

Hydrogen Energy Association

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Date: Wednesday, 24th April 2024

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Dear Colleague,

The Hydrogen Energy Association's response to the DfT consultation on 'Enabling road use of hydrogen-powered non-road mobile machinery.'

I am writing on behalf of the Hydrogen Energy Association (Formerly the UK Hydrogen and Fuel Cell Association) and in response to your current consultation on 'Enabling road use of hydrogen-powered non-road mobile machinery'. The Hydrogen Energy Association (HEA) 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 110 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.

With over 15 years of experience, the HEA is a leader in advocating for and accelerating the transition to Net Zero in the UK through the deployment of hydrogen & fuel cell solutions. We promote and represent our members' interests across the hydrogen space, and campaign for the best policy outcomes for the industry across the full range of applications and opportunities.

Relative to other mobility sectors such as Heavy Goods Vehicles (HGV), Light Commercial Vehicles (LCV) and passenger vehicles, Non-road Mobile Machinery (NRMM) has made slow progress in the transition to Net Zero. Given that NRMM contributes to as much as 2.7% of total UK GHG emissions¹, it is vital that adopting decarbonised solutions is made as easy as possible. In this respect, removing the regulatory barriers that currently prevent the use of Hydrogen-powered NRMM on public roads without an exemption, known as a vehicle special order (VSO), is an important step in accelerating the uptake of hydrogen technology in the NRMM sector.

Q.1 Do you agree with enabling the road use of hydrogen-powered NRMM and agricultural vehicles?

Yes. Given that the NRMM is somewhat behind in the transition to Net Zero relative to other mobility sectors, it is imperative that barriers, including regulatory, to the adoption of low carbon solutions are removed as quickly as possible. These are machines and vehicles that, due to their size and energy

¹ <https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-to-2021>

demands are likely to have limited options for decarbonization and zero-emission technologies. Enabling the road use of hydrogen-powered NRMM and agricultural vehicles is an important step in the transition and would allow greater uptake of hydrogen technology across the sector. The need for special permission to often use a limited amount of pre-approved routes is restrictive of sector growth.

Q.2 Do you agree in limiting the amendment to allow only new machinery powered by hydrogen?

No. We advocate for as many hydrogen solutions being implemented as possible, and limiting the road use of hydrogen applications to new NRMM and agricultural vehicles at this early stage would have an adverse effect on the uptake of hydrogen technology. NRMM equipment requires a significant capital investment and including retrofit solutions will widen the options available and help to accelerate decarbonisation progress. Retrofitting existing vehicles can reduce emissions in the short-term at a fraction of the cost of new machinery and allows users to extract the full lifetime value of existing machinery and vehicles while still progressing the transition to Net Zero, which is a large benefit in terms of sustainability.

Retrofitting allows sector-wide confidence in the technology to be developed and provides an early market for hydrogen, demonstrating to customers, investors, regulators, and supply chain stakeholders that the fuel is a suitable decarbonisation option. Provided that it is suitably controlled and adheres to existing safety standards relating to the storage, refuelling, and transportation of hydrogen, there is no reason why retrofitting would present any additional safety concerns.

The HEA would also recommend further clarification as to what constitutes “new machinery.”

Q.3 Should we consider options to enable the safe retrofit of NRMM and agricultural vehicles to operate on hydrogen in future?

Yes. The safe retrofitting of existing machinery with hydrogen solutions has been demonstrated in the UK and across the EU. If the application complies with the relevant safety standards, there is no reason why retrofitting should not be part of the range of decarbonisation options available. The concept of safety in this context should be less related to the whether the equipment is “new” or “used” and more focused on the safety standards and protocols for handling and using hydrogen. For instance, it is equally as possible for the relevant aspects of a hydrogen retrofit application and its supporting equipment to be compliant with UN Regulation No. 134 (R134) as it would be for new machinery.

The use of the word “amateur” is concerning. Innovation in the lower Technology readiness Level (TRL) stages often comes from start-ups, SMEs, and grant funded research, and much of the emerging technology is new to the market. There is the need for improved training and skills in the hydrogen sector so that individuals working in these fields are sufficiently trained in line with the existing statutory obligations. Rather than prohibiting the retrofitting of existing vehicles with hydrogen applications, the Government should focus on expanding the skillset, training programmes, and safety standards to keep pace with technology advancements.

Q.4 Do you agree with our approach to ensuring hydrogen safety is sufficiently covered in this amendment?

In principle, yes, mandating compliance to elements of UN R134 would be beneficial, providing that due consideration is given to the particular attributes of NRMM and existing requirements around its

use. In particular, it should be noted that, if UN R134 in its current form is adopted for equipment classed as 'machinery' that occasionally use the road network, then the regulation could be restrictive for certain types of technology. Ordinarily, non-road machinery would be subject to the Pressure Equipment Directive (PED), which has been a widely used safety standard for construction machinery. If UN R134 is adopted, the performance and engine capacity of such machinery will be limited in order to comply with what has historically been a standard used for small cylinder cars. For instance, JCB would not be able to use its V060 cylinder. If UN R134 is to be adopted, it must be amended for NRMM machinery to accommodate the different performance requirements.

One part of the UN R134 that is problematic is section 7.2.4.2, which specifies the position of the hydrogen fuel tank and its proximity to the outer edge of the vehicle. This issue has been raised by many hydrogen stakeholders as it limits where the storage tank can be located on the vehicle, something that requires careful consideration in retrofitted machinery.

In addition to this, and for the reasons explained above, the HEA believes that more focus should be placed on enhancing awareness, training, and opportunities to share information.

Q.5 Do you agree with the proposed categories of vehicles (as defined in C&U) which will be the subject of the amendment?

Yes, although the comments above are equally relevant to road vehicles already covered by C&U where retrofitted hydrogen applications are currently banned.

Q.6 Are there other gaseous fuels that we should be seeking to enable road use of for NRMM and agricultural vehicles?

Whilst the decarbonisation of NRMM and agricultural machinery may involve a number of fuels, hydrogen provides the most flexibility in the challenging environments in which they operate.

We would welcome the opportunity to discuss our recommendations further.

Kind Regards,



Celia Greaves
CEO