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Maritime Trade Impacts of Carbon Prices

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International Chamber of Shipping (ICS)

- Global trade association for shipowners/operators
- Membership world's national shipowner associations from 40 countries
- Collective viewpoint of all sectors and trades, and over
 80% of global tonnage (set to increase when China joins)
- Represents global industry with all intergovernmental bodies that impact shipping, including IMO (since 1961)



Some initial background

- IMO has resumed work on a global economic measure (A.K.A. market-based measure) for GHG reduction by international shipping, with some kind of financial contribution by ships based on their CO2 emissions
- Discussions have resumed in earnest next round of IMO negotiations in December 2022
- ICS is leading shipping industry in these IMO negotiations
- But key issue for developing nations, whose support will be vital for an IMO agreement, is impacts on national economies of increasing fuel costs by adding mandatory contribution for CO2 emissions



Industry position on GHG (as represented by ICS)

- Net zero emissions by 2050 from international shipping
- This requires production/uptake of alternative fuels (ammonia, hydrogen, sustainable biofuels, synthetics, etc).
- ICS therefore supports of global economic measure to narrow the price gap and raise funds to expedite international shipping's transition, including developing countries, so new fuels are available in all ports worldwide
- Immediate goal at least 5% of energy used by shipping (equivalent to about 15 million tonnes of marine fuel per annum) to be produced from alternative fuels by 2030 – to reach 'take off' point to net zero by 2050

Agenda Today

- Initial Impact Assessment of various (levy) contribution quanta per tonne of CO2 emissions (produced with Clarksons Research)
 - Submitted by ICS to IMO April 2022 in support of ICS's original proposal for flat rate (levy) contribution system by ships, based on CO2 emitted
 - Document ICSW-GHG 12/3/8 (ICS) (included with IMSF slide deck)
- But debate has now moved on to development of global
 "Fund and Reward" system and identification of variables
 for calculating quantum of contribution by ships and
 'reward rate' for CO2 prevented by use of alternative fuels

IMO Measures for Existing Fleet – New ICS Guide – Available November 2022



Linternational Chamber of Shipping Shaping the Future of Shipping



ICS supports flat rate contribution per tonne of CO2 emitted as mechanism <u>all sectors can with</u>

- In 2021 ICS proposed flat rate contribution system to IMO and submitted detailed regulatory proposal, setting out collection mechanism, supported by detailed economic impact assessment prepared with Clarkson Research
- ICS has not suggested what quantum should be a political decision for IMO Member States
- Instead, ICS has suggested initial contribution rate should not be "disproportionately high" (not raising money for its own sake) until alternative fuels are widely available, but should be subject to 5 year "ratchet" following a review of Technology Readiness Levels and alternative fuel availability

Economic Impact Assessment for ICS (by Clarksons Research)

- Analysed impact on freight rates and price of delivered cargo of a range of "contribution quanta" equivalent to between USD 50 to USD 400 per tonne of fuel, looking at range of trades and voyages, eg:
 - Iron Ore Australia/China & Brazil/China
 - Crude Oil Mid East/China
 - Oil Products India/China & Singapore/Fiji
 - Perishable cargo (EC South America/Asia)

Then compared with bunker prices/volatility and freight rate changes/volatility over previous 10 years

Bunker Price Volatility: Longer-Term View

• HSFO fuel prices varied by c.US\$600/t over the last 10 years, and c.US\$200/t in the last year alone



Source: Clarksons Research. *HSFO = "High Sulphur Fuel Oil", bunker grade with a maximum 3.5% sulphur content. HSFO was the principal bunker fuel in the shipping industry prior to start 2020, but is now mainly consumed by merchant vessels equipped with SOx scrubber technology.

• Example Company Comp



Source: Clarksons Research. Estimated additional fuel cost due to carbon levy basis - standard vessel and voyage assumptions. Basis standard c.2010-built VLCC, consuming 67 tonnes of fuel per day at 12.5 knots laden, and 51 tonnes per day at 12 knots ballast. Figures include estimate for consumption in port and on ballast leg (round voyage assumed). Calculations basis 270,000t cargo from Ras Tanura to Ningbo. Freight rate data prior to August 2018 basis Ras Tanura-Chiba.

