

January 23, 2025

RE: UK Emissions Trading Scheme scope expansion: maritime sector

Dear UK ETS Authority:

The International Council on Clean Transportation (ICCT) welcomes the opportunity to comment on the questions posed by the UK ETS Authority in its open consultation “UK ETS scope expansion: maritime sector” published November 28, 2024, and closing January 23, 2025.

The ICCT is an independent, nonprofit research organization founded to provide exceptional, objective, and timely research and technical analysis to environmental regulators. Our work empowers policymakers and others worldwide to improve the environmental performance of road, marine, and air transportation, benefiting public health and mitigating climate change.

The ICCT supports the expansion of the UK ETS to the maritime sector. In particular:

- We support the proposal to cover UK-EEA voyages from the outset.
- We support the proposal to include at-berth emissions, including for international voyages.
- We recommend expanding the scope to all international voyages as soon as possible, but not later than the 2028 review.
- We suggest lowering the threshold for inclusion from 5,000 gross tonnage (GT) to 400 GT as soon as possible, but not later than the 2028 review.

Additional details can be found in the responses appended to this letter. Please contact me with any questions or if further clarification is needed.

Respectfully,



Bryan Comer, PhD  
Director, Marine Program  
International Council on Clean Transportation  
[bryan.comer@theicct.org](mailto:bryan.comer@theicct.org)

[www.theicct.org](http://www.theicct.org)

[communications@theicct.org](mailto:communications@theicct.org)

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## Section A: Implementing the UK ETS for maritime

### Scope of the Scheme

#### *Definition of a domestic voyage*

**1. Do you agree with the proposed definition of a domestic voyage? (Y/N) Please explain your response, providing evidence where possible.**

No, because the definition excludes ships and routes that contribute to domestic maritime emissions but are not covered, including ships below 5,000 gross tonnage (GT) and ships on voyages to, from, or between UK Crown Dependencies and British Overseas Territories. The UK should quantify or collect independent, third party estimates of these emissions to determine if they are a significant share of the total inventory. If so, it may be necessary to include these voyages in the definition for the policy to effectively reduce domestic shipping emissions in a future expansion of the UK ETS.

**2. Do you agree that the proposed definition will capture all relevant domestic emissions? (Y/N) Please explain your response, providing evidence where possible.**

No. The definition does not capture all domestic emissions due to the 5,000 GT threshold and because emissions for voyages to, from, or between UK Crown Dependencies and British Overseas Territories are largely emitted (except for emissions that occur in UK ports), as mentioned in our response to question 1. An ICCT study found that 40% of ships that had berthed at EU ports in 2019 were between 400 and 5,000 GT, and these ships represented 28% of at-berth energy (fuel) consumption.<sup>1</sup> While not a direct reflection of UK vessel patterns, including vessels below 5,000 GT in the UK MRV would more accurately represent domestic shipping emissions. We suggest the threshold be lowered and accompanied by the proposed definition here that includes at-berth emissions to capture emissions from at-berth harbor craft vessels in addition to the voyages the consultation outlines.

**3. Do you envisage this definition leading to any loopholes or perverse incentives? (Y/N) Please explain your response, providing evidence where possible.**

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<sup>1</sup>Liudmila Osipova and Camilla Carraro, *Shore power needs and CO<sub>2</sub> emissions reductions of ships in European Union ports: Meeting the ambitions of the FuelEU Maritime and AFIR* (ICCT, 2023), <https://theicct.org/publication/shore-power-eu-oct23/>.

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Yes. Operators might be incentivized to structure voyages in such a way that they avoid coverage under the UK ETS, which could undermine the overall effectiveness of the scheme. For example, ships may divert their paths to stop in non-covered ports, possibly including Crown Dependencies or British Overseas Territories to avoid being included in the program. This could reduce the incentive for operators to invest in emissions reductions and would limit the policy's impact on shipping emissions. Additionally, excluding ships smaller than 5,000 GT may lead companies to operate or build smaller ships that have higher GHG intensities, undermining the effectiveness of the scheme.

**4. Do you agree with the inclusion of emissions at berth in a UK port from ships performing both domestic and international voyages? (Y/N) Please explain your response, providing evidence where possible.**

Yes, emissions at berth not only contribute to climate change, they also harm near-port communities by worsening air quality. Ships consume a considerable amount of energy at berth, which results in GHG emissions and air pollution. The ICCT study referenced in our answer to question 2 found that in 2019, 16,000 ships in EU ports demanded nearly 5.9 terawatt-hours of energy while at-berth. In the United States, the ICCT estimated that at-berth ships emitted about 1.4 million tonnes of carbon dioxide and nearly 27,000 tonnes of combined air pollution (nitrogen oxides, sulfur oxides, particulate matter) in 2019, impacting tens of millions of people in low-income, near-port communities.<sup>2</sup> Other ICCT research has quantified the health benefits of reducing at-berth emissions from ships. For example, port electrification in the U.S. ports of New York/New Jersey and Seattle was expected to significantly reduce air pollution, which could result in \$60-150 million in annual health benefits.<sup>3</sup>

*Disparity in carbon pricing obligation through differing emissions coverage on routes between Northern Ireland and Great Britain, and Republic of Ireland and Great Britain*

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<sup>2</sup> Tom Decker and Elise Sturup, *Nationwide port emissions screening for berthed vessels: Prioritizing U.S. port electrification to improve air quality for near-port communities*. (ICCT, 2024), <https://theicct.org/publication/us-port-emissions-screening-berthed-vessels-sept24/>.

