WORLD SHIPPING COUNCIL
PARTNERS IN TRADE

MLIT

Ministry of Land, Infrastructure, Transport and Tourism

Design and Implementation of the Vessel Efficiency Incentive Scheme (EIS)

EXECUTIVE SUMMARY

The Vessel Efficiency Incentive Scheme or "EIS" is a proposal made by Japan and the World Shipping Council at the International Maritime Organization (IMO) to stimulate significant improvements in the carbon efficiency of the world's maritime fleet. The proposal would establish explicit efficiency standards for both new and existing ships in the world fleet. Vessel efficiency would be measured using the Energy Efficiency Design Index (EEDI) developed by the IMO.

New and existing ships meeting the specified standards would not be subject to any fees or costs other than those costs associated with the design and installation of more efficient ship technologies. Those ships that fall short of the specific standards would be required to pay a fee (or penalty) that is based on the amount of fuel consumed and how far short of the standard the specific ship falls. As such, the per-unit fee applied to each tonne of fuel is adjusted based on the relative efficiency of the vessel.

The EIS allows a ship to avoid recurring regulatory costs by meeting the standards established in the Convention. This feature is unique to the EIS proposal and is significant as it provides an option in the marketplace for cost avoidance that is not available in a system that would impose a uniform levy or tax on all ships and all fuel purchases (Danish et al. proposal) or in emissions trading proposals that require the purchase of emission credits. In those systems, the *ship may reduce its costs* by improved vessel efficiency or the use of selected technologies, but *it cannot fully avoid these costs* because those proposals would require on-going payments of capital over time as every tonne of fuel or CO_2 is taxed equally regardless of the vessel's efficiency.

Application of a uniform fuel levy or emissions trading scheme would result in a much larger increase in the cost of maritime transportation and world trade, because the primary focus of these proposals is revenue generation rather than a focus on maximizing improvements in the shipping sector itself. By focusing on accelerated improvements in fleet efficiency, the EIS proposal would reduce the actual carbon footprint of the industry, and serve the interests of society by increasing the energy efficiency of the industry that transports the majority of global commerce.

I. Background

Shipping's role in world trade and development

Maritime shipping is an essential facilitator of global trade. Less well known, but highly significant, is how advances in marine transport technology like containerization, vessel efficiency improvements, and inter-modal transportation development have greatly facilitated economic growth and the efficient movement of goods across the world. Modern shipping practices enable the developing world to participate in the world economy in a way that was inconceivable 60 years ago. As a result, the economic welfare of all nations has been enhanced, and ocean shipping provides the most carbon efficient form of transportation.

At the same time, there is a general recognition that carbon emissions from human activities is contributing to global climate change, and that these emissions should be reduced. Transportation produces roughly 27% of the world's CO2 emissions. [1] Roughly 21.3% comes from road transportation (trucks and cars), .5% comes from rail, and 3.3% comes from all marine transportation (2.7% comes from international maritime shipping and .6% from domestic shipping and fishing)[2]. Aviation produces roughly 1.9%, although its high altitude emissions are believed to have a more significant effect on climate.

The need for and challenges to formulating a global solution

An effective effort to address carbon emissions needs to be global in scope. Furthermore, many governments have recognized that the unique extra-territorial nature of international aviation and maritime transport requires international solutions to address each mode through the respective specialized international bodies -- the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO).

The IMO has invested considerable effort in the development of different technical and management mechanisms, such as the Energy Efficiency Design Index (EEDI), the Energy Efficiency Operational Indicator (EEOI), and the Shipboard Energy Efficiency Management Plan (SEEMP). Additionally, IMO Member States and consultative organizations have proposed a variety of more comprehensive market-based measures (MBMs) designed to further reduce greenhouse gas emissions. A number of proposals have been tabled before the IMO to date, but most of the market-based proposals fall into two broad categories.

