Analytical annex to the UK Emissions Trading Scheme (ETS) scope expansion: maritime

Annex to the joint consultation of the UK Government, the Scottish Government, the Welsh Government and the Department of Agriculture, Environment and Rural Affairs for Northern Ireland

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Contents

This annex covers proposals made in the UK Emissions Trading Scheme Scope Expansion: Maritime consultation.

Analytical annex

This annex provides background to the UK Emissions Trading Scheme (UK ETS) and the maritime sector, to which we are consulting to expand the scheme. It gives an overview of the factors influencing the impacts of the consultation options and considerations. It is not intended to reflect the full evidence base on which decisions will be taken, nor the full evidence base on which proposals have been developed to date. It is not a formal impact assessment. We will seek to gain further evidence to inform decisions from this consultation.

In the Authority Response to consultation, the UK ETS Authority, hereafter 'the Authority', made up of the UK Government, Scottish Government, Welsh Government and the Department of Agriculture, Environment and Rural Affairs in Northern Ireland will set out impacts of combined proposals, considering the interaction of proposed options and overall scheme impacts. Where we identify specific risks of options, we will set out the actions we will take to appropriately mitigate any such impacts where it is necessary to do so.

Section 1: UK ETS overview

Characteristics of the UK ETS

To consider the context of scope expansion, this section sets out characteristics of the existing UK ETS.

Scope/size of market

The UK ETS represents approximately 25% of UK territorial emissions based on the latest 2022 data[1]. The scheme covers the UK's power sector, energy-intensive industry, and emissions from domestic flights, flights from the UK to the European Economic Area (EEA), flights from GB to Switzerland, and flights between the UK and Gibraltar.

There were 678 installations and 369 aircraft operators in the UK ETS main scheme in 2022.[2] In addition, the scheme regulates 250 installations under the Hospital and Small Emitter (HSE) opt out, as well as 110 Ultra-Small Emitters (USE).[3] Five UK installations – electricity generators in Northern Ireland – remain in the EU ETS under the terms of the Windsor Framework.

The UK ETS covers carbon dioxide emissions for all activities with the addition of perfluorocarbons for aluminium production and nitrous oxide produced in the production of nitric, adipic, glyoxal and glyoxylic acid.

The Authority confirmed in its 2023 Authority Response[4] that it intends to expand the scope of the scheme to maritime by 2026. This would mean including an additional sector in the UK ETS and capping a greater proportion of UK emissions to further contribute to delivering net zero and UK carbon reduction targets at lowest cost for industry. Further details are subject to consultation.

Emissions

In 2022, UK ETS-covered emissions amounted to 111 million tonnes of CO_2 equivalent ($MtCO_2e$) – of which stationary installations accounted for 103 MtCO2e and aircraft operators 8 $MtCO_2e$. This represents a year-on-year increase in UK ETS emissions of 3 $MtCO_2e$ since

[1] DESNZ analysis based on DESNZ (2023), 'Provisional UK greenhouse gas emissions national statistics 2022', https://www.gov.uk/government/statistics/provisional-uk-greenhouse-gas-emissions-national-statistics-2022
[2] Based on operators with recorded 2022 emissions in UK ETS Emissions and Surrenders report published in May 2023: https://reports.view-emissions-trading-registry.service.gov.uk/ets-reports.html
[3] See published list Hospital and Small Emitter list here: https://www.gov.uk/guidance/opt-out-of-the-uk-ets-if-your-installation-is-a-hospital-or-small-emitter; See published list of Ultra-Small Emitters here: https://www.gov.uk/guidance/opt-out-of-the-uk-ets-if-your-installation-is-an-ultra-small-emitter
[4] DESNZ, Welsh Government, The Scottish Government, and Department of Agriculture, Environment and Rural Affairs (Northern Ireland) (2023), 'Developing the UK Emissions Trading Scheme: main response', https://www.gov.uk/government/consultations/developing-the-uk-emissions-trading-scheme-uk-ets

2021. This was driven by an increase in aviation activity following the end of the COVID-19 pandemic. This compares to total UK territorial emissions of 417 MtCO2e in 2022.

Cap

In technical terms, the cap refers to the legal limit on the number of UK Allowances (UKAs) that can be created in each year. There is similarly a cap for the trading period (1 January 2020 – 31 December 2030). Whilst created as a form of a cap on emissions, these allowances will not automatically be surrendered for the year they are created since they can be banked for surrender in subsequent years or borrowed ahead of time. The cap does imply a limit on the emissions in scope of the scheme in the longer term, however, thereby acting as an abatement incentive.

The base annual cap level, before accounting for hospital and small emitters:

- in 2021 was 156 $MtCO_2e$,
- in 2022 cap was 151 $MtCO_2e$,
- in 2023 was 147 $MtCO_2e$,
- in 2024 will be 92 $MtCO_2e$,

In the Authority Response 2023[5], the Authority committed to reduce the annual base cap to approximately 49 $MtCO_2e$ in 2030 which means decreasing the overall Phase I, 2021-2030, base cap from 1,366MtCO2e to 936$MtCO_2e$. This in line with the Carbon Budget Delivery Plan from March 2023, reflecting the full delivery of decarbonisation policies across sectors covered by the ETS such that the UK meets its carbon budgets (CBs) and nationally determined contribution (NDC) in 2030.

