Special Issues List in Section

Design and Control of Hybrid Renewable Power Systems
Guest Editor: Dr. Costas Elmasides
Deadline: **30 August 2022**

The Political Economy of Sustainable Energy
Guest Editors: Prof. Dr. Anna Szeląg-Sikor; Prof. Dr. Jakub Sikora; Dr. Zofia Gródek-Szostak; Dr. Marcin Suder
Deadline: **20 October 2022**

Economic and Technological Advances of Green Energy and Sustainable Development
Guest Editors: Prof. Dr. Sergey Zhironkin; Prof. Dr. Michal Cehlar
Deadline: **30 December 2022**

Hydrogen and Carbon Capture Technology
Guest Editor: Prof. Dr. Abdul-Ghani Olabi
Deadline: **31 December 2022**

Hydropower for Sustainable Water and Energy Development
Guest Editors: Prof. Dr. Fausto Alfredo Canales; Prof. Dr. Alexandre Beluco
Deadline: **10 January 2023**

Advanced Wind & Solar Power Generation and Sector-Coupling Solutions for Renewable Energy Curtailment
Guest Editor: Dr. Seung Jin Oh
Deadline: **31 January 2023**

Environmental Management Systems and Renewable Energy Sources in Agricultural and Social Sciences
Guest Editors: Dr. Stanisław Bielski; Dr. Anna Zielińska-Chmielewska; Prof. Dr. Luboš Smutka
Deadline: **31 March 2023**

Progress in Alternative Fuels for Future Electrical Power System
Guest Editor: Dr. Guohui Song
Deadline: **4 April 2023**

For more information about our Special Issues, please visit:
https://www.mdpi.com/journal/energies/sections/sustainable_energy

MDPI is a member of

Affiliated Societies

Follow Us

facebook.com/MDPIOpenAccessPublishing
twitter.com/MDPIOpenAccess
linkedin.com/company/mdpi
weibo.com/mdpicn
Wechat: MDPI-China
blog.mdpi.com

www.mdpi.com **mdpi.com/journal/energies**

See www.mdpi.com for a full list of offices and contact information. MDPI is a company registered in Basel, Switzerland, No. CH-270.3.014.334-3, whose registered office is at St. Alban-Anlage 66, CH-4052 Basel, Switzerland.

Basel, June 2022

IMPACT FACTOR 3.252
CITESCORE 5.0

energies

an Open Access Journal by MDPI

Section B: Sustainable Energy

energies

IMPACT FACTOR 3.252

CITESCORE 5.0

an Open Access Journal by MDPI

Section Information

Sustainable energy is a form of energy that meet our today's demand of energy without putting them in danger of getting expired or depleted and can be used over and over again. Sustainable energy should be widely encouraged as it do not cause any harm to the environment and is available widely free of cost.

Topics of interest for publication include but are not limited to: Renewable Energy Sources; Solar Power; Solar Heating; Wind Power; Managing Intermittency of Solar Power and Wind Power; Hydropower; Wave, Tide and Ocean Thermal Energies; Bioenergy; Biomass; Biofuel; Biogas; Geothermal Energy; Other; Desalination; Hydrogen Production Technology and Fuel Cells; Climatology and Meteorology; Energy System Integration; Electrical Energy Storage; Photovoltaic Technology Conversion; Non-Renewable Energy Sources; Nuclear Power; Fuel Switching; Carbon Capture and Storage; Greenhouse Gas Emissions; Sustainable Energy Market and Industry Trends; Trends for individual technologies; Hydroelectricity; Wind Power Development; Solar Thermal; Photovoltaic Development; Biofuel Development; Geothermal Development; Sustainable Energy Policy; Environmental; Greenhouse Gas Emissions; Economic; Socio-cultural; Socio-Economic and Policy.

Featured Papers

DOI:10.3390/en13174541

Digitization, Digital Twins, Blockchain, and Industry 4.0 as Elements of Management Process in Enterprises in the Energy Sector

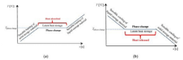
Author: Piotr F. Borowski

Abstract: In the 21st century, it is becoming increasingly clear that human activities and the activities of enterprises affect the environment. Therefore, it is important to learn about the methods in which companies minimize the negative effects of their activities. The article presents the steps taken and innovative actions carried out by enterprises in the energy sector. The article analyzes innovative activities undertaken and implemented by enterprises from the energy sector. The relationships between innovative strategies, including, inter alia, digitization, and Industry 4.0 solutions, in the development of companies and the achieved results concerning sustainable development and environmental impact. Digitization has far exceeded traditional productivity improvement ranges of 3–5% per year, with a clear cost improvement potential of well above 25%. Enterprises on a large scale make attempts to increase energy efficiency by implementing the state-of-the-art innovative technical and technological solutions, which increase reliability and durability (material and mechanical engineering). Digitization of energy companies allows them to reduce operating costs and increases efficiency. With digital advances, the useful life of an energy plant can be increased up to 30%. Advanced technologies, blockchain, and the use of intelligent networks enables the activation of prosumers in the electricity market. Reducing energy consumption in industry and at the same time increasing energy efficiency for which the European Union is fighting in the clean air package for all Europeans have a positive impact on environmental protection, sustainable development, and the implementation of the decarbonization program.