The first category is the proposed use of a new international instrument to generate significant revenues from the maritime sector, either through a fuel tax or levy, or the auctioning of

[1] Second International Maritime Organization Green House Gases Study 2009

[2] Many stakeholders have argued that any market-based measure designed to address shipping emissions, and any revenues generated, should be consistent with the relative contribution that shipping makes when compared to total anthropogenic carbon emissions.

emission credits that would then finance the reduction of GHG emissions and other projects outside of the marine sector. Because these proposals would increase the cost of maritime transport's fuel costs, some residual improvement in vessel emissions is generally forecast on the economically logical grounds that the more expensive an economic input is, the greater the reason to use less of it. However, the primary emphasis of these proposals is not on reducing emissions from the maritime sector itself, but on the generation of revenues to finance climate-related projects outside the maritime sector.

The second category of proposed market-based measures are efficiency based proposals that focus on creating economic incentives that would explicitly drive improved efficiency and reduced emissions from within the maritime sector itself.

This paper focuses on describing the proposal submitted to the IMO by Japan and the World Shipping Council to establish a global Efficiency Incentive Scheme (EIS).

II. The Vessel Efficiency Incentive Scheme (EIS)

The Efficiency Incentive Scheme or EIS is a proposal made by Japan and the World Shipping Council to stimulate significant improvements in the fuel and carbon efficiency of the world's maritime fleet. The proposal recommends the establishment of explicit efficiency standards for both new and existing ships in the world fleet. Vessel efficiency would be measured using the Energy Efficiency Design Index (EEDI) developed by the IMO.

New and existing ships that meet the specified standards would not be subject to any fees, penalties or costs other than those costs associated with the design and installation of more efficient ship technologies. Those ships that fall short of the specific standards would be required to pay a fee (or penalty) that is based on the amount of fuel consumed and how far short of the standard the specific ship falls. As such, the per-unit fee applied per tonne of fuel is adjusted based on the relative efficiency of the vessel. New and existing ships meeting the specified standard would be fully exempt from any fees.

What is unique about EIS when compared to other market-based proposals?

- **EIS provides full, operational cost avoidance capability that serves as a powerful market incentive.**

  Many of the "market-based measures" under consideration by the IMO propose to impose additional, new costs on every tonne of fuel purchased or every tonne of CO_2 emitted. This approach would certainly raise the cost of transporting goods by water, as fuel costs are the most substantial operating cost of a ship; however, these proposals would have limited effect on the design and construction of better ships and would have only a limited effect on reducing carbon emissions from shipping. The EIS, in contrast, would allow a ship to fully avoid additional tonne-unit costs if it made the investments necessary to achieve the stipulated standards to be established in the Convention.

This feature is unique and highly significant in terms of the commercial market, because it provides an option for cost avoidance that is not available in a system that applies a uniform levy or tax to all ships and fuel purchases (Danish et al. proposal), or in emissions trading that requires the purchase of emission credits. In those systems, the ship may reduce its costs somewhat by improved vessel efficiency or the use of selected technologies, but it cannot avoid these costs, because those proposals would require significant payments of capital each year as every tonne of fuel or CO_2 would be taxed equally regardless of the vessel's efficiency.

The ability to fully avoid repetitive per-unit costs under the EIS proposal would drive significant environmental and efficiency improvements within the maritime fleet itself. These improvements would occur because ships would have a greater incentive to improve vessel efficiency and thereby reduce carbon emissions because they have the opportunity to fully avoid a per-unit operational cost that is unavoidable in many other market-based proposals.

Another difference that arises from the proposed EIS when compared to the uniform levy or carbon tax approach is the additional incentive created for shipyards and all ship owners to strive for the production of the most efficient ships. A tax uniformly applied to every tonne of fuel purchased raises the operating costs of the party paying for the ship's fuel. In the oil trades, that party will generally be the oil cargo interest chartering the ship. In liner shipping, that party will be the ocean carrier, who will in turn seek to recover those costs from the cargo shippers. But if the vessel owner is insulated from the effects of paying these higher costs, and if the cost is simply an added cost passed on to cargo interests and charterers, the result will be transportation price increases without adequate incentive to truly improve ship design and to reduce emissions from within the shipping sector.

Some ship owner interests, who charter their vessels out to others, understandably favor the uniform levy concept, because they would not have to pay the new charges levied, as these would be paid by the charterer. But the EIS system, in contrast, would give ship owners a more substantial stake in improving vessel efficiency and would lead to reduced operating costs for the ship. This effect becomes even more pronounced if fuel prices rise, as is expected in coming years. This in turn would create a much greater and much needed incentive for shipyards to design and produce more efficient ships.

