Survey on the utilization of solar energy in China

Overview

Climate change issues have become significant challenges in China's sustainable growth due to the excessive use of fossil fuels. Though, the Chinese government has successfully utilized solar energy resources to overcome these issues. However, studies focusing on assessing consumers' willingness to utilize solar energy are scarce in the country. Th. ••Cost of solar energy has a negative effect on consumers' willingness to utilize solar energy.••Perception about self-effectiveness and environmental concern have positive effects.••Awareness of solar energy and belief of solar energy benefits also have positive effects.••Perception about neighbors' participation is found to has an insignificant effect.Solar energyConsumersTheory of planned behaviorStructural equation modelingASE Awareness of solar energyPES Perception about self-effectivenessBSB Belief of solar energy benefitsCSE Cost of solar energyECO Environmental concernPEN Massive reliance on conventional fuels (coal, oil, ad gas) not only has a burden on the national economy but also directs various environmental problems such as global warming, carbon emissions, and unpredictable weather conditions (Kavari et al., 2019). The excessive use of conventional fuels results in the depletion of natural resources (Mukeshimana et al., 2020; Irfan et al., 2020e; Jabeen et al., 2020). Therefore, a new energy structure needs to be established (Elavarasan et al., 2020a). Alternate energy sources (wind, solar, and biomass) would be used in this new energy structure, which on the one hand, can reduce the cost of oil imports and, on the other hand, mitigate climate problems (Rezaee et al., 2019).Solar energy is regarded as a promising way to mitigate climate change and resolve pollution issues (Creutzig et al., 2017; Irfan et al., 2019a). Several countries have taken steps to uplift solar energy's share in their energy portfolio (Valdés and Leon, 2019). Solar power schemes are believed to enri...

Article Content

Evaluation of annual and temporal photovoltaic (PV) surplus energy ...

While industrial buildings offer considerable potential for solar energy utilization, there are significant challenges associated with managing PV surplus energy production during peak hours. ... This challenge is increasingly relevant in China. A comprehensive survey and investigation conducted in 2023 assessed the PV adoption capacity of six ...

Solar Energy Utilization Potential in Urban Residential Blocks: A ...

In dense, energy-demanding urban areas, the effective utilization of solar energy resources, encompassing building-integrated photovoltaic (BIPV) systems and solar water heating (SWH) systems ...

Energy Utilization and Carbon Reduction Potential of Solar Energy ...

Energy efficiency in high-density urban areas is increasingly gaining more attention as the energy crisis and environmental issues worsen. Urban morphology is an essential factor affecting the energy consumption and solar energy development potential of buildings. In response to the research gap of previous studies that only analyzed building energy ...

Solar energy in China

The most important key figures provide you with a compact summary of the topic of "Solar energy in China" and take you straight to the corresponding statistics. Companies

Renewable energy for sustainable development in China: ...

China is the world''s largest renewable energy installer with a capacity of 1020 gigawatts in 2021. This study aims to analyze the public discourse around China''s green energy and green technology and the paths to sustainable development by comparing public policy. The public discourse analysis approach and Grey Prediction Model are applied to analyze the ...

Adoption of renewable energy technologies (RETs): A survey on ...

Solar water heaters are the most popular solar energy utilization technology in rural China. By the end of 2009, 49.97 million square meters of solar heating facilities had been installed, which was more than triple the amount in 2001, for an annual average growth of 30%.

Solar Energy in China: The Past, Present, and Future

What is unique about solar energy in China is that it was an important export industry in the early 2000s, before it emerged as a critical renewable energy industry. We have ...

Household residential energy choices in green transition: insights …

Figure 1 illustrates the changes in rural residential energy consumption and its structure in China between 1991 and 2016. Based on the work of Han and Wu (), the trend of total rural residential energy consumption from 1991 to 2016 can be divided into five phases.The first phase is from 1991 to 1995. In this period, total rural residential energy consumption …

Sustainable Energy Technologies and Assessments

For example, Zhang, et al. concluded that the total solar radiation in China displayed a downward trend from 1979 to 2017, and the variation trend of the solar radiation over the years was 2.54 MJ/m 2 /yr. Feng, et al. developed a new global solar radiation model which can accurately represent the decadal variability of solar ...

Heating choices and residential willingness to pay for clean …

The findings showed that environmental concerns, perception of solar energy and the cost of solar energy significantly influenced their willingness to use it. Shojaeenia et al. (2022) investigated the driving factors of the clean energy transition among 75 countries and concluded that optimizing the institutional quality and the welfare level ...

Farmers'' attitudes and adoption preferences toward household solar ...

