

Which type of solar energy is best for high-rise residential buildings

How can solar energy be used in high-rise buildings?

These strategies can be applied and adapted to high-rise buildings by using direct solar gain, indirect solar gain, isolated solar gain, thermal storage mass and passive cooling systems. On the other hand, considering active solar technologies can also add extra potential by providing part of the building necessary energy demands.

Can high-rise buildings gain solar radiation?

Finally, high-rise buildings have great potential to gain solar radiations because of their vast facades. Analyzing case studies illustrate that applying solar passive strategies in high-rise buildings have a meaningful effect on reducing the total annual cooling and heating energy demand.

Can solar-powered high-rise buildings achieve net-zero energy status?

Examined feasibility of solar-powered net-zero energy high-rise buildings. The maximum permitted EUI by net-zero energy status is 17-28 kWh/m². Meeting this EUI is harder than most stringent building codes. Taller the building, harder it becomes to achieve net-zero energy status. Building orientation impacts maximum permitted EUI.

Can solar passive strategies be used as an alternative in high-rise buildings?

Therefore, by considering the use of solar passive strategies and active technologies as an alternative in high-rise buildings, this study tries to fill some of the current gaps as much as possible and its proposed fundamental message is changing architects' and construction builders' view in dealing with the subject. 1.1. Research methodology

How much solar energy does a building need?

Conversely, the best-performing residential and commercial buildings have EUIs of 50-75 kWh/m² a. Only if building heights are limited to 5-10 floors does the available solar energy, and thus the permitted EUI, reach 50-75 kWh/m² a.

Should high-rise buildings be net-zero energy?

Only if building heights are limited to 5-10 floors does the available solar energy, and thus the permitted EUI, reach 50-75 kWh/m² a. Therefore, we recommend that policymakers not require high-rise buildings to be net-zero energy, unless they are prepared to limit building heights to 5-10 floors. 1. Introduction

He, Q and Ng, S T (2017) Energy-Efficient Window Retrofit for Existing High-rise Residential Buildings with the Consideration of Mutual Shading In: Chan, P W and Neilson, C J (Eds) Proceeding of the 33 rd Annual ARCOM Conference, 4-6 September 2017, Cambridge, UK, Association of Researchers in Construction Management, 755-

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Energy & Buildings Investigating the potential impact of a compartmentalization and ventilation system retrofit strategy on energy use in high-rise residential buildings Energy Build., 199 (2019), pp. 20 - 28, 10.1016/j.enbuild.2019.06.035

NZE high rise residential buildings are subjected to additional challenges due to the high energy consumption from central and communal facilities (Troy et al., 2003, Karen, 2010, Melbourne Energy Institute, 2013), limited roof space for the applications of rooftop renewable energy technologies (Eley, 2017), increased potential for overshadowing in high-density ...

Indoor natural ventilation of residential buildings is challenging in High-rise high-density urban environment. By analyzing 659 residential floor plans built in Hong Kong over the past 10 years, a trend of bigger floor plan with multiple units and preference of view over ventilation as design principle were identified.

Office buildings [52] and residential apartments [53] in cities are usually high-rise buildings with high energy intensity or limited effective area for PV installation. This results in a low ...

This study presents a robust energy planning approach for hybrid photovoltaic and wind energy systems with battery and hydrogen vehicle storage technologies in a typical ...

High-rise buildings have a significant impact on the surrounding environment. Building-integrated solar water heating (SWH) systems are effective ways to use renewable energy in buildings.

In order to evaluate high-rise buildings in terms of solar energy use, the author analyzes the case studies from both passive solar strategies and active solar technologies" aspects. In the first phase; direct solar gain, indirect solar gain, isolated solar gain, thermal storage mass and passive cooling as a meaningful factor to obtain passive strategies are ...

Energies 2019, 12, 3078 3 of 26 Figure 1. Geographical distribution of surveyed projects. Figure 2. The height of the investigated high-rise buildings by year completed.

The results show the best shapes for high-rise buildings are circle and square, to ensure the best BIPV system efficiency. The BIPV should be located on the roof and the "U" ...

Previous research examined the impact of the various ESMs on buildings" energy use reductions. For example, Cardinale et al. (2003) studied the performance of natural ventilation on energy saving on a two-storey semi-detached house in Italy through energy simulation. Ihara et al. (2015) investigated the effect of building fabric including solar reflectance and U-value of ...

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