- **EIS focuses on improved fleet efficiency and emissions reductions versus revenue generation.**

Under a uniform fuel levy or emissions trading scheme, a ship must pay considerable sums of money to an international fund, even if the vessel has been designed or modified to achieve maximum efficiency standards that would be considered state-of the art.

In contrast, the EIS envisions stretch goals that push higher and higher levels of efficiency across the fleet with a consequent reduction in CO_2 emissions. If a ship does all that is reasonably possible and represents the most carbon efficient form of transportation when

compared to its peers and other transportation modes, it should not incur an on-going financial penalty.

The emissions trading scheme and levy approaches result in an increase to the cost of transportation and world trade, because the primary focus of the proposals is revenue generation versus a focus on maximizing improvements in the shipping sector itself.

By focusing on defined improvements in fleet efficiency, the EIS proposal would reduce the actual carbon footprint of the industry, and serve the interests of society by increasing the energy efficiency of the industry that transports the majority of global commerce.

Does the EIS represent a progressive means for addressing greenhouse gas emissions from ships?

As governments and other organizations across the world struggle with the daunting challenges of moving to a less carbon dependent economy, it is important to recognize that each industry sector must ultimately find ways to significantly reduce its dependence on carbon-based fuels and in the shorter-term, to stimulate dramatic improvements in efficiency.

Adoption of an EIS for shipping across the world would advance clean transportation policy in both the developed and developing world, while offering a number of benefits that will be difficult to obtain otherwise. These include:

- Removal of known market barriers to the design and construction of more efficient vessels;

- An economic incentive for significant improvement in the existing fleet;

- A focus on in-sector reductions versus approaches that require the regulated community to finance projects to be undertaken in other sectors , which may or may not produce actual carbon emission reductions and which are extremely difficult to verify as actually producing reductions in global carbon emissions;

- Creation of what is arguably the most powerful market incentive under consideration at the IMO, because the EIS allows ship owners and operators to fully avoid per-unit operational costs;

- Allowing ship owners and operators to invest in the reduction of CO_2 while realizing a continuous return on investment through significantly lower operating costs; [3]

[3] This contrasts with the payment of per-unit carbon costs assessed against fuel or CO_2 emissions where these monies leave the sector with no "return" on the expenditure. Furthermore, under a fuel levy or ETS per-unit expenditures can be expected to be incurred indefinitely into the future. However, improvement of the fleet will be largely limited to the market price of fuel as the per-unit cost associated with an emissions trading scheme or a carbon tax constitutes too weak a price signal to significantly stimulate technology investment in the fleet.

- Accelerated improvement in the efficiency of the world fleet faster than would occur via systems that place uniform per-unit costs on carbon emissions or fuel;

- Motivating new ships to be built and existing ships to be retrofitted in a manner that pushes innovation beyond the EEDI standards currently under consideration by the IMO; and

- Avoiding the creation of the misleading notion that one has capped emissions from the shipping sector, when no proposal actually caps emissions from shipping[4].

III. Is a large international fund critical to effectively addressing carbon emissions from the shipping sector?

The proposed EIS would result in the generation of monies from vessels failing to meet the specified standards; however, if properly designed, the system would not generate the magnitude of funds projected in many market-based measures. This is driven by the fact that the principal purpose of the EIS is not to raise many billions of dollar in new revenues for an international compensation fund, but to create an effective regulatory motivation for ships to undertake efficiency improvements – improvements which would not occur under alternative market-based measures or in business-as-usual scenarios where improvements are largely a function of fuel price and whatever technical standards are adopted over time through the IMO.

Some parties have argued that a system must be adopted that generates massive amounts of money on an annual basis, with some estimates ranging from 7 to 20 billion dollars to be raised from international shipping on an annual basis. Arguments for these capital intensive approaches range from a reported need to enlist the support of developing countries, to funding out-of-sector projects intended to offset the expected growth of emissions from international shipping.

