Air Pollutant Emissions from Domestic Vessels and Inland Waterways – Response Form

Responses should be submitted to domesticshipping@dft.gov.uk

FOR ALL RESPONDENTS (individuals, organisations, businesses etc.)

1. Your Details

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The National Bargee Travellers Association (NBTA) is a volunteer organisation formed in 2009 that campaigns and provides advice for individuals who live on boats on UK inland and coastal waterways and who do so without having a permanent residential mooring (Bargee Travellers). Such boaters live in an itinerant fashion, moving regularly from place to place as is either permitted or required under a number of pieces of legislation. There are as yet no accurate statistics but we estimate that there are around 15,000 to 50,000 people living on 7,200 to 24,000 boats without permanent moorings on the UK waterways. The NBTA has members on all the major navigation authorities' waterways and beyond.

We are grateful for the opportunity to feed into this Call for Evidence and to be able to highlight the unique position of people who live on their boats without a permanent mooring regarding the creation of emissions. There are two main ways that a boat on the inland or coastal waterways will create an air emission:

- **engine exhaust** – this is may be for propulsion, to generate electricity or to heat water
- **burning of solid fuels** – this is mainly to heat the boat and for heating water

In both cases, the emissions are linked to activities which are required for the boat to function as a home. To a lesser extent emissions are also created by the use of bottled gas for cooking and instant water heating, which is used in the vast majority of boats. In the case of propulsion, the emissions produced are largely due to the requirement of many boaters without a permanent mooring to move regularly around the waterway system as a condition of their licences. Not to move would create a breach of these conditions which could lead to their licences being revoked or not renewed and, as a result, the boat would be seized and removed and the owner would be made homeless and would lose the only major asset that they own.

In the case of heating and generation of electricity, these are essential activities which serve basic human needs. Not being able to meet these would lead to a boat being uninhabitable and again risks the owner becoming effectively homeless or living in conditions which would be hazardous to their health. Restrictions on emissions in certain areas would effectively ban boat dwellers from those areas which could impact on access to work, school, family and friends. This would amount to social cleansing of the Bargee Traveller community from certain areas.

As a result, we stress the need to consider the impact which any potential policies around emissions could have on boats which are used as homes and on their occupants. The community of people who live on boats without a permanent mooring includes a considerable number of people who are on a low income or who were homeless prior to obtaining a boat. For many, investment in alternative options may not be possible without financial aid.

As well as highlighting the risks that are raised by the fact that boats are used as homes, we would also like to note the environmental benefit. When analysing the environmental impact of emissions from boats which are homes, we argue that the correct comparison to make is not with other vessels but with houses on land. Under this comparison, boats fare very well producing significantly lower levels of greenhouse gases per capita than houses. It is therefore vital to take a holistic view when assessing emissions from boats which are used as homes, and not to view or directly compare them with other forms of transport.

We would stress that boats are designed to be self-sufficient and self-contained in their use of fuel and water. They are not generally designed to be connected to external sources of power or water. Where they are connected to mains water, electricity or gas, this is often the result of conversion of a vessel from its original purpose of navigation to static use (as a home or otherwise).

Due to the complexities of boats which are used as dwellings when considering policy around emissions, we would recommend that such vessels should be exempted from any legislation or regulation that is primarily concerned with craft used for recreation, leisure, business or commercial purposes.

2. General questions on size and characteristics of the sector

Please provide details of the different types of vessels that you know of (in England's inland waterways and/or the UK's coastal waters) that are NOT currently subject to environmental standards for air pollutant emissions.

The Clean Air Act 1993 **does** apply to boats on inland waterways but only under the provisions made in Part VI Section 44 as boats on inland waterways fall within the definition of "vessels" given in the Clean Air Act 1993 Part VII Section 64.

Part VI Section 44 of the Clean Air Act 1993 provides for the prohibition of dark smoke emissions from both a boat's chimneys and its engine. The section also allows for the prosecution by a local authority of the person in command or charge of the vessel for an offence under this section.