[5] DESNZ, Welsh Government, The Scottish Government, and Department of Agriculture, Environment and Rural Affairs (Northern Ireland) (2023), 'Developing the UK Emissions Trading Scheme: main response', https://www.gov.uk/government/consultations/developing-the-uk-emissions-trading-scheme-uk-ets

Section 2: Maritime

As noted in the consultation, the Authority is seeking stakeholder views on implementing the expansion of the UK ETS to cover maritime.

The purpose of this section of the analytical annex is to provide an overview of the analysis underpinning the maritime part of the consultation. Where possible, we explain the approach to options generation and assessment for proposals outlined at consultation. It is not intended to reflect the full evidence base on which decisions will be taken, nor all evidence on which proposals were developed, and we seek further evidence as part of this consultation.

In the Authority Response to the consultation, the UK ETS Authority will set out impacts of combined proposals, considering the interaction of proposed options and overall scheme impacts, including regional and sectoral impacts where feasible and appropriate. Where we identify specific risks of options, we will set out the actions we will take to appropriately mitigate any such impacts where it is necessary to do so. More information on this can be found in section 4 of this annex.

Overview

The UK has a strong history as a maritime nation and relies heavily on the maritime sector, with 95% of imports (by weight) arriving by sea.[6] The maritime sector in 2019 directly contributed 227,100 jobs and around £18.7 billion[7] to UK gross value added (GVA), including a shipbuilding industry which directly supported 35,000 jobs across the country, added £2 billion[8] to UK GVA and is underpinned by a vast supply chain and skilled jobs around the country in both the civil and defence sectors.

Greenhouse gas emissions

Estimates from the UK's National Atmospheric Emissions Inventory (NAEI)[9] suggest that the total greenhouse gas (GHG) emissions from seagoing ships within the UK domestic maritime sector in 2019, which has the same definition as the proposed scope of the UK ETS expansion (see "Definition of UK domestic maritime emissions" section) were 5.0 million tonnes of carbon dioxide equivalent ($MtCO_2e$). 4.5$MtCO_2e$ of these were produced while ships were at sea and the remaining 0.5$MtCO_2e$ from ships at berth. These figures exclude inland waterways and leisure craft, which were estimated to produce a further 1.0$MtCO_2e$.

[6] DfT (2023), Transport Statistics Great Britain: 2022 Summary; Transport Statistics Great Britain: 2022 Summary - GOV.UK (www.gov.uk)
[7] Maritime UK (2022), State of the Maritime Nation 2022, https://www.maritimelondon.com/wp-content/uploads/2022/06/CEBR-report-2022pdf.pdf
[8] Maritime UK (2022), The economic contribution of the UK Maritime Engineering and Science Industry; https://www.maritimeuk.org/media-centre/publications/2022-cebr-reports/
[9] National Atmospheric Emissions Inventory (NAEI) (2023), UK Greenhouse Gas Inventory, 1990:2021. https://naei.beis.gov.uk/reports/reports?report_id=1108

2019 figures are presented within this document as this is the most recent year that is unaffected by COVID-19 for which we have a full set of data. These estimates and all other estimates in this document are for the GHG emissions that are generated by the operation of ships, which are also known as tank-to-wake (TtW) emissions. These estimates therefore do not include the GHG emissions from the production and distribution of the fuels and other energy sources (e.g. electricity) that are used by ships, which are also known as well-to-tank (WtT) emissions.

Abatement options and policy

There are a range of potential technologies and other solutions at various stages of development that may be used to reduce emissions in the maritime sector. These include:

- Technical and operational energy efficiency measures to reduce fuel consumption, including air lubrication bubbles, wind assistance, waste heat recovery systems, twisted rudders, hull coating management and speed optimisation.
- Zero and near-zero GHG emission fuels and energy sources, including hydrogen, ammonia, methanol, biofuels, renewable electricity, other synthetic fuels, and nuclear energy.
- Emissions capture/treatment technology. Technologies that can be used to capture and treat shipping emissions, for example on board exhaust gas cleaning systems or exhaust gas recirculation systems are some of the solutions being used to tackle the air pollutant emissions from maritime.
- Shore power. Technology enabling ships to switch off their engine and plug into the grid whilst berthed, which can reduce emissions.

Uncertainty remains about the extent to which all these technologies will be available as some are in early stages of development. We expect the UK ETS as well as existing and planned policies at both the UK and international stage to encourage the development and uptake of these technologies. These policies could include measures to increase the use of zero, and near-zero GHG emission fuels, exploration of further measures in targeted sectors, research and development (R&D) funding for the sector through UK SHORE (the UK Shipping Office for Reducing Emissions), and policies to reduce the sectors wider environmental impacts.

At the international level, the International Maritime Organisation (IMO) is responsible for measures to improve the safety and security of international shipping and to prevent pollution from ships. The IMO has existing policies to encourage improvements in energy efficiency, namely the Carbon Intensity Indicator (CII), the Energy Efficiency Existing Ship Index (EEXI) and the Energy Efficiency Design Index (EEDI).[10] The IMO is also considering future

[10] International Maritime Organisation (IMO), EEXI and CII – ship carbon intensity and rating system. https://www.imo.org/en/MediaCentre/HotTopics/Pages/EEXI-CII-FAQ.aspx

decarbonisation policies, following the revised GHG reduction strategy for international shipping that was adopted in July 2023.[11]

Similarly, the EU has expanded the scope of the EU ETS to include ships over 5000GT[12] from 2024, including 50% of emissions from ships on voyages between the EU and non-EU member states. The EU has also adopted new legislation (FuelEU maritime[13]) which includes measures to ensure that the greenhouse gas intensity of fuels used by the shipping sector will gradually decrease over time.