The notion that increasing the cost of international marine transportation through a fuel charge or the imposition of an emissions trading system is a prerequisite to support from developing countries has been consistently and repeatedly refuted in every debate at the IMO in recent years. One developing country after another has made it clear that increasing the cost of maritime trade is an unacceptable strategy given the critical importance that maritime trade plays in the economic well-being and development of these countries. Few, if any, developing countries at the IMO have argued that creating a multi-billion dollar fund through a market-based measure applicable to marine shipping is desirable or appropriate from their perspective.

The second argument is that increasing world trade and maritime traffic requires the purchase of billions of dollars worth of out-of-sector projects intended to offset emissions generated by the growth of global trade and maritime traffic. Even with the most well-intentioned and well-

[4] Creating a real cap on maritime emissions would create a perverse incentive for higher utilization of less carbon - efficient forms of transportation. No one has proposed capping what land transportation modes would be allowed to produce in the way of carbon emissions, even though surface transportation produces roughly 81% of all the carbon emissions resulting from the transportation sector.

designed procedures developed to meet such a goal, it is not reasonable to assume that many, or even a majority of such projects, would result in actual reductions in the planet's CO_2 inventory. This fact is one of the primary reasons that most market-based systems that allow for trading severely limit the use of offsets. Moreover, unlimited or significant use of out-of-sector offsets undermines the central purpose of achieving more significant improvements in the maritime sector itself.

The second argument is also premised on the idea that maritime transport should be subject to an absolute reduction as estimated from an existing baseline. This approach might be appropriate public policy if other more carbon-intensive industries and transportation modes were subject to such a cap; however, no such cap exists on road transportation, rail, or aviation in either a national or an international context.[5] Given that governments have found it inappropriate to cap emissions from other transportation sources that are far more carbon–intensive than marine transport, it would be a strange and perverse development to create a figurative cap on the most carbon efficient mode of transportation, encouraging even further migration of selected commodities to air, road, and rail. [6]

If the global community had reached agreement that all sources of carbon emissions needed to be capped, and all transport sectors must operate within such a cap just as all nations' utilities, factories and other carbon emitters had to operate within such a cap, then the maritime sector could not argue that such a regime was unfair or discriminatory. But the global community is nowhere near such an agreement on capping the 97% of carbon emissions produced from non-maritime sources, so the merit and precedent of applying the concept to the most carbon efficient form of transportation is very questionable.

Returning to the argument that raising $7 to $20 billion in new revenues per annum from international shipping is critical to a positive IMO outcome, it is not clear that such an approach is either environmentally effective or economically efficient. Indeed, discussions in Europe already recognize the political likelihood that substantial portions of any monies raised in such a scheme are likely to be diverted to the national treasuries of collecting governments with little, or no assurance that the funds would be spent on projects that result in reduced CO_2.

[5] Some parties might argue that such caps or limits exist as the result of Annex I country commitments under the Kyoto Protocol, but no government to our knowledge has placed any explicit cap or limit on transportation emissions.

[6] Some parties perceive that there is no real alternative to trans-oceanic transportation. This perception has merit for some commodities, like oil, but not all. Some commodities transported by sea can also move via international air freight. Further, many cargo routing decisions are also subject to price sensitive calculations that determine where cargos are off-loaded for inter-modal transfer to rail and/or truck. The distances and CO_2 emissions involved in these inter-modal trade-offs may be large in many cases and may grow more so, as projects such as the expansion of the Panama Canal provide expanded maritime transport options.

IV. How effective can the EIS be in reducing emissions from international shipping?

An EIS system would provide an explicit and direct financial incentive to improve the efficiency of new ships which is greater than other market-based measure proposals currently under consideration at the IMO. An EIS system would provide a direct market incentive for ships to avoid recurring costs (assessed per tonne of fuel consumed) by implementing improvements in the existing fleet that would satisfy specific standards set forth in the Convention. Because the proposal would allow ship owners and operators to fully avoid per-unit operational costs as described earlier, this approach would result in significant reductions in emissions, and such improvements in the fleet can reasonably be expected to occur over a shorter time than with most other market-based proposals under consideration.