Dark smoke is defined in Part I Section 3 (1) as "any emissions of smoke seen from a chimney over a period of time that appears darker than the Level 2 (40%) grid in the Ringelman chart series". "Over a period of time" means that a brief temporary emission

of dark smoke, for example in order to light a stove, is not an offence under the Clean Air Act 1993.

Although Smoke Control Zones and Smoke Control Orders are made and enforced by local authorities under Part III Section 18 (1), the content of such Smoke Control Zones or Orders has no effect on smoke, grit or dust from vessels covered by Part VI Section 44 of the Act, due to the exemption for such vessels under Section 44 (6).

The exemption for vessels from some, but not all, of the provisions of the Clean Air Act 1993 is vitally important given the way that boats that are used as homes are heated, predominantly, by the burning of solid fuels. Any changes to the current regulatory environment around these emissions would need to consider the considerable impact that it would have on boats that are used as homes.

Where possible, please estimate the number of each type of these vessels in operation.

No accurate statistics exist, but we estimate the numbers of boats on the UK's inland and coastal waterways used as homes without a permanent mooring to be between 7,200 and 24,000. The majority of these are steel narrowboats with inboard diesel engines. Around 15% are steel widebeam narrowboats; around 15% are GRP cruisers with either petrol outboard or diesel inboard engines, and around 5% are larger steel vessels, wooden boats, converted ships' lifeboats, yachts, or miscellaneous craft such as self-built huts mounted on pontoons.

We recognise it will not be possible to provide accurate estimates for all vessel types but would appreciate a view from stakeholders on both the broad scale of the sector, and any detailed knowledge they have of vessels in their area of expertise (for example a single Navigation).

Where you have detailed knowledge of such vessels please provide (if possible) information on:

a. ***age;*** The majority of boats used as homes without a permanent mooring are between 10 and 40 years old. Steel narrowboats in particular, which are the majority of craft in this category, have a long life lasting up to 60 years or more if kept in good repair.

b. ***engine('s) age (both propulsion and any auxiliary systems)*** The age of engines corresponds to the age of boats, with many engines being 10 to 40 years old and more. Portable generators which are mostly run on petrol may last 10 years or more.

c. ***engine sizes*** GRP petrol outboard 11.2kw, GRP diesel inboard 74.6kw - 99.4kw, steel narrowboat diesel 74.6kw - 99.4kw, widebeam narrowboat 29.8kw-37.3kw, yachts 54kw - 74.6kw, wooden boats and ex-lifeboats 74.6kw - 99.4kw, large steel vessels in excess of 99.4kw. Portable generators are typically 1kw - 2kw.

d. ***fuel types*** Chiefly diesel and petrol, but biodiesel is sometimes used. A small number of boats are powered by batteries charged by solar panels with a back-up diesel generator but these engines are not necessarily powerful enough to be safe on rivers or coastal waters.

e. ***annual fuel consumption*** This varies widely depending on the distances travelled; the number of people living on the boat, the amount of electricity used for domestic purposes and whether the boat has solar panels fitted. For example a single Bargee Traveller with a smaller narrowboat and engine, using minimal domestic electricity with a solar panel and travelling the minimum distance/range to avoid having their boat seized by the navigation authority, may consume as little as 130 litres of diesel per year. If they have a smaller solid fuel stove for heating and they burn mostly wood, their consumption of coal may be as low as 80kg per year and their consumption of wood around 2000kg per year.

f. ***annual hours of usage*** Again this varies widely, but the example above would mean 130 hours of engine usage per year.

g. ***typical load factors*** Generating while stationary 10%; running on still inland waters 30% - 50%, running on rivers and ocean 50%-105%.

h. ***average rated horsepower*** See engine sizes above.

3. Emissions from the Sector

Do you consider that the air quality impact of the concerned vessels is a concern?

We think that it is important when making an assessment of the impact of emissions from boats which are used as homes to do so in the correct context, which we believe is the context of all dwellings including houses and flats. According to MHCLG data, in 2018 there were 24.2 million dwellings in the UK. On the other hand, although no statistics are collected, we estimate that there is a total of 70,000 people living on 33,500 boats in UK inland and coastal waters, of which an estimated 15,000 to 50,000 people live on 7,200 to 24,000 boats without a permanent mooring. This is less than one tenth of one percent of the number of dwellings. At a national level, the impact of emissions from boats used as homes is negligible.

