaining authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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