Rationale

A key market failure facing the maritime industry is the existence of negative externalities. At present, maritime fuel prices do not reflect the social costs of their GHG and air pollutant emissions. This means there is currently a suboptimal incentive for shipowners and operators to invest in reducing their emissions. Expansion of the UK ETS to cover the maritime sector would contribute to addressing this market failure by applying a price to the emissions from maritime included within the scheme, in the form of the cost of UKAs, therefore helping to provide an incentive for shipowners and operators to invest in technologies to reduce their emissions to reduce their exposure to this carbon price.

Research carried out for the Department for Transport in 2019 also identified further market barriers to decarbonisation of the sector, including split incentives to invest, imperfect information, and coordination failures.[14] The inclusion of maritime in the UK ETS may also indirectly help to overcome some of these other barriers.

Scope of the scheme expansion

Definition of UK domestic maritime emissions

The proposed scope of UK domestic maritime emissions includes emissions from voyages which start and end at the same port in the UK, as well as those going from one UK port to another and emissions whilst at anchor and while moored on these voyages, both at sea and at offshore structures. We also propose to include all emissions at berth within UK ports including from ships that have arrived from or are departing to an international destination.

[11] International Maritime Organisation (IMO) (2023), Revised GHG strategy for global shipping adopted. https://www.imo.org/en/MediaCentre/PressBriefings/pages/Revised-GHG-reduction-strategy-for-global-shipping-adopted-.aspx

[12] GT = Gross tonnage, a measure of the size or carrying capacity of a ship

[13] Council of the European Union (2023), FuelEU maritime initiative: Council adopts new law to decarbonise the maritime sector. https://www.consilium.europa.eu/en/press/press-releases/2023/07/25/fueleu-maritime-initiative-council-adopts-new-law-to-decarbonise-the-maritime-sector/

[14] UMAS, E4Tech and Frontier Economics (2019), Reducing the maritime sector's contribution to climate change and air pollution: Identification of market failures and other barriers to the commercial deployment of emission reduction options. A report for the Department for Transport. https://assets.publishing.service.gov.uk/media/5d24aaf7e5274a2f9d175695/identification-market-failures-other-barriers-of-commercial-deployment-of-emission-reduction-options.pdf

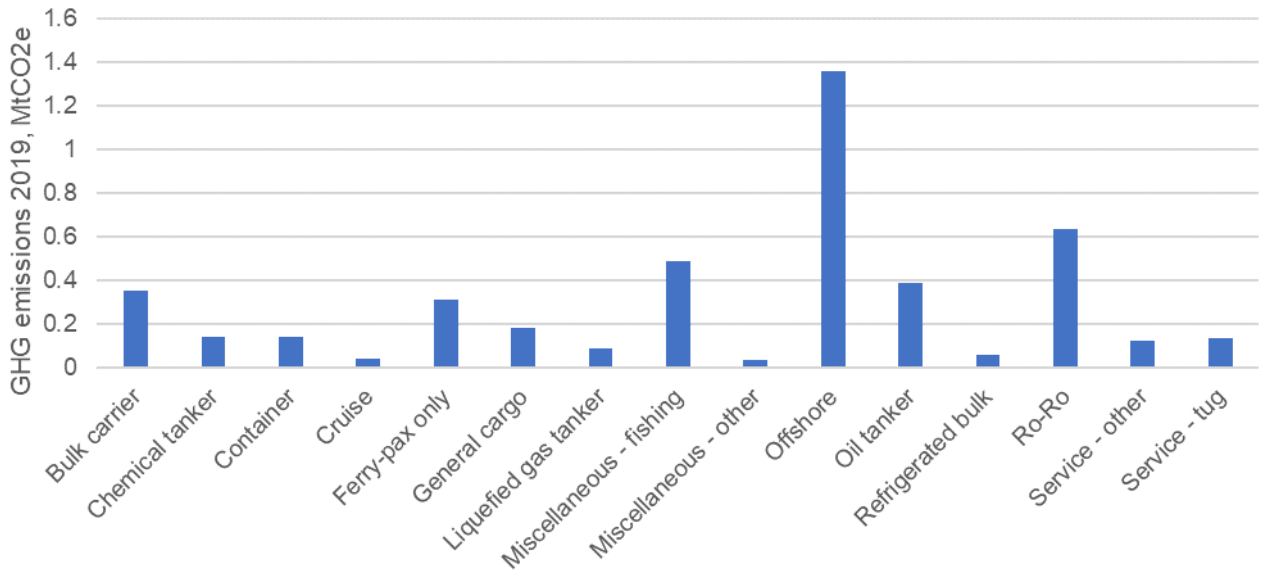
It is also important to note that we propose that UK domestic maritime emissions should also include emissions that are produced while a ship is at berth in a UK port, even if the ship is conducting an international voyage once it leaves the port.

Based on UK NAEI data, it is estimated that total UK domestic maritime's GHG emissions (including inland waterways and leisure craft) were around 6.0MtCO_2e in total in 2019.[15]

As it is anticipated that ships that exclusively operate in inland waterways and leisure craft would generally be significantly smaller than the size threshold that the Authority is proposing to use to determine which ships are included in the UK ETS (see the consultation document for further details), the GHG emissions from seagoing ships are of particular relevance.

It is estimated that seagoing ships within the UK domestic maritime sector were responsible for approximately 4.5MtCO_2e of GHG emissions when these ships were at sea in 2019. This can be split by ship type, as shown below. This figure does not include emissions produced by leisure craft or on inland waterways.

