

Can a near zero energy building be implemented in Egypt?

Hence a near zero energy building whose rationalized energy needs can be covered by a solar PV system is achieved. An economic analysis of the various solutions demonstrate the feasibility of adopting the near zero energy building concept in Egypt. Buildings have been consuming energy and resources at an ever-increasing rate worldwide.

What is net zero energy building (NZEB)?

So, the national trend and the target of this phase is reducing the energy consumption in the buildings sector by applying the Net Zero Energy Building (NZEB) strategies to the new buildings and refurbishment the existing buildings to reduce the demand and apply on-site generation to reach NZEB target.

How to achieve zero-energy state?

To reach the zero-energy state, a two-step approach is adopted. The first step involves energy rationalization and the second step involves energy generation. In the former, the energy rationalization is adopted by implementing several strategies that address the demand side, or the supply side.

What is a zero energy building?

This can be achieved by adopting the concept of Zero Energy Buildings (ZEB) or near Zero Energy Buildings (nZEB). A ZEB is one that annually consumes a total amount of energy that is roughly equal to the amount of renewable energy generated on site [4].

How to achieve net zero energy building?

Achieving Net Zero Energy Building The photovoltaic panels are required to achieve NZEB will be calculated. The existing area which could be used is 5,616 m² which produce 1,296,191 kWh/a. The building net energy consumption after cover these areas with photovoltaic panels will be 3,113,523 kWh/a.

Which countries are achieving zero-energy building?

Based on the GBPN state-of-the-art energy code scoring system, Netherlands, Germany, France and Denmark scored the highest due to their clearly identified roadmaps towards achieving the Zero-Energy Building concept.

Considering net-zero energy building (NZEB), Irfan et al. [21] proposed a model in sub-zero temperature zones for an energy-neutral or net-zero energy home. ... In Egypt, a case study was undertaken in an academic building to reduce energy usage using various tactics, such as a grid-connected photovoltaic system (Omar et al., 2022 ...

Semantic Scholar extracted view of "Optimal strategy for transition into net-zero energy in educational

buildings: A case study in El-Shorouk City, Egypt" by A. Omar et al. ... A general sizing methodology of grid-connected PV systems to meet the zero-energy goal in buildings ... Buildings consume 30% of the total energy consumption around the ...

Data analysis, computation, and machine learning for energy systems. Integrated operation of information and communication technologies (ICT) in smart grids. Sustainability assessment of energy systems: Policy, regulation, management, and economics. Climate change, net-zero energy generation and carbon capture.

Retrofitting "nearly-zero energy" heritage buildings has always been controversial, due to the usual association of the "nearly-zero energy" target with high energy performance and the utilization of renewable energy sources in highly regarded cultural values of heritage buildings. This paper aims to evaluate the potential of turning heritage building stock ...

The main objective of this study is to discuss the economical and the environmental analysis of a net zero energy (NZE) tourist village in Alexandria, Egypt, by maximizing the renewable energy fraction and minimizing the greenhouse gases (GHG) emissions. The hybrid photovoltaics (PV)/wind/diesel/battery system is found to be the ...

2. The overall system cost will obtain to calculate the saving results from the system conversion (from conventional to zero energy system). This paper is organized as follows: Section III describe the renewable energy system component. Section V & IV is for Simulation of Renewable energy system and data collection.

DUBAI, UNITED ARAB EMIRATES - During the 28 th Conference of the Parties to the U.N. Framework Convention on Climate Change, the United States and Net Zero World partner countries announced progress on building clean, secure energy systems in leading emerging economies. Net Zero World is the U.S. Department of Energy's flagship initiative that ...

A.I. Omar et al. Sustainable Energy Technologies and Assessments 49 (2022) 101701 Nomenclature LCOE Levelized cost of energy NZEB Net-zero energy building NPC Net present cost O& M Operating and maintenance PV Photovoltaic RES Renewable energy system ROI return of investment VAV-RTU Variable air volume-rooftop unit VRF Variable refrigerant flow ...