The same is also true at a local level. Taking London as an example, MHCLG data shows that the average London borough contains around 100,000 dwellings. Even if every boat which was used as a home without a permanent mooring were placed in a single borough, they would account for less than 10% of all dwellings and, in reality, it would not be possible to fit more than several hundred in a single borough making the actual number closer to 1% **as a maximum**. Again, the impact of emissions is negligible.

Indeed, even on a side by side analysis of a boat against a house, research has shown that the level of greenhouse gases emitted by a boat used as a home is less than that of a house per capita.

Seen against houses, at national, local and at the individual level, the impact of the emissions of boats is favourable. As a result, we would see any regulation which impacts on the level of emissions for boats which are used as homes without similarly impactful regulations also being placed on all houses as being disproportionate and discriminatory.

Do you hold any views or data in relation to these air quality impacts?

We believe that in terms of numbers, the impact of emissions from boats used as homes is negligible both compared to the impact of emissions from all dwellings and compared

to the impact of emissions from all transport. See below for details of S*ustainable cities: an environmental sustainability study on canal-boat housing in London*.

Therefore when considering policy around emissions, we would recommend that boats used as homes should be exempted from any legislation or regulation that is primarily concerned with craft used for recreation, leisure, business or commercial purposes. We would also recommend that any legislation or regulation that impacts on the level of emissions for boats which are used as homes should not be introduced without similarly impactful regulations also being placed on all dwellings.

Are you aware of any industry or academic research that is relevant to this Call for Evidence?

Yes. *Sustainable cities: an environmental sustainability study on canal-boat housing in London:* Dissertation by Iwona Grala in partial fulfilment of the requirements for the MSc in Sustainable Development for Distance Learning Students of the University of London, Centre for Development, Environment and Policy (CeDEP), School of Oriental and African Studies (SOAS) (September 2017). Held in University Library.

See page 35: "The research shows that overall, liveaboard boaters use less energy compared to conventional housing, however this difference is not significant when compared to liveaboards with permanent moorings, there is only a significant reduction in energy use from CCers [Bargee Travellers]."

See also *In Time for Tomorrow?* by Rosemary Randall and Andy Brown, p157: "People earning under £15,000 [per annum] usually have low carbon footprints".

Research by Kennet and Avon Boating Community in 2011 showed that 51% of Bargee Travellers had an income of £20,000 or less and 40% had incomes below the minimum wage. See http://kanda.boatingcommunity.org.uk/wordpress/wp-content/uploads/2011/10/KA-boaters-survey-interim-report.pdf

4. Current regulatory landscape

Are you aware of any cases where an existing regulatory regime is not working effectively or is creating an unintended negative outcome for business or the environment?

As an example, the Department is aware that historically some vessels have changed use and effectively entered a regulated trade with an unregulated engine giving the new entrant a commercial advantage over compliant ships.

Are you aware of any appropriate standards or regulatory approaches that could be translated to the sector to reduce emissions?

As stated above, we believe that for boats which are used as homes, the current regulatory landscape is working well. We again stress that any regulatory changes which could impact boats used as homes must consider the significant impact it could have on the owners, including homelessness.

Due to the complexities of boats which are used as dwellings when considering policy around emissions, we would recommend that such vessels should be exempted from any legislation or regulations which is primarily concerned with craft used for recreation, leisure, business or commercial purposes.

5. Innovation in the sector

Are you aware of any innovations in your part of the sector, or wider maritime transport that could help mitigate pollutant emissions from the concerned vessels?

Many boats used as homes have solar and wind power, although not all can afford it. There are some boats with electric engines powered by solar panels, although the set up is expensive at present and they tend to have large back-up diesel generators to charge the batteries when the solar panels do not generate enough power. There are concerns about the safe performance of electric engines in strong river currents or at sea.

Do you have any views on what Government could do to promote innovation in the sector?

