Decarbonising smaller vessels call for evidence

Summary

- There is a great variety in the types of vessels and craft which fit into the smaller vessels category, with many not having a clear pathway to a zero-emission future.
- Near-zero emission fuels are an essential transitional fuel to support smaller vessels to decarbonise.
- The technology for decarbonising smaller vessels exists on a small scale, and opportunities for investment in zero emission propulsion systems for smaller vessels should increase in the next 5-10 years.

About Logistics UK

Logistics UK is one of the country's largest business groups, and the only trade association which represents all of logistics. Our mission is to support, shape and stand up for a safe, sustainable and efficient logistics sector. Our membership of more than 20,000 includes global, national and regional businesses and SMEs spanning road, rail, inland waterways, sea and air as well as the customers of freight services, such as retailers and manufacturers. We deliver services, representation and thought leadership, helping members and policymakers to seize new opportunities for the sector and the economy as a whole.

The logistics sector

Logistics underpins our economy and is fundamental to our way of life. It supplies our hospitals, schools, factories, construction sites, shops and homes with everything they need, everywhere, every day – nothing moves without it.

The efficiency of logistics and the productivity of the economy are completely intertwined. Due to this relationship, Oxford Economics found in 2023 that getting the policy and infrastructure environment right for logistics would unlock up to £8 billion a year in productivity-led growth.

However, we are not currently going in the right direction. The UK fell from 4th to 19th place in the World Bank Logistics Performance Index over the past decade, largely as a result of border friction and underinvestment in transport corridors.

Logistics is a major sector in its own right. It contributes £185 billion to the economy each year (12% of UK non-financial GVA), is one of the UK's largest employers, providing good jobs with strong career progression – 2.7 million people (8% of the UK workforce) are employed in logistics roles, and its key hubs provide a catalyst for further growth and investment, helping places to thrive.

Vessels below 400 gross tonnage (GT)

Technology

Question 1: What type of technological solutions for reducing emissions do you anticipate will be available in the next 5 to 10 years within your sector? For example, fully electric, electric with an extender, hybrid, zero or near-zero emission fuels (such as green hydrogen), or something else? Alternatively, if it is not possible to use zero or near-zero, emission propulsion technologies, state this and explain why.

Logistics UK recognises that there are some technological solutions already available to operators of smaller vessels. For example, in Antwerp, a fully electric tug has been utilised. There is an electric ferry in operation from Canary Wharf to Rotherhithe, and hybrid ferries in operation at Woolwich. Two London Clipper vessels are hybrid, with a fully electric Clipper vessel due to be delivered later this year. At the Port of London authority, a fully electric pilot vessel was trialled but has been decommissioned and replaced with a new diesel vessel.

Technology is fast advancing, but port conditions must be considered. The electric trials taking place are in calm waters and are not fit for all weather and water conditions experienced at other ports. The technology has the potential to advance in the next five-ten years, but it is not at a sufficient level to be introduced at all port types today. Optimism in the industry and from the government is essential to build business confidence to invest in these vessels due to their long lifespan.

The role that zero and low emission fuels will play in this transition cannot be understated. UK ports are already using alternative fuels including hydrotreated vegetable oil (HVO), and this has had a significant impact on reducing emissions. However, the price premium imposed on fuels like HVO makes them 60p per litre more expensive than white diesel. These fuels are needed for the maritime sector to decarbonise, especially for ports which have more difficult weather and water conditions, and the government should work with industry to remove the price penalty.

Question 2: Is the technology already available to purchase/use/adopt?

The battery electric technologies are in the trial phase and are not currently available to be adopted by all ports which have different operating conditions. Calmer waters and less extreme weather conditions are prerequisites for the operation of these trial vessels, so although they exist, it will be years before they will be ready to operate at a variety of ports, and on a larger scale.

Question 3: What technological and operational solutions are you considering to reduce your emissions? What factors have influenced this?

Alternative fuels:

Currently, some UK ports are using alternative fuels like HVO. This is due to current supply availability, and that they are drop in fuels, making them much more easily adopted. At some ports, all vessels and landside vehicles are operating using HVO to reduce emissions immediately, in the absence of suitable zero emission technologies.

