Solar energy utilization case analysis

Among the different renewable energy sources, solar energy is utilized for energy reduction in buildings because of its ease of use and excellent maintenance and repair. In this study, an air-based photovoltaic/thermal (PVT) system that improves solar energy utilization was developed, and its performance was experimentally compared with that of the existing ...

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 aimed to ...

Abstract. Due to the growing reduction of fossil fuels and, on the other hand, the emission of pollution due to the use of these fuels, renewable energy is a very good alternative ...

Influential factors of utilization from solar and wind energy respective to the sustainability development for case study area including influential economic factors such as total investment, cost of production energy, revenue and capital return rate and environmental factors Spm, Co 2, Nox, So 2, Hc and Co can be seen in Figure 5.

Already in 1989, the scope for solar energy utilization in the Indian textile industry was studied by Gupta (1989), followed by Abdel- Dayem and Mohamad (2001), who presented a feasibility study ...

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

Solar-assisted pulverized coal power systems offer higher solar energy utilization efficiency, enabling pulverized coal power plants to rapidly achieve energy-saving and emission-reduction targets. This study proposes the incorporation of two solar heaters to create a new solar tower assisted pulverized coal power (STPCP) system for the cascade utilization of ...

For the harnessing waste heat, a 25 kW capacity Organic Rankine Cycle (ORC) system, 20 evacuated tube solar collectors (ETSC) for solar energy utilization, and a water electrolyzer for hydrogen production are employed. As a result of the thermodynamic analysis of the whole system, the energy and exergy efficiency is calculated as 5.17 %, 2.63% and ...

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 ...

To investigate the impact of climate change on the regional solar energy potential, this study analyses the average sunny hour and solar radiation from monthly data from Jan. 2009 to Apr. 2021 and applies the ...

Solar energy utilization case analysis

The global capacity of renewable sources of energy is 2357 GW in 2019 with a rise of 176 GW from 2018. Among them, solar energy is dominant with a total installed capacity of 623 GW in 2019 and 55% of the newly ...

In current practice, both solar PV systems and solar photothermal (PT) systems are widely used solar energy utilization technologies. In this regard, large-scale seasonal thermal energy storage tanks are typically matched with large-scale centralized solar photothermal heating systems. Therefore, it is necessary to compare the performance of the ...

The study delved into how Energy Storage Batteries (ESB) can boost self-consumption and independence in homes fitted with solar panels in Baghdad city capital of Iraq. We examined various ESB sizes, ranging from 2 kWh to 14 kWh, to gauge their influence on a building energy efficiency. The evaluations, spanning daily to yearly periods, indicated that as ...

Semantic Scholar extracted view of "Promoting solar energy utilization: Prediction, analysis and evaluation of solar radiation on building surfaces at city scale" by Ying Yue et al. Skip to search form Skip to main content Skip to account menu. Semantic Scholar"s Logo. Search 222,012,181 papers from all fields of science. Search. Sign In Create Free ...

The global transition to renewable energy is required to address climate change, reduce environmental impacts, and contribute to a pathway to a sustainable energy future [1, 2].Solar energy is considered the primary energy source of the future sustainable world because of its advantages over other renewable energy sources like wind, geothermal, and biofuel [2].

In such cases, exploiting clean energy is crucial for the sustainable development of Shanghai. ... For each scenario, the solar energy utilization assessment consists of three steps: selecting a suitable rooftop, estimating the cost and benefit of solar energy utilization. 3.3.1. Assessment of PV system utilization. Selecting suitable rooftops for PV system: Based ...

Several studies have assessed solar energy utilization at the block level and analyzed the impact of urban form indicators on solar energy utilization potential. J. Zhang et al. defined thirty typical urban block types to study the impact of urban form on solar gain and energy efficiency. The results show that different urban block types lead to considerable ...

The model developed for the 5.5 kW solar PV system was analysed for the simulation period of 8760 h (1 year). Fig. 3 shows the results of this analysis, indicating the system generates 10.48 MWh, 13.67 MWh and 11.12 MWh for each of these locations, Melbourne, Perth and Sydney, respectively. Table 3 depicts the output 5.5 kW solar PV panel system for ...

Determining the Factors Affecting Solar Energy Utilization in Saudi Housing: A Case Study in Makkah . by

Solar energy utilization case analysis

Amin Barnawi. Amin Barnawi ... the paper delves into an analysis of Saudi Arabia"s solar energy potential, situating the nation"s energy requirements within the context of its geographical attributes. Next, it proceeds to evaluate the current state of solar ...

The research method included both literature review and case analysis of a house-holder in Ghana. The study investigated the role of financing mechanism such as subsidy in making SHS more affordable. In this particular work a load require-ments of all electrical appliances from a household leaving in Dawenya a suburb of Tema in Greater Accra Region, with the help of ...

The analysis results indicated that in terms of heating energy intensity, case AF (high-rise tower-multi-story slab) had the highest block energy intensity of 8 kWh/m 2 *y, ...

The findings indicate significant potential for photovoltaic applications in primary and secondary school buildings. A combination of facade and rooftop photovoltaics can result in the zero-energy consumption of these ...

The analysis concluded that the development of solar energy sector in Romania depends largely on: viability of legislative framework on renewable energy sources, increased subsidies for solar R& D ...

Solar energy increases its popularity in many fields, from buildings, food productions to power plants and other industries, due to the clean and renewable properties. To eliminate its intermittence feature, thermal ...

Solar, wind, hydro, oceanic, geothermal, biomass, and other sources of energy that are derived directly or indirectly as an effect of the "sun"s energy" are all classified as RE and are renewed indefinitely by nature [2].This means that they are sustainable, they can be replenished, and they have no harmful side effects for the most part, except in the process of ...

Solar PV (photovoltaic) systems are a renewable energy technology that allows the utilization of solar energy directly from the sun to meet electricity demands. Solar PV has the potential to create a reliable, clean and stable energy systems for the future. This paper discusses the different types and generations of solar PV technologies available, as well as ...

Based on global distribution of solar energy and its feature, this paper discusses a review about solar energy"s utilization techniques, mainly discusses the latest development of photo-thermal ...

Through a detailed and systematic literature survey, the present review study summarizes the world solar energy status, including concentrating solar power and solar PV ...

This review suggests some selective proposal for the further advancement of the optimization in solar energy systems. The analysis, key findings, and recommendations would be helpful toward the development of efficient and sustainable energy management in the renewable energy domain. 2. Reviewing methodology.

Solar energy utilization case analysis

The content analysis was adopted to ...

In addition, in the winter, as shown in Figure 10, the PV system showed a solar energy utilization efficiency of 17.03%, but the PVT system showed a performance improvement of 1.96% in panel power generation and an additional improvement of 17.42% in solar collection efficiency, resulting in a total solar energy utilization efficiency of 35.43%.

Request PDF | A life-cycle cost analysis of High Voltage Direct Current utilization for solar energy systems: The case study in Turkey | With technological advancements in High Voltage Direct ...

This study focuses on conducting a comprehensive cost-benefit analysis of solar energy integration in residential buildings. Methods: The approach involves a novel comparison between photovoltaic ...

Based on global distribution of solar energy and its feature, this paper discusses a review about solar energy"s utilization techniques, mainly discusses the latest development ...

PDF | On Jul 1, 2023, Abdullahi Mohamed Samatar and others published The utilization and potential of solar energy in Somalia: Current state and prospects | Find, read and cite all the research ...

The three typical solar energy utilization systems mentioned in the previous section manifest in different forms for practical application in China. Therefore, this study selects the most common form of the three solar energy ...