V. How would the EIS work in practice?

- **Application**

  The proposed EIS would apply to all ship types and sizes for which the IMO has established an Energy Efficiency Design Index (EEDI) baseline and requirement. The current draft EEDI regulations developed under the IMO would apply to tankers, bulk carriers, container ships, general cargo ships, and chemical carriers. An EEDI value would be calculated for each new and existing ship. Further development of appropriate EEDI formulas for specialized Ro-Ro vessels, passenger ships, ferries, and other vessel types are under development at the IMO. Minimum size thresholds would be established based on examination of statistical baseline data and policy considerations to ensure adequate coverage of the fleet and those ships responsible for the vast majority of maritime emissions.

- **Setting Standards**

  The proposed EIS would include explicit energy efficiency standards for specific vessel classes and sizes consistent with the approach developed under the IMO. Standards would be established not only for new builds, but separate standards would also be agreed upon for the existing fleet. An EIS system is intended to establish aggressive, but realistic, standards applicable to both new and existing ships. New and existing vessels that meet the specified standards would be exempt from any type of fee or charge. Those ships that fail to meet the specified standards would be required to pay a specific fee applied to each tonne of fuel purchased by the vessel.

- **When is a fee applicable and how does one determine the amount applicable to a specific vessel?**

  Payment of a fee would be applicable only to ships that fail to meet the standard specified within the EIS.

The amount of a given fee would be determined by the degree of variance between the EEDI of a specific ship and the applicable EEDI standard. As the fee is assessed on each tonne of fuel consumed by a given ship, the total fee is proportional to the level of fuel use of the vessel. These two features ensure that the total fee paid has a high degree of equity in its application to different ships. A ship with that falls short of the EEDI standard by a small margin would pay less per tonne of fuel consumed than a vessel that falls short of the EEDI standard by a wide margin. Moreover, as the fee is assessed against fuel consumed, the total fees paid by a vessel also reflect the degree of fuel use and the emissions generated by the vessel.

In summary:

Ship meets or exceeds applicable standard - no fee applies.

Fee applied to ships not meeting standard =
Specific fee ($Y / per tonne of fuel) x total tonnes of fuel

Standards for existing ships would be less stringent than those established for new builds in light of the more limited suite of technical measures that can be applied to existing ships. Figure 1 illustrates how the fee is established for new ships, including an incentive to exceed the required EEDI standard.

