

Energy Efficiency Improvement in Static Holiday Homes: A Review of Regulatory Development and Case Study

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Abstract:

Static holiday homes are an important part of the leisure and tourism sector, but their energy performance is often significantly poorer than that of conventional residential buildings, leading to higher energy use and carbon emissions. This paper reviews the evolution of relevant standards and regulations in major markets and examines how these changes have shaped expectations for improved thermal and energy performance. A UK case study is then used to evaluate the practical impact of selected energy-saving measures through validated dynamic simulation in IES VE. Parametric analysis was conducted to assess fabric upgrades, airtightness improvements, smart heating controls, waste water heat recovery (WWHR), and a 3.6 kW solar PV system with battery storage. The results show that fabric upgrades reduced space heating demand by 15.3%, while improved airtightness reduced infiltration losses by up to 58% and heating demand by up to 7%. Smart thermostatic radiator valves improved temperature stability, the PV-battery system met up to 86% of summer electricity demand, and domestic hot water consumption was reduced by more than 70% through WWHR and water-saving fixtures. The findings demonstrate how evolving regulatory expectations can inform practical retrofit strategies and support the decarbonisation of the static holiday home sector.