Vessels also have long lifespans, are bespoke, expensive to build and can be in operation for 60-70 years. On average, the Thames fleet has another 10- 20 years of operational life. This means that the need to replace these vessels is not immediate, and the use of low-emission fuels like HVO should be a prioritised for the sector, with price penalties removed.

Operators are also considering the use of alternative fuels including green hydrogen, green methanol and green ammonia, in particular for cases where there are higher power demands and longer journeys which make electric battery technologies unsuitable. Additionally, biofuels including biomethane and biodiesel, and e-fuels are being considered. These fuels can achieve near negative lifecycle GHG emissions and are attractive for smaller vessels.

Retrofitting:

For retrofitting vessels, depending on the vessel, there is not always sufficient space in the hulls for batteries. Additionally, the substantial weight of the batteries needed can cause issues with vessel stability, and mean a vessel is no longer able to operate. In some areas like the tidal Thames, the average age of a vessel is between 40-50 years. These vessels are worth between £100,000- £200,000. The cost of retrofitting a vessel to electric (removing the engine, fuel tank and installing a battery) can be £400,000. Therefore, for older vessels which dominate much of the inland waterways, it does not make financial sense.

Electric, fuel cell and hybrid systems:

With newer technologies, ports are considering purchasing new electric vessels, including tugboats and pilot vessels, ferries and hybrid workboats. However, this is not a transition which will take place quickly. Where electrification is the preferred route, many of the available technologies are not yet able to perform sufficiently in ports which have more difficult and unpredictable weather and water conditions, or where there is insufficient charging infrastructure along inland waterways.

Electric batteries do not last long enough on a single charge to ensure consistent and uninterrupted operation. There are also challenges with speed and power, especially as during extreme weather events which are increasing in frequency in the UK, more power is needed, and tugboats can be operating for 10-12 hours at a time, which means that batteries are not sufficient for the needs of the operations. In addition to the unpractical nature of this, it also raises critical issues around health and safety. Workers responding to emergency calls out at sea must be reassured that vessels are able to operate for long periods of time, with confidence they have enough power to return to shore. Currently, range does not meet these requirements.

Obtaining grid upgrades and sufficient power to the ports is also a consideration, especially due to long wait times for grid upgrades and connections, and huge costs for it to be improved. However, given the grid upgrades are often required for larger vessels, including ferries and cargo ships, there is already ongoing work to increase power capacity which will not exclude the charging needs of smaller vessels.

Technology and innovation:

The sector is embracing technology by investing in solutions which can be implemented immediately. One example is AI-driven route optimisation and “just in time” arrivals which can reduce energy use by up to 14%. Hydrodynamic vessel design and improvements are also reducing emissions, for example from hydrodynamic hulls and more efficient propellers. Consideration of speed, for example reducing speed based on weather and traffic conditions, can reduce fuel consumption and lower emissions.

Influencing factors:

Business optimism is a factor which influences change. The government has emphasised the role that a modal shift to water freight from road freight can have on reducing emissions. If demand for water freight increases, members feel that there will be more opportunity for more investment in alternative technologies to reduce emissions. Additionally, government programmes like UK SHORE enable investment into technologies like hybrid ferries and help to build positive use cases and business confidence for private adoption of these technologies.

Inland waterway vessels will be in operation for 60-70 years, and so business optimism about the sustained future demand for water freight is essential to encourage investment in alternative technologies.

There is regulatory pressure from the IMO’s 2023 GHG Strategy which indirectly influences smaller vessels, alongside wider stakeholder demand for low-emission transport to meet Scope 3 emissions targets which pushes operators towards cleaner and more efficient technologies.

Question 4: Do you agree or disagree with the identified subsectors that have a clear technological pathway for decarbonisation? Explain the reasons for your answer.

