

SUPER HIGH-RISE BUILDINGS CAN BE EQUIPPED WITH SOLAR POWER GENERATION



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 solar panels be used in high-rise buildings? Despite the city's subtropical climate and abundant solar energy resources, along with numerous buildings with potential for PV power generation, architects remain cautious about adopting extensive PV panels on the facades of high-rise buildings.



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.



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.



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.

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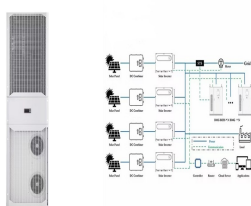
Can solar passive strategies be used as an alternative in high-rise buildings? Therefore, by considering the use of solar passive strategies and active technologies as an alternative in high-rise buildings, this study tries to fill some of the current gaps as much as possible and its proposed fundamental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



The wind-driven aerodynamic noise of super-high-rise building facades not only affects the experience of use inside the building but also reduces the life cycle of building facade materials to some extent. In this paper, we are ???



Keywords: Daylighting, High rise building, Solar Energy Energy Efficiency. Discover the world's research. 25+ million members; provide power generation, cooling, heating and hot water supply.



For investigation of the wind load characteristics on high-rise buildings with opening, a series of rigid rectangular high-rise building models with opening were tested by synchronous multi



The buildings in high-rise blocks are generally over 24 m in height and are mainly utilized for high-tech industries such as electronics and precision instruments. Then, the industrial blocks are further segmented according to their differences in form and layout. As for PV power generation, not all solar radiation can be efficiently

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This paper presents an integrated energy management solution for solar-powered smart buildings, combining a multifaceted physical system with advanced IoT- and cloud-based control systems.



Previous studies indicated that buildings are the primary Energy Strategy Reviews 45 (2023) 101013 sustainability in buildings, high energy efficiency needs to be targeted by reducing



A value of approx. 60 to 150 W/m² in relation to the effective area of the building is used to estimate the power demand (power to be supplied) of a high-rise building. Because of the wide range, it must be estimated for the planning of the building whether the figure will be closer to 60 W/m² or 150 W/m².



BIPV system to provide a good sunlight exposure no matter what the high-rise building shape is. For PV panels, the best height is 0.618 m, the optimum tilt angle and array spacing is 30 and



Having a net-zero-energy building, with solar energy as the only renewable energy source employed, can be an elusive task. In high-rise buildings, in particular, creating net-zero-energy ???

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But with the increased usage and acceptability and lowering costs for solar PV renewable energy, their use in high-rise buildings and commercial buildings is paving the way for use on large-scale . Energy system that links the PV modules to the building and a district energy system to maximize the local use of the electricity generated, including storage, power ???



Solar energy is the linchpin in the pursuit of net-zero energy buildings. By harnessing sunlight and converting it into electricity, buildings equipped with solar panels generate power on-site. This energy can be used to meet the building's operational needs, from lighting and heating to cooling and appliances.



Solar Chimney Power Plants (SCPP) represent a promising renewable energy source on a large scale [1], exploiting both direct and diffuse radiation and with the advantage of no consumption of fossil fuels, thanks to their reliability for both day and night operation [2, 3]. There is a low global warming risk linked to this technology, including construction, ???



One project was conducted in India to investigate the practicality of the potential hydropower generation from wastewater in high rise buildings, while this technology can only be used for in-situ

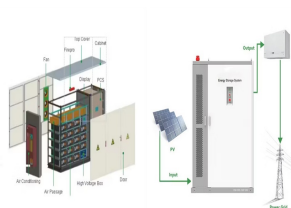


The fire risks of BIPV systems are of particular concern since fire involving solar glazing and solar tiles would become a direct life safety threat to building occupants. 3 International Energy Agency Photovoltaic Power Systems Programme (IEA PVPS) also identified research gaps and urgent research needs on the fire safety of BIPV systems.

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Despite all the policies and pledges toward Net-Zero Energy Buildings (NZEBS) in place, reaching net-zero energy performance in buildings remains a demanding and elusive goal [12]. Among potential on-site renewable/carbon-free energy sources, solar energy is the most favoured and commonly used renewable energy source for NZEBs [13, 14]. A limited area for harvesting ???



The project reported in this study explores energy-saving opportunities through BIPV through a case study. It addresses the potential improvement of the building envelope structure of an existing 24-story office building tower located in Nanshan Knowledge Park C1, Shenzhen, China (Fig. 1). The existing building adopts a standard stick system glass curtain ???



Solar-integrated buildings, equipped with photovoltaic (PV) solar panels, possess a transformative capability to generate their electricity. This shift from complete dependence on grid power to self-generation through solar energy has profound financial implications that benefit both building owners and occupants.



With the continuous rise in the energy consumption of buildings, the study and integration of net-zero energy buildings (NZEBS) are essential for mitigating the harmful effects associated with



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Super high-rise building is a typical architectural form of urban modernization, and it is also the trend of urban architectural development. This paper reviews the development history of super high-rise buildings in China combined with the engineering practice of representative super high-rise buildings since the 1980s, such as the Shanghai Center, ???



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The aim of this paper is to analyse the energy use of high-rise residential buildings in subtropical climate and examine the impacts of different energy saving measures for developing strategies



In high-rise buildings, fresh water delivered by urban mains is firstly pumped to a water tank positioned on the roof of the building, then delivered to users via down-feed pipelines [1,4,5].

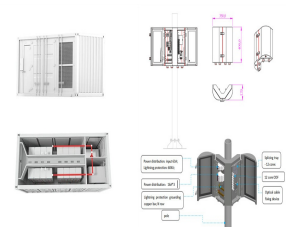


As high-rise buildings become more and more slender and flexible, the wind effect has become a major concern to modern buildings. At present, wind engineering for high-rise buildings mainly

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In spite of the physical limitations present, solar power can be an attractive option for high-rise buildings. Direct use of solar power works even with limited space, and a corporate PPA can be



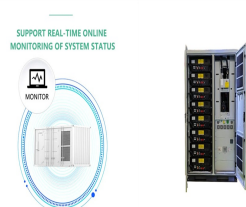
Attaching traditional solar modules on the side of a high-rise building takes some innovation and Arch Solar used masonry anchors to secure the modules to the side of the building in an array that



To explore the influence of openings on wind loads and wind speeds in high-rise buildings, the wind flow around three-dimensional (3D) square cylinders with a breadth/height aspect ratio of 1:6 was numerically simulated ???



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feasibility of designing a micro hydel power generation utilizing the harvested rain water for a multi storey tall buildings by design a storage system for storing of the harvested rain water at the top storey of the building and another as the underground storage tank for collecting the water after power generation for other uses. The

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Solar energy generation is a sunrise industry just beginning to develop. With the widespread application of new materials, solar power generation holds great promise with enormous room for innovation to improve efficiency conversion, reduce generating costs and achieve large-scale commercial application. Many countries hold this innovative technology in high regard, with a ???



Therefore, to maximize the solar energy generation, architects should consider square and round high-rise buildings and "U" type podiums for mounting BIPV systems in commercial complex