<sup>3</sup> Zhihang Meng and Bryan Comer, *Electrifying ports to reduce diesel pollution from ships and trucks and benefit public health: Case studies of the port of Seattle and the port of New York and New Jersey*, (ICCT, 2023), <https://theicct.org/publication/marine-ports-electrification-feb23/>.

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**5. Do you agree with our position that routes between Northern Ireland and Great Britain should face equivalent carbon pricing obligations to that between the Republic of Ireland and Great Britain? (Y/N) Please explain your response, providing evidence where possible.**

Yes, we agree. In particular, we support the option demonstrated in Figure 3: “50% of emissions from in-scope ships both arriving in or departing from the UK to the EEA are included within the UK ETS, ensuring equivalence on routes between Northern Ireland and Great Britain, and Republic of Ireland and Great Britain.” This would cover emissions from relevant voyages between Northern Ireland and Great Britain and between the Republic of Ireland and Great Britain. This position would also prevent ships from re-routing or gaming behavior by selecting to call certain ports to avoid a 100% coverage. Additionally, it would expand the scope of the UK ETS in a way that increases overall emissions coverage, thereby also increasing the effectiveness of the scheme.

**6. Do you agree that subjecting in-scope ships on voyages between Northern Ireland and Great Britain to 50% (as opposed to 100%) of their carbon pricing obligation under the UK ETS would be suitable for ensuring carbon pricing obligation equivalence and emissions coverage equivalence between Northern Ireland and Republic of Ireland? (Y/N)**

**a. Should this option be time limited or exist for as long as there remains a disparity in the carbon pricing obligation on these routes?**

No, please see our response to question 5. We recommend 100% coverage between Northern Ireland and Great Britain, and 50% coverage between the Republic of Ireland and Great Britain under the UK ETS, which would ensure equivalence because, in both cases, 100% of emissions would be covered.

**7. Do you believe expanding the scope of the UK ETS to include 50% emissions coverage on UK-EEA routes could a) lead to better decarbonisation outcomes for the sector and b) be a suitable alternative approach to ensuing equivalence in carbon pricing obligations to that outlined in Question 6 above? (Y/N) Please explain your response, providing evidence where possible.**

Yes. Expanding the scope to cover 50% of emissions generated on UK-EEA routes would lead to better decarbonization outcomes because it would result in a larger proportion of emissions that would be covered under the UK ETS. As outlined in the consultation, this inclusion would promote

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decarbonization and the development of alternative technologies and reduce emissions that affect human health and the environment. This would be a good first step toward including all international voyages within the scope of the UK ETS and would both reduce GHG and air pollution emissions, as well as increase ETS revenues.

**8.** Are there any other alternative approaches we should consider? Please explain your response, providing evidence where possible.

**9. Do you consider that there are differing impacts of these two approaches which we should consider when making a final decision? (Y/N) Please explain your response, providing evidence where possible.**

Yes, as explained above, the approach defined in Figure 3 is preferred as it would cover all emissions from voyages between Northern Ireland and Great Britain and between the Republic of Ireland and Great Britain, as well as expand the scope of the UK ETS to emissions on voyages to or from the EEA, improving the effectiveness of the scheme by providing greater incentives to reduce emissions on these voyages while also increasing revenue for the UK. Conversely, the approach presented in Figure 2 would not cover emissions from all voyages and may encourage re-routing or gaming behavior.

**10. Do you foresee any additional consequences of this policy intervention that we should be aware of? (Y/N) Please explain your response, providing evidence where possible.**

Yes; one positive consequence: Expanding the scope to cover 50% of emissions from voyages to, or from the UK and EEA will help international shipowners build experience with reporting to the UK system which can help prepare both shipowners and the UK for a potential future expansion of the UK ETS to all international voyages. These shipowners are a good group to begin with because they are already experienced at reporting emissions under the EU ETS system, and they will be already reporting all emissions on voyages between the UK and EEA to the EU MRV.

### *Threshold for the Scheme*

**11. Should we consider a de minimis threshold for operators with very low emissions to avoid a compliance burden? (Y/N) If so, what should this de minimis threshold be? Please explain your response, providing evidence where possible.**

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No because the sum of many ships emitting low emissions could be large; more data would be needed to justify excluding these ships. If a de minimis threshold is considered, we recommend exclusions be granted on an annual basis rather than permanently, in case that same ship begins emitting more in a future year.

**12. If you support a de minimis threshold, should a simplified process apply or should the requirements of the UK ETS not apply at all? (Y/N) Please explain your response, providing evidence where possible.**

We do not support a de minimis threshold but, if one is decided, we recommend a simplified process apply so that some estimate of these emissions is provided.

