

UK DOMESTIC MARITIME DECARBONISATION JULY 2022

UKPIA RESPONSE

1. What is your feedback on the overall ambition and feasibility of the Net Zero Strategy pathway for domestic maritime vessel emissions?

Thank you for providing an indicative pathway for the decarbonisation of the Domestic Maritime sector.

The Net Zero Strategy Pathway assumes a baseline increase in emissions to 2050. However, there is no explanation for the rationale for this increase and it would be helpful to articulate this. Some may be understandably due to an increase in the number and size of vessels as the economy grows¹; however, it does not take account of any normal underlying improvements in vessel efficiency that would happen regardless of the transition to Net Zero.

It would also be useful to articulate the source of the ongoing emissions in 2050; is this for example heritage vessels and private pleasure craft?

It would be useful to articulate the expected life of vessels operating in the UK domestic maritime sector and whether this was considered in the pathway. Inland vessels often have significant lifespans, often more than 20 years², so vessels being constructed this year are likely to still be in useful service in 2050. The explanation could include, for example a discussion on whether the options for retrofitting vessels for new fuel sources³ discussed later in the consultation have been considered in the analysis.

2. What role do you think the following alternative fuels and energies may play in decarbonising domestic maritime sector vessels (within your subsector, if appropriate)? What evidence do you have to support this opinion?

- Low carbon hydrogen
- Low carbon hydrogen-derived fuels like ammonia or synthetics e.g. methanol or methane etc. equipped with carbon capture systems
- Electricity and battery technologies
- Onboard renewables e.g., Wind or Solar
- Nuclear power
- Biofuels (please include the generation and associated production process of biofuel(s) of interest)
- LNG
- Any other alternative fuels and energies which have not been presented or examined here, that may be important in the UK domestic maritime sector's decarbonisation.

¹ <https://www.oecd.org/ocean/topics/ocean-shipping/>

² <https://www.bbc.co.uk/news/uk-scotland-61161932>

³ <https://www.weforum.org/agenda/2021/10/net-zero-shipping-decarbonisation-new-strategy/>

The choice of technologies ultimately sits with the vessel owner or operator rather than fuel suppliers. Any mandates should therefore be set on a wake-to-wheels Greenhouse Gas (GHG) reduction basis for the vessel owner or operator. Placing a mandate on fuel suppliers to reduce the GHG intensity of their fuels in isolation will not be effective in decarbonising the maritime sector.

As articulated in our response to the Low Carbon Fuel Strategy (LCFS) Call for Ideas⁴, a range of low carbon energy vectors will be needed to effectively decarbonise the maritime sector.

We strongly disagree with the assumption that biofuels will not be used by the maritime sector, despite this being the advice of the CCC. Renewable fuels offer the fastest short-term reduction in GHG emissions while alternative technologies for fuels and vessels develop and are deployed. As we indicate in our response to Q1, vessels being built now will still be in service in 2050. If retrofitting is not an option, then apart from scrapping the vessel at significant environmental and financial cost, then low carbon fuels such as Hydrogenated Vegetable Oils (HVO) or Fatty Acid Methyl Ester (FAME) would still be an effective means of decarbonisation and should be considered⁵. In addition, some renewable fuels such as FAME distillation bottoms which are not suitable or use in road fuels are suitable for use in maritime applications and should be encouraged.

Onboard Carbon Capture and Storage (CCS)⁶ and Fuel Cells⁷ may also be used. Page 34 of the Consultation discusses a phase out date for the sale of new non-zero emission domestic vessels. CCS is not a suitable technology for road fuels applications but is suitable for maritime applications. Therefore, it is not appropriate to simply follow the route being considered for road fuels, with fossil fuel engines coupled with CCS remaining an applicable in maritime applications.

The UK maritime sector does not sit in isolation from the rest of the international maritime sector⁸, with vessel technologies being developed for the wider market. The UK needs to consider and support an international effort in decarbonising the sector including those within IMO and the EU.

It is unlikely that a one size fits all solution will work in this situation (as is also the case with aviation). For example, battery technology may be more suited to shorter routes such as ferry or harbour operations.

⁴ <https://www.ukpia.com/media/2832/ukpia-low-carbon-fuels-strategy-call-for-ideas.pdf>

⁵ <https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/energy-outlook/bp-energy-outlook-2022.pdf>

⁶ <https://www.offshore-energy.biz/value-maritime-to-install-worlds-1st-onboard-ccs-unit-on-ship-in-operation/>

⁷ <https://www.fuelcellsystems.co.uk/marine-fuel-cells>

⁸ <https://www.maritimeuk.org/about/about-us/>

3. What value do you think different efficiency and energy saving measures could have in helping to achieve domestic maritime vessel decarbonisation (in your sub-sector, if appropriate)?