The main activities which lie behind emissions are:

- propulsion
- heating
- generation of electricity

In the case of **propulsion**, most boats have diesel engines. There is some innovation around the use of electric engines however there are very few boats currently employing this approach as the costs are high and there are concerns about the safe performance of these engines in strong river currents and at sea. Retro-fitting diesel boat engines with emission reducing technology will be complex and expensive; requiring boats to fit new engines would be financially prohibitive to most boat dwellers given that the cost of a new boat engine is in the region of £6000 to £8000.

On **heating**, the majority of boats have solid fuel wood, coal or multi-fuel stoves as their only source of heating. In many cases the stoves also function as a way of heating water and cooking. As the primary source of heat, they are an integral part of most boaters' homes, rather than an aesthetic add-on to an existing central heating system. The impact of any policy which restricted the use of wood burning or solid fuel stoves on boats would be substantial, especially in comparison to the relatively small number of stoves in question. A minority of boats (but especially holiday hire boats) have diesel heaters that are run on the same grade of diesel that is used to power the engine.

An alternative to solid-fuels would be bottled LPG gas, however it is very rare for a boat to use gas for heating, due to the dampness and condensation caused by this source of fuel; the greater risk of carbon monoxide poisoning from gas heaters and the prohibitive cost. Most boats use bottled gas in 13kg bottles or smaller for cooking and often for heating water. The cost of buying gas in 13kg bottles is almost double the price per kg compared

to buying gas in 47kg bottles which are used in houses where no there is no mains gas. Using electricity as a source of heating is not practical for boats which are rarely, if at all, attached to the grid.

On **electricity**, many boats make use of solar power and, to a lesser degree, wind power. This can reduce the level of emissions from running the engine to create power. Naturally there are seasonal fluctuations in the amount of power that can be created this way and so it is not a total replacement for running the engine or a generator.

There are some initiatives to place shore line power points on sections of the towpath for use by itinerant boaters however these are only currently in pilot stages (e.g. in Islington) and not all boats have the correct hardware to attach to these. Without funds to upgrade their vessels, these boats will not be able to use these facilities. While such initiatives could be of use to boats for charging their batteries, they only have limited use when it comes to heating. This is because installing electric heaters is expensive and unless there are shore line hook ups all across the network, there is little point in a travelling boat adding them for only very occasional use. In addition, the cost of using electricity from a shore hook-up is prohibitive for most Bargee Travellers, who cannot afford even the £6.00 per day (which if using electricity became compulsory would amount to £42.00 per week) that is charged at Llangollen, for example. The level of this charge is proportionally far more expensive than electricity supplied to houses and would be a disproportionate and unjust measure if all other forms of heating and charging batteries were banned. The same applies to the use of electricity for cooking: boats used as homes are not fitted with such equipment at present, and the cost of fitting and use would be prohibitive.

6. Barriers to mitigating emissions from the concerned vessels

Considering the design, construction and equipment currently used on board the concerned vessels, and the infrastructure requirements of alternative propulsion methods, what are the technical barriers to mitigating the emission of air pollutants?

The high cost, especially in comparison to similar equipment in houses and flats, both of installation of infrastructure on the waterways and of equipment on boats.

The impracticality of installation of electric charging points on the towpaths of the nation's 4,700 miles of inland waterways, most of which are not in urban areas, and at anchorages and swing/ buoy moorings on the coast, where there is no existing electricity supply.

Depending on the design of the cable ducts, the risk of damage to cabling and serious injury to boaters where electric cables run along waterway towpaths. Only a very few areas of waterway towpaths have mooring rings or bollards installed. On most of the towpath, boats are moored by hammering mooring pins into the ground and attaching ropes to them. If cabling is installed along towpaths, there is a risk that mooring pins will be hammered into the cables, causing damage and serious injury.

The difficulty of converting or retrofitting existing marine diesel engines to non-polluting fuels, which is far more complex than conversion of road vehicle engines due to the low temperature of the exhaust and the low RPM of the engines.

The unprofitable nature of inland waterway boat building generally, which is a niche market with very low profit margins thus discouraging innovation.

Some measures to mitigate air pollutant emissions could involve retrofitting, or indeed scrapping vessels, what would the estimated financial costs of such steps be?