This paper investigates the combination of passive design strategies and on-site renewable energy generation systems. The aim is to achieve compromises (balance) between energy demand for heating, cooling, lighting, domestic hot water and energy supply from renewable resources on an annual basis to reach net plus-energy performance for residential ...

The tourism sector is a key source of national income, and the use of renewable energy resources promotes green and sustainable tourism. In addition, ensuring a reliable supply and efficient use of clean energy is a primary objective of Egypt's Vision 2030, as it has a significant impact on the sustainable development and growth of the tourism sector in Egypt.

Shell Egypt, a strategic partner of the Egypt Petroleum Show (EGYPES) 2024, emphasized the importance of addressing the energy trilemma, showcasing innovative initiatives aimed at shaping a ...

orientations) and energy efficient mechanical systems as well as renewable energy systems, were provided by employing EnergyPlus and TRNSYS 16 simulation software [8]. 2. NET ZERO ENERGY BUILDINGS IN EGYPT In Egypt, 74% of the electricity used is consumed towards reaching thermal comfort, where 65% goes to cooling purposes while 9%

From Zero Energy House to Zero Energy Settlement As previously shown housing sector is one of the most growing sectors in Egypt, and residential buildings consume more than 50% of the electric energy generated in Egypt, ...

Building sector consumes 40% of the total energy consumption worldwide. This number is much higher in Egypt. It reached 52% of total energy sold in 2014 with an annual average growth of 5.2%.

The Open-Source Energy Modelling System (OSeMOSYS) was used to define a long-term decarbonisation strategy for Egypt's energy sector. OSeMOSYS is a dynamic, bottom-up, multi-year energy system ...

An article by Fouad, Moataz, Kandil, Shihata, and Morgan describes the optimization of PV systems and thermal insulation layers in a zero energy building under Egyptian climate conditions.

The purpose of this research is to discuss the applicability of having a zero-energy educational building in Egypt by installing a PV system and decreasing the demand using the energy ...

Egypt Time, GMT +2: 11:30 AM-1:00 PM. Triggered by the 2021 IPCC assessment report, governments and businesses from across the world have pledged ambitious goals, and mobilized resources at scale to accelerate the transformation to Net Zero.

Net Zero Roadmap: A Global Pathway to Keep the 1.5 °C Goal in Reach. 2023 Update. Flagship report -- September 2023 . All reports. 1 Sign In. You are ... of increasing electricity demand for cooling and decreasing generation efficiency calls for a more resilient energy system. Although Egypt has less than 80 mm of annual rainfall, flood risks ...

Request PDF | Energy rationalization for an educational building in Egypt: Towards a zero energy building | Buildings have been consuming energy and resources at an ever-increasing rate worldwide.

Egypt to establish long-duration, low-cost energy storage systems. ... Egypt's energy strategy 2035, which focuses on exploring the potential of RE resources in the country, also talks about the use of hydrogen, including grey hydrogen produced from fossil fuels; blue hydrogen produced from fossil fuels with the use of carbon capture and ...

The study confirmed the feasibility of converting existing buildings in Egypt to zero-energy or near-zero-energy goals at an affordable price. In addition, this study recommended that the optimal PV panel type fitting with the Egyptian climate is the polycrystalline type, and the optimal PV system used in applying the retrofitting approach is ...

This study presents detailed design steps for a zero building using a grid-connected photovoltaic (PV) system with a battery to supply the load demand for a building in Egypt (31.0409°N, 31.3785°E).

A.I. Omar et al. Sustainable Energy Technologies and Assessments 49 (2022) 101701 Nomenclature LCOE Levelized cost of energy NZEB Net-zero energy building NPC Net present cost O& M Operating and maintenance PV ...

The zero energy building (ZEB) concept mainly depends on the dual-nature of the building attached photovoltaics systems acting as active elements for energy generation as well as shading elements for energy savings. Previous studies have shown that the maximum energy savings occur when the internal heat gains and the internal lightings consumption are reduced ...

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