This is beyond UKPIA's general area of expertise; however, we agree that efficiency and energy saving measures should also be promoted as part of the effort to decarbonise the sector.

The Maersk McKinney Moller Centre for Zero Carbon Shipping's Industry Transition Report⁹ may offer further information on energy efficiency saving measures.

4. How should the technological transitions required to decarbonise the domestic maritime sector best be supported? What evidence do you have to help refine our understanding in this area?

UKPIA suggests that recent developments in low-carbon aviation such as competitions and an equivalent of the Jet Zero Council would be beneficial in being applied to the maritime sector.

The aviation sector is receiving significant support to decarbonise, with July 2022 announcements¹⁰ regarding the Jet Zero strategy at the Farnborough International Airshow. These include, for example an announcement on a Sustainable Aviation Fuel (SAF) mandate, and £165m of support for pioneering SAF projects. There is also a government run competition for the first Net Zero Transatlantic Flight for 2023¹¹, encouraging the practical development required for the transition. The Jet Zero Council¹² is also active in the decarbonisation of the UK Aviation Sector.

We welcome the establishment of the new unit, UK SHORE in March 2022¹³ to tackle shipping emissions together with the £206m of new funding to accelerate research. While a few years behind comparable efforts in the aviation sector, the development of a similar approach for the maritime sector would be welcome. However, decarbonisation of the maritime sector will incur significant expenditure and further funding will be needed; for example, to enable vessel upgrades, and fuelling infrastructure.

UKPIA would support the expansion of the Clean Maritime Decarbonisation Competition (CDMC) to become a multi-year programme. We would also urge the Government to provide more notice of funding rounds of future phases of the CDMC so that industry can prepare project proposals that can benefit from this funding. Current experience indicates that the timelines are prohibitively tight to submit a project proposal for this competition.

⁹ https://cms.zerocarbonshipping.com/media/uploads/documents/MMMCZCS_Industry-Transition-Strategy_Oct_2021.pdf

¹⁰ <https://www.gov.uk/government/news/skys-the-limit-as-uk-sets-out-strategy-to-reach-net-zero-aviation-and-deliver-guilt-free-flying>

¹¹ <https://www.gov.uk/government/news/first-ever-net-zero-transatlantic-flight-to-take-to-the-skies-in-2023>

¹² <https://www.gov.uk/government/groups/jet-zero-council>

¹³ <https://www.gov.uk/government/news/dft-launches-uk-shore-to-take-maritime-back-to-the-future-with-green-investment>

As we indicate in our response to Q2, applying a mandate on maritime fuel similar to the SAF mandate on aviation is not appropriate. While SAF remains the only short-term option for decarbonising aviation, other options exist in the maritime sector such as electrification or hydrogen for short journeys and CCS for longer journeys. Placing a mandate on fuel suppliers to reduce the GHG intensity of their fuels in isolation will not be effective in decarbonising the maritime sector.

5. Are you able to provide any additional evidence on the costs and benefits associated with decarbonising UK domestic maritime vessels?

The UCL / UMAS study^{14,15} may offer some insights into the costs and benefits associated with decarbonising UK domestic maritime vessels.

6. How should intermediary, indicative decarbonisation targets for UK domestic maritime sector vessel emissions be formulated?

UKPIA recommends that certainty is needed to support the significant levels of investment required to decarbonise the maritime sector. This includes firm intermediary targets to set the trajectory for maritime decarbonisation to provide investor confidence in the transition.

One option to consider may be the introduction of a GHG-reduction based scheme for the maritime sector based on vessel owners. However, this may need to be carefully considered to prevent unintended consequences, such as vessels bunkering in non-UK facilities at lower cost.

7. What are the most significant barriers to domestic maritime decarbonisation at scale (if appropriate, within your subsector)?

We agree with the list of barriers presented in the consultation as being the highest-impact obstacles to maritime decarbonisation.

For the UK Fuel supply sector, we see the following as being the most significant barriers

1. Negative externalities (economic barrier)
The lack of a structure in place to incentivise GHG reductions in the sector limits demand for the uptake of new technologies
4. Existing Infrastructure and onboard technologies (Structural barrier)

¹⁴ <https://www.globalmaritimeforum.org/content/2020/01/Aggregate-investment-for-the-decarbonisation-of-the-shipping-industry.pdf>

¹⁵ <https://www.ucl.ac.uk/bartlett/energy/news/2021/apr/new-research-finds-major-opportunities-decarbonising-maritime-transport>

With Barrier 1 limiting demand for new technologies, development in the required infrastructure is limited.

