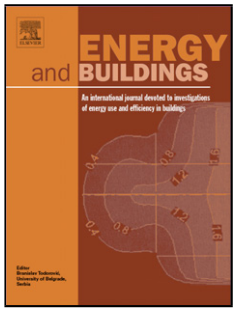

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TITLE

Dynamic evaluation of the thermal inertia of a single-family house: Scope of the retrofitting requirements to comply with Spanish regulations

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HIGHLIGHTS

The annual energy demand of a single-family house was estimated.

Meteorological and use profiles defined in the Spanish regulations were considered.

The weakest construction elements of the house were identified.

The influence on the demand of four proposed retrofitting measures was analysed.

Integrated actions needed to comply with Spanish regulations and Passivhaus standard.

ABSTRACT

This paper presents a study of the thermal performance of a single-family house located in a coastal city in northern Spain that was built according to Spanish standards during the 1990s. The study estimates an annual energy demand of around 95 kWh/m^2 and a thermal power rating of the heating system of around 16 kW. The potential energy savings that would be obtained by implementing different retrofitting measures frequently used nowadays are also quantified: installing a ventilation system with heat recovery, improving the insulation of opaque construction elements, replacing the existing windows with high-thermal performance windows, and reducing air infiltration rates. These integrated actions on the house would reduce the annual energy demand below the requirements of both the Technical Building Code (24.24 kWh/m^2 year for this case of study), which is the regulation currently in force in Spain, and the well-