



POLICY BRIEF

Advancing noise regulations to increase uptake of Air Source Heat Pumps

The Future Homes Project Acoustics Team

Acoustics Research Centre, University of Salford

July 2025



Executive summary

Air Source Heat Pumps (ASHPs) are central to the UK's Net Zero strategy. However, concerns about noise, particularly in residential areas, could slow adoption.

Current guidelines primarily focus on absolute sound levels. Yet, research shows that the sound character of the ASHP and its cumulative effects influence *how people perceive noise*, known as 'psychoacoustics'.

The Acoustics Research Centre at the University of Salford, with funding from Innovate UK, is investigating:



how tonal characteristics and background noise affect ASHP perception and annoyance



how siting and physical barriers shape ASHP noise transmission



the cumulative acoustic effects of multiple ASHPs

This policy brief shares key research findings to stimulate dialogue with policymakers.

- We offer clear, evidence-based recommendations for revising planning policies and improving standards, including but not limited to the Microgeneration Certification Scheme (MCS) 020.
- Guidance must be scientifically robust *and* easy to apply, ensuring that as the government scales up ASHP installations to meet climate goals, noise impacts are also properly addressed.



Why noise matters for ASHP deployment

ASHPs are widely seen as a low-carbon solution for domestic heating, but **when units are poorly designed, sited or maintained, noise issues can arise.**

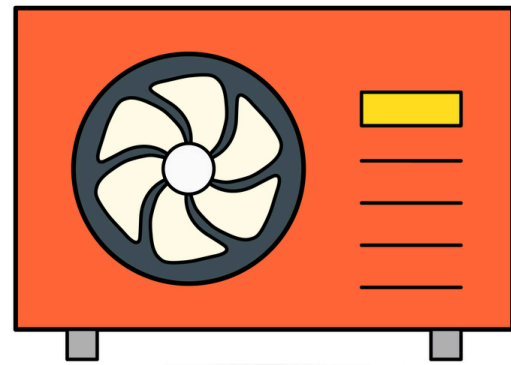
Under current MCS 020 a) guidelines, compliance with Permitted Development Rights (PDR) is assessed using absolute sound levels alone. However, the **MCS 020 consultation response recognises the need to address:**

- sound character, particularly tonality
- cumulative effects of multiple units
- the potential for a gradual rise in ambient noise¹ (“noise creep”) across neighbourhoods caused by cumulative effects

These concerns were raised by local authorities, professional bodies such as the Institute of Acoustics (IOA) and Chartered Institute of Environmental Health (CIEH), and via a literature review comparing UK standards with BS 4142² and international approaches.

At the design stage, manufacturers have a crucial role to play. The Department for Energy Security and Net Zero (DESNZ) report notes that **most manufacturers view noise as a priority** and recognise that it will influence future product design decisions.

To enable large-scale ASHP deployment without eroding public trust, regulations must balance technical accuracy with user-friendliness. Future guidance should better reflect how people perceive ASHP noise.



Research overview

To explore how people perceive and react to ASHP noise under realistic conditions, we are conducting a series of laboratory and field-based acoustic measurements and psychoacoustic testing.

The findings are intended to inform updates to ASHP noise regulations and best practice, ensuring they are both robust and practical.

Key areas of investigation



acoustic features such as tonality and low-frequency content



the role of siting and physical barriers



effects of background noise³



cumulative and interaction effects of neighbouring installations

¹ Ambient sound: “totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far” (BS 4142)

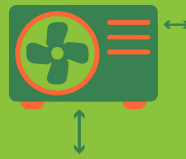
² BS EN 4142:2014+A1:2019 “Methods for rating and assessing industrial and commercial sound”

³ Background sound: the sound at the assessment location when the specific sound source is not present (in this case a heat pump) (interpretation of BS 4142)

Key findings



The sound character of ASHPs includes low-frequency noise and changes over time that can cause annoyance.



Appropriate placement of ASHPs is critical to ensure minimum disturbance for neighbours as the sound energy is not distributed equally in all directions.



Background noise³ levels affect annoyance. The same ASHP under the same operating and installation conditions can lead to different levels of annoyance depending on the existing background noise.

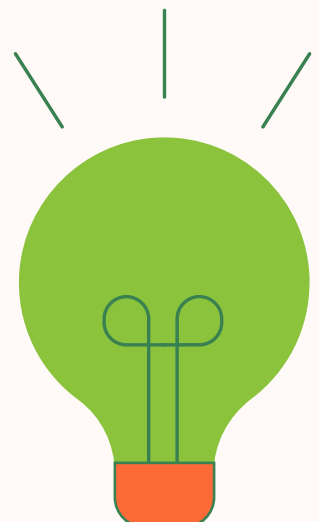


The effect of barriers (e.g., fences, walls) is oversimplified in PDR assessments.

Recommendations

To ensure ASHP deployment addresses noise impacts and aligns with Net Zero goals without compromising community wellbeing:

- 1** Introduce corrections or penalties for sound character (e.g., tonality, changes over time) in MCS 020 assessments
- 2** Incorporate an estimate of site-specific background noise levels into MCS 020 assessments
- 3** Improve noise prediction models to reflect siting, orientation and real-world barrier and cumulative effects
- 4** Support field validation studies for model accuracy
- 5** Embed noise-awareness in installer and designer training programmes





Interested in a demonstration of heat pump sounds? **Get in touch.**

Get involved

- Partner with us to facilitate field studies or laboratory measurements
- Visit us for a tour of the world-class acoustics facilities

For more information, for a demonstration or to discuss collaboration opportunities contact **Professor Antonio J. Torija Martinez**.

bit.ly/FutureHomesAcoustics



**Prof Dr Antonio J.
Torija Martinez**

Professor of Acoustic Engineering
and Psychoacoustics,
University of Salford
a.j.torijamartinez@salford.ac.uk



**Dr Simone
Graetzer**

Senior Research Fellow,
Acoustics Research Centre,
University of Salford
s.n.graetzer@salford.ac.uk



**Dr Jonathan
Hargreaves**

Lecturer,
Acoustics Research Centre,
University of Salford
j.a.hargreaves@salford.ac.uk

Locally-led Innovation Accelerators delivered in
partnership with DSIT, Innovate UK and City Regions



Innovate
UK