China has abundant solar energy resources and the whole territory is divided into four (Class I, II, III, IV) belts according to total solar radiation of one year. Guangdong province has great potential in developing solar energy resources, which lies in Class III with annual sunshine hours of 2200 and radiation amount of 4200–5800 MJ/m 2 .

Vectorized solar photovoltaic installation dataset across China in …

Across the expansive and fertile land of China, solar energy resources are abundant, with most regions having an annual average daily solar radiation of over 4 kWh/m 2 and more than 2,000 hours of ...

survey of geothermal power generation combined with …

Introduction. Since the Industrial Revolution, people have increased the exploitation and utilization of fossil energy such as coal and oil. This has led to a series of problems such as energy shortages and environmental …

Life cycle assessment of three typical solar energy utilization …

Global energy demand has continued to be impacted by the Covid-19 pandemic since the end of 2019. According to Global Energy Review 2021 by the International Energy Agency (IEA), global demand for energy in 2020 is down 4% from the previous year, the largest decline since World War II and the largest absolute decline on record ina''s rapid …

National Survey Report of PV Power Applications in COUNTRY

By the end of 2022, the cumulative installed capacity of renewable energy reached 1,213GW, accounting for 47.3% of the country''s total installed capacity of power generation, which was ...

National goals or sense of community? Exploring the social ...

China is both the world''s largest clean energy market and the world''s largest polluter .Driven by factors such as increased economic activity and rapid economic growth, by the end of December 2020, China''s installed solar photovoltaic (PV) capacity had gone up by 260.5 billion kW .However, nearly one-third of the world''s CO 2 emissions also come from ...

Energy transition based on effective energy use in household ...

Solar energy is mainly used in northern China, especially both of solar cooker and solar heating room are used less in the south. ... Energy consumption in China''s rural areas: A study based on the village energy survey. J Cleaner Production, 143 (2017), pp. 452-461. View PDF View article View in Scopus Google Scholar J. Huang, W. Li, L ...

China maintains high utilization rates of wind, solar power

In the first seven months of 2024, wind and solar power generation totaled 1.05 trillion kilowatt hours, accounting for roughly 20 percent of China''s total electricity generation.

National Survey Report of PV Power Applications in CHINA

By the end of 2015, China''s accumulated PV installation reached 43.18 GW to become the largest country in the world in terms of PV installation. Of which, PV power station accounted for 37.12

Geothermal power generation in China: Status and prospects

According to the 2015 survey and evaluation results of the China Geological Survey of the Ministry of Land and Resources of China, the heat capacity of shallow geothermal energy (within a depth of 200 m or less) in 336 cities at prefecture level and above is 1.11 × 10 17 kJ/°C. 30 The annual recoverable resources are equivalent to 700 million ...

An assessment of consumers'' willingness to utilize solar energy in ...

China has abundant solar energy resources and if used efficiently, the country can satisfy all its present and future energy requirements (Chen et al., 2017). However, China ...

Integration of solar technology to modern greenhouse in China: ...

Meanwhile, energy delivery is a critical input to the effective operation of modern greenhouses. In a literature survey of greenhouses in different countries by Hassanien et al. , the annual electrical energy consumption per unit greenhouse area is among 0.1–528 kW h m −2 yr −1.And the cost of a greenhouse in Turkey heated by coal is calculated by Canakci et al. , ...

Geothermal energy in China: Status, challenges, and policy ...

There is a significant difference in the distribution and load demand of China''s fossil, wind, and solar energy between the east and the west. Using Hu''s Line as the dividing line (Fig. 1), the eastern region, therefore, covers a land area of about 39%, contains about 89% of the population and is responsible for about 86% of the electricity and ...

An assessment of consumers'' willingness to utilize solar energy in ...

Climate change issues have become significant challenges in China''s sustainable growth due to the excessive use of fossil fuels.Though, the Chinese government has successfully utilized solar energy resources to overcome these issues. However, studies focusing on assessing consumers'' willingness to utilize solar energy are scarce in the country.

Enabled comparative advantage strategy in China''s solar PV development

Various factors are shaping solar PV development, especially relative to that of wind power. Solar energy resource potential is a crucial factor in solar PV (photovoltaic) development and substantial research efforts have been devoted to estimating their amounts and geographic distributions (Kabir et al., 2018; Suri et al., 2007) sts have been playing a crucial ...

Status and trend analysis of solar energy utilization technology

Status and trend analysis of solar energy utilization technology. T Q Sun, D L Cheng, L Xu and B L Qian. Published under licence by IOP Publishing Ltd IOP Conference Series: Earth and Environmental Science, Volume 354, 2019 International Conference on New Energy and Future Energy System 21–24 July 2019, Macao, China Citation T Q Sun et al 2019 ...

