

What is smart construction engineering & management (CEM)?

This research conducts a comprehensive analysis of advancements in construction engineering and management (CEM) with smart techniques. It showcases applications of smart techniques within CEM. Highlights the integration potential of smart techniques in CEM. Explores future research paths for smart construction in CEM.

What is the optimal energy management of a smart building?

The optimal energy management of the smart building means obtain the best consumption of the load demand and the optimal scheduling coordination of the interconnected energy sources like diesel generators, PV units, wind turbines and other renewable energy sources 3, 4.

Can energy-harvesting concrete be used for smart infrastructures?

Therefore, the use of energy-harvesting concretes can turn infrastructures into distributed energy storages or generators, thus supporting the next generation of smart infrastructures, such as electrical chargers, sensors, illuminations and communications. Energy-harvesting concrete mimicking autotroph system

What is smart city construction?

Facing challenges such as resource shortages, environmental pollution, and energy pressures, smart city construction--an innovative urban development model--aims to improve urban governance and promote green development through advanced technologies like information and communication technology and the Internet of Things .

Does smart city construction promote the transition to a low-carbon economy?

This study highlights the key role of smart city construction in promoting the transition to a low-carbon economy by enhancing renewable energy use. The main contributions of this paper are as follows: first, it provides empirical evidence of the impact of smart city construction on renewable energy use and verifies its robustness.

How to reduce the energy bill cost of a smart building?

The buying and selling cost of energy. In this case the EM of the smart building is solved using the suggested MINFO for reducing the bill cost of energy. Initially, without EM solution (base case) the bill cost for the whole day is 169.96 EUR while the PAR is 2.024 p.u.

This collaboration aims to constantly improve exchanges and cooperation in scientific and technological innovation for offshore wind power, energy storage, and distributed ...

Reliable, efficient and low carbon energy supply is one of the key requirements for next generation smart cities [5]. The close proximity of multiple energy vectors like electric power, heat and gas, introduces

opportunities for energy systems integration and real time management of multiple energy vectors [6].The vision for the future smart energy system is to have ...

Jingchao Xie's research focuses on sustainable building design, energy efficiency, and thermal performance optimization. His work primarily revolves around adaptive building ...

In order to meet the requirements of automatic mapping of the smart substation models, based on the application requirements of the smart substation model construction and automatic model association configuration, the automatic generation technology of smart station diagram models is studied, and the automatic correlation modeling method and wiring diagram ...

The term Smart Energy or Smart Energy Systems was defined and used in order to provide the scientific basis for a paradigm shift away from single-sector thinking into a coherent and integrated understanding of how to design and identify the most achievable and affordable strategies to implement coherent future sustainable energy systems. This way of using the ...

To contribute to a better understanding of the state of the art of smart techniques for engineering projects, this paper provides a comprehensive review of multi-criteria decision ...

**SMART MATERIALS FOR SCIENCE AND ENGINEERING** Smart materials, also known as advanced or creative materials, are described as advanced materials that react intuitively to environmental changes or as materials that can return to their original shape in response to certain stimuli. Smart materials are classified as either active or passive based on ...

The application of energy storage technology can improve the operational stability, safety and economy of the power grid, promote large-scale access to renewable energy, and increase the proportion of clean energy power generation. ... Chang Jie et al 2014 Research progress in lithium ion power batteries for energy storage [J] Chemical Industry ...

Smart Construction (SC) is a peer-reviewed Open Access (OA) journal focused on publishing original works, communications, reviews, perspectives, and commentaries in areas of intelligent construction, operation, and maintenance ...

Energy storage is one of the hot points of research in electrical power engineering as it is essential in power systems. It can improve power system stability, shorten energy generation environmental influence, enhance system efficiency, and also raise renewable energy source penetrations. ... Hybrid energy storage system challenges and ...

Smart materials, also known as intelligent or stimuli-responsive materials, have attracted attention in science and engineering. Smart materials are divided into six different groups: shape memory materials, piezoelectric

materials, magnetostrictive materials, electro-rheological and magneto-rheological fluids, and self-healing materials.

Explain how key energy storage technologies integrate with the grid; ... Yi Cui is a Professor in the Department of Materials Science and Engineering at Stanford University. Cui studies nanoscale phenomena and their ...