*Inclusion of methane and nitrous oxide emissions*

**13. Do you agree with the inclusion of emissions from the combustion or slippage of methane and nitrous oxide emissions from maritime activity within the scheme? (Y/N) Please explain your response, providing evidence where possible.**

Yes. Methane (CH<sub>4</sub>) emissions from ships fueled by liquefied natural gas (LNG) and nitrous oxide (N<sub>2</sub>O) emissions from ships fueled by ammonia are expected to increase as these fuels are used to comply with international regulations that aim to reduce air pollution and carbon dioxide, but which may inadvertently increase methane and nitrous oxide emissions. Research published by the ICCT has shown that real-world methane slip from 18 ships using LNG in low-pressure, dual-fuel, four-stroke engines averaged 6.4%, with a median of 6.05%, and we have therefore recommended that regulators assume that these LPDF 4-stroke engines emit at least 6% methane slip when calculating the carbon dioxide equivalent emissions from using this fuel and engine combination, an increase from the 3.1% assumed by the EU and 3.5% assumed by the IMO in the Fourth IMO GHG Study (note that the IMO is currently reviewing the default methane slip assumptions for use in its LCA Guidelines, so this value is may increase).<sup>4</sup> The ICCT has just initiated a second iteration of the Fugitive and Unburned Methane Emissions from

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<sup>4</sup> Bryan Comer, et al., *Fugitive and unburned methane emissions from ships (FUMES): Characterizing methane emissions from LNG-fueled ships using drones, helicopters, and on-board measurements*, (ICCT, 2024), <https://theicct.org/publication/fumes-characterizing-methane-emissions-from-lng-fueled-ships-using-drones-helicopters-and-on-board-measurements-jan24/>.

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Ships project (FUMES 2), which seeks to quantify real-world methane slip from two-stroke LNG-fueled engines; a final report should be published in late 2026, but interim results may be available sooner.

Nitrous oxide emissions are low for conventional marine fuels but may be high for ships that use ammonia as a marine fuel. It will be challenging to establish a default emission factor for N<sub>2</sub>O given the very limited use of ammonia as a marine fuel to date and limited data on N<sub>2</sub>O emissions in the literature. The ICCT together with Environmental Defense Fund (EDF) has analyzed N<sub>2</sub>O emissions from ammonia-fueled engines in the literature and has found a wide range of emissions. A submission to the IMO's 18<sup>th</sup> GHG Intersessional meeting is forthcoming which summarizes these data. We recommend that the UK ETS authority review that paper when considering which default N<sub>2</sub>O emission factors to use in the first instance. A starting point for default N<sub>2</sub>O emission factors could be 0.0025 g N<sub>2</sub>O/g fuel (equivalent to 0.134 g N<sub>2</sub>O/MJ assuming 0.0186 MJ/g NH<sub>3</sub>), based on the maximum N<sub>2</sub>O emissions observed in two separate studies, Jin et al. (2023)<sup>5</sup>, and Zhou et al. (2024)<sup>6</sup>. This default emission factor should be reconsidered in the future, as more real-world data becomes available, perhaps as part of the 2028 review.

For both methane and N<sub>2</sub>O, the ICCT recommends allowing shipowners to demonstrate that they are emitting less than the default emission factors for methane and N<sub>2</sub>O through a two-step approach. The first step would be to certify the engine emissions on a test cycle, such as the IMO 2008 NO<sub>x</sub> Technical Code (NTC 2008). Note that the IMO's NTC 2008 is being revised, with a view towards adding a low engine load test point and revising the weighting factors applied to emissions measured at each engine load test point (mode point). The ICCT has published recommended changes to the NTC 2008 to better reflect real-world engine operations.<sup>7</sup> The second step would be an onboard validation using real-world data, such as from continuous emissions monitoring systems (CEMS). For methane, another option such as calculating the expected methane slip based on laboratory engine testing combined with

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<sup>5</sup> Shouying Jin, et al., "Effects of fuel injection strategy and ammonia energy ratio on combustion and emissions of ammonia-diesel dual-fuel engine," *Fuel* 341 (2023), <https://www.sciencedirect.com/science/article/abs/pii/S0016236123002818>.

<sup>6</sup> Xinyi Zhou, et al., "Ammonia marine engine design for enhanced efficiency and reduced greenhouse gas emissions," *Nature Communications*, 15, no. 2110 (2024), <https://www.nature.com/articles/s41467-024-46452-z>.

<sup>7</sup> Bryan Comer, Serkan Ünalán, and Xiaoli Mao, *Updating marine engine emission standards using real-world data: A potential update to IMO's NO<sub>x</sub> Technical Code*, (ICCT, 2024), <https://theicct.org/publication/updating-marine-engine-emission-standards-using-real-world-data-nov24/>.

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onboard engine load monitoring is possible. It is important that this second onboard validation step be made mandatory because methane and N<sub>2</sub>O emissions are both sensitive to how the engine is operated, and the test cycle may not reflect real world engine operations or conditions.

**14. Do you agree with our proposal for how to calculate an operator's greenhouse gas emissions on a carbon dioxide equivalent (CO<sub>2</sub>e) basis? (Y/N) Please explain your response, providing evidence where possible.**

No. We recommend using the IPCC Sixth Assessment Report (AR6) global warming potentials (GWP) and to consider using 20-year global warming potentials (GWP20) rather than 100-year global warming potentials (GWP100), given the urgency with which global GHG emissions must be reduced to limit warming to the levels agreed in the Paris Agreement. From the IPCC AR6 report, the GWPs are as follows: CO<sub>2</sub> has a GWP of 1 in both GWP20 and GWP100; CH<sub>4</sub> of fossil origin is 82.5 GWP20 and 29.8 GWP100; N<sub>2</sub>O has a GWP of 273 in both GWP20 and GWP100.<sup>8</sup> The IPCC AR6 report is the most up-to-date scientific consensus on GWPs for these GHGs.