Please see the previous answer. With regard to retrofitting, we again note that retro-fitting diesel boat engines with emission reducing technology will be complex and expensive; requiring boats to fit new engines would be financially prohibitive to most boat dwellers given that the cost of a new boat engine is in the region of £6000 to £8000.

Scrapping vessels that are used as homes will be seen as draconian and discriminatory, will create fear and anger amongst the boat dwelling community, and will carry with it an enormous social cost and burden on the state in terms of the level of homelessness that it would cause. Most Bargee Travellers cannot afford to move into bricks and mortar housing, and the financial and social cost of legislation that would compel them to scrap their homes would be extreme. Any policy of scrapping boats that are used as homes would violate the rights of boat dwellers to respect for their homes under Article 8 of the European Convention on Human Rights.

If a scrappage scheme was introduced that provided financial compensation to Bargee Travellers, to avoid widespread homelessness this would need to cover the full cost of purchasing a new boat with all the suitable emission-free technology. The cost of purchasing a new boat would otherwise be prohibitive, for example currently a nearly-new medium sized narrowboat costs £139,950 (see https://www.tingdeneboatsales.net/boat-spec?BoatID=6659307).

7. Solutions to existing barriers to mitigating emissions

What are the technical solutions to overcoming barriers to mitigating emissions from the concerned vessels? Please refer to the barriers you have outlined in the above section.

Propulsion:

To encourage the production and use of biodiesel for boat engines as an interim measure. This would need to be done with financial incentives both for producers and to ensure the price was lower than mineral diesel for the end users. This would mitigate emissions of NOx and SOx. If implemented with the appropriate pricing, this would be extremely popular with boaters and would mitigate the effect of the expected end to the use of red diesel in private boat engines.

Research into new types of marine engines suitable for boats that are used as homes, for example cleaner burning engines or engines that use alternative sources of power such as solar, hydrogen or biodiesel.

Research into the use of Sterling engines in boats used as homes, as these are quieter and more efficient than internal combustion engines, and can be run with a wider range of fuels.

Research into LPG and hydrogen injection into diesel engine air intakes instead of diesel, and the construction and use of small private electrolysers.

Further research into electric motors and battery banks.

Research into the construction and retro-fitting of catalytic converters, filters and other air cleaning technologies to reduce the impact of marine engine exhaust emissions.

Grant funding for the purchase and retro-fitting of catalytic converters, filters and other air cleaning technologies to boats that are used as homes, given that the cost of these modifications is extremely high.

Grant funding for the purchase and installation of new engines in boats that are used as homes, given that the cost of a new engine is £6,000 to £8,000.

The development of pedal powered boats for use on canals.

Electricity generation:

Grant funding for the purchase and installation of solar panels and wind generators on boats to reduce the use of boat engines or generators to generate electricity for domestic use when stationary.

The extension of the Feed-In Tariff regime to boats and specifically to boats without a permanent mooring (and by implication to other mobile dwellings such as caravans).

The development of more efficient, quieter wind generators for boats.

Heating of space and water:

Research into the production of a low-cost, low emission solid fuel for use in solid fuel stoves for heating space and water.

Grant funding for the purchase and installation in boats that are used as homes of domestic electrical appliances running from shore power in the event that electricity hook-up points are provided widely throughout the waterways.

Research into ground source heat pumps on boats, using the boat's base plate as the hot end.

Research into burning hydrogen for heating.

Further research into the most efficient form of electric heating for use in boats that are used as homes.

If electricity hook-up points are provided at temporary moorings along the waterway towpaths, funding and technical solutions would need to be provided to navigation authorities to install mooring rings or bollards throughout the waterway system, otherwise the cost would be prohibitive and the design of the rings or bollards may not be the most durable or effective.

If electricity hook-up points are provided at temporary moorings along the waterway towpaths, a credit scheme or grant scheme to enable the low-cost provision of electricity for boat dwellers who otherwise may not afford to use these. For example, a certain number of credits issued to each boat per annum.

Can you see a role for Government in facilitating the mitigation of air pollutant emissions from the concerned vessels? What role could the Government take?