Rajagopal received his Ph.D, in Electrical Engineering and Computer Sciences and M.A. in Statistics from the University of California, Berkeley. He has specialized in creating and deploying large sensing systems, and using the ...

Smart construction technology to improve the construction performance. Energy-efficient building design for a sustainable urban city. Additive manufacturing in offsite construction to enable rapid construction. ...

The major of Energy Storage Science and Engineering meets the demands of the transformation of national energy and the construction of "clean, low-carbon, safe and highly-efficient" energy system. To advance the ...

Results indicate that MINFO significantly improves smart building EM, achieving a reduction of 53.20% in electricity costs (cost only), 53.19% in PAR (PAR only), and 50.84% in ...

This paper aims at providing a state-of-the-art review of smart energy storage concepts and its integration into energy management practices. In doing so, we will provide a ...

This Special Issue will prioritize works that not only advance technical frontiers but also critically address ethical, regulatory, and socio-economic dimensions of smart construction ...

In March 2011, "energy storage" appeared for the first time in The National 12th Five-Year Plan Outline. It is pointed out in the third section of Section 11 of the outline: rely on advanced technologies such as information, control and energy storage to promote the construction of smart grids [14]. In November, the National Energy Science ...

Concrete with smart and functional properties (e.g., self-sensing, self-healing, and energy harvesting) represents a transformative direction in the field of construction materials. ...

Civil and Environmental Engineering Department, King Fahd University of Petroleum and Minerals (KFUPM), Dhahran 31261, Saudi Arabia ... the ultimate objective of progressing towards smart cities involves the evolution of research in sustainable smart construction materials, which is the need of the hour. ... energy storage materials; energy ...

In exploring the impact of smart city construction on renewable energy use, our approach integrates smart city

theory with National Innovation System (NIS) theory to provide ...

In November 2014, the State Council of China issued the Strategic Action Plan for energy development (2014-2020), confirming energy storage as one of the 9 key innovation fields and 20 key innovation directions. And then, NDRC issued National Plan for tackling climate change (2014-2020), with large-scale RES storage technology included as a preferred low ...

One area in AI and machine learning (ML) usage is buildings energy consumption modeling [7, 8]. Building energy consumption is a challenging task since many factors such as physical properties of the building, weather conditions, equipment inside the building and energy-use behaving of the occupants are hard to predict [9]. Much research featured methods such ...

His research interests include nanomaterials for energy storage applications, energetic materials, and nanoenergetics-on-a-chip. His research results have been published in Progress in Materials Science, Nano Energy, Small, ChemSusChem, Nano Research, Combustion and Flame, Energy, Applied Energy, etc. with a total citation > 1200 (h-index=18). ?

This Section discusses research topics related to sustainable engineering and sustainable science. Over the past few decades, sustainable ideas have been introduced into engineering-related fields at an astonishing speed. ... structural engineering, and construction technology: smart and sustainable structural design; innovative technology and ...

Smart construction of multifunctional  $\text{Li}_{1.5}\text{Al}_{0.5}\text{Ge}_{1.5}(\text{PO}_4)_3/\text{Li}$  intermediate interfaces for solid-state batteries ... College of Materials Science and Engineering, Hunan University, Changsha, 410082, Hunan, ... Li intermediate interfaces for solid-state batteries // Energy Storage Materials. 2022. Vol. 46. pp. 68-75. GOST all authors ...

The potential of SM and IM can be further unlocked if it is linked to other technologies, such as intelligent transportation, smart energy/grid, smart building, intelligent healthcare, smart city, and intelligent society. Research areas may include multi-physics modeling, social internet, data storage, privacy and security, standards, and ethics.

"This research provides a new idea for energy storage chips that could be used in a wide range of devices, such as vehicle networking, smart agriculture, medical wireless monitoring and the ...

The key enabling technologies are in systems engineering and material science [9]. Steel, alloys (e.g., titanium or aluminum alloys) and more recently strong materials such as composites are used for the flywheel rotor and the housing that contains it. ... being utilized for grid support, and emphasize the growing importance of energy storage ...

Cross-disciplinary approaches bridging civil engineering, computer science, materials science, and behavioral economics are strongly encouraged. This Special Issue will prioritize works that not only advance technical frontiers but also critically address ethical, regulatory, and socio-economic dimensions of smart construction ecosystems.

This paper mainly studies the wisdom site construction management based on BIM technology and obtains the following conclusions: (1) the use of BIM technology to ...

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