# China energy storage building ventilation

Can natural ventilation save energy?
The utilization of natural ventilation creates tremendous energy saving potential,reducing the emissions associated with coal-fired power generation,especially in North China. In addition,the inte-gration of natural ventilation to office buildings would result in lower initial construction costs as a result of downsizing HVAC sys-tems.

Can natural ventilation improve the cooling and energy-saving potential of a museum?
The chosen study case here is a typical science museum, with a total building area of 11,447 m 2, a volume of 55,726.81 m 3, and shape coefficient of 0.30 (Table 1). The technology museum implemented several strategies to enhance the cooling and energy-saving potential through natural ventilation.

How does natural ventilation affect energy consumption?
Since natural ventilation mainly affects air conditioning energy consumption in terms of energy saving,the design building reduces cooling energy consumption by 8.54 kWh/m 2 and heating energy consumption by 0.1 kWh/m 2 compared to the baseline building.

What is the energy consumption of buildings in China?
Energy consumption in the building sector in the United States and the European Union is about 40 %,while in China,it is 27.3 %[,,]. The energy intensity of buildings in China is much lower than in the United States and the European Union,where the most significant influence in China is related to the industrial sector .

How does ambient air pollution affect natural ventilation potential in China?
Natural ventilation potential is affected largelyby ambient air pollution in China. NV hours of 76 Chinese cities based on weather and ambient air quality are estimated. Cooling energy savings and carbon reductions of 35 major Chinese cities are estimated. 8-78% of the cooling energy usage can be potentially reduced by NV.

How can natural ventilation be used for space cooling under local climatic conditions?
The floor layout,building orientation,and internal structureare optimized to make full use of natural ventilation for space cooling under local climatic conditions. The natural ventilation model is established through computational fluid dynamics (CFD) for airflow evaluation under indoor and outdoor pressure differences.

Latent heat energy-storage is a commonly used heat energy-storage method in buildings (Zhussupbekov et al., 2023; ... The indoor temperature and per capita ventilation of the building are shown in Table 5. ... China building energy consumption and carbon emissions research report.

Improving the thermal performance of building envelope is an important way to save building energy consumption. The phase change energy storage building envelope is helpful to effective use of renewable

energy, reducing building operational energy consumption, increasing building thermal comfort, and reducing environment pollution and greenhouse gas ...

Seasonal thermal energy storage (STES) allows storing heat for long-term and thus promotes the shifting of waste heat resources from summer to winter to decarbonize the district heating (DH) systems. Despite being a promising solution for sustainable energy system, large-scale STES for urban regions is lacking due to the relatively high initial investment and ...

Latent thermal energy storage (LTES) can provide more energy per volume than a sensible thermal storage system, making LTES a promising solution for buildings either integrated into building envelope (passive LTES) or in ventilation systems (active LTES) to reduce cooling demand. ... Figure 7.15 shows the nighttime ventilation potential for ...

The consumption of energy storage in the building through PCMs helps achieve net zero goals through a reduction in CO 2 emission [305]. The consumption of electrical energy changes substantially ...

Analysis on night ventilation eff ect of buildings with different energy consumption levels in Shenyang Li Xiaoxu1, Huang Kailiang1*, Feng Guohui1, Jing Danyang1, Liu Dan1, Li Jiawei1 1School of Municipal and Environmental Engineering, Shenyang Jianzhu University, Shenyang 110168, China; Abstract. In this paper, the effects of night natural ventilation on indoor thermal ...

This review paper critically analyzes the most recent literature (64% published after 2015) on the experimentation and mathematical modeling of latent heat thermal energy storage (LHTES) systems in buildings. Commercial software and in-built codes used for mathematical modeling of LHTES systems are consolidated and reviewed to provide details ...

In China, there are more than 4,000 km 2 of rural and urban building areas of which 95 % are high energy consumption buildings. The energy consumption of these buildings accounts for 28 % of the national total (Wang and Wang 2007).Non-residential buildings, which usually have higher energy consumption levels than residential buildings, account for 70 % of ...

In the northern regions of China, ground-source-based heating and air conditioning systems are highly regarded for their efficiency and energy-saving capabilities, as they utilize renewable energy sources. This case study focuses on the Antaeus dynamic energy-saving demonstration building, an office building located in the city of Jinan, China.

PDF | On Aug 12, 2019, Jiang Liu and others published Climatic and seasonal suitability of phase change materials coupled with night ventilation for office buildings in Western China | Find, read ...

Problems of global warming, environmental deterioration and energy consumption have become the primary concerns of the world. In responses to these issues, the mission of "energy conservation and emission

reduction" has formed and carried out [1].Energy is mainly consumed in three sectors including industry, transportation and construction, in which ...

Adapting to the local climate is the key to developing nearly-zero energy buildings (NZEBs). During cooling season in Western China, the climate conditions are characterized by a large daily temperature range and high solar radiation, and improving the thermal storage performance of buildings is an effective passive cooling design strategy for NZEBs.

Ventilation system with thermal energy storage (TES) using phase change materials (PCMs) can be employed to save energy in buildings, which stores outdoor coldness in the PCMs at night and releases this energy to cool down the fresh ventilation air during the daytime. However, its performance depends on the design parameters. This paper presents a ...

Large space circular coal storage dome (LSCCSD) offers an environmental and dependable alternative to open stockpiles, and it has been consequently widely applied in China. However, due to the lack of scientific guidelines, its natural ventilation performance is lower than expected. Natural ventilation potential strongly depends on the roof geometry and ...

Combining natural and mechanical ventilation, hybrid ventilation is an effective approach to reduce cooling energy consumption. Although most existing control strategies for HVAC systems with hybrid ventilation provide acceptable operation results, there still often exists a mismatch of demand and response from sensing, decision making, and operating. ...

From 2000 to 2014, the energy consumption by the building sector in China increased from 0.289 to 0.819 billion tons of standard coal [1]  2020, more than 35% of the total energy consumption is predicted to come from the building sector in China [2].Thus, various design strategies have been proposed and developed for building energy conservation in order to reduce the building ...

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