Logistics UK disagrees with ports service vessels having a clear pathway to decarbonisation. When facing more extreme weather or difficult conditions, tugs must operate for 10-12 hours in one consecutive shift. It would not be possible to charge a tug during these operations and it would be dangerous for a tug to lose power whilst operating. Tugboats use more energy during extreme weather and would therefore require additional charging when it is not possible to do so. Another concern is the insufficient space to hold the size and weight of suitable batteries given their small size.

Logistics UK disagrees with inland waterways having a clear pathway to decarbonisation. Members have voiced their interest in seeing the government's pathway for these vessels, which are diverse, and which face unique challenges obtaining grid connections at small inland ports. Electrification of inland waterways would likely require the installation of large transformers to procure energy, but which residents living on the waterways would reject. For inland waterways, there are long routes which have little to no charging capacity, obtaining grid connections would be expensive and time consuming, and the cost of electricity is not an incentive due to the UK having some of the most expensive electricity costs in Europe. The uniqueness of the inland waterway freight subsector is explored in Logistics UK's report on Waterborne Freight (Jun 2025).[1]

Question 5: Do you agree or disagree with the identified subsectors have an unclear technological pathway for decarbonisation? Explain the reasons for your answer.

Logistics UK agrees with these identified subsectors and asks for port service vessels and inland waterway vessels to be included in this list.

Operating costs

Question 8: What are the top 3 factors that contribute most to overall operational costs? Include answers for both zero or near-zero emission vessels and traditionally fuelled vessels.

1. Maintenance and infrastructure

Ports must be given priority grid upgrades to facilitate the decarbonisation of their operations. This is not currently the case, and one of our members has received quotes of upwards of £200m to upgrade their infrastructure, as well as timelines of more than 10 years. This is a huge challenge and contributes significantly to overall operational costs. Charging facilities, and charging users for those facilities, will be an essential source of income to cover these costs. However, electricity is cheaper on the continent, and given the delays to grid upgrades, operators will have planned to charge their vessels and vehicles elsewhere in the interim, with those plans unlikely to change given the high electricity costs in the UK.

Fuel cell and battery-operated vessels incur higher maintenance costs due to complex operating systems. A further concern is where and how to have a new zero or near zero emission systems maintained, serviced and overhauled. The operating of alternatively fuelled vessels requires additional crew training and compliance which adds to labour and administrative costs, particularly for smaller operators with more limited resources.

For older traditionally fuelled vessels, maintenance costs are higher due to the need for more frequent maintenance. This is particularly the case for the inland waterways subsector. Wear and tear on mechanical systems along with compliance with emissions regulations (e.g. IMO's Energy Efficiency Existing Ship Index (EEXI) and the annual operational carbon intensity indicator (CII) and CII rating) increase overall compliance costs.

2. Cost of alternative technologies

Ports have invested significantly in using lower emission fuels like HVO. This transition is already costing one member upwards of £100,000 per year in the fuel price difference alone due to HVO costing 60p per

[1] Logistics UK, The UK Logistics Network: Waterborne Freight, https://logistics.org.uk/waterbournefreight-1.

litre more than white diesel. Other alternative fuels like green hydrogen, methanol or ammonia are also more expensive than fossil fuels due to limited production capacity and high energy input requirements.

Carbon credits must incentivise and fund the use of lower emission fuels and the transition, and not only focus on penalising the use of high emitting technologies. The UK government must make this funding available and easily accessible for ports to access and benefit from and commit to a consistent and long-term policy plan.

For traditionally fuelled vessels, fuel costs remain the largest operational cost and represents a significant expense for subsectors like fisheries where cost competition is critical.

3. Environmental impacts and challenges

There is considerable concern around the impacts of the transition, including around the source of energy. Where a port can transition their operations to electric, and where they can access sufficient energy, the energy must be green and sustainable for the full benefits of the transition to be realised. There are concerns around some knock-on impacts of the transition. This includes NO_X emissions from increased ammonia use, health and safety concerns around charge points on the docks, and biodiversity concerns where huge infrastructure upgrades and projects need to be implemented for grid upgrades.

For traditionally fuelled vessels, emissions are much higher, and more vessels will face regulatory penalties and fuel price volatility over time, increasing costs. Additionally, customers are increasingly asking for low emission delivery of goods and services due to environmental considerations.