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Impact Example: Brazilian & Australian Iron Ore Estimated impact of levy equivalent to additional US\$1-\$24/t (Brazil-China) / US\$0.5-US\$8/t (Aus-China) Exports to China

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Australia-China (c.3,500 miles)

S A	Scenario	Est. Additional Fuel Cost (\$m)	Est. Cost Per Tonne Of Iron Ore Shipped (\$)
	1 (\$25/t CO2)	\$0.09m	\$0.5
	2 (\$50/t CO2)	\$0.18m	\$1.0
	3 (\$100/t CO2)	\$0.35m	\$2.0
	4 (\$200/t CO2)	\$0.70m	\$4.1
	5 (\$400/t CO2)	\$1.40m	\$8.2

Brazil-China (c.11,000 miles)

Scenario	Est. Additional Fuel Cost (\$m)	Est. Cost Per Tonne Of Iron Ore Shipped (\$)	Par VC
1 (\$25/t CO2)	\$0.27m	\$1.5	<u>کر ج</u>
2 (\$50/t CO2)	\$0.53m	\$3.0	
3 (\$100/t CO2)	\$1.1m	\$6.0	
4 (\$200/t CO2)	\$2.2m	\$12.0	
5 (\$400/t CO2)	\$4.3m	\$24.0	

Source: Clarksons Research. Estimated additional fuel cost due to carbon levy basis standard vessel and voyage assumptions. Basis standard c.2010-built Capesize bulkcarrier, consuming 43 tonnes of fuel per day at 12 knots ballast. Figures include estimate for consumption in port and on ballast leg (round voyage assumed on both routes). Calculations for Brazil-China basis 177,000t cargo from Tubarao to Qingdao, and for Australia-China basis 172,000t from Dampier to Qingdao.

Impact assessment for ICS – Summary Conclusion

Contribution up to about USD 100 tonne of CO2 (USD 314 tonne of fuel) would probably have "no disproportionately negative impacts" on economies of States, including developing countries and 'geographically remote' nations

However, development of an IMO economic measure is a politically sensitive issue for developing countries and linked to politics of climate change (CBDR-RC principle)

Before an IMO economic measure can be adopted, a comprehensive impact assessment will be required, probably conducted by likes of UNCTAD

Outcome of IMO negotiations so far

- Flat rate contribution many States say they prefer or could accept this (including some EU States)
- Cap and trade system (global ETS) like regional EU emissions trading system – but little support so far at IMO. Given strong opposition from non-EU States, little possibility of consensus support
- (China-led) Fund and Reward (F&R) proposal (and Japanese "feebate" variant). Seen as a means of minimising economic impacts on States
- China-led F&R proposal is significant because it's supported by several influential but 'conservative' States (e.g. Argentina, Brazil, South Africa, UAE)



ICS Board has decided to support concept of a Fund and Reward System in detailed a submission to the next round of IMO negotiations in December

The detailed ICS submission to IMO (made on 21 October) is included with slide deck.....



(Revised) Fund and Reward (F&R) system as suggested by ICS to IMO

- Contributions paid by ships based on annual CO2 emissions (as verified by IMO Fuel Oil Data Collection System)
- Contributions made to an "IMO Maritime Sustainability Fund (IMSF)" would have two main purposes:
 - Fund a Rewards Programme for ships for <u>CO2 prevented</u> by the use of "eligible alternative fuels" to **narrow** price gap and give signal to energy producers and shipping industry (to achieve 5% alternative energy target for 2030)
 - Funds for developing nations for in-sector use (alternative marine fuel production, bunkering infrastructure etc), plus R&D programmes

Rewards element addresses weakness of flat rate contribution only

- If contribution quantum is initially small it will not close price gap with alternative fuels (at least 2 or 3 or more times as expensive as Liquid Fuel Oil)
- But if contribution quantum alone is sufficient to close price gap (US\$3,000 per tonne of fuel?) the impact on trade would be politically unacceptable for most IMO States
- But rewards for CO2 emissions prevented is a way of *narrowing* price gap – to expedite production and use of alternative fuels, while making it possible to keep the contribution quantum (and trade impacts) relatively small

Discussions at ICSW-GHG 13 (5-9 Dec 2022)

- In June, IMO MEPC invited new proposals for combining elements of proposals already made, that could be developed into an economic measure under Phase III of the IMO Work Plan (in second half of 2023)
- On 21 October, ICS submitted a new proposal for a revised "Fund and Reward" (F&R) proposal
 - This combines elements of China's proposal for a rewards system, but only for ships which use eligible "alternative fuels" with ICS proposal for a flat rate contribution by ships

Most of money to be used to fund rewards, but some to help maritime GHG reduction measures in developing nations

Variables involved in setting Reward Rate for CO2 prevented by use of new fuels (to narrow price gap)

Objective is to balance need to collect **sufficient contributions** to meet main purpose of measure - to **provide rewards** for up to **5% of energy** used by shipping being generated by "eligible alternative fuels" in 2030, with **contribution quantum** that avoids **'disproportionately negative impacts on States'** i.e. initially not to high to be politically acceptable.