### *Exemptions*

#### **Government non-commercial maritime activity**

**15. Do you have any views on the exemption of Government non-commercial maritime activity, or the activity covered by this term? (Y/N) Please explain your response, providing evidence where possible.**

Yes. If government non-commercial maritime activity (GNCMA) ships are exempted, the UK should nevertheless monitor, report, and verify fuel consumption and emissions and report progress towards decarbonization.

#### **Further possible exemptions**

##### *Scottish Island Ferry Services*

**16. Do you think an exemption is necessary for specific ferry services serving island communities in Scotland? (Y/N) Please explain your response, providing evidence where possible.**

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<sup>8</sup> IPCC, *Sixth assessment report*, (IPCC, 2023), <https://www.ipcc.ch/assessment-report/ar6/>.

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No. The UK ETS is meant to encourage the reduction of GHG emissions from ships and excluding ships works contrary to this goal. It seems appropriate to include these ships and emissions provided they are in scope (e.g., >5,000 GT or >400 GT, depending on what the ETS authority decides). Offering exemptions can be a slippery slope. There may be other ways government can compensate residents for the potential cost increases associated with applying the ETS to these ferry services rather than exempting them. Any exemption weakens to ability of the ETS to reduce GHG emissions from ships.

**17. Do you think an exemption is necessary for specific ferry services serving peninsular communities in Scotland? (Y/N) If so, what would be a suitable definition of remote peninsular communities? Please explain your response, providing evidence where possible.**

No. The UK ETS is meant to encourage the reduction of GHG emissions from ships and excluding ships works contrary to this goal. It seems appropriate to include these ships and emissions provided they are in scope (e.g., >5,000 GT or >400 GT, depending on what the ETS authority decides). Offering exemptions can be a slippery slope. There may be other ways government can compensate residents for the potential cost increases associated with applying the ETS to these ferry services rather than exempting them. Any exemption weakens to ability of the ETS to reduce GHG emissions from ships.

**18. If these services are exempted, do you think they should be subject to UK ETS MRV regulations? (Y/N) Please explain your response, providing evidence where possible.**

Yes, so that the ETS Authority can collect data on the magnitude of fuel consumption and emissions these ships are responsible for to determine if they should be covered in the future or if there should be targeted efforts by the government to support decarbonizing these ferry services, such as assisting with vessel retrofit or replacement that enables zero-emission operations, such as batteries, fuel cells, or dual-fuel internal combustion engines that use advanced zero or near-zero life-cycle GHG

**19. Do you have any further comments to make on an exemption for ferry services serving island and/or peninsula communities in Scotland?**

No; please see our responses to questions 16, 17, and 18.

*Other sectors*

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**20. Do you consider that there are any further subsectors which might be unduly impacted by the policy and require exemption? (Y/N) Please explain your answer, including on whether UK ETS MRV regulations should apply, and provide evidence where possible.**

No, not without further evidence of undue impacts and, even then, there may be other government remedies to lessen or eliminate these undue impacts aside from exemptions.

## Adjusting the Cap for Maritime

**21. Do you agree that the proposed approach, of adding allowances equivalent to emissions in scope per emissions trajectories aligned to the CBDP, is the most appropriate approach to adjusting the cap and to ensure the emissions reductions required to deliver climate targets? (Y/N). Please explain your response, including by proposing an alternative approach if appropriate.**

Yes, but with caution. The proposed approach of adjusting the UK ETS cap in line with the emissions trajectories outlined in the CBDP is a step in the right direction. It ensures that the cap remains aligned with the UK's long-term climate targets, including net zero by 2050. However, it's important to ensure that the cap adjustment fully accounts for all relevant emissions from the maritime sector, including those from both domestic and international voyages, at sea and at berth. Adding allowances based solely on projections may not fully capture the emissions reductions potential from the maritime sector.

An alternative approach might include more flexible mechanisms for reviewing the cap, allowing for adjustments in response to real-world emissions data and technological progress. Additionally, it would be beneficial to explore the inclusion of all maritime activities, including voyages to and from Crown Dependencies and British Overseas Territories, to ensure comprehensive emissions coverage.

Finally, it would be useful to ensure that the cap is adjusted with sufficient ambition to drive substantial decarbonization across the maritime sector, particularly in the early years of the scheme when emission reductions may be more challenging to achieve, and yet when reducing emissions will be necessary to limit the cumulative emissions that deduct from the remaining carbon budget available between now and 2050.

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**22. Do you agree with the proposed approach to adjusting the cap to account for the inclusion in the scheme of emissions from the maritime sector? (Y/N). Please explain your response with reference to any alternative approaches or sources of evidence, or consideration of how to account for emissions from GB-NI and/or UK-EEA voyages.**

No. While the proposed cap adjustment approach based on the emissions trajectory outlined in the CBDP aligns with the UK's long-term climate targets, it is important that the cap is regularly updated based on real-world emissions data to ensure it remains robust and reflective of actual emissions trends. We recommend that any future adjustments to the cap be made in a manner that aligns with the UK's decarbonization pathways and climate targets. This means that while the cap may be initially adjusted upward to account for the inclusion of shipping emissions, future adjustments should only be downward to ensure the cap remains aligned with the UK's goal of achieving net-zero emissions by 2050.