5. Inter-organisational coordination failures (organisation barriers)

With Barrier 1 limiting demand for new technologies, development in the required infrastructure is limited.

8. Which international policies, programmes, and initiatives do you expect will have the most impact on how the UK's domestic maritime sector decarbonises?

We expect that the IMO Initial Strategy and upcoming revision will have the biggest impact on the UK's domestic maritime sector, for the following reasons

- Maritime technologies including fuel and propulsion systems are developed on an international, rather than national level even if the vessels are only used on a national basis. Therefore, international cooperation such as within IMO is best placed to provide consistent and realistic development of decarbonisation technologies at the scale required
- An international mechanism is best placed to prevent unintended consequences, such as vessels bunkering with higher carbon fuels out with UK jurisdiction, potentially leading to higher GHG emissions.
- If the UK unilaterally decides to decarbonise the maritime sector faster than other major world economies, then this is likely to increase the operating costs for the shipping sector, which has the potential to impact prices of goods and services in the UK relative to international competitors, notably in neighbouring countries.

Given the points raised above, while IMO may be expected to have the biggest impact, efforts within the EU including the "Fit for 55" Initiative will also be beneficial in creating a level playing field for the development and introduction of low carbon technologies.

In our view, unilateral UK approaches, while providing a degree of ambition and helping international efforts, would have a lower impact. We encourage the UK Government to synergise regulatory developments with IMO and EU Institutions. This provides a level playing field free of market distortion and / or carbon leakage.

9. What do you think are the key lessons from international policies, programmes, and initiatives that we should consider in our approach to decarbonising the UK domestic maritime sector?

The UK RTFO¹⁶ has been as successful as it has been because it was based on underlying EU directives (The EU Renewable Energy Directive¹⁷) which were in force in the UK at the time, that promoted ground transport decarbonisation across Europe. This created a long-term framework which significantly reduced the impact on the UK alone, both in terms of the

¹⁶ <https://www.gov.uk/guidance/renewable-transport-fuels-obligation>

¹⁷ <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0016:0062:en:PDF>

development and investment in low carbon fuel production technology and on the UK's competitiveness.

Similarly, the EU is planning on introducing a maritime regulation called FuelEU Maritime¹⁸, and extend the EU Emissions Trading Scheme (ETS)¹⁹ and Renewable Energy Directive (RED)²⁰ to the maritime sector as part of the "fit for 55" initiative. These regulatory developments are expected to be introduced on a similar timeframe to those in the UK. Again, this creates as close a level playing field for the UK as possible, allowing investment in UK maritime decarbonisation and maintaining the UK's competitiveness.

These highlight that an international approach should be taken to decarbonising the UK maritime sector.

10. Are there any additional interventions targeting economic barriers that the government could explore introducing to complement and enhance our current approach, in the short, medium, and long term?

We note the recent consultation on developing the UK ETS scheme²¹ which included aspects of decarbonisation of the maritime sector, and would refer to our response to this consultation, (a copy of which is available from UKPIA on request).

We agree that the measures outlined in the consultation reflect the main policy options available to government to incentivise decarbonisation in the maritime sector. In particular we welcome the £23m in funding for the Clean Maritime Demonstration Competition (CMDC) and the £206m for UK SHORE and its ongoing research.

We note that there is an inconsistency in the measures presented; however, on one hand earlier in the consultation there is a statement that biofuels are not part of the decarbonisation solution (following the CCC), but the measures presented include amending the RTFO to incentivise Renewable Fuels Not of Biological Origin (RFNBOs) and specifically mentions the maritime sector in this regard. In addition, some renewable fuels such as Fatty Acid Methyl Ester (FAME) distillation bottoms which are not suitable for use in road fuels are suitable for use in maritime applications We would encourage a consistent strategy approach, allowing low carbon fuels such as biofuels to maximise options to decarbonise the maritime sector.

11. What are the potential benefits and impacts of mandating or incentivising the incorporation of energy efficiency and energy saving measures on board domestic maritime vessels, where possible?