Figure 1: Greenhouse gas emissions from seagoing ships in the UK domestic maritime sector when these ships were at sea, split by ship type (2019)



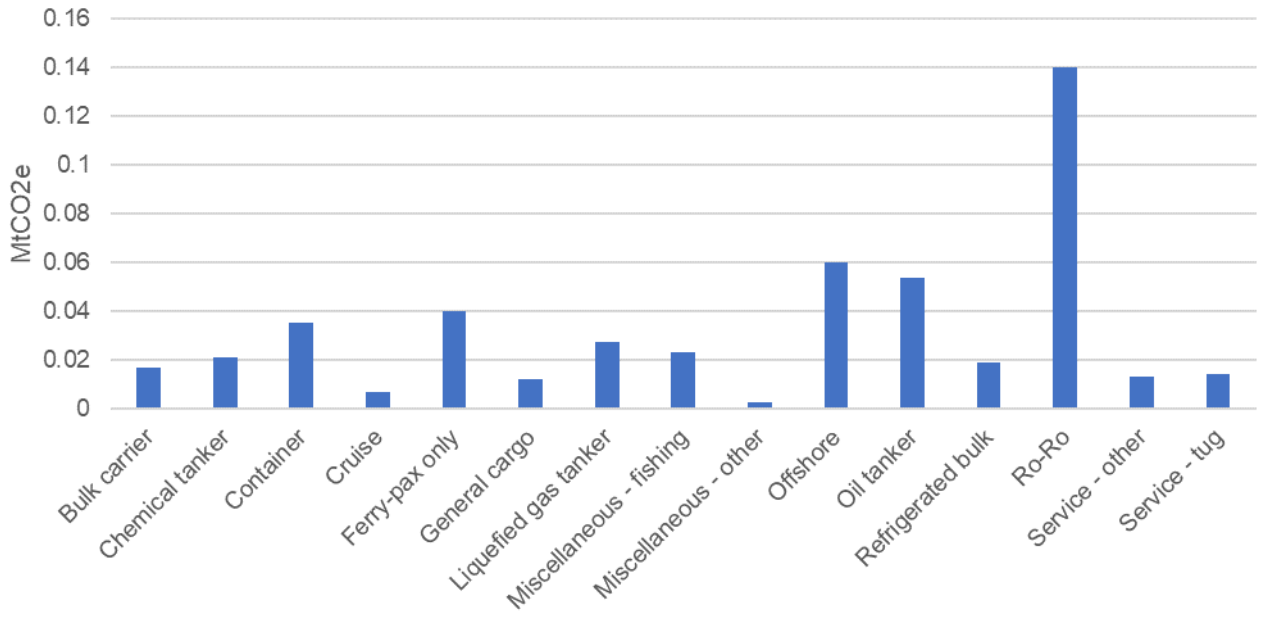
Source: NAEI

In addition, it is estimated that seagoing ships within the UK domestic maritime sector were responsible for approximately 0.5 MtCO_2e of GHG emissions when these ships were at berth in 2019.[16] This can be split by ship type, as shown below. This figure does not include emissions produced by leisure craft or on inland waterways.

[15] National Atmospheric Emissions Inventory (NAEI) (2023), UK Greenhouse Gas Inventory, 1990:2021. https://naei.beis.gov.uk/reports/reports?report_id=1108

[16] Report: Greenhouse Gas Inventories for England, Scotland, Wales & Northern Ireland: 1990-2021 - NAEI, UK (beis.gov.uk)

Figure 2: Greenhouse gas emissions from seagoing ships in the UK domestic maritime sector when these ships were at berth, split by ship type (2019)



Source: NAEI

Furthermore, it should be recognised that the total GHG emissions from UK domestic maritime are split between the nations within the UK, and hence the inclusion of domestic maritime in the UK ETS has the potential to impact on all nations within the UK. The following table shows the estimated domestic maritime GHG emissions associated with each nation within the UK. This figure does include emissions produced by leisure craft and on inland waterways.

Table 1: Greenhouse gas emissions from the UK domestic maritime sector, split by nation within the UK (2019)

Nation	2019 Emissions ($MtCO_2e$)	Proportion
England	3.5	58%
Scotland	2.0	34%
Wales	0.3	5%
Northern Ireland	0.2	3%

Source: Greenhouse Gas Inventories for England, Scotland, Wales & Northern Ireland: 1990-2021 - NAEI, UK[17]

[17] Report: Greenhouse Gas Inventories for England, Scotland, Wales & Northern Ireland: 1990-2021 - NAEI, UK (beis.gov.uk)

Treatment of routes between Northern Ireland and Great Britain

As outlined in the consultation, the EU has expanded the EU ETS to include maritime emissions, including coverage of 50% of emissions from voyages both arriving in or departing from a port under the jurisdiction of an EU Member State, to or from a port outside of the jurisdiction of an EU member state from 2024. This means that ships on voyages between the UK and Republic of Ireland would be subject to surrender obligations for 50% of emissions under the EU ETS, while ships on voyages between Great Britain and Northern Ireland would be subject to surrender obligations for 100% of their emissions under the proposals above for UK ETS expansion. We are consulting on two options to avoid potential distortions.