Heating load reduction characteristics of passive solar buildings in ...

China''s Tibet autonomous region has abundant solar energy resources, cold winters, and cool summers. These are ideal conditions for the application of passive solar heating methods. However, differences in climatic conditions and building types can significantly affect passive solar technology''s feasibility, which makes it challenging to promote passive solar ...

survey of geothermal power generation combined with renewable energy ...

Introduction. Since the Industrial Revolution, people have increased the exploitation and utilization of fossil energy such as coal and oil. This has led to a series of problems such as energy shortages and environmental pollution [].With the shortage of energy supply and the aggravation of environmental pollution, another Industrial Revolution ...

Booming solar energy drives land value enhancement: Evidence ...

The rapid expansion of photovoltaic (PV) power stations in recent years has been primarily driven by international renewable energy policies. Projections indicate that global PV installations have covered an area of 92000 km 2, equivalent to the entire land area of Portugal (Zhang et al., 2023b, Zhang et al., 2023c).Based on current growth rates, China''s ...

Solar energy curtailment in China: Status quo, reasons and ...

Based on the literature survey, one can find that analyze of the status quo, causes and solutions of the solar energy curtailment in China is still insufficient. As the problem has appeared for many years with high rejection rate, a detailed analysis of the solar energy curtailment of China''s is quite necessary in order to help the sustainable ...

Characteristics and prospect of geothermal industry in China ...

As mentioned above, China was more than once in sync with the international level in geothermal energy utilization during the 1970s and 1980s, when China was capable of generating power by geothermal energy in areas at altitudes above 4000 m (Zhao et al., 2023). Unfortunately, the progress was put on hold for some economic reasons.

Solar Power Development in China

China is one of the fortunate countries in the world blessed with abundant solar energy. Its annual horizontal solar irradiation is equivalent to 2.4 × 10 12 t (2.4 trillion metric tonnes) of standard coal, which could correspond to the total electricity output by tens of thousands of the Three Gorges Hydropower Station over two-thirds of China, the annual ...

Energy consumption in China''s rural areas: A study based on the ...

Improvements on the structure of rural energy consumption plays a vital role in reaching these objectives, since rural energy consumption is an important contributor to China''s CO 2 emissions, due to China''s large rural population, high proportion of coal and biomass energy and low energy utilization efficiency (Zhang et al., 2014).

Development of solar photovoltaic industry and market in China, ...

Solar photovoltaic (PV) technology has developed rapidly in the past decades and is essential in electricity generation. In this study, we demonstrate the relationship between PV incentive policies, technology innovation and market development in China, Germany, Japan and the United States of America (USA) by conducting a statistical data survey and systematic ...

Solar Energy Utilization Potential in Urban Residential Blocks

In dense, energy-demanding urban areas, the effective utilization of solar energy resources, encompassing building-integrated photovoltaic (BIPV) systems and solar water heating (SWH) systems inside buildings, holds paramount importance for addressing concerns related to carbon emission reduction and the balance of energy supply and demand. This study ...

Building a Great Solar Wall in China

Analysis of Landsat data indicates that solar projects have contributed to the greening of deserts in other parts of China in recent years. As of June 2024, China led the world in operating solar farm capacity with 386,875 megawatts, representing about 51 percent of the global total, according to Global Energy Monitor''s Global Solar Power ...

National Survey Report of PV Power Applications in China 2023

Record Growth in PV Installations: In 2023, China installed 216.3 GW of new PV capacity, a remarkable 147.5% year-on-year increase, bringing its total cumulative capacity to 609 GW. ...

Towards zero-energy buildings in China: A systematic literature ...

Although China is a developing country, its energy consumption has exceeded that of the USA and is now the highest in the world. The primary energy consumption in China reached 3.86 × 10 7 GWh in 2018, accounting for 22% of the world''s total primary energy consumption and being 1.42 times that of the USA (IEA, 2019).The energy consumption in the ...

National Survey Report of PV Power Applications in China

connected PV installation in the first quarter in China decreased by 23% compared with that of last year. However, the situation changes since Q2 due to the rapid control of the epidemic in ...

Social acceptance of solar energy technologies in China—End ...

There are abundant solar energy resources in China. The available zone of solar energy, where annual hours of sunlight are more than 2200 and annual irradiation amount is above 5000 MJ/m 2 has a share of more than 67% of soil area in China (Liu et al., 2010). In 2008, China produced 1.78 GW of solar panels, about 26% of the world production.The accumulative ...

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