

A Response to the Consultation on the draft revised Air Quality Strategy

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Response authors:

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The response provides evidence and policy recommendations in relation to the following questions:

Questions 6, 7, 8.

Responses:

Question 6: What more could local authorities do within the existing regulatory framework to reduce pollution from inappropriate domestic burning?

1. There is currently a lack of public awareness of the impact poor air quality and domestic burning.¹ The cost-of-living crisis and increased gas prices have motivated households to install and use domestic wood burners for heating, without being aware that they are a significant source of air pollution.
2. Some local councils (*e.g.* Southampton) have started keeping track of sources of domestic wood burning, which is a good start to being able to monitor and influence inappropriate use. Regulations should also continue to ensure that all domestic users are properly installed by a qualified professional and that only appropriate fuels are used. For example, damp/wet wood (*i.e.* with a higher moisture content), and use of older/non-approved stoves has been shown to generate greater PM emissions as well as a greater content of polyaromatic hydrocarbons which are a contributor to PM carcinogenicity through their ability to bind DNA.²
3. Where domestic wood burning is being used because there is a lack of financially viable alternative (either in terms of replacing solid fuel-driven heating or because of the lower cost of solid fuel), grants could be made available to encourage shift to more sustainable/efficient heating/insulation solutions.
4. Just as air Quality Management Areas are monitored on the basis of exceedances of NO₂ concentrations, there may be a need to identify areas where air quality is particularly affected by solid fuel combustion, and to focus mitigation efforts on these areas. This may involve tracking the number of homes using solid fuel for heating, or may necessitate monitoring of airborne tracers of solid wood combustion.
5. Nonetheless, given that even “correct”, DEFRA-approved stoves produce particulate emissions per megawatt hour orders of magnitude greater than use of natural gas for heating,³ efforts should be focused on reducing wood burning altogether.
6. Overall, these should not be left to local authorities but requires a national effort.

¹ Ramirez et al (2019) Public Awareness of Air Pollution and Health Threats: Challenges and Opportunities for Communication Strategies to Improve Environmental Health Literacy. *Journal of Health Communication* 24(1):75-83

² Fleisch et al (2020) Residential wood stove use and indoor exposure to PM_{2.5} and its components in Northern New England. *Journal of Exposure Science & Environmental Epidemiology* 30:350-361, Price-allison et al (2019) Emissions performance of high moisture wood fuels burned in a residential stove. *Fuel* 239:1038-1045, Guerrero et al (2019) Effects of wood moisture on emission factors for PM_{2.5}, particle numbers and particulate-phase PAHs from *Eucalyptus globulus* combustion using a controlled combustion chamber for emissions. *Science of the Total Environment* 648:737-744, Horaket al (2022). Influence of co-combustion of unsuitable fuels with standardized fuels in households on CO, OGC, PM, and PAH emissions. *Environmental Science and Pollution Research* 29:44297-44307.

³ <https://consult.defra.gov.uk/airquality/domestic-solid-fuel-regulations/>

Question 7: How do you feel local authorities can most effectively reduce pollution from industrial sources they are responsible for?

1. Continual monitoring is important to be able to keep track of the situation. The current National Atmospheric Emissions Inventory (NAEI) is critically important to maintain air pollutant emissions estimates from all anthropogenic emission sources in the UK.
2. Further development of modelling and measurement tools (e.g. ADMS, chemical monitoring) can improve source apportionment analyses to police industrial emissions. These models are also currently limited by limited AURN monitoring site data/equipment.
3. Overall, these should not be left to local authorities but requires a national effort.

Question 8- How do you feel local authorities can most effectively reduce pollution from transport and non-road mobile machinery (NRMM)?

