

Fresh air and low carbon...

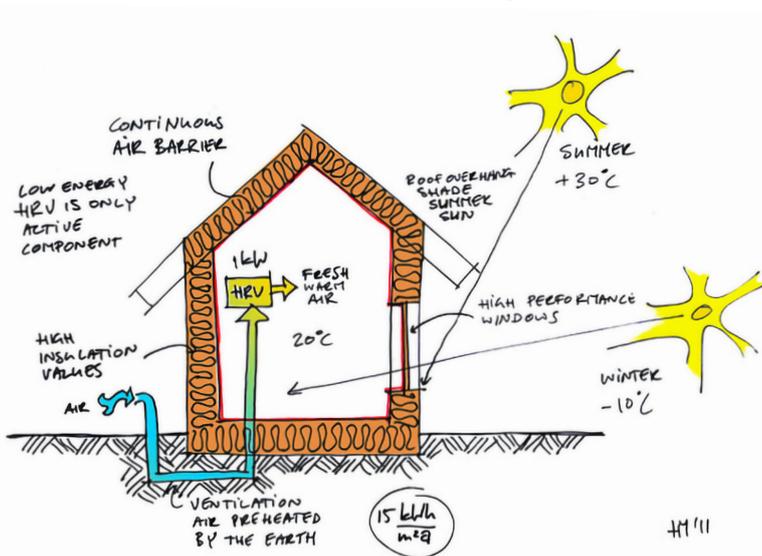
Why is maintenance the missing link and how can this be remedied?

Two imperatives for UK homes

Energy for heating UK homes is a prime contributor to environmentally destructive carbon emissions. The escalating climate emergency demands we **cut home energy use without further delay**.¹

Reducing carbon emissions drives policy initiatives that promote home energy efficiency. To achieve the UK's goal of zero carbon emissions by 2050, it is crucial that homes are increasingly airtight to cut heat loss.

But low energy use is not the only imperative for homes. Our everyday living environment must **protect and nurture the health of occupants**, as well as the planet.



Airtightness plays a critical role in the quality of indoor air. The constituents of the air we breathe everyday, in our homes and outdoors, impact on health throughout life.²

Low energy use and fresh indoor air are **both essential**, whatever the design approach, as just one example here illustrates.

Image credit: Hajo Meijer, Ecocentric Design

Cutting carbon and protecting health... the link

The **quality of ventilation** of homes sits at the intersection of these critical concerns for housing. As homes become more airtight, optimum ventilation for healthy indoor air and minimal heat loss needs:

- ✓ Expertly designed **ventilation strategies** and correctly specified systems
- ✓ Accurately installed and rigorously commissioned **technologies**
- ✓ Appropriate **operation** of ventilation by occupants

In practice, there is another essential requirement, that is frequently overlooked:

- ✓ Ventilation systems need to be **maintained** regularly to perform effectively for the life of the dwelling. Depending on the system, this will include regular filter changes, periodic servicing, cleaning, recalibrating, as well as routine repairs.

breathable
homes
fresh air and low-carbon

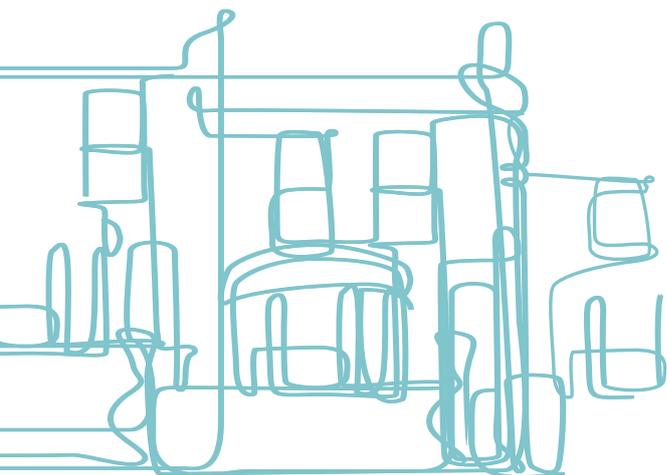
¹Committee on Climate Change (2019) [UK housing: Fit for the future?](#); Intergovernmental Panel on Climate Change (2021) Sixth Assessment Report: [Summary for Policymakers](#) ²Royal College of Physicians & Royal College of Paediatrics and Child Health (2016) [Every breath we take: The lifelong impact of air pollution](#); (2020) [The inside story: Health effects of indoor air quality on children and young people](#)

Exploring the maintenance perspective

Recent research³ reveals **why** maintenance does not get the attention it requires to ensure long-term healthy indoor air and low carbon emissions, and **how** housing providers can remedy this.

85 individuals contributed experience, knowledge and views to answer these questions:

- 51 maintenance professionals working in the UK shared their expertise and opinions on home ventilation, in an online survey and in-person focus group
- 34 residents and staff at 5 energy-efficient housing association schemes across England participated in face-to-face interviews, sharing their practical day-to-day experience of maintaining ventilation



The research focused on recently built low-carbon homes, designed to prevent heat loss through airtight^x construction, with a range of ventilation systems.^{xx}

^x Defined in the research as $<5\text{m}^3/\text{hr}/\text{m}^2@50\text{Pa}$
^{xx} MVHR, PIV, extract fans, tricklevents

What the research revealed

The impact of ventilation on health is typically underestimated by housing organisations, or indeed overlooked entirely, at all stages in the life of dwellings. As a result, lack of ventilation maintenance creates the risk of unhealthy indoor air.

Carbon emission reduction has little or no influence on maintenance or management practice, although it is the key driver for new home design, including ventilation design.

Disconnections between housing practices are impeding ventilation maintenance and operation. Connections between short-term development and long-term occupation phases are weak or missing.

Call to action for housing organisations

Embed good indoor air quality as a strategic **health responsibility**, to current and future residents, and **reflect this objective in ventilation maintenance practice**.

Ensure homes designed to be at or near **zero carbon**, achieve this in practice, for the long term, and **reflect this goal in ventilation maintenance practice**.

Tackle **operational practices** that hinder ventilation maintenance throughout the lifecycle of dwellings and **connect the development and occupation phases**.

breathable
homes
fresh air and low-carbon

Please feel free to contact me on jenny@jennybrierley.com or 07948 211861 if you would like to delve deeper into the research or discuss how these findings can be put into practice in your organisation.

³Brierley, J M (2021) Fresh air and low-carbon: a practice approach to home ventilation, PhD thesis, School of Architecture, University of Sheffield, available at [etheses.whiterose.ac.uk/29017](https://theses.whiterose.ac.uk/29017).

Thank you to the housing associations and individuals who contributed to this research. This visual summary was produced in collaboration with the Research Retold team at www.researchretold.com (2021).