Figure 1 Application of Efficiency Standards to New Ships

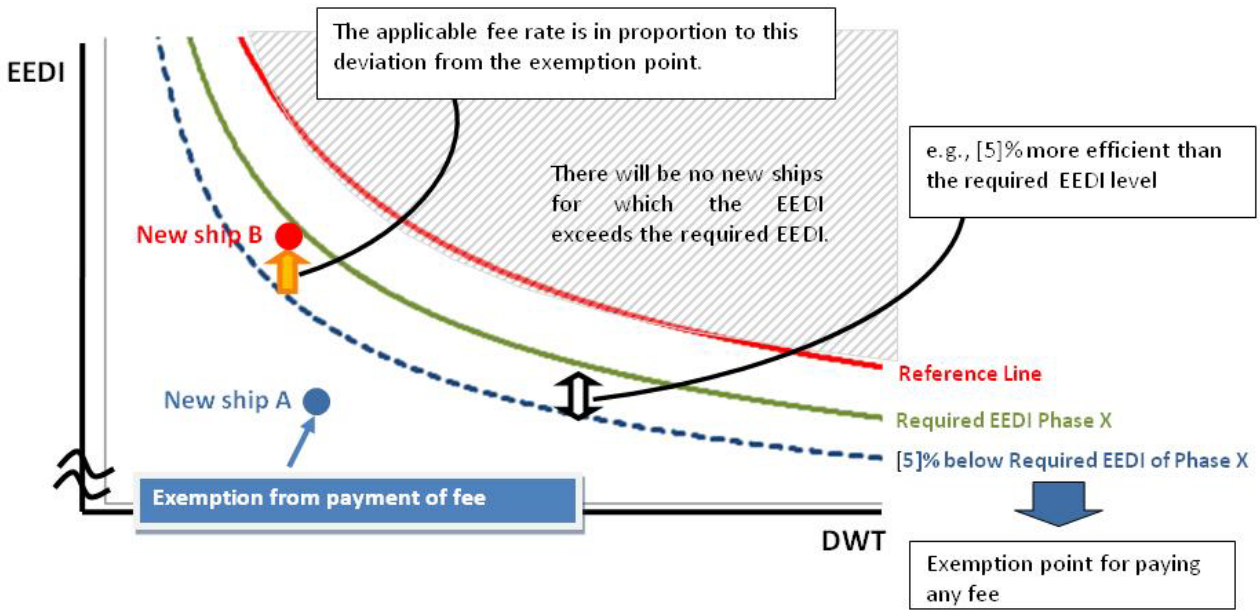
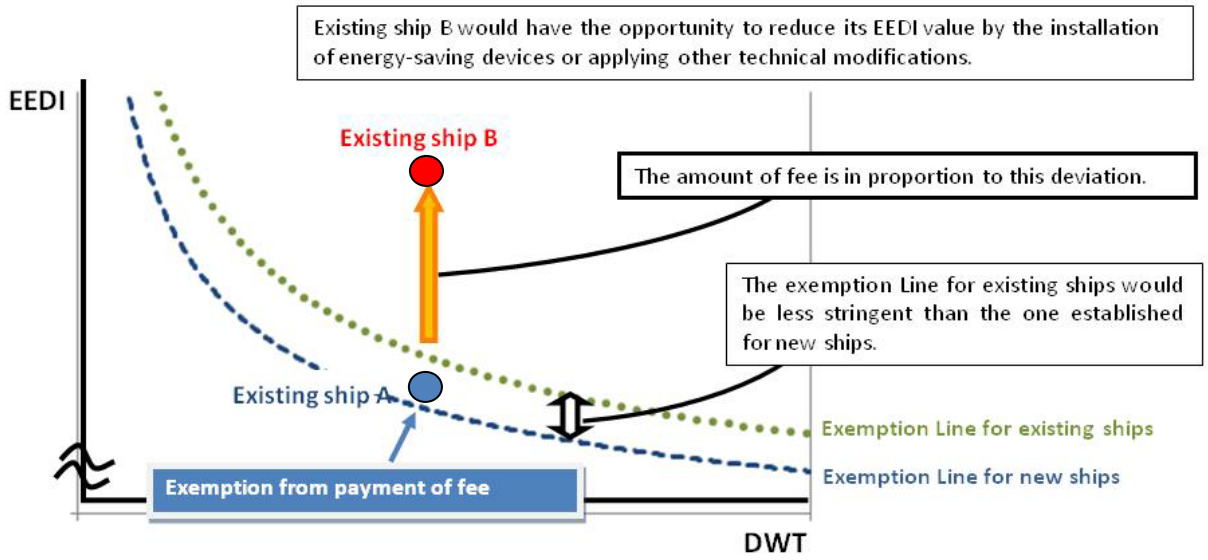


Figure 2 illustrates how the fee is established for existing ships failing to meet the required standard.

Figure 2 Application to Existing Ships



VI. EIS management and use of funds

A *Fund Administrator* would be created under the EIS Proposal to manage and oversee collection and use of the fees collected as well as fiduciary responsibilities associated with management, investment, and oversight of the monies. Those ships subject to the payment of fees under the EIS would make periodic payments directly to the Fund Administrator consistent with the EEDI rating of the ship and the ship's fuel consumption during the period.

Each ship would have an individual electronic account tied to its unique IMO identification number. Monies would not need to be collected via bunker fuel suppliers, but would be submitted directly to the designated Fund Administrator. Ships would be required to retain bunker delivery notes and an oil-record book (already required under MARPOL Annexes I and VI) to provide documentation of fuel purchased and consumed in a given period.

Monies collected under the EIS would be allocated to support further in-sector reductions through research and development focused on additional efficiency gains and emission reductions in the maritime fleet, and funding other projects consistent with guidance to be set forth by the parties in the EIS instrument. The actual allocation of revenue generated through the EIS would be determined by the parties to the EIS Instrument.

VII. Frequently Asked Questions

Under the proposed EIS, can the EEDI value of an existing ship be improved?
Yes. An existing ship may improve its EEDI value through recognized and certified improvements in the vessel. Example improvements include the addition of flow devices, waste heat recovery systems, de-rating of the engine, and other recognized technical measures for improving efficiency of the vessel.