DOI:10.3390/en13020340

Thermal Energy Storage for Grid Applications: Current Status and Emerging Trends

Authors: Diana Enescu, Gianfranco Chicco, Radu Porumb and George Seritan

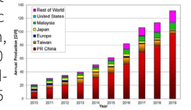


Abstract: Thermal energy systems (TES) contribute to the on-going process that leads to higher integration among different energy systems, with the aim of reaching a cleaner, more flexible and sustainable use of the energy resources. This paper reviews the current literature that refers to the development and exploitation of TES-based solutions in systems connected to the electrical grid. These solutions facilitate the energy system integration to get additional flexibility for energy management, enable better use of variable renewable energy sources (RES), and contribute to the modernisation of the energy system infrastructures, the enhancement of the grid operation practices that include energy shifting, and the provision of cost-effective grid services. This paper offers a complementary view with respect to other reviews that deal with energy storage technologies, materials for TES applications, TES for buildings, and contributions of electrical energy storage for grid applications. The main aspects addressed are the characteristics, parameters and models of the TES systems, the deployment of TES in systems with variable RES, microgrids, and multi-energy networks, and the emerging trends for TES applications.

DOI:10.3390/en13040930

Snapshot of Photovoltaics—February 2020

Author: Arnulf Jäger-Waldau

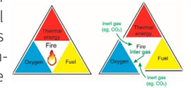


Abstract: Since the demonstration of the first modern silicon solar cells at Bell Labs in 1954, it took 58 years until the cumulative installed photovoltaic electricity generation capacity had reached 100 GW by the end of 2012. Then, it took another five years to reach an annual installation capacity of over 100 GW in 2017 and close to 120 GW in 2019. As a consequence, the total world-wide installed photovoltaic electricity generation capacity exceeded 635 GW at the end of 2019. Although it witnessed a 20% and 25% decrease in annual installations in 2018 and 2019, respectively, China was again the largest market with 30 GW of annual installations. The number of countries in the club with more than 1 GW annually has increased to 18 countries in 2019. The use of local battery storage systems in solar farms as well as decentralized photovoltaic electricity generation systems combined has again increased, due to the falling storage system costs.

DOI:10.3390/en13174538

The Method of Combating Coal Spontaneous Combustion Hazard in Goafs—A Case Study

Authors: Dawid Szurgacz, Magdalena Tutak, Jarosław Brodny, Leszek Sobik and Olga Zhironkina



Abstract: One of the major natural hazards occurring during the process of mining exploitation are endogenous fires. They cause very large material losses and constitute a threat to the health and life of the workers. Such fires usually start and develop in the goafs. The remaining coal and the oxygen-containing air flowing at a certain rate may lead to endogenous fires. The basic element of the assessment of the occurrence of an endogenous fire and the degree of its development is the chemical composition of the air flowing out of the longwall and the goafs. The monitoring of this composition also makes it possible to assess the severity of such a fire. The damage that can be caused by the endogenous fire requires scientific and experimental research being carried out on a wide scale in order to limit its occurrence and development. All papers and research mentioned in the paper aim to find a tool that will help to control the fires. The paper discusses the development of a new and original method of combating the threat of endogenous fires. It is based on the installation designed to feed an ash and water mixture or an ash and water mixture with carbon dioxide to goafs. The foundation of the paper is a method based on a vast depth of expertise and knowledge gained by the authors in the field of combating endogenous fires. The developed installation prepares and transports ash and water mixtures together with carbon dioxide to the zones with high probability of endogenous fires. The mixture is a preparation of the surface of a mine, and later, it is transported underground by pipelines to the goafs where a high level of the fire hazard was identified. The construction of the system and the composition of the mixture used are both original solutions; their practical application limited the process of spontaneous heating of coal. Monitoring the chemical composition of gases in the air of the goafs made it possible to control the effects of applied measures; it proved that carbon dioxide used as an inert gas disturbs the process of carbon oxidation, and the water and ash mixture limits the inflow of the air with oxygen. The advantage of the method is particularly evident in the case of the exploitation of deposits where coal has a short incubation time. This original approach allows for a better and more effective response to endogenous fires.