NB: "Energy" is referred to in the target as alternative fuels have different energy density to conventional fuel oil (e.g. for ammonia about 0.43 that of Diesel/Gas Oil)

Assuming annual fuel consumption by shipping of 300 million tonnes per annum, this would be equivalent to about **15 million tonnes** of "eligible alternative fuels" per annum in 2030

Reward Rate for CO2 emission prevented

- For a global regulation, it's not really possible to meaningfully estimate future cost of low/net zero fuels to work out level of reward needed to close price gap with conventional fuel oil
- ICS therefore proposes that Reward Rate for use of new fuels be linked to average global cost of conventional fuel oil over past 5 years – i.e. about USD 400 per tonne
- If the reward rate was linked to, say, 80% of the average 5 year price per tonne of fuel oil (i.e. USD 320) this would result with a Reward Rate of 100 USD per tonne of CO2 prevented, based on one tonne of fuel oil combusted being equivalent to 3.2 tonnes of CO2 emitted.

Calculating the annual Reward for ships using eligible alternative fuels

If the reward rate was set at USD100 per tone of CO2 prevented, a ship combusting 10,000 tonnes of ammonia per year might receive a reward of about USD1.38 million (after account is taken for the lower energy density of the fuel)

10,000 (tonnes of ammonia used) X 3.2 (tonnes of CO2 prevented compared to use of conventional fuel) X USD100 (reward rate) X 0.43 (energy density) = USD 1.38 million

Identifying variables that lead to calculation of the contribution quantum per tonne of CO2 emitted

- ICS takes no view (within reason) on the quantum of contribution to be made by ships to the IMO Fund
- However, total contributions raised annually must be sufficient to fund the purpose of the economic measure:
 - Obligations of IMO to fund Reward Rate agreed for energy producers and shipping companies which invest in new fuels, as Reward Rate would be set by an IMO regulation
 - Other uses of funds collected, like support for developing nations and R&D

Identifying the variables of F&R system

- A 2030 "alternative energy target" is needed to establish total annual funds from contributions required from ships
- If target is e.g. 5% of energy from new fuels (equivalent to 15 million tonnes per year) and Reward Rate is set at e.g. USD100 per tonne of CO2 prevented, then this would require about USD5 billion per year to be funded
- If similar amount is required to fund other purposes of the measure (e.g. support in developing nations) then total amount required would be USD10 billion a year

Based on **250 million tonnes** of fuel oil being subject to payment of contributions annually, this would require a contribution of about **USD 40 per tonne of fuel** or about **USD 12 per tonne of CO2 emitted**

Variables for designing global F&R system

- A Total annual funding required to meet obligations of IMSF (total annual funding required for rewards programme plus funding for other agreed purposes) which would depend on:
 - .1 The percentage alternative energy goal agreed for 2030 e.g. 5%;
 - .2 The different types of alternative fuels that were determined to be eligible for rewards;
 - .3 The agreed minimum percentage of total annual contributions to IMSF that are allocated for the funding of rewards;
 - .4 The agreed minimum percentage of total annual contributions to IMSF that are allocated for all purposes other than rewards;

Variables for designing global F&R system (2)

And **the Reward Rate** for CO₂ emissions prevented using "eligible alternative fuels" which **will depend on:**

- .1 The average global price of conventional fuel in five years preceding the adoption of the measure;
 - .2 The agreed percentage of this five year average global price on which the reward rate will be based; and
- .3 Agreed estimates of the minimum annual total fuel consumption of ships, during the first five years of implementation, to which mandatory contributions are applicable.

Conclusions

- Design of global economic measure to help shipping reach net zero is complex (many moving parts)
- But by identifying the variables (and then reducing them) governments can have clearer idea of the final contribution quantum (and trade impacts) so they are be able to move forward quickly with their complex negotiation
- With political will a global economic measure to expedite take-up of new fuels could be in place by 2024.



