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EDITED AND REVIEWED BY

Faik Bilgili,
Erciyes University, Türkiye

*CORRESPONDENCE

Mihaela Simionescu,
✉ mihaela.simionescu@unibuc.ro,
✉ mihaela.simionescu@ipe.ro

SPECIALTY SECTION

This article was submitted to
Environmental Economics and
Management,
a section of the journal
Frontiers in Environmental Science

RECEIVED 28 February 2023

ACCEPTED 06 March 2023

PUBLISHED 09 March 2023

CITATION

Simionescu M (2023), Editorial:
Assessment of nuclear and renewable
energy utilization for sustainable
economic growth.
Front. Environ. Sci. 11:1175937.
doi: 10.3389/fenvs.2023.1175937

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Editorial: Assessment of nuclear and renewable energy utilization for sustainable economic growth

Mihaela Simionescu^{1,2*}

¹Faculty of Business and Administration, University of Bucharest, Bucharest, Romania, ²Institute for Economic Forecasting, Romanian Academy, Bucharest, Romania

KEYWORDS

renewable energy, nuclear energy, sustainable development, energy efficiency, policies

Editorial on the Research Topic

Assessment of nuclear and renewable energy utilization for sustainable economic growth

The main objective of this Research Topic is to provide theoretical and empirical findings in the domain of renewable energy and particularly nuclear energy use to achieve sustainable development. Eight articles were published in this Research Topic to advance knowledge in this field. Most of the papers considered pollution as the most important threat for sustainable development and the use of renewable energy should be a priority for policymakers, companies and population in the next decades. Moreover, besides renewable energy promotion, some papers bring alternative solutions to reduce pollution: the use of government subsidies to promote sustainable technologies, improvement of managerial abilities, more energy efficiency, better coal price forecasts, green economic growth, and green innovation.

The role of renewable energy in reducing pollution is revealed in few papers. Environmental Kuznets curve (EKC) hypothesis was tested by [Khan et al.](#) using panel data models and quantile regressions to make comparisons between two groups of countries (nine emerging economies and 13 developed states) in the period 1991–2016. The negative correlation between economic growth and CO₂ was supported for developing countries, while EKC hypothesis was validated for high-emitting developed countries. Renewable energy and especially nuclear energy reduced pollution in 163 countries in the period 2000–2020, with wind being the most efficient energy source in the fight against environmental degradation ([Horobet et al.](#)). For 20 newly emerging economies, [Gnangoin et al.](#) indicated that renewable energy use and human capital acted like complementary levers in the fight against pollution in the period 1990–2021.

Less pollution might be achieved also through more energy efficiency and optimization of energy structure. In this context, an increasing efficiency gap was observed between fossil and clean fuel in 30 Chinese provinces in the period 2000–2017 ([Chen et al.](#)). Green innovation reduced carbon emissions in India in the period 1995–2020 and contributed in this way to sustainable development ([Pachiyappan et al.](#)).

The coal price forecasting is also necessary to control the carbon emissions and modern techniques like machine learning could provide accurate predictions. The combined CEEMDAN-GWO-CatBoost forecasting model developed by [Wang et al.](#) improved the performance of predictions based on other machine learning models, econometric models and deep learning models for Bohai-Rim Steam-Coal Price Index on the horizon 5 January 2011 to 22 June 2022.

Governments are responsible for the elaboration of the policies to achieve the transition towards environmentally-friendly and sustainable technologies. However, the effectiveness of these policies depends on the capacity of companies to use government subsidies to perform research and development (R&D). Government subsidies determined more patent outputs in 68 LiB Chinese companies in the period 2012–2018, but a significant growth in R&D has not been achieved (Wu et al.). Managerial ability is directly correlated with company performance and might help firms to promote green technologies and renewable energy consumption to reduce pollution (Chen et al.).

Author contributions

The author confirms being the sole contributor of this work and has approved it for publication.

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