Question 12: If you do not monitor your GHG emissions and air pollutants, tell us why and if you intend to start monitoring them? What would make you start monitoring your GHG emissions and air pollutants and are there any barriers preventing this? Do you expect the transition to zero, or near-zero, emission propulsion systems to have any negative wider environmental impacts?

Examples of environmental impacts include, but are not limited to, water quality, biodiversity, climate change adaptation and noise pollution.

Most companies produce a statement in their annual report about their environmental performance. These operators will be able to disclose how many litres of diesel they have procured, and subsequently the emissions from the use of the diesel. Not all operators will record specific pollutants from fuel use (e.g. NOx emissions).

The environmental impacts of moving to zero or near zero emission propulsion systems will vary depending on the chosen technology or fuel. Generally, this move is expected to improve air quality and reduce noise and water pollution.

There can be adverse effects from the transition to zero or near zero emission propulsion systems. Noise pollution would increase and impact different communities should a large electrical substation be erected in the proximity of a port to produce the necessary power and will have an impact on biodiversity during the construction phase. Additionally, if the power used to charge electric vessels is not renewably sourced, this will have a negative impact on air quality.

However, in the context of smaller vessels, the impact of these vessels on noise pollution and air quality is minimal in comparison to other larger vessels in the waterways and should be considered within this larger context. Water freight also represents a potential modal shift, and is able to move large quantities of material using much less fuel than other modes.

Barriers to switching to zero, or near-zero, emission vessels

Maritime sector and inland waterways

Question 32: What are the barriers to switching to zero, or near-zero, emission propulsion systems for specific vessel types?

One of the barriers to switching to zero emission propulsion systems, particularly electric systems, is the cost of upgrading the infrastructure needed to facilitate charging at berth. One port has received quotes for

upgrades upwards of £200m, and a wait time of more than 10 years. The government must prioritise the needs of ports to decarbonise their operations.

Additionally, the UK has high standing charges for electricity and gas. This additional cost will have a hugely negative impact on the profit a port is able to make. Given logistics companies operate on small margins, these standing charges have a disproportionate impact on their profitability.

One member has shared that the cost of operating an electric tug would be higher than using diesel due to the high electricity costs in the UK. This member is considering an electric tug where a traditionally fuelled tug currently operates for 4.5 hours per cargo delivery, burning 600 litres of gas oil, costing about £360 at current prices. They have calculated that the average price of electricity for industrial use in the UK is £0.26 / KWh, and so the energy cost for the electric tug per cargo delivery on the contract would be £416.

Where there are unclear pathways for smaller vessels, lower emission fuels will play a longer term and crucial role, and so the role of lower emission fuels needs to be more clearly defined, and their supply earmarked. Competing demand for lower emission fuels, including from the aviation sector via the SAF Mandate, reflects future competition across the logistics sector for the supply of these fuels. This will also have a detrimental impact on the cost effectiveness of the fuels which already are bought at a premium to diesel. The government will need to intervene to ensure there is an adequate and sustainable supply of lower emission fuels for all parts of the industry.

In addition, the Renewable Transport Fuel Obligation (RTFO) Order must be amended so that all inland waterways commercial craft are considered ‘non-road transports’, whether operating on tidal or non-tidal water. The current RTFO scheme precludes the use of biofuels in commercial craft used on tidal and coastal waters, although it does permit biofuel use on inland waterways under ‘non-road transports. If the scheme included all commercial craft operating in Category A-Category D waters, with no distinction between tidal and non-tidal, it would enable this sub-sector of maritime to achieve the maximum GHG savings in the shortest amount of time through allowing the use of low emission fuels. Enabling the switch to low emission fuels would deliver significant reductions in GHG emissions from the commercial inland waterways fleet in the short to medium term, until barriers to zero emission propulsion systems are available and suitable for operations.

Question 39: Would you support the introduction of a registration system for sub-sectors that do not currently have one, such as inland waterways or recreational vessels, for supporting decarbonisation goals?