We would recommend that Government look at mitigating the effects of navigation authority legislation, policy and enforcement, all of which force boats without a permanent mooring to travel more than they need to and thus to emit more air pollutants

than they need to. For example, on Canal & River Trust waterways the legislation requires boats without a home mooring to be used *bona fide* for navigation without remaining for more than 14 days in any one place. In addition, Canal & River Trust introduced an *ultra vires* policy in 2015 of requiring boats without a permanent mooring to travel a range of at least 20 miles within their licence period. The 2015 policy requiring a 20-mile range causes Bargee Travellers to make unnecessary journeys purely in order to prevent their homes being seized and removed from the waterways.

On other navigation authority waterways, for example those managed by the Environment Agency or Middle Level Commissioners, similar policies, legislation or enforcement on the part of riparian owners or navigation authorities results in Bargee Travellers being moved on unnecessarily, in most cases contrary to the Public Right of Navigation that includes the right to moor for undefined temporary periods.

Government intervention both in preventing unnecessary, unwanted boat movement and in facilitating the provision of more temporary and permanent mooring space for boats used as homes would significantly mitigate emissions from propulsion.

The Government could provide grant funding to support the purchase or upgrading of solar panels, wind generators and additional batteries in boats used as homes; to upgrade solid fuel stoves; and possibly to retro-fit engines with emission limiting devices, if the technology were available.

The Government could also fund research into the development of a low cost, low emission, carbon-neutral solid fuel for heating; this would benefit all who live off-grid, for example in caravans and remote houses as well as boats.

Referring to the diagram on possible policy interventions in the "Future Policy Development" section of this Call for Evidence, what is your view on these Department's possible policy interventions?

- **Incentives for cleaner vessels (e.g. retrofit)**

  Any incentives should recognise that household carbon emissions are directly linked to household income; that people earning £15,000 or less per annum generate lower emissions and that typically, Bargee Travellers are on very low incomes. Any incentives for retrofitting would have to fully compensate Bargee Travellers financially otherwise the cost would be prohibitive. Incentives would also have to take into account enforcement action that could be taken against them if they do not travel the distances required by the navigation authority as the result of any retro-fitted equipment, especially those on Canal & River Trust waterways.

- **Introduction of financial incentive or lever to reduce emissions**

  Any financial levers to reduce emissions would have to take into account possible enforcement action by navigation authorities if Bargee Travellers accept incentives that mean they do not travel the distances required by navigation authorities such as Canal & River Trust. To impose a situation of conflicting legislation and/or policy, where Bargee Travellers were forced to travel less by emissions reduction regulations but were required to travel greater distances or ranges by conflicting navigation authority enforcement would be unjust, as they would be faced with a choice of which law to break. Most would choose to break the law that did not risk the loss of their home.

- **Standardisation of regulations (in line with wider regulations on air quality)**

  Any standardisation of regulation or legislation on air quality must reflect the unique position of boats used as homes without a permanent mooring in that unlike houses they exist completely off-grid. The standardisation of regulations must not lead to the unintended consequences of boats that are used as homes becoming effectively uninhabitable because regulations prevent them from heating, lighting or moving their homes.

  In the case of propulsion, the emissions produced are largely due to the requirement of many boaters without a permanent mooring to move regularly around the waterway system as a condition of their licences. Any standardisation of emission control regulations must challenge and mitigate waterway legislation and navigation authority enforcement policy where these conflict with regulations aimed at reducing emissions.

  When considering policy around emissions, we would recommend that boats used as homes should be exempted from any legislation or regulation that is primarily concerned with craft used for recreation, leisure, business or commercial purposes. We would also recommend that any legislation or regulation that impacts on the level of emissions for boats which are used as homes should not be introduced without similarly impactful regulations also being placed on all dwellings.

- **Introduction of specific regulations for appropriate domestic vessels**

  When considering policy around emissions, we would recommend that boats used as homes should be exempted from any legislation or regulation that is primarily concerned with craft used for recreation, leisure, business or commercial purposes. We would also recommend that any legislation or regulation that impacts on the level of emissions for boats which are used as homes should not be introduced without similarly impactful regulations also being placed on all dwellings.