Why would an EIS be expected to result in more significant and accelerated improvements in vessel efficiency when compared to emissions trading scheme or a fuel levy applied to all ships?
An EIS system creates a powerful market dynamic where ship owners and operators may respond in a manner that allows them to avoid recurring per-unit fuel charges or the on-going purchase of emission credits. By meeting established efficiency standards, one has the ability to completely avoid these costs. In this scenario, any cost to the vessel is focused on capital investments to improve vessel efficiency, which subsequently provide a return on investment through reduced fuel consumption.

Under an emissions trading system or a uniform fuel charge or carbon tax, one does not have the option to avoid these recurring costs. Moreover, because the market price of carbon or the cost of the fuel levy would be relatively low when compared to the cost of fuel, the incentives produced from an emissions trading scheme, fuel levy or carbon tax proposal to actually change vessel efficiency and reduce maritime carbon emissions may be quite low.

In an EIS, who pays the fee?
Responsibility for payment of any applicable fees occurs when fuel is purchased. The payment may be made by the vessel owner, operator, or charterer consistent with the contractual terms agreed upon by the parties.

Are older vessels disadvantaged under the EIS proposal?
Age alone is not always a reliable indicator of how efficient or inefficient a given vessel may be. The amount of the fee would be determined by the degree of variance between the EEDI of a specific ship and the applicable EEDI standard.

Would an EIS system utilize the same EEDI standards currently proposed for adoption at the IMO?
We expect that any standards adopted at the IMO for new builds would remain in effect. The parties may choose to include more aggressive standards for new builds built well into the future. The IMO would need to identify appropriate standards for existing ships and how to structure those standards relative to the age of a vessel. For example, a ship over 25 years old may be exempted or subject to a less stringent requirement in light of its limited life expectancy.

Can operational measures such as slow steaming be employed to improve the vessel's efficiency rating?
The technical measure must be certified and reflected in the EEDI calculation. Considering this, one can de-rate the engine for a lower power setting (coincident with the lower cruising speed)

and improve the vessel's EEDI value. Temporal speed changes that are not reflected through de-rating of the engine would not result in any change of the EEDI value.

Under an EIS would a significant number of ships fail to meet the required efficiency standards, choosing to pay the fee instead?

Establishing the proper base fee for application in the EIS is important. If set too low, many ships might choose to pay the fee. As the purpose of the system is to stimulate efficiency improvement in the fleet, Japan and WSC believe that the fee would need to be set at a level that would motivate most ships to make the necessary improvements while leaving some flexibility for those business cases where paying the fee may make more sense; for example, in the case of a vessel that is close to retirement.

The Bahamas has recently proposed the adoption of mandatory efficiency standards for both new and existing ships using traditional port and flag state enforcement mechanisms to enforce the standards. Could the EIS be modified to use this approach? Possibly, but the challenge lies in how one could establish a set of flag and port state penalties that would be effective in ensuring compliance with the standards applicable to a specific vessel. In this scenario, a vessel that fails to comply with the necessary standard may be forced to make technical modifications to the vessel to achieve the standard or face retirement. Such a system is possible, but would require further consideration and debate regarding the details of such an approach.

Can the EIS revenues be used to achieve carbon reductions through offsets?

Yes, it could be set up to do so. The EIS generates monies as a result of fees applied in the system. The allocation and use of funds is a decision to be taken by the parties. As such, the parties to an EIS may choose to allocate funds to research and development, the funding of offsets, or other purposes as the parties deem appropriate.

What potential impacts on world trade can be anticipated with adoption of an EIS?

An EIS system is designed to stimulate significant improvements in the efficiency of the world's maritime fleet and to reduce CO_2 emissions generated by ships. An EIS can be expected to increase capital cost for building and retrofitting both new and existing ships, but it can also be expected to result in a decrease in the per-unit fuel cost of moving goods by sea. By creating a more efficient maritime fleet and reducing fuel consumption, every nation's exports and imports would benefit from greater efficiency in the transportation of their goods. This contrasts sharply with proposed emissions trading systems and proposals to apply a uniform fuel levy that would increase the per-unit cost of moving goods by sea.

Why Would Efficiency Improvement Systems Be Preferable to Other Proposed Market Based Measures?

