High-rise buildings have Chinese solar energy

Can solar energy be used in high-rise buildings?
As urban areas become more populated and densified,it becomes more important to have low-energy high-rise buildings with minimal GHG emissions. On this account,this study evaluates the feasibilityof achieving net-zero energy performance by employing solar energy in high-rise buildings in North America.

Why is building energy consumption a problem in China?
There are many ways to realize the energy supply of the building itself. Therefore,as far as the current situation of excessive building energy consumption in contemporary China is concerned,it is due to the imbalance between building energy creation and building energy consumption.

Why are ultra-low energy buildings a problem in China?
With the acceleration of China's urbanization process and the improvement of people's living standards , as well as the increasingly stringent requirements for energy conservation and emission reduction, ultra-low energy buildings are also facing some problems and challenges in the process of rapid promotion and application .

Can photovoltaic building integration work in China?
Thirdly,a variety of photovoltaic building integration modules are used,with a total solar power generation power of about 400 KWp,making it a benchmark project for photovoltaic building integration in China,as shown in Table 10.

Why is China pursuing a photovoltaic era?
China's pursuit of photovoltaic (PV) power,particularly rooftop installations,addresses energy and ecological challenges,aiming to reduce basic energy consumption by 50% by 2030. The northwest region,with its solar potential,is a focal point for distributed PV growth,which has already exceeded 50% of the energy mix by 2021.

Can rooftop photovoltaics help China achieve a carbon peak?
2030 is a critical milestone for China in achieving carbon peak, and large-scale deployment of rooftop photovoltaics is one of the key measures to support this goal in response to national planning and design. Hence, this study selects the summer of 2030 as the simulated period .

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. Impediments, such as security concerns, aesthetics and functionality, make it difficult to apply SWH systems in high-rise buildings. At present, only China uses SWH ...

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Energy consumption in existing buildings accounts for about 40% of global energy use, which has exceeded the demand of the manufacturing and transportation sectors [1] ina is the world"s largest energy consumer in general, as well as the second largest for all buildings and the largest for residential buildings globally [2].The existing building stocks in ...

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In this paper, high-rise residential buildings in the cities of Xi"an and Yulin, which have differences in solar radiation, in the western solar enrichment area of China are taken as the research objects. The four objectives of building energy consumption, thermal comfort, life-cycle cost, and life-cycle carbon emissions are weighed using the SPEA-2 algorithm by adjusting ...

Zero energy consumption buildings have significant economic benefits, such as the release and implementation of China"s GB/T51350-2019 (Near-Zero Energy Building Technical Standard), which has made China"s ...

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The cooling effects of land-sea breezes can complicate UHI conditions [10,11]. Complex urban geometry

casts shadows between high-rise buildings, reduces sun exposure, and narrows the surface view ...

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A limited area for harvesting solar energy, low efficiency of technologies available, and finally low density of solar energy are the key hindrances that make achieving net-zero energy performance using solar energy difficult. For high-rise buildings, reaching the net-zero energy goal is even more difficult, mainly because of their large floor ...

The best orientation is southward followed by southeast, southwest and with the BIPV tilting upward at 30°. 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 buildings.

While previous studies only considered electricity as an energy-saving source, this research comprehensively assesses and quantifies the energy-saving potential of BIPV façades for high-rise office buildings in different climatic zones in China under all useful energy utilization. Four typical office building models were established, and numerical simulations ...

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