Data from the NAEI does not provide a breakdown of emissions by route, therefore it is not possible to provide estimates of emissions from voyages between Northern Ireland and Great Britain. However, the inventory does include all departing emissions from Northern Ireland, which can give help to a sense of the potential 50% exemption to equivalise treatment of UK-NI and UK-ROI voyages. As set out above, these were 0.2 $MtCO_2e$ in 2019. This figure includes emissions from voyages within Northern Ireland, alongside those from Northern Ireland to Great Britain. Doubling this figure could provide an estimate of the emissions from ships travelling in both directions between Northern Ireland and Great Britain, though this is likely be an overestimate. DfT analysis of data from Sea/ by Maritech, suggests that 86% of voyages between Northern Ireland and Great Britain during 2022 were from ships over 5000GT.

Threshold for the scheme

The Authority proposes to include ships over 5000GT within the UK ETS from 2026. Analysis of 2019 emissions data from the NAEI suggests that approximately 39% of the GHG emissions from seagoing ships within the UK domestic maritime sector were produced by ships over 5000GT.[18]

As a simplifying assumption, this estimate assumes that all inland waterways and leisure craft are below 5000GT. This has been necessary due to the limitations of the available evidence on the gross tonnage of these ships.

Inclusion of methane and nitrous oxide emissions

As outlined in the consultation, we are proposing to include additional GHGs from maritime within the scheme, specifically methane and nitrous oxide. Analysis of 2019 emissions data from the NAEI estimates that approximately 0.002$MtCO_2e$ of Methane (CH_4) and 0.06$MtCO_2e$ of Nitrous Oxide (N_2O) were produced by seagoing ships within the UK domestic maritime sector.[19]

[18] ETS Authority (2023) Developing the UK Emissions Trading Scheme: Main response, p108. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1166812/uk-emissions-trading-scheme-consultation-government-response.pdf

[19] Report: Greenhouse Gas Inventories for England, Scotland, Wales & Northern Ireland: 1990-2021 - NAEI, UK (beis.gov.uk)

Exemptions

Government non-commercial maritime activity

As outlined in the consultation, the Authority intends to exempt emissions from government non-commercial maritime activity (GNCMA) from the UK ETS. This policy position follows the approach normally taken under the Merchant Shipping Act 1995. This term includes activities such as when operating for non-commercial purposes:

- Military ships
- Customs / Border Force ships
- Police ships
- Coastguard and other government search and rescue ships
- Emergency/medical ships, such as NHS/ambulance boats
- Government research ships
- General Lighthouse Authority ships (used for non-commercial purposes)

Emissions from military ships are not included in emissions estimates set out in this document. Emissions from other forms of Government non-commercial activity are likely to be small and to largely fall under the 5000GT threshold. Data from the UK Ship Register shows that only 2 out of 187 potential non-commercial government ships (excluding military and Border Force ships) are over the 5000GT threshold.

Scottish island ferry services

Though island populations exist across the UK, there are a particularly large number of communities in Scotland that rely on these services, with around 93 inhabited offshore islands in Scotland, the vast majority of which are not connected to mainland Great Britain by road.

The Scottish Government, which is part of the Authority, is committed to improving outcomes for island communities, including through increasing population levels and improving transport services. These objectives are set out in the National Islands Plan[20] and all Scottish Ministers have a statutory responsibility and duty to implement and deliver on the strategic objectives set out in this Plan.

As outlined in the consultation, the Authority is minded to exempt ferry services serving Scottish islands from the UK ETS, reflecting the particular importance of the Islands (Scotland) Act 2018 in Scottish Government policy making. Any eventual exemption would be subject to review in future, in particular if viable, lower-emissions alternatives for these ferry services become commercially available. The planned 2028 review on the threshold would be the first opportunity to review any exemption.

[20] Scottish Government (2019), 'The National Plan for Scotland's Islands', https://www.gov.scot/publications/national-plan-scotlands-islands/

Table 2 illustrates the potential emissions from these ferries that would be removed from the scope of the UK ETS if the Authority proceeds with this exemption. These figures are illustrative only because they are based on historical EU MRV 2019 data, when eleven 5000GT+ ships were part of the fleet emitting a combined total of 0.17MtCO_2e. Future emissions could change due to ships joining or leaving the fleet, technological development, or changes in voyage frequency.

We have not deducted emissions from ferry services to Scottish islands, but an illustrative range of emissions associated with these ships is included in this analytical annex. We will refine this ahead of the Authority Response and deduct emissions from cap adjustment pathway accordingly.

Table 2: Illustrative size of Scottish island ferry services exemption, 2026-30.

Total illustrative exemption size: 5000GT+ Scottish island ferry services CO_2 emissions 2026-30, MtCO_2e	Illustrative exemption size as a proportion of total proposed maritime cap adjustment
0.9-1.1	7-9%

A range is presented in table 2. The lower part of the range assumes no change in ferry emissions compared with 2019, whereas the upper part of the range assumes an increase in emissions of 27% to account for expected changes to the size of the fleet. These ranges should not be seen as bounds on future emissions – the true figures could be higher or lower due to unexpected changes in the sector. We will look to improve this analysis ahead of the Authority Response.

Note that table 2 is based upon the effect on the scheme with the proposed 5000GT threshold. Were it to be lowered following the review of the threshold by 2028, we would expect that more ships and therefore more emissions would be exempted in this way.

