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Editorial

Education, Communication and Decision-Making on Renewable and Sustainable Energy

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Abstract: This editorial aims to introduce the themes and approaches covered in this special issue on education, communication, and decision-making on renewable and sustainable energy. At first, I discuss the themes and topics that have informed the creation of this special issue. Then, I provide an overview of the content of each paper that is included on the special issue. Additionally, this editorial provides a solid background on the relationships between the factors affecting decision-making on renewable energy sources as well as on the degree of influence education and communication takes part in the attitudes of the public towards renewable energy sources.

Keywords: decision-making; education; communication; investments; policy; RES

1. Introduction

During the last two decades, we have witnessed an evolution in the energy sector. Many countries throughout the world have been shifting their energy production methods from fossil fuel usage to more environmentally friendly methods. These methods are described under the term Renewable Energy Methods and propose the usage of Renewable Energy Sources (RES) based on wind, water, biomass, solar, and geothermal energy for the production of energy. This shift is mainly caused by the increase in public awareness on environmental problems and climate change, which are both related to the increase in Greenhouse Gas (GHG) emissions [1,2].

Alternate methodologies for reducing GHG emissions are also being applied. Energy saving is also an efficient way of confronting the problem. With the usage of the term "energy saving" we mean the reduction in the amount of energy consumed in a process or system, or by an organization or society, through economy, elimination of waste, and rational use. The application of initiatives regarding energy saving within school units can only bring benefits and lead towards reduction of energy cost [3]. Educational institutions are the most appropriate places in which students are taught energy conservation and involved in activities regarding rational energy management. Students are given opportunities to appreciate activities regarding energy saving and disseminate what they learnt in their wider social environment. The environmental education strategies applied constitute a significant educational process which strengthens student awareness of environmental issues [4].

The main goal of this special issue is the determination of methodologies which can be applied in education in order to raise the awareness of students as well as their families in issues related to renewable sources as well as in issued related to energy conservation [5,6].

Furthermore, an effort was made in order to determine the factors, parameters, and criteria affecting decision-making during the selection and investment in renewable energy sources [7].

Finally, an attempt was made in order to recognize methods for communicating the usage of RES and energy saving to the public. This is due to the fact that, in many communities, there are issues with the acceptance of RES installation as the public considers them as factors causing environmental degradation [8].

2. Overview of the Articles in the Special Issue

Zafeiriou et al. studied the relationship between agricultural carbon emissions equivalents and income per capita for the agricultural sector in different EU countries with the assistance of the nonlinear autoregressive distributed lag (NARDL) co-integration technique. Their findings validate the existence of a strong relationship between GHG emissions and agricultural income, since the co-integration among the two variables is established in all instances, while the asymmetric impact of agricultural income on carbon emissions may well provide policy makers with tools which, when implemented, may well promote the increase of agricultural income along with GHG effect mitigation in a successful way.

Attoye et al. aimed to develop a conceptual framework for an educative-communication approach for presenting BIPV proposals to encourage its adoption. The research paper focuses on developing a holistic research and market proposals which justify scholarly investigation and financial investment. By using a multiple case study investigation and Design Research Methodology (DRM) principles, the authors developed an approach which combines core communication requirements, the pillars of sustainability, and a hierarchical description of BIPV alongside its unique advantages. A two-step evaluation strategy involving an online pilot survey and a literature-based checklist was used to validate the effectiveness of the developed approach. The results show that understanding environmental and economic benefits are found to be significantly important to people who are likely adopters of BIPV ($p < 0.05$), making these benefits crucial drivers of adoption.

Kerstin Tews analyzed the effects of the privileges for "community energy actors" in the German auction scheme for on-shore wind energy. Those privileges aim to guarantee a level playing field for small actors and to enhance societal acceptance. The results of the first rounds of auctions did not merely reveal an acceptable level of losses due to recognized trade-offs between policy objectives. Instead, the results indicate a complete failure regarding all three objectives of the revised support scheme for renewables—controlled renewable energy expansion, actor plurality, and cost efficiency.

