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Dear Colleague,

UK Domestic Maritime Decarbonisation Consultation: Plotting the Course to Zero

I am writing on behalf of the UK Hydrogen and Fuel Cell Association (UK HFCA) and in response to your current consultation on UK Domestic Maritime Decarbonisation.

The UK HFCA is the leading pan-UK trade body in the hydrogen energy sector, with a Mission to support the growth of our members and the sector, and to ensure that the right policy framework is in place. Our 100 plus member companies represent over 200,000 employees globally, with combined revenues over £400 billion, and cover the entire value chain from raw material sourcing, to supply chain and components, financing, professional services, B2B and consumer facing solutions.

Hydrogen will play a substantial role in all aspects of energy and can make an important contribution to the decarbonisation of the UK's domestic maritime sector, an area of significant importance to the UK's Net Zero transition.

This response from the UK HFCA covers the following questions:

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

Question 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***

At this stage in the decarbonisation of domestic maritime the future trajectories for low carbon fuels are unclear, and the feasibility of the range of options requires further assessment. Both low carbon hydrogen, and fuels derived from it, such as ammonia, are being explored by the maritime sector to evaluate their relative merits. The focus from Government should be on ensuring that issues such as regulation, infrastructure and compliance are addressed rather than prescribing which fuels should be supported. Low carbon hydrogen will likely always be cheaper to produce than low carbon hydrogen derived ammonia on a volumetric basis. Synthetic fuels are also under consideration. Factors such as storage and marine engineering requirements result in a number of uncertainties regarding which fuel should be utilized. DfT should therefore support the full range of alternative fuels that have the potential to decarbonise domestic maritime.

Question 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?*

The technological transition to decarbonise the domestic maritime sector requires all technology routes to remain open at this stage. As such, support for R&D and trials should extend across the range of options. Existing R&D support, such as that offered via CMDC, has been welcome as a starting point for progressing fuel cells and other technologies; however, the current process is unsatisfactory; it has been rife with delays, locks parties into potentially problematic delivery timescales and is hampered by lack of scale of budgets. New support should be finessed to avoid these issues. With regard to trials, it is crucial that there is co-ordination and balance in the infrastructure available, so that trials at all scales can be run alongside each other.

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

As discussed above, a key barrier to domestic maritime decarbonisation at scale is the availability of deployable solutions. Government support for R&D is needed across the range of solutions and technology types to evaluate and confirm the best decarbonisation options.

Beyond that, a second barrier is the lack of clear milestones to accelerate progress. We recommend the establishment of a target timescale for at-sea demonstrations within the next 2-3 years.

A third barrier is cost and risk of scale-up. A Call to Action published by the Global Maritime Forum[1] highlighted that industrial scale demonstration projects which involve the full value chain will assist in driving down costs and scaling up demand. Demonstration projects at scale come with higher risks and higher costs and Government incentives will be required to de-risk projects.

Finally, it is challenging to navigate certification and standards for decarbonising a vessel in the UK with hydrogen. The current situation finds project owners facing certification and standards that were never designed for the application of hydrogen. Furthermore, there is a lack of knowledge within the standards authorities on the application of hydrogen fuel within the maritime sector. This certification

[1] https://www.globalmaritimeforum.org/content/2021/09/Call-to-Action-for-Shipping-Decarbonization.pdf

and standards barrier can be addressed by including more hydrogen and ammonia specific content, while ensuring that certification bodies are equipped with the knowledge to assess all alternative fuels for maritime.

Question 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?***

Singapore has implemented a 'Maritime Decarbonisation Blueprint'[2] which includes emissions reduction targets for port terminals and domestic harbour craft. Another important aspect of this blueprint is its recognition that the country will have to be prepared to supply and support multiple low and zero-carbon maritime fuels such as biofuels, methanol, ammonia and hydrogen. Adding to this Blueprint, Singapore's Maritime and Port Authority has recently announced that it will establish a global centre to assist in driving emissions reductions in shipping – a UK focused equivalent should be implemented as part of a new Advanced Propulsion Centre for marine (see also Question 14).

In South Korea, the Government will invest $870m by 2030 in eco-friendly shipping technology development projects through its "2030 Green Ship-K Initiative"[3]. The scheme includes the construction of 10 plus ships which can demonstrate emission reduction through LNG bunkering and LNG-ammonia mixed fuel propulsion. Support will also be made available for the retrofitting of existing ships. The scale and scope of this support provide valuable lessons for the UK.

Question 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?***

In the short term, DfT should consider the inclusion within the UK's freeport programme of a requirement for signed commitments to decarbonisation among all organisations bidding for government funding. This measure will ensure that the UK's levelling up of port areas is fully aligned with the objective of decarbonising the UK domestic maritime sector. A further measure, as supported by the Global Maritime Forum[4], is the delivery of market-based policy interventions which include carbon levies, emissions taxes and emission trading schemes. This could be further developed by introducing tiered docking use / fee structures based on carbon emissions – providing greater incentive for maritime decarbonisation. Ideally this would be done in collaboration with EU ports.
In the medium term, support for hydrogen and ammonia fuel costs in maritime applications is important, as the low carbon fuel which will be used for the maritime sector remains uncertain. DfT should ensure that all fuel options receive support from Government while industry can work to establish which fuel caters for each sub-sector (e.g. ferries, service boats, canal boats, shipping etc.) of domestic maritime. In addition, we recommend that establishment of an Advanced Propulsion Centre for marine to facilitate the industrialisation of clean maritime technology. This Centre should cover the full value chain, from early concept stage onwards, so that solutions can be optimised from the outset.
The transition to decarbonise domestic maritime in the UK can only happen following early support and investment from Government in the technology solutions required. This will aid in ensuring the

[2] https://www.mpa.gov.sg/media-centre/details/cos-2022---media-factsheet---maritime-singapore-decarbonisation-blueprint-working-towards-2050
[3] https://www.offshore-energy.biz/south-korea-unveils-initiative-to-promote-eco-friendly-ship-technologies/#:~:text=Entitled%20%E2%80%9C2030%20Green%20Ship-K%20Initiative%E2%80%9D%2C%20it%20is%20part,a%20brand%20image%20of%20a%20Korean%20eco-friendly%20ship.
[4] https://www.globalmaritimeforum.org/content/2021/09/Call-to-Action-for-Shipping-Decarbonization.pdf

maritime sector has the confidence and support available to invest in decarbonisation in line with the Government's net zero policy objectives. Properly designed, it will also help to develop UK growth via new businesses with excellent export opportunities.

The UK HFCA would welcome the opportunity to discuss our recommendations further.

Kind Regards,

Celia Greaves
CEO