Participating in the scheme

Monitoring, reporting, and verification

We intend to use the existing UK Monitoring, Reporting, and Verification of CO_2 emissions from ships (UK MRV) regime[21] as the basis for the expanding the scope of the UK ETS to maritime. However, we intend to deviate in five general areas from the existing UK MRV regime, which are further detailed in the consultation. The existing UK MRV regime applies

[21] Maritime & Coastguard Agency (2023), 'MIN 669 (M+F) Amendment 1 – Reporting emissions data into the UK MRV regime', https://www.gov.uk/government/publications/min-669-mf-amendment-1-reporting-emissions-data-into-the-uk-mrv-regime/min-669-mf-amendment-1-reporting-emissions-data-into-the-uk-mrv-regime

only to ships over 5000GT, transporting cargo and/or passengers for commercial purposes to and from UK ports, between UK ports or within UK ports (including while at berth). Ships in scope of the UK MRV regime must produce an approved emissions monitoring plan and verified annual emissions report, from 2024 approval of monitoring plans and verification of reports is undertaken by United Kingdom Accreditation Service (UKAS) accredited verifiers. Following each reporting period, a document of compliance (DoC) must be carried on ship covering the previous reporting period.

The majority of ships that we propose to be in scope of the UK ETS are already included in the UK MRV regime, given that UK MRV currently applies to ships over 5,000 GT transporting cargo and/or passengers for commercial purposes to and from UK ports (including while at berth). The types of ships that are not currently included in UK MRV but that we propose will be included in the UK ETS are expected to be largely offshore related, including anchor handling tug supply (AHTS) ships, construction ships, mobile offshore production units, platform supply ships, survey units and utility support ships. We estimate that this could cover around 145 ships.[22]

Impacts of the scheme

Decarbonisation impacts

As outlined in the rationale section above, a key market failure in the maritime sector is that maritime fuel prices do not reflect the social costs of their GHG and air pollutant emissions. Expansion of the UK ETS to cover the maritime sector would contribute to addressing this market failure by applying a price to the emissions from maritime included within the scheme, in the form of the cost of UKAs, therefore helping to provide an incentive for shipowners and operators to invest in technologies to reduce their emissions to reduce their exposure to this carbon price. We expect this to address the market failure and help decarbonise the sector in line with our climate commitments.

Distributional impacts and carbon leakage

In 2023, the Department for Transport and the Department for Business, Energy and Industrial Strategy commissioned a research study conducted by Frontier Economics to gain a better understanding of the potential risks of carbon leakage, internal carbon displacement, and competitive disadvantage resulting from the expansion of the UK ETS to include domestic maritime, with a particular focus on routes between Great Britain and Northern Ireland[23].

The report found that, for the three routes between Great Britain and Northern Ireland that were focused on, the expansion of the UK ETS to maritime is likely to provide a strong incentive to accelerate decarbonisation. It also found that the risk of carbon leakage, internal

[22] Estimates based on DfT analysis of Sea/ by Maritech data, of a total 4,459 ships that produced UK domestic maritime emissions in 2021.
[23] Frontier Economics (2023), 'Economic research on the impacts of carbon pricing on the UK domestic maritime sector', https://www.frontier-economics.com/media/5hmhnehy/the-impacts-of-the-uk-domestic-maritime-sector-joining-the-uk-ets.pdf

carbon displacement, and competitive disadvantage, resulting from the expansion of the UK ETS to maritime, were all low. Importantly, the risk was low if the EU ETS maritime proposals were in place. If the EU proposals were not in place, then the risk of carbon leakage, internal carbon displacement, and competitive disadvantage would all be higher if the proposed expansion into the UK ETS were to be implemented. The EU ETS expanded into the maritime sector in January 2024, covering ships of 5000 GT and above.

Future review of the threshold for the scheme

The consultation is seeking views on committing to review the maritime threshold for the UK ETS in 2028, should the UK ETS be expanded to the maritime sector from 2026. A potential lower threshold could be 400GT.

Analysis of 2019 emissions data from the NAEI found that approximately 76% of domestic maritime emissions were produced by ships over 400GT and 39% by ships over 5000GT. These correspond to 4.6MtCO_2e and 2.4MtCO_2e respectively.[24]

As a simplifying assumption, these estimates assume that all inland waterways and leisure craft are below 400GT. This has been necessary due to the limitations of the available evidence on the gross tonnage of these ships. As outlined in the consultation, we would welcome any data on this that could enable these estimates to be improved.

This lower threshold could bring into scope a wider range of ships and sub-sectors and correspondingly, a greater proportion of maritime emissions. However, we do not currently hold complete data on many of these ships, such as ships operating on inland waterways.

Lowering the threshold would lead to an increase in the required cap adjustment to cover more of the sector, for which we would progress additional work ahead of any policy decision.

We will undertake further analysis on the impact of lowering the threshold to 400GT ahead of the 2028 review of that option.

Coverage of international routes

The consultation is seeking views on how potential future inclusion of international emissions in the UK ETS could work, in the event that multilateral action at the International Maritime Organization (IMO) be delayed or prove insufficient in reducing GHG emissions from international shipping. Responses to our previous consultation made it clear that there was interest in expanding the UK ETS coverage to cover a share of international maritime emissions. The EU ETS includes 50% of emissions from ships over 5000GT on voyages between the EU and non-EU member states.

[24] DESNZ, Welsh Government, The Scottish Government, and Department of Agriculture, Environment and Rural Affairs (Northern Ireland) (2023), 'Developing the UK Emissions Trading Scheme: main response', https://www.gov.uk/government/consultations/developing-the-uk-emissions-trading-scheme-uk-ets

The Authority recognises the primary route to addressing international emissions remains multilateral action taken at the International Maritime Organization (IMO) and confirms that it will not expand in-scope emissions for non-EEA international voyages for 2026. However, in this consultation we are exploring potential coverage, in the event that IMO action is delayed or is insufficient in reducing GHG emissions from international shipping. We are looking specifically at what proportion of emissions should be in scope and when an expansion should take place, whilst taking necessary steps to avoid double charging or adverse impacts on operators.