Do you have any alternative suggestions of measures the Department could consider?

8. Unintended Consequences of Policy Interventions

Do you consider that there is a risk of unintended or underestimated consequences if Government seeks to intervene in the sector? Do you have any examples of issues that could arise?

As examples – a scheme focused on existing vessels could lead to pressure to scrap some ships, leading to a problem with recycling capacity, or a financial incentive to support new technology could result in undue market distortion negatively impacting existing operators.

As stated above, there is a considerable risk of unintended consequences if the Government seeks to intervene on emissions from boats used on UK waterways without making suitable provision for boats which are used as homes without home moorings. Many emissions from these boats are intrinsically linked to activities which are required for the boat to be used as a dwelling (heating, electricity generation) or as part of the conditions of the licence (navigation of the system, i.e., propulsion).

Any regulation which impacts on the ability of a boat dweller to propel or heat their boat, jeopardises the ability for the boat to be used as a home. This in turn leads to the risk of homelessness. This is not hypothetical, while the boat dwelling community is far from homogeneous, it does contain significant numbers of people who are vulnerable, are on low incomes and many have experienced homelessness. For those who have moved onto a boat as a way out of homelessness or as a way of preventing it, policies which create barriers to their using a boat as a home, or which indirectly restrict, price them out or prohibit them from living on their boats in certain areas, could push them into homelessness.

As well as this stark risk, it is also important to note that the impact of emissions regulations on the general population of boat dwellers may be disproportionally significant as it may require them to make expensive modifications to their boat, limit the areas in which they can live or reduce their quality of life. Where the scope of legislation or regulations is mainly intended to cover boats used for leisure or commercial purposes, and given the small number of boats used as homes compared to the overall number of vessels, we would recommend that boats which are used as homes are exempted unless their specific situation is taken into account explicitly within the legislation.

There is also a risk of creating a situation that results in conflicting legislation and/or policy, where Bargee Travellers are forced to travel less by emissions reduction regulations but were required to travel greater distances or ranges by conflicting navigation authority enforcement. This would be unjust, as they would be faced with a choice of which law to break, and would be penalised either way, simply for the act of living in their homes.

The issue of emissions from all types of off-grid homes must be carefully and holistically considered in order to avoid the unintended consequences of such homes, whether they are boats, caravans, remote houses or otherwise, becoming uninhabitable due to the effect of emissions reduction legislation, or alternatively people being prosecuted for continuing to live in them.

9. Longer Term Trends in the Sector

In relation to trends in your sector, or the sector as a whole, do you have any information on (with regards to the concerned vessels):

1. **The lifetime of vessels and the turnover/replacement rate of old vessels with new builds;** Modern steel narrowboats last 40-60 years, the market for new boats is growing in that more boats are being built and very few are being scrapped.
2. **Information on the types of new vessels expected to be built;** The majority of new vessels that will be used as homes that we expect to be built are steel narrowboats and in particular a growing number of widebeam narrowboats.
3. **Information on the future fuels these vessels are likely to use;** Searching for a new engine has revealed that none of the steel narrowboat builders or engine

manufacturers have remotely addressed the issue of producing narrowboat engines that conform to Euro 6 standards.

4. **The potential for the "greening" of this sector, so that air pollutant emissions are effectively and proportionally tackled.**

   Biodiesel and low emission solid fuel or wood only reduces the NOx/ SOx/ GHG emissions, though not the PM emissions. There is the potential to further develop new build electric boats, especially for use on canals where a small number of electric boats are already in use as homes. There is also the potential to develop pedal powered boats for use on canals. We note however that the only pedal powered narrowboat that we are aware of that has been used as a home was subject to enforcement action in 2015 by Canal & River Trust due to not travelling 'far enough', partly because it could only be driven in almost windless conditions, otherwise it was very difficult to steer. See https://www.youtube.com/watch?v=5upAf7waaLg Further research is needed into the design of pedal powered boats; if more pedal powered narrowboats are built, Government intervention may be required to halt Canal & River Trust's policy of requiring boats without a permanent mooring to travel a range of at least 20 miles within their licence period.