¹⁸ https://ec.europa.eu/info/sites/default/files/fueleu_maritime_-_green_european_maritime_space.pdf

¹⁹ https://ec.europa.eu/clima/eu-action/transport-emissions/reducing-emissions-shipping-sector_en

²⁰ <https://www.eumonitor.eu/9353000/1/j9vvik7m1c3gyxp/vlkimgggznzr>

²¹ <https://www.gov.uk/government/consultations/developing-the-uk-emissions-trading-scheme-uk-ets>

The UK could look to mirror new IMO regulations such as Carbon Intensity Indicator (CII)²² and Energy Efficiency Existing Ship Index (EEXI)²³ to vessels which are currently exempt, such as non-convention vessels. With the existing legal frameworks and compliance solutions already in place, this would require minimal investment.

12. What are the potential benefits and impacts of developing a zero-emission capability standard, either as a mandate or incentive for new ships? What do you think is a reasonable definition of zero-emission capability?

UKPIA believes that technology neutral policies are needed coupled with support for GHG reductions on a Life Cycle Based approach, rather than effective prohibition of selected technologies.

The IMO are likely to start work on a mandatory carbon intensity code within the next 2-3 years, and this should be the basis of any applicable standards used in the UK.

There are potential benefits of a zero-emission capability standard in creating certainty for investment and construction of new vessels. A similar approach has been taken with UK domestic boilers, with a call for evidence on hydrogen-ready boilers issued in December 2021²⁴ (to which UKPIA responded).

However, care must be taken when considering the implementation of this on a unilateral basis. For example, will this apply only to ships built in the UK for the UK Domestic market, or will it apply to those built in international shipyards as well? A poorly implemented mandate may have perverse incentives, such as rendering UK shipyards uncompetitive or increasing operating costs for UK based vessel owners relative to their international competitors.

The ability of shipyards to produce ships meeting the new standard also needs to be carefully considered so that the mandate, or incentives can be realistically met within the set timeframe.

13. Are you aware of any domestic or international regulatory measures that you think currently discourage progress toward maritime decarbonisation, and should be reviewed by the government?

UKPIA is not aware of any domestic or international regulatory measures that can discourage progress towards maritime decarbonisation. However, as per our previous responses we would encourage an international, rather than unilateral, move to decarbonising the maritime sector. The UK should also make every effort to normalise the use of conventional renewable fuels as a transitional element of the journey to decarbonisation.

²² <https://www.dnv.com/maritime/insights/topics/CII-carbon-intensity-indicator/index.html>

²³ <https://www.dnv.com/maritime/insights/topics/eexi/index.html>

²⁴ <https://www.gov.uk/government/consultations/enabling-or-requiring-hydrogen-ready-industrial-boiler-equipment-call-for-evidence>

14. Which regulatory interventions do you think the government should support in the short, medium, and long term to help accelerate decarbonisation and complement existing plans and proposals?

Targets should be technology neutral, allowing low carbon technologies to compete on a level playing field in promoting effective GHG reductions. There should be no “picking winners” such as ammonia against options such as on-board CCS, fuel cells, renewable fuels, or battery supply.

We strongly disagree with the assumption that biofuels will not be used by the maritime sector, despite this being the advice of the CCC. Low-carbon or renewable fuels offer the fastest short-term reduction in GHG emissions while alternative technologies for fuels and vessels develop and deployed. As we indicate in our response to Q1, vessels being built now will still be in service in 2050 and low-carbon fuels offer a suitable means of reducing the GHG emissions of these vessels.

15. What are the benefits and impacts of mandating the carbon intensity of fuels and energies used in the domestic maritime sector?

The choice of technologies ultimately sits with the vessel owner or operator rather than fuel suppliers. Any mandates should therefore be set on a GHG reduction basis for the vessel owner or operator.

If a scheme mandating the carbon intensity of fuels is applied to the maritime sector, then it must be carefully considered to ensure that it is fit for purpose. For example, in the FuelEU Maritime legislation²⁵ it is proposed that this be the ship owner. This would allow the ship owner to look at the most cost-effective options for their GHG reductions

It needs to be recognised that a mandate on the carbon intensity of fuels will come with an increased cost which may initially be borne by the ship operator, but ultimately will be passed on to the hauliers or passengers using the vessels. Placing the GHG reduction obligation on the ship owner allows them to choose the lowest cost decarbonisation option available to them. Finally, the carbon intensity of fuels needs to be assessed on a well-to-wake basis²⁶, covering the full lifecycle; including only tank-to-wake components is likely to lead to unintended consequences elsewhere in the fuel supply system.

16. What more can the government do to help convene the maritime industry, connect, coordinate, and support its collaborative efforts to decarbonise the sector?