All ships that begin or end a voyage at a UK port are in the currently proposed expansion of the UK ETS because at berth emissions are part of the proposed scope. Therefore, we expect that including some or all of emissions from international voyages themselves will not bring any additional operators into scope of the scheme, though it would of course increase the emissions in scope.

Section 3: Cap adjustment

Approach to cap adjustment

In the 2023 Authority Response[25], we set out our intention to reduce the overall scheme cap to make it consistent with net zero, meaning a total of 936 million allowances will be available over Phase I (2021-2030) before accounting for hospital and small emitters. This proposed revised cap was set based on whole-system modelling of the economy-wide emissions reductions to meet our carbon budgets (CBs), nationally determined contribution (NDC), and net zero, as well as analysis of the policies required to achieve them. If we were to leave the cap at the same level as the proposed net zero-consistent cap when expanding the scope of the UK ETS, sectors covered by the scheme would be forced into additional abatement. Instead, we propose to adjust the cap to reflect the additional emissions brought into scope using the same net zero consistent approach as for the 2023 Authority Response[26].

Details of cap adjustment

Cap adjustment

As outlined in the consultation document, we propose that we adjust the UK ETS cap based on the most up-to-date decarbonisation pathway for the UK domestic maritime sector. The indicative cap trajectory provided in this consultation is therefore based on the analysis for domestic maritime that informed both the Net Zero Strategy (NZS) and Carbon Budget Delivery Plan (CBDP).[27] If an updated decarbonisation trajectory were to be produced ahead of the Authority Response, we would seek to adjust instead per that more recent trajectory. In this scenario, the Authority would intend to notify stakeholders upon publication and seek their views on to allow for these updated figures to inform consultee responses to this consultation. The adjustment figures will be confirmed in the Authority Response to this consultation, subject to adjustments to account for final emissions coverage and our consideration of advice from the Climate Change Committee.

Table 3 sets out this indicative cap adjustment for the scope as proposed in this consultation, using figures based on the sectoral emissions trajectory from the CBDP. Analysis carried out by DESNZ of the NAEI data has been used to estimate the share of emissions from ships within the proposed size threshold of the scheme, based on data from Ricardo Energy & Environment on ship length. The figures in the table account for coverage of tank-to-wake

[25] [25] DESNZ, Welsh Government, The Scottish Government, and Department of Agriculture, Environment and Rural Affairs (Northern Ireland) (2023), 'Developing the UK Emissions Trading Scheme: main response', https://www.gov.uk/government/consultations/developing-the-uk-emissions-trading-scheme-uk-ets

[26] [26] DESNZ, Welsh Government, The Scottish Government, and Department of Agriculture, Environment and Rural Affairs (Northern Ireland) (2023), 'Developing the UK Emissions Trading Scheme: main response', https://www.gov.uk/government/consultations/developing-the-uk-emissions-trading-scheme-uk-ets

[27] DESNZ (March 2023) Carbon Budget Delivery Plan. https://www.gov.uk/government/publications/carbon-budget-delivery-plan/carbon-budget-delivery-plan

(TtW)[28] emissions of carbon dioxide, nitrous oxide, and methane, both at sea (when conducting UK domestic voyages) and at berth, from ships of 5000GT and above. They do not include emissions by ships of below 5000GT, or any coverage of international voyages, or any other potential derogations (e.g., a potential partial exemption for UK-Northern Ireland voyages). It has been possible to exclude these ships because the NAEI modelling is done on a bottom-up agent-by-agent basis.

As outlined in this consultation, we intend to exempt emissions from government non-commercial maritime activity. Many of these emissions are from military ships, which were not covered by this analysis. We have not removed emissions associated with non-military government non-commercial ships due to a lack of data availability. However, we will seek to understand this better to ensure that the adjustment to be confirmed in the Authority Response will account accurately for the emissions in scope.

We also are also minded to exempt ferry services to Scottish islands. Our modelling includes any such ships that are at least 5000GT. We have not deducted these emissions from the single emissions trajectory, but the Scottish island ferry services section above provides an illustrative range of emissions associated with these ships. We will refine this ahead of the Authority Response and deduct emissions from cap adjustment pathway accordingly.

Table 3: Indicative cap adjustment pathway based on the proposed approach and the Carbon Budget Delivery Plan trajectory for sectoral emissions.

	2026	2027	2028	2029	2030
Indicative cap adjustment (millions of UKAs)	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**

In the previous Authority Response, we advised that our estimates for in-scope emissions from maritime in the first year of inclusion in the UK ETS (2026) would be equivalent to around two million UK allowances, decreasing each year for the remainder of the phase. The CBDP trajectory is flat and assumes no real abatement before 2030 (but with significant emissions savings beginning in the early 2030s). As discussed above, if an updated decarbonisation trajectory were to be produced ahead of the Authority Response, we would seek to adjust instead per that more recent trajectory.

[28] Tank-to-wake (TtW) emissions are those generated by the operation of ships only and are distinct from well-to-wake (WtW), or lifecycle, emissions which also include emissions from the upstream production and distribution of the fuels and other energy sources.