For the sake of clarity, the first year of maritime emissions inclusion (2026) should reflect an adjustment based on the projected emissions, as described by the decarbonization pathway (e.g., the CBDP). This ensures that the cap is aligned with the UK's overall emissions reduction goals. After the initial adjustment, the cap should decrease over time to ensure it stays in line with emissions reduction goals; we recommend including reductions between 2026 and 2030, not a flat cap. If emissions fall faster than expected, the cap should be adjusted downward, but emissions should not cause an upward adjustment to the cap. The primary purpose of the cap is to limit emissions, and increasing it would undermine that. If emissions increase in a future year (due to economic factors, unforeseen circumstances, or temporary challenges), the cap should remain fixed or be adjusted downward, depending on the trajectory of overall emissions reductions. There should be no provision to raise the cap in response to increased emissions from the maritime sector, as that would be counterproductive.

**23. Do you have views on whether allowances from cap adjustments in Phase I should all flow directly to auctions, or whether a proportion should flow to reserve pots? Please explain your response, providing evidence where possible.**

We recommend that allowances from cap adjustments in Phase I should flow directly to auctions, given that the UK ETS already has plans to bring tens of millions of reserve allowances to the market over the next several

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years, presumably from sectors already covered by the ETS.<sup>9</sup> Allowing allowances to flow directly to auctions ensures that the market remains flexible and responsive, providing clear price signals for emissions reductions across sectors, including maritime. This is crucial for incentivizing the decarbonization efforts required to meet the UK's climate targets.

**24. What would you expect to be the impact of the proposed approach to cap adjustment on participants in the sector and/or the wider UK ETS market? Please explain your response, providing evidence where possible.**

A flat cap does not incentivize early actions to reduce GHG emissions from the maritime sector. Without immediate action, aligning UK emissions trajectories with the Paris Agreement only becomes more difficult.

## Participating in the scheme

### *Regulatory regime and operator requirements*

**25. Do you agree with the proposed regulatory provisions, such as the scheme year, compliance dates, content of the emissions monitoring plan and penalties regime, operator requirements, or applicable regulator? (Y/N) Please explain your response, providing evidence where possible.**

Yes.

### *Monitoring, Reporting and Verification of CO<sub>2</sub> emissions from ships (MRV) regime and the UK ETS MRV requirements*

**26. Do you agree that we should use the UK MRV regime as the basis for the UK ETS, with deviations for the purpose of the UK ETS MRV requirements as outlined? (Y/N) Please explain your response, providing evidence where possible.**

Yes, provided that additional deviations are made to align the scope of the UK ETS MRV if additional changes are made as a result of this consultations, such as expanding the scope to cover UK-EEA voyages.

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<sup>9</sup> UK Government, Scottish Government, Welsh Government, and the Department of Agriculture, Environment and Rural Affairs, *Developing the UK Emissions Trading Scheme: Main response*. (3 July 2023), <https://assets.publishing.service.gov.uk/media/649eb7aa06179b000c3f7608/uk-emissions-trading-scheme-consultation-government-response.pdf>.

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When changes to the scope are made in the future, such as expanding to cover ships <5000GT, then the appropriate changes to the UK ETS MRV should also be made.

**27. Do you agree that the approval of monitoring plans for maritime should be in line with existing UK ETS processes? (Y/N) Please explain your response, providing evidence where possible.**

**28. Do you agree that we should remove the requirement for a Document of Compliance from the UK ETS MRV requirements? (Y/N) Please explain your response, providing evidence where possible.**

**29. How best should we account for biofuels and other sustainable fuels used in the maritime sector in the scheme? How best can we consider lifecycle emissions for fuels used in the maritime sector in the scheme? Please explain your response, providing evidence where possible.**

Though biofuels are generally attributed zero combustion carbon dioxide emissions, their upstream production emissions are relevant and warrant an adjustment within an ETS accounting framework. Therefore, emissions from alternative fuels should be accounted for on a well-to-wake basis, including quantified indirect land-use change emission factors in the case of biofuels where relevant. The life-cycle scope of emission factors for alternative fuels should be consistent with that used for the evaluation of transport fuels under the UK's Renewable Transport Fuel Obligation (RTFO).

For biofuels, IMO interim guidance in MEPC.1/Circ.905 could be considered which, among other things, requires biofuels to be certified and to achieve at least a 65% well-to-wake GHG reduction compared to the fossil fuel baseline to qualify to use their calculated well-to-wake GHG intensity (gCO<sub>2</sub>e/MJ) when calculating life-cycle emissions. If they do not meet that threshold, biofuels are assigned a carbon factor equal to that of the equivalent fossil fuel type.