Andreopoulou and Koliouska evaluated the Renewable Energy Enterprises performance in the Internet in the Thessaloniki Prefecture regarding the characteristics of sustainability using a Multi-criteria Decision Analysis method called TOPSIS. The method was used to provide a ranking of the Renewable Energy Enterprises according to their sustainability. According to the results of the research, the Renewable Energy Enterprises achieve a good level of sustainability but not the optimum. However, it is suggested that the entrepreneurs should adopt modern environmental policy, sustainable marketing, green network framework, and a certified environmental management system in order to consider their enterprise sustainable.

Mroz et al. presented the results of a research on the integration of environmental protection issues into curricula by Polish teachers. In this research, it was assumed that the environmental protection issues included the challenges related to the sustainable management of natural resources. The sample consisted of 337 teachers of general subjects who were employed in schools in the Małopolska region (southern Poland) and working with students in lower-secondary (13–16 years old) and upper-secondary (16–20 years old) schools. The results of the research showed that many teachers know how to integrate environmental protection issues into their curricula.

Drosos et al. measured the industrial consumer satisfaction in the natural gas sector in Greece, by using the Multicriteria Satisfaction Analysis (MUSA) method. The researchers measured the industrial customer satisfaction based on criteria concerning the provided products and services, communication and collaboration with providers' staff, customer service, pricing policy, and website. The research results are based on the analysis of 95 questionnaires collected during the period between June 2017 and October 2017. The results show that the index of the global customer has a good performance as its value is about 74.99%.

Papadopoulou et al. investigated the views and attitudes of citizens of the Thessaloniki municipal area towards RES. For data collection, they used structured questionnaires which were filled out by performing personal interviews. Random sampling was performed to select the sample, and,

in total, 420 citizens participated in the survey. The results showed that the respondents supported the replacement of lignite plants with renewable energy sources since they perceived that they constitute a necessary solution providing opportunities for economic growth and improvement to their quality of life. Finally, a vast majority of the responders expressed increased interest in future investment in photovoltaic systems, which, in their opinion, could contribute to improving air quality and increasing the energy independence, not only of Greece, but also of households.

Kularathna et al. evaluated the possible co-existence options available for Japan's MRE projects through data collected from interviews and questionnaire surveys in two development sites in Nagasaki and Kitakyushu in Southern Japan. The authors overcame the limitations of data unavailability and uncertainty by using the Dempster Shafer Analytic Hierarchy Process (DS-AHP) for evaluating the best co-existence strategy out of five potential options. The results indicate that local fisheries prefer the oceanographic information sharing option. whereas most of the other stakeholders prefer using local resources to construct and operate the power plant, creating business involvement opportunities for the local community.

Tsiantikoudis et al. studied the economic growth—environmental degradation relationship—namely, the environmental Kuznets curve (EKC) hypothesis—in alignment with the autoregressive distributed lag (ARDL) approach. The novelty of the study is attributed to the usage of the carbon emissions equivalent deriving by deforestation as an index for environmental degradation. In addition, the researchers used the gross domestic product (GDP) per capita as a proxy for income, being determined as an independent variable. The entire research was performed for Bulgaria, a country which recently joined the European Union. Research findings cannot validate the inverted U-shape of the EKC hypothesis; instead, an inverted N pattern was confirmed.

Karasmanaki et al. tried to identify the most important factors that affect environmental students' willingness to invest in renewable energy by developing a logistic regression model. According to their analysis, the results showed that the majority of the participants expressed their willingness to invest in RES. The most important factors determining this willingness were the environmental values, the low risk and profitability of renewable investments as well as the preference for certain energy types. However, willingness to invest was irrespective of the current taxation and subsidies, suggesting that significant improvements are required in these areas.

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