Market impact

In this section we outline the potential impact on the UK ETS market of expanding to the Maritime sector with the proposed cap adjustment.

Table 41: Comparison of size of Maritime cap adjustment with the net-zero consistent UK ETS cap 2026-2030, millions of UKAs.

Type	2026	2027	2028	2029	2030
Maritime Cap Adjustment	2.4	2.4	2.4	2.4	2.4
Net zero-consistent overall scheme cap	79.1	70.1	53.5	50.9	49.3
Cap adjustment + net zero-consistent cap	81.5	72.5	55.9	53.3	51.7
Maritime cap adjustment as a percentage of the overall adjusted net zero-consistent cap	3%	3%	4%	5%	5%

Table 4 demonstrates that the proposed cap adjustment for the scope expansion to the maritime sector would make up a small proportion (5%) of the overall UK ETS cap in 2026-2030. The adjustment would increase the cap between 2026-2030 from 303MtCO_2e to 315MtCO_2e, which is an increase of 1% to the total cap for UK ETS Phase I (2021-2030), from 936 MtCO_2e to 948 MtCO_2e.

Given the size of the proposed cap adjustment, based upon the 5000GT threshold and current market size, we expect that the proposed cap adjustment to account for expansion to domestic maritime would have a limited impact on the UKA price and traded emissions levels. There are also limited risks associated with setting the cap above or below true emissions being brought into scope because the difference between the two is likely to be small as a proportion of the overall traded sector.

We will carry out further analysis on the impact of the cap adjustment for maritime on the UK ETS market prior to confirming the cap adjustment in the Authority Response. This will include analysis identifying the level of market driven abatement at different carbon prices, and how this will affect the sector's emissions.

Section 4: Analytical considerations for the Authority Response

Following the consultation, the Authority Response will assess the feasibility and impact of scope expansion to maritime in more detail, considering stakeholders' responses to this consultation. This will be based upon analysis of the options presented in this consultation. We will also assess the following considerations:

Emissions reductions, carbon prices, and wider environmental impacts

The primary benefit of an ETS is the benefit to society of emissions reductions that are achieved as operators choose to abate rather than purchase and surrender UKAs. Expanding the scope of the UK ETS is expected to incentivise abatement in the maritime sector. Depending on the impact on carbon price, UK ETS scope expansion will also impact the decarbonisation pathway of the current traded sector. If scope expansion leads to a higher carbon price, we would expect additional abatement in the existing traded sector, and vice versa. We hope to quantify these benefits using modelling based on marginal abatement cost curves (MACCs), business as usual (BAU) emissions, and the updated cap trajectory. We will also look to consider wider environmental impacts where data allows.

Resource costs to operators

A key cost of this policy is expected to be resource costs to maritime participants newly in scope of the UK ETS associated with reducing their emissions. We expect that this will include permanent abatement and efficiency measures, both of which will require investment by operators. The precise level of abatement will be determined the UKA price, with higher prices driving more abatement and thus higher resource costs. We hope to quantify these costs using MACCs for maritime.

Compliance costs

Compliance costs reflect the costs incurred by maritime operators to purchase the allowances necessary to meet their obligations under the UK ETS. This will be an increased burden on new participants to the UK ETS since they will have to comply with UKA surrender obligations. Additional scope expansion could potentially lead to a change in carbon prices and thus compliance costs for existing participants. In general, higher carbon prices will tend to increase compliance costs, while reductions in emissions will tend to reduce them. Compliance costs constitute a social transfer from market participants to government when UKAs are purchased

on the primary market, or a social transfer between participants when they are traded on the secondary market. We hope to quantify these costs using data from UKA auctions.

Administrative costs

Administrative costs to participants are the costs incurred from complying with obligations in the UK ETS. This includes costs associated with monitoring, reporting, and verification, as well as the administrative costs related to managing, planning, and surrendering allowances for compliance.

New participants to the scheme in the maritime sector will be exposed to these costs. However, we do not expect these costs to be significant compared to operational costs, and for most domestic ships who already report emission under the existing UK MRV regime, these changes are not expected to have a significant additional impact on administrative costs. We expect that the assessment of these costs will be a mixture of qualitative and quantitative.

Operator impacts

The new compliance costs for maritime operators could impact their competitiveness, but also lead to an impact in the industrial sector. This is an indirect impact, where UK ETS costs in the maritime sector are passed through to other firms. For example, any new UK ETS costs in the maritime sector could be passed through to other firms though increased transport costs. These could impact the competitiveness of maritime firms in the UK. We expect that the assessment of these impacts will be qualitative.

Wider economic impacts

The impact that scope expansion has on the market itself could have an impact on the wider economy. By increasing the scope of the UK ETS, we would be incentivising more ships to decarbonise and potentially invest in decarbonisation technologies and could also contribute to increased technological innovation, for example via increased R&D spending. This could lead to positive spillovers, reducing the cost (and accelerating uptake) of future abatement. Additionally, this decarbonisation could support jobs and investment in the green economy across the UK. We expect that these impacts will be qualitative.

Firm behaviour

All the potential impacts listed above depend significantly on how operators engage with the UK ETS and compliance markets. Compliance costs will also depend on operators' UK ETS market behaviours, such as banking, hedging and the use of future free allocation. Where possible and known, we will analyse the impacts of these behaviours. Where the extent or impact of these behavioural factors are unknown, we will highlight this uncertainty.

This publication is available from: www.gov.uk/government/consultations/uk-ets-scope-expansion-maritime-sector

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