10. Additional information

Please provide any additional information that you consider may be of use to policy makers or areas where you feel more research/evidence is required.

We would urge further research to be done into the impact of any legislation or regulation on boats which are used as homes, with specific reference to boats which do not have permanent moorings. These boats should be considered in a manner like housing, rather than transport.

For further information on boats used as homes without a permanent mooring please see evidence submitted by the NBTA to the Women and Equalities Select Committee Inquiry into Inequalities Affecting Gypsy, Roma and Traveller Communities here:

http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/women-and-equalities-committee/tackling-inequalities-faced-by-the-gypsy-roma-and-traveller-communities/written/69196.pdf
or
http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/women-and-equalities-committee/tackling-inequalities-faced-by-the-gypsy-roma-and-traveller-communities/written/69196.html

11. Specific Questions for Vessel Owners and Operators

Has the vessel ever been re-engined or have you considered re-engining your vessel? If you have considered re-engining, but decided against doing so, what were the reasons for not replacing the engine?

For Bargee Travellers, re-engining is normally only considered or carried out from necessity when the current engine is no longer serviceable or no longer economic to repair. Some boaters who can afford it will re-engine with a vintage engine for heritage reasons; there is considerable historical and heritage interest in vintage narrowboat engines in the waterways community especially among the wealthier leisure boaters who have the resources to explore and enjoy this aspect of our waterways heritage. Some people own and live on historic boats with the original engine still fitted. Vintage engines can be up to 100 years old. Recent investigations have shown that there is nil availability of alternative fuel and/or low emission engines for the kind of boats lived on by Bargee Travellers. For the Bargee Traveller community, the cost of installing a new engine is prohibitive so it is rarely done out of choice. When it is done, the replacement engine is very often second-hand or reconditioned, and very rarely new.

What regulatory regime (if any) does your engine/vessel operate within – for example the Recreational Craft Directive, MARPOL or NRMM regimes.

Recreational Craft Directive and Boat Safety Scheme

Where is the vessel moored or stored? (For example: ashore; home or commercial storage premises; marina; private land; river or canal bank; buoy etc.)

Bargee Travellers mostly moor their boats on the canal or river bank for 14 days in any one place or for longer temporary periods. Some will take winter moorings between November and March: these can be on the canal bank or less often in private marinas. A small minority of Bargee Travellers moor their boats on swing/ buoy moorings.

Do you have access to shore power points?

Bargee Travellers have no access to shore power on the river or canal bank or on swing/buoy moorings. If they take temporary or winter moorings in a private marina they are likely to have access to shore power for that temporary period. Very occasionally there are visitor moorings that have shore power but this provision will be charged for and thus may not be affordable; for example, Canal & River Trust charges £6 per day for electricity and an individual water supply at Llangollen visitor moorings.

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12. Specific questions for Navigation Authorities, Port and Harbour Authorities

If possible, please provide an estimate of the air pollutant emissions for the types of vessel operating under your area of jurisdiction.

If relevant, please provide information on any steps being taken to reduce the emissions from these vessels – for example provision of plug-in-power when alongside or the provision of innovative fuels.

If relevant, please provide non-personal, non-individualised information on the membership/users of your waterways/ marina/ boatyard/ club/ organisation so that the Department understands who any potential future policies will impact upon. *For example, a snapshot of the number of users who would fall into broad commercial/recreational groupings, estimates of numbers of users who live afloat etc.*

If possible, please provide an estimated quantification of the air pollutant emissions (disaggregated by air pollutants as defined above) attributable to each type of vessel operating on waters under your authority

If relevant please provide information on any steps being taken in the waters under your authority) to reduce emissions – for example provision of plug-in-power when at berth or the provision or bunkering of alternative fuels.

13. Specific Questions for marinas, boatyards and boat storage companies:

How many berths do you supply?

What percentage of your capacity do you provide electrical connections to?

Do you have sufficient electrical supply to provide electricity to your berth holders?

Do you source electrical power from renewable sources? (e.g.: local solar/wind or via a renewable energy tariff from the grid)

Do you have any views on how Government could encourage the supply of renewable power at point of use in your sector?