**30. Which greenhouse gas emission factors for each maritime fuel and energy source would be most appropriate to use under the scheme? Are these emission factors fit for purpose for calculating lifecycle CO<sub>2</sub>e emissions? Please explain your response, providing evidence where possible.**

For TTW emissions, the ICCT recommends using the initial default emission factors in Appendix 2 of Annex 10 of the IMO's 2024 LCA

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Guidelines, as found in Resolution MEPC.391(81) adopted 22 March 2024, with the following exceptions:

First, we recommend increasing the methane slip (Cslip) assumption for LNG Otto (dual fuel medium speed) aka LPDF 4-stroke engines from 3.5% to at least 6%, based on the ICCT's recommendation in its 2024 FUMES report, referenced previously.<sup>10</sup> We note that methane slip varies depending on engine technology.

Second, because a default emission factor is not provided for N<sub>2</sub>O from ammonia-fueled engines, we recommend starting with 0.0025 g N<sub>2</sub>O/g fuel (equivalent to 0.134 g N<sub>2</sub>O/MJ assuming 0.0186 MJ/g NH<sub>3</sub>), based on the maximum N<sub>2</sub>O emissions observed in two separate studies, Jin et al. (2023)<sup>11</sup> and Zhou et al. (2024).<sup>12</sup> This default emission factor should be reconsidered in the future, as more real-world data becomes available, perhaps as part of the 2028 review.

For WTT emissions, we recommend using the methods in the UK RTFO.

For biofuels, we recommend the UK ETS adopt the approach of FuelEU Maritime whereby food and feed crops biofuels are given the same emission factor as the least favorable fossil fuels.

**31. Do you agree that the changes outlined above should also be made to the existing UK MRV regime? (Y/N) Please explain your response, providing evidence where possible.**

Yes, to harmonize the monitoring, reporting, and verification needed to comply with both the UK MRV and the UK ETS MRV systems.

### *Point of Obligation*

### **Approach to Defining the Obligated Entity**

### **Cost Recovery**

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<sup>10</sup> Comer et al. (2024), <https://theicct.org/publication/fumes-characterizing-methane-emissions-from-Ing-fueled-ships-using-drones-helicopters-and-on-board-measurements-jan24/>.

<sup>11</sup> Jin et al. (2023), <https://www.sciencedirect.com/science/article/abs/pii/S0016236123002818>.

<sup>12</sup> Zhou et al. (2024), <https://www.nature.com/articles/s41467-024-46452-z>.

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**32. Do you agree with the proposed approach to defining the obligated entity? (Y/N) Please explain your response, including your views on the requirements for the delegation of responsibility, and on the proposed default position where those requirements are not met. If you do not agree, please outline your preferred alternative approach.**

**33. Do you agree with our understanding of the ability for the obligated entity to seek entitlement to cost recovery? (Y/N) Please explain your response, including the extent to which you would expect revision to contractual arrangements.**

#### *Guidance*

**34. On which aspects of the policy proposals should we produce guidance, and to what timescale? Please explain your response, providing evidence where possible.**

We recommend providing guidance on how to calculate well-to-wake emissions for reporting under the UK ETS by the end of 2026 to facilitate reporting and verification for the 2026 reporting period.

### Impacts of the scheme

#### *Decarbonisation impacts*

**35. Does the section above capture all relevant short and long term decarbonisation impacts of the UK ETS? (Y/N) Please explain your response, providing evidence where possible.**

No, the expected health benefits of decarbonizing shipping, including by incentivizing the use of fuels and energy that emit less or zero air pollution, could also be described. Additionally, many ports are located near urban areas or vulnerable communities that are disproportionately impacted by pollution from maritime transport. By reducing harmful emissions from ships, especially at berth, the UK ETS can directly contribute to improved public health, especially in port cities and coastal communities, as well as shipping industry workers, who can be exposed to high levels of air pollution. The UK ETS will also, of course, mitigate the negative consequences of climate change by reducing GHG emissions. Climate change itself presents serious risks to public health, from extreme heat events to the spread of infectious diseases and extreme

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weather events. By decarbonizing the maritime sector, the ETS can contribute to addressing the root causes of these global health risks.

**36. How else could the UK ETS support decarbonisation in the sector? Please explain your response, providing evidence where possible.**

The UK ETS may also incentivize infrastructure development promote technological and fuel innovation, and spur complementary policy instruments, such as targeted R&D funding, and incentives for first-movers. For example, the UK could set aside a portion of the auction revenue generated by incorporating maritime into the ETS into a maritime decarbonization fund. The UK could consider the EU's approach, which allocates revenues from the sale of 20 million allowances to support investments in maritime decarbonization, representing approximately 38% of the total expected revenue generated from adding shipping to the EU ETS.<sup>13</sup>

**37. Do you consider that the application of the UK ETS will have any further environmental impacts, positive or negative? (Y/N) If negative, are there any mitigations that could be taken? Please explain your response, providing evidence where possible.**

Yes, we believe the application of the UK ETS to the maritime sector will have predominantly positive environmental impacts, but there are some potential negative impacts that should be monitored and mitigated.

Positive environmental impacts include reductions in GHG emissions, improved air quality, and technical innovation.

Potential negative environmental impacts include carbon leakage. Ships may avoid the UK ETS by rerouting to other regions with less stringent regulations. While this is a common concern in carbon pricing schemes, the UK ETS can mitigate this risk by working closely with key trading partners to promote cooperation in addressing emissions from maritime transport. The UK can also advocate for strong international policies through the International Maritime Organization that apply to all ships globally. If set at a level at least as effective as the UK ETS system, there would be no incentive to reroute.

