



SUSTAINABLE TRADITIONAL
BUILDINGS ALLIANCE

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How resilient are buildings in the UK and Wales to the challenges associated with a changing climate?

By Professor Carolyn Hayles

The urgency and likely impact of climate change has been thoroughly assessed by scientists, the results of which are now widely published in academic literature and regularly reported in the mainstream media. Together with projected temperature increases, extreme climate events are expected to occur more frequently, for example heavy precipitation events are likely to become more commonplace in the UK and Wales. In addition to UK and Welsh government-lead decarbonisation programmes aimed at reducing our reliance on fossil fuels within the built environment, it is now more important than ever to start to look at how we adapt our buildings to address the challenges caused by a changing climate. Current decarbonisation efforts are unlikely to hold global warming to 1.5°C. Consequently, we need to prepare for warmer, wetter, and more extreme weather patterns. Professor Carolyn Hayles, climate embedded research fellow with Welsh Government between 2020-2021 sought to understand how resilient dwellings in Wales are to the challenges associated with a changing climate.

Research activities included an extended desk study, climate vulnerability modelling, stakeholder engagement and dissemination. The desk study has provided an overview of the resilience of buildings in Wales, and more widely the UK, to the challenges associated with a changing climate. It has demonstrated that current building regulations, standards and assessment tools fail to meet the needs of a society hoping to tackle climate change. Improving our understanding of the relationship between energy use, indoor health and comfort, the thermal mass and moisture dynamic of the building envelope, will allow better informed decisions, as they will provide a better sense of future risks to energy efficiency, occupant health and comfort, and dwelling management.



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The climate vulnerability modelling, undertaken in collaboration with [Resilient Analytics](#) in the USA has identified climate vulnerabilities specific to the Welsh housing stock, namely:

1. Increased incidences of summertime overheating in a majority of Welsh dwellings;
2. Poorer indoor environmental quality principally due to an increase in relative humidity; and
3. [Building Fabric Stressors](#) from solar, wind, rain etc.

The stakeholder engagement has demonstrated the interest in and the need for more research and government guidance on the practicalities of risk-based adaptation.

Recommendations are made to Welsh Government, Welsh building regulations and related national reference standards, and the wider housing sector, and include:

1. The merging of decarbonisation decision making with risk-based climate adaptation.
2. More consistent messaging, climate change evidence and climate safety legislation, withing building regulations and standards.
3. Investment in skills and training on climate mitigation and adaptation, amongst other things, to avoid further maladaptation.
4. Ensuring the distribution and accessibility of climate change mitigation and adaptation understanding and competences, including publicising climate-adaptive behaviours that will improve health and wellbeing in the home.