

Solar energy design for the first and second floors of residential buildings

An energy-saving facade panel for non-residential buildings has been numerically investigated. ... hours for the second option. In the case of the first option, however, these losses tend to grow ...

The first case study was performed by Athienitis et al. in two papers [20, 21], which describe the BIPV/T use in the "Ecò Terra," one of the first residential buildings in Canada that achieved the net-zero annual energy consumption target. The papers perform the modelling, design, and study of the efficiency of BIPV/T coupled with a ventilated concrete slab (VCS) for ...

The global energy crisis necessitates enhancing energy independence for regions and countries by advancing the utilization of renewable energy sources. Solar energy offers a sustainable method for enhancing energy efficiency in buildings through the integration of solar greenhouses or sunspaces. These passive solar systems play a vital role in reducing the ...

An energy performance analysis of pre-existing residential buildings with an overall design is performed using simulation programs. ... roof, and windows should be ...

To save energy and commit to the environmental protection and sustainable development of green ecological buildings, how to integrate solar energy systems with the reconstruction of...

energy consumption for residential buildings with accuracy has great importance (Liu et al., 2019) and (Al-Addous and Albatayneh, 2020). The residential buildings in KSA have relatively high ...

The objectives can be listed as follows: (i) to develop an integrated solar based building energy system to produce power, heat, and cooling along with domestic hot water by using building facade, roof and parking area, (ii) to analyze the proposed system with the first and second laws of thermodynamic, (iii) to simulate the subsystems with extensive simulation ...

In order to achieve zero-or low-carbon buildings, two main strategies are adapted (1) use of passive ...

The introduction of integrated passive design strategies based on improving energy and solar efficiency for detached residential house with two floors and four bedrooms in Sydney, effectively reduced the total energy needed for cooling and heating by 37% and 36% respectively [22].

However, the average preferred floor level of residence, is 29.3 in Hong Kong and 20.9 in Singapore (Yuen and Yeh, 2011) Considering the above trends in the tropical cities, three high-rise residential buildings are modelled to have 11, 21 and 31 floors with a floor to floor height of 3 m (Fig. 2).

Solar energy design for the first and second floors of residential buildings

The annual energy consumption of residential buildings in Tianjin, China, was dynamically simulated using Design-builder software. By collecting a large number of residential design cases, building energy consumption of residential buildings per unit was analysed based on several common plan shapes. The results indicate that, firstly ...

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