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<sup>13</sup> Liudmila Osipova and Camilla Carraro, *Shipping emissions under the European Union Emissions Trading System* (ICCT, 2023), <https://theicct.org/publication/shipping-emissions-under-eu-ets-dec23/>.

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## *Potential distributional impacts and carbon leakage risk*

**38. Do you consider that application of the UK ETS will lead to any adverse impacts for any particular communities or regions, or sub-sectors of the maritime economy. (Y/N) Please explain your response, providing evidence where possible.**

**39. Do you consider that application of the UK ETS will lead to any carbon leakage or modal shift to other transport types? (Y/N) Please explain your response, providing evidence where possible.**

Regarding carbon leakage, ships may avoid the UK ETS by rerouting to other regions with less stringent regulations. While this is a common concern in carbon pricing schemes, the UK ETS can mitigate this risk by working closely with key trading partners that to promote cooperation in addressing emissions from maritime transport. As one concrete measure, expanding to cover 50% of international voyage emissions, not only to/from the EEA, but elsewhere, can mitigate the risk of carbon leakage. The UK can also advocate for strong international policies through the International Maritime Organization that apply to all ships globally. If set at a level at least as effective as the UK ETS system, there would be no incentive to reroute.

Regarding modal shift, there is a possibility that the carbon price within the UK ETS could incentivize a modal shift from maritime transport to other transport types such as road or rail. This could happen if the increased costs for shipping make it more attractive for freight to be moved via land-based transport, particularly for short distances or goods that do not require large-scale shipping. However, there is already competition to move goods from other modes and shipping is typically a low-cost option to move freight. The marginal costs of the ETS allowance price may not be enough to provide an economic incentive for modal shift, and then there are other practical barriers to modal shift, including whether there is additional capacity in the road or rail sector to absorb additional demand, whether the goods that could be shifted are actually suitable for transport via road or rail, and whether the overall infrastructure and logistics capabilities are in place to handle a significant increase in land-based freight. Expanding the UK ETS to cover on-road and rail freight transportation could mitigate the potential for modal shift.

## *Equality Considerations*

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**40. Do you consider that the application of the UK ETS to the maritime sector will lead to any impacts for any groups with protected characteristics under the Equality Act 2010? And do you consider any elements of the UK ETS expansion to the maritime sector could be designed to achieve the objectives set out under s149 of the Equality Act 2010? Please explain your response, providing evidence where possible.**

## Section B: Potential further expansion of the UK ETS to additional maritime emissions

### Future review of the threshold for the scheme

**41. Do you agree that a lower threshold could support the maritime sector to decarbonise? (Y/N) Please explain your response, providing evidence where possible.**

Yes, a lower threshold would include more voyages, including commercial harbor craft. In the ICCT report referenced earlier, out of all ships that berthed at EU ports in 2019, the share of ships between 400-5,000 GT was nearly 40%. We also found that those vessels between 400-5,000 GT were responsible for about 28% of the total at-berth energy demand from all ships that berthed in EU ports in 2019.

While the report examines berthing emissions, it still clearly demonstrates a significant portion of vessels and emissions that would be omitted with the current threshold of 5,000 GT. Lowering the threshold and including emissions from more vessels would provide a more accurate representation of the scope of emissions, especially near ports. These emissions especially harm the environment and the health of the communities and should be included in the UK ETS. Lowering the threshold would also increase ETS revenues.

**42. Do you agree that if we were to lower the threshold, it should be to 400GT? (Y/N) Please explain your response, providing evidence where possible.**

Yes, 400 GT is typically used as a lower boundary for regulation, including at the IMO. However, smaller ships are theoretically easier to decarbonize given the opportunities to use technologies such as

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batteries, wind-assisted propulsion, or fuel cells. The UK could consider complementary policies targeting ships not covered by the UK ETS to encourage actions to decarbonize this segment of the fleet.

**43. Is it practical for ships between 400GT and 5000GT to undertake monitoring, reporting and verification requirements? (Y/N) Should there be a simplified monitoring regime or should the threshold be lowered? Please explain your response, providing evidence where possible.**

Yes, it is practical for ships between 400 GT and 5000 GT to undertake monitoring, reporting, and verification. There should be no need to simplify the reporting. For example, offshore vessels of 400 GT and above and general cargo vessels between 400-5,000 GT are included in the EU MRV; there is no reason why other ship types could not also comply with MRV requirements.

**44. Would any inland waterways or leisure craft be captured by a 400GT threshold? (Y/N) Please explain your response, providing data where possible.**

Yes, it is possible that some inland waterway ships or leisure craft could be captured by a 400GT threshold. However, some of these inland waterway ships may legitimately be included in the ETS. Leisure craft would not and could be included in the exemptions, and we would expect the total number of leisure craft greater than 400 GT to be low.

**45. When would be an appropriate date for lowering the threshold if we were to lower it in the future? Please explain your response, providing evidence where possible.**

The consultation suggests that the threshold could be lowered as early as 2029 if this item is meant to be reviewed by the end of 2028; however, we would recommend lowering the threshold as soon as possible and reconsidering whether the threshold could be implemented immediately in 2026 or phased in between 2026 and 2029 to increase the amount of emissions covered by the UK ETS and therefore increase its effectiveness.