1. Local and national authorities can help reduce local impacts of shipping on air quality through support of shore-power for vessels when docked in port ('cold-ironing'), enabling them to turn-off their diesel generators whilst alongside in ports.⁴ This could be both direct financial support, or regulatory incentives for companies to adopt shore-power, as well as providing a supporting role in convening stakeholders (port operators and owners – which can be local authorities, shipping companies, shippers of goods, electricity grid providers – none of whom might directly see economic returns from installing shore-power) and in deriving sustainable cost models for its operation. The California Air Resources Board has a well-developed set of measures and incentives to encourage emissions-reducing behaviour (<https://ww2.arb.ca.gov/resources/documents/berth-faqs>).
2. A component of the local air quality impact of shipping comes from road traffic associated with a port (HGVs and for passenger and cruise ports, private vehicles).⁵ In this case the introduction and enforcement of low-emission zones for vehicles, provision of routes to the port away from populated areas, support for alternative transport means (e.g. electrified rail) and freight consolidation warehouses can all help.
3. In terms of port operations, then switching non-road mobile machinery to electric, or Hydrogen, or other zero-local emissions power would help air quality. Local authorities could play a role here. Very directly if they own the port (as in some cases), but indirectly through low-emissions zones and policies that do not exempt the port/industrial uses and through convening and supporting stakeholders both financially and logistically with provision of, e.g.

⁴ Thunis et al (2019). Source apportionment to support air quality planning: Strengths and weaknesses of existing approaches. *Environment International* 130:104825, Gulia et al (2015). Urban air quality management-A review. *Atmospheric Pollution Research*. 6(2):286-304, Thakrar et al (2020) Reducing Mortality from Air Pollution in the United States by Targeting Specific Emission Sources. *Environmental Science & Technology Letters* 7(9):639-645.

⁵ Berechman and Tseng. Estimating the environmental costs of port related emissions: The case of Kaohsiung. *Transportation Research Part D: Transport and Environment* 17(1):35-38, Giuliano and O'Brien (2007). Reducing port-related truck emissions: The terminal gate appointment system at the Ports of Los Angeles and Long Beach. *Transportation Research Part D: Transport and Environment* 12(7):460-473, Kozawa et al (2009). Near-road air pollution impacts of goods movement in communities adjacent to the Ports of Los Angeles and Long Beach. *Atmospheric Environment* 43(18):2960-2970.

electricity. In Southampton, London and Felixstowe, the container ports could look at further adopting electric (or Hydrogen) straddle carriers and cranes, for example, as other ports are starting to do (e.g. Antwerp, Duisburg, Valencia).

4. Ports can be incentivised to act as ‘decarbonisation hubs’ for their region – becoming sources of low-emission energy for themselves and their hinterland, particularly if they install renewable energy generation.⁶ Wind turbines on industrial land, solar panels on large warehouse (and car park) roofs, etc. Local authorities could provide a key role in enabling planning permission and in convening stakeholder groups.
5. In the case of ports, there are two overriding reasons why management and enforcement should primarily be the responsibility of national government rather than local government. First, ports, especially cargo ports, but also passenger vessel ports, generally fulfil a national-level function *i.e.* imports and exports passing through a port are not solely, or even at all, of use for the local economy, but as passing through what is essentially a gateway to the country – especially important in an island nation like the UK. Therefore, regulation, mitigation, and enforcement of emissions should not be borne by local bodies. Second, if local government is left to set local standards for nation-level infrastructure, there is the potential for different areas to have different regulations, and thus potentially compete for use of facilities through lesser regulation. Therefore, regulation (and its enforcement) as well as mitigation should be in the domain of national government. In the UK this could potentially be led by association with Freeport status and regulation. Furthermore, given that the adverse health impacts of air pollution (as are, and continue to be, well documented in the research literature) arising from nationally critical infrastructure are likely to fall disproportionately on local populations, funding for improved monitoring and mitigation should be provided by national government, not local government.

⁶ Notteboom and Haralambides (2023). Seaports as green hydrogen hubs: advances, opportunities and challenges in Europe. *Maritime Economics & Logistics* 25:1-27, Pivetta et al (2022). Multi-Objective Optimization of a Hydrogen Hub for the Decarbonization of a Port Industrial Area. *Journal of Marine Science and Engineering* 10(2):231, <https://www.weforum.org/agenda/2022/04/co-creating-change-ports-as-energy-hubs-of-the-future/>