As discussed in our response to Q5, the Jet Zero Council has been established to promote decarbonisation in the aviation sector. While we recognise the establishment of UK SHORE,

²⁵ https://ec.europa.eu/info/sites/default/files/fueleu_maritime_-_green_european_maritime_space.pdf

²⁶ <https://theicct.org/sites/default/files/publications/Well-to-wake-co2-mar2021-2.pdf>

we would encourage the establishment of a similar organisation to the Jet Zero Council for the maritime sector, bringing together high-level key stakeholders who can enable the transition at the scale required.

17. Does government have a role in providing advice or greater clarity on the technology and investment options for the domestic fleet?

The role of the government should be to outline the policy direction and framework under which GHG reductions in the maritime sector can progress. As has been seen in decarbonisation efforts in other sectors, including the road transport sector, this then encourages the innovation and investment in the technology required at the scale needed by operators in the sector at all levels in the supply chain.

There would seem to be little benefit in the government intervening to provide clarity itself on the options to the sector directly.

18. Should the government explore options to disincentivise contractual behaviours which are creating a structural barrier to decarbonisation? How should government approach this?

In UKPIA's experience, we have not had experience of decarbonisation avoidance in the maritime sector. However, this should be discouraged as much as possible. There are inevitable unintended consequences when government intervene in this manner.

The role of the government should be to outline the policy direction and framework under which GHG reductions in the maritime sector can progress. As has been seen in the RTFO, this then encourages the innovation and investment in the technology required at the scale needed by operators in the sector at all levels in the supply chain.

As indicated in our response to Q17, the government should establish a suitable framework to incentivise GHG reductions in the sector and allow operators to manage the reductions. This encourages innovation and investment to allow decarbonisation at the scale required.

19. How do you think the UK's MRV system could be improved to help support public and consumer engagement with maritime decarbonisation?

This is an area that needs significant consideration before being implemented.

Whilst the intent for public and consumer engagement is worthwhile, it has the potential to be misrepresented in the media and lead to unintended consequences which will have a significant societal and resilience impact. It could for example lead to certain ships being

prevented from entering harbours by protest action. This could lead to import supply disruptions, notably those of the crude oils and fuels required ²⁷ to keep the UK moving.

UKPIA suggests that there is alignment of the UK MRV system used in maritime decarbonisation and the UK ETS proposals.

20. What role do you think the government should play in encouraging public and consumer investment in maritime decarbonisation efforts?

Education in maritime decarbonisation issues will be of significant benefit to consumers. This should be targeted to ensure that the key messages are effectively delivered.

One example where education on decarbonisation has been effective is around the introduction of gasoline with higher levels of bioethanol in September 2021²⁸. This gave a clear rationale for the introduction, including the expected benefits allowing consumers to make an informed decision on the fuel that they were using. We would encourage any public engagement on the maritime sector to be along similar lines.

21. Do you have any other comments to share with us, about any aspect of domestic maritime decarbonisation?

While renewable fuels used in the maritime sector may attract Renewable Transport Fuels Certificates (RTFCs) with commercial value, the fact that if they are deemed not to meet the required sustainability criteria would lead to them incurring a new RTFO obligation has deterred their take up in the maritime sector at scale. We would therefore encourage discussions with the DfT Low Carbon Fuels Team to remove this risk from the RTFO, recognising that this should apply to the maritime sector only.

We note the OECD International Transport Forum work in this area, including their publication of a report outlining the pathways to zero-carbon shipping ²⁹. In particular they have recommended the following policy points:

- Set a clear, ambitious emissions-reduction target to drive decarbonisation of maritime transport.
- Support the realisation of emissions-reduction targets with a comprehensive set of policy measures.
- Provide smart financial incentives to advance the decarbonisation of maritime shipping.

²⁷ <https://www.gov.uk/government/statistics/petroleum-chapter-3-digest-of-united-kingdom-energy-statistics-dukes>

²⁸ <https://www.gov.uk/guidance/e10-petrol-explained>

²⁹ <https://www.itf-oecd.org/decarbonising-maritime-transport>

Further information on maritime decarbonisation can also be found in a Sep 22 report published by DNV³⁰. This work provides indicative timelines for various technologies, highlights that collaboration will be key to an effective transition, and gives some indication of likely costs.

22. Do you have any other comments?

UKPIA has no further comments at this time

³⁰ <https://www.dnv.com/expert-story/maritime-impact/Collaboration-is-key-to-scale-up-fuel-availability-in-time.html>