**46. What will be the impacts of lowering the threshold? Would any sub-sectors be disproportionately impacted? Please explain your response giving evidence where possible.**

Commercial harbor craft and smaller vessels that operate near ports could be more impacted if the threshold was lowered; however, these

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ships also contribute to near-shore and near-port air pollution that could be reduced by their inclusion in the ETS, resulting in public health benefits. Some smaller fishing vessels may also be impacted.

## Coverage of International Routes

In the event that the conditions highlighted above at the IMO were realised;

**47. Should the UK ETS be expanded to include emissions from all international voyages starting or ending in the UK in future? (Y/N) Please explain your response, providing evidence where possible.**

Yes. We recommend the UK ETS be expanded to include emissions from all international voyages starting or ending in the UK. By doing so, the UK ETS could cover significantly more emissions than if it only included domestic shipping, resulting in higher emissions reduction and additional revenue generation.

An emissions inventory published in 2020 by the Climate Change Committee<sup>14</sup> found that in 2018, international shipping emissions were estimated to account for roughly half of the UK's shipping emissions. The domestic shipping emissions were estimated using automatic identification system (AIS) data, but the international shipping emissions were estimated based on data on fuel sold to international vessels in the UK. We believe, as the report acknowledges, that this international emission estimate is low, as most vessels refuel overseas rather than in the UK. This methodological difference represents domestic emissions as a much higher portion of total UK shipping emissions.

A more recent study published by Transport & Environment in 2023<sup>15</sup> used AIS data to estimate 2021 CO<sub>2</sub> emissions from UK commercial shipping. T&E used AIS data to estimate emissions from both domestic and international shipping. The study found that total CO<sub>2</sub> emissions from UK shipping were 22 million tonnes, more than 80% of which were from international shipping. The report went on to explain that only ~10% of

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<sup>14</sup> Climate Change Committee, *The sixth carbon budget: Shipping*, (CCC, 2020), <https://www.theccc.org.uk/wp-content/uploads/2020/12/Sector-summary-Shipping.pdf>.

<sup>15</sup> Transport & Environment, *A pricey omission: Not charging ships for their pollution costs the UK £1.6bn/yr* (T&E, 2023), <https://te-cdn.ams3.cdn.digitaloceanspaces.com/files/A-pricey-omission-not-charging-ships-for-the-pollution-they-cause-costs-the-UK-1.6bn-yr-1-1.pdf>.

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the total UK shipping emissions from 2021 would be covered under the UK ETS guidelines. The ~90% of emissions the UK ETS would not cover would equate to £1.6 billion in revenue annually if included in the scope. The report suggests that the UK government use an activity-based measure based on UK MRV data to estimate both domestic and international shipping emissions. It also suggests expanding the scope to include all vessels >400 GT and include 50% of international voyages in the UK ETS.

Additionally, a recent ICCT publication<sup>16</sup> shows that international voyages represent a large share of maritime transport emissions in the United States. The study found that if the United States adopted an MRV program that covered domestic and international voyages, it would have covered roughly 103 million tonnes of CO<sub>2</sub>e in 2022, 80% of which were from international voyages. By applying a GHG price between \$70/tonne of CO<sub>2</sub> (EU ETS carbon price as of September 2024) and \$230/tonne CO<sub>2</sub>e (EPA-estimated social cost of carbon adjusted for inflation) to 50% of international voyages and 100% of domestic voyages, and 100% of in-port emissions, the US could generate between \$4.5 to \$15 billion annually.

By only including domestic voyages, a significant portion of shipping emissions remain outside of the scope of the UK ETS and, in addition to hampering the policy's ability to reduce GHG emissions, a large source of revenue is lost. We expect significant benefits in emissions reduction and revenue generation by extending the UK ETS to international voyages.

**48. If you agree with the above, do you think 50% of emissions from voyages by inscope ships making an international voyage which starts or ends in the UK from overseas should be covered? (Y/N) Please explain your response, providing evidence where possible.**

Yes, because it would result in 100% emissions coverage for ships on UK-EEA voyages and it would also provide an incentive for other countries to establish similar schemes to reduce emissions and raise revenue on UK- or EU-connected voyages.

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<sup>16</sup> Bryan Comer, Elise Sturup, and Xiaoli Mao, *Estimating greenhouse gas emissions from U.S. maritime shipping: Potential benefits of a monitoring, reporting, and verification system*, (ICCT, 2024), <https://theicct.org/publication/estimating-ghg-emissions-from-us-maritime-shipping-nov24/>.

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**49. If you support the inclusion of international voyages, do you have a view on when this should be implemented? Please explain your response, providing evidence where possible.**

International voyages should be included as soon as possible to allow the UK to monitor and reduce GHG emissions to meet the net zero by 2050 goals established by the UK government. The consultation suggests that international voyages could be covered as early as 2029; however, we would recommend including international voyages as soon as possible and reconsidering whether the threshold could be implemented immediately in 2026 or phased in between 2026 and 2029 to increase the amount of emissions covered by the UK ETS and therefore increase its effectiveness.

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