It is important for the IMO to be successful in its efforts to create an internationally accepted regime for addressing greenhouse gas emissions. Ships engaged in global commerce need a consistent, uniform set of rules that govern their operation regardless of whether they are on the high seas or within the waters of any particular nation. Regulations governing the environmental performance of ships, including CO_2 emissions, need to be the same at both ends of the voyage.

Patchwork regulation by different governments will be less effective at addressing the environmental issue and will be more costly and complicated for the industry to comply with.

One proposal before the IMO is to establish an "emissions trading system" (ETS) based on a cap and trade model. An emissions trading scheme in theory could be a potentially attractive model to the extent it produces real carbon emissions based on the lowest global cost for carbon emission reduction. The problem is that governments of many major economies have made it clear that they have no intent to cap their carbon emissions. Other governments have discussed the idea, but taken no action on it. Even in those nations that are potentially sympathetic to establishing a cap and trade regime on their national emissions, there is no nation that proposes within such a system to cap transportation or maritime emissions alone. Instead, for the emissions trading scheme concept to be an internationally operational system, all major carbon emitters would need to be subject to common standards, with emissions trading across all industrial sectors producing the most economically efficient emission reduction mechanism. Whatever the theoretical advantages of such a system, it is not currently a practical option.

Another proposal under consideration at the IMO is the imposition of a uniform levy[7] or tax on every tonne of fuel purchased, regardless of what measures a ship has taken to become more efficient and reduce its carbon emissions. The purpose of the levy or tax would be to capitalize a multi-billion dollar international fund that would then be empowered to undertake various kinds of projects around the world outside the maritime sector. On a political level, it is clear that such an international sales tax would encounter serious objections in principle by a number of governments. Operationally, such a proposal has found some favor with some ship owners that do not pay the ship's fuel bills because they charter their vessels out to cargo interests (as in the tanker or bulk trades) or to ocean carriers (as in the liner shipping/container trades); however, a regime whose principal effect is to make maritime transportation more expensive, while providing only marginal improvements in the efficiency of the fleet, would not serve the long-term needs of the industry, the environment, or the cargo interests that use maritime transportation services.

The Vessel Efficiency Incentive Scheme (EIS) is intended to build on the good work done to date by the IMO in developing new efficiency design standards for ships. Requiring transportation conveyances (like cars, trucks and locomotives) to be manufactured to defined standards that become more rigorous over time is a well established approach to improving transportation emission regulation. The EIS proposal builds on that approach and provides a further financial

[7] The term "levy" as used in market-based measures proposals made to the IMO by Denmark et al., and as used in various discussions of the IMO debate, is generally understood to mean a uniformly applied charge to every tonne of fuel purchased by a ship. For this reason, it is at times referred to as a fuel or carbon tax. The EIS proposal of Japan and the WSC would create a required payment on fuel purchases, but the charge would not be applied to ships that met or exceeded defined standards, and would vary in amount based on how efficient or inefficient the ship was in comparison to the established standards. In this sense the EIS proposed charges are more in the nature of a penalty for noncompliance, and are not a tax. Some have characterized the EIS proposal as a levy proposal; this characterization can be made so long as the differences from the other levy proposals are understood.

incentive to build new ships that will be much more efficient than today's fleet, and to stimulate improvements in the existing fleet that will be in operation for another 25 to 30 years.

VIII. Conclusion

While maritime transportation is already the most carbon efficient way to transport goods, an Efficiency Incentive Scheme (EIS) would result in a greater reduction in the carbon footprint of the world's fleet, at less cost to the industry and to exporters and importers, than a uniform fuel levy or emissions trading system. Moreover, the IMO's focus of action should be on improving the environmental performance of the maritime sector itself as effective climate policy over the long-term will require reduced carbon emissions within the fleet itself. Focusing on in-sector efficiency improvements will lead to immediate environmental benefits while also establishing the foundation for further advances in the fleet as technologies and fuels change over time.

For specific questions concerning the Vessel Efficiency Incentive Scheme (EIS), please contact Mr. Bryan Wood-Thomas of the World Shipping Council at bwoodthomas@worldshipping.org or Mr. Shioiri at the Japan Ministry of Land, Infrastructure, Transport and Tourism at shioiri-t24r@mlit.go.jp .

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