The UK Chamber of Shipping holds the registration records for inland waterway and recreational vessels and the Maritime and Coastguard Agency (MCA) inspects and licences all vessels and will hold data.

It would be useful for government to elaborate on what registration information is required here and what the reporting requirements would be, as well as what the purpose of the data collection is. Will this kind of registration system open up funding opportunities for trials with forms of non-diesel propulsion? Inland waterways are diverse and unique, with many smaller operators, and so any introduction of a registration system should be done with caveats for the sector to ensure practicality and fairness.

General questions

Question 40: Are there any specific vessels and/or subsectors that should be exempt from potential future policy which may aim to accelerate the adoption of zero or near-zero emission propulsion systems? State your reasons why.

Certain vessels and subsectors warrant exemptions due to technological, economic or operational constraints. For example, deep sea tugs and research vessels, fisheries, and inland waterway vessels.

For deep sea tugs and research vessels, these vessels face unique challenges with limited access to charging or alternative fuel infrastructure, long ranges and high-power demands. Retrofitting is impractical and costly and can impact the stability of the vessel. Energy efficiency measures for these vessels including hull optimisation and waste heat recovery would be the preferred avenue for emissions reduction.

For fisheries, particularly small-scale operators, the tight margin operations which are already heavily impacted by fuel cost mean that upfront investment into low emission and zero emission technologies is unaffordable. The fleet traditionally has a long lifespan (>20 years) which makes turnover slow.

Inland waterway freight vessels should be exempted until such time as HVO becomes available at an affordable cost and/or alternative fuel systems become readily and commercially available and useful.

Question 41: what, if any, do you think are the main barriers to accelerating the use of zero or near-zero technologies?

The main barriers are the cost and time requirements for necessary grid infrastructure upgrades, the competition and cost of zero emission fuels, the high electricity costs in the UK, and early-stage technology which is not ready for investment.

Question 43: what, if any, are the 3 environmental impacts that you are most concerned about in the transition to zero emission fuels?

For the transition, consideration must be given to the source of the fuels. For example, whether electricity is generated from renewable power sources, and for hydrogen, whether it is green, blue or grey. Additionally, for ammonia as an alternative fuel, the impact of an increase in NO_X emissions, and the impact on the water toxicity is a concern. Where grid upgrades are required, and charging infrastructure must be built, these are large infrastructure developments which will require materials, and which may require the loss of ecologically important land in order to be built.

Question 44: do you agree or disagree with our identified subsectors having a clear technological pathway for decarbonisation?

Logistics UK agrees with all but the port service vessels as having clear pathways for decarbonisation. When facing more extreme weather or difficult conditions, tugs must operate for 10-12 hrs in one consecutive shift. It would not be possible to charge a tug during these operations and it would be dangerous for a tug to lose power whilst operating. Tugboats use more energy during extreme weather and would therefore require additional charging when it is not possible to do so. Another concern is the insufficient space to hold the size and weight of suitable batteries given their small size.

Question 45: do you agree or disagree with our identified subsectors having an unclear technological pathway for decarbonisation?

Agree.

Question 47: do you have any other comments?

The freight and logistics sector makes a vital contribution to the UK economy and UK's competitiveness globally, as recognised by the UK Government's Industrial Strategy published this year. The strategy commits to working closely with the logistics industry to ensure that developments, investments and policies support the industry in playing a role to grow the economy. Decarbonisation is a business opportunity, but without government support and financial backing, the cost of the necessary infrastructure and new technology is a barrier to transition the sector. Ports are recognised in the government's Industrial Strategy as foundational industry, and thus must have infrastructure and grid upgrades prioritised and funded by the government to facilitate and grow local economies and support national economic prosperity.

While the push for decarbonisation is urgent, policies introduced by the government must balance ambition with practicality, ensuring that the IMO's focus on a "just and equitable transition" is enacted. This highlights the need to avoid disproportionate impacts of vulnerable sectors or regions, especially smaller businesses and areas which rely on the existence of waterborne industry for livelihood and community. Registration systems and exemptions should be designed with stakeholder input to ensure feasibility and to avoid any unintended economic or cultural consequences.