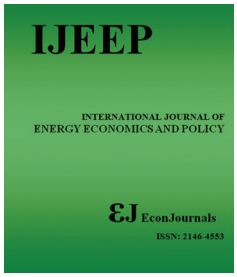

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Investing in the Future: A Systematic Literature Review on Renewable Energy and its Impact on Financial Returns

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ABSTRACT

This study aimed to examine the impact of renewable energy on financial returns for organizations. Using the systematic literature review methodology proposed by Kitchenham, A total of 35 papers were selected from the Web of Science database, covering a period of 18 years, from 2005 to 2023. The selection process was carried out on January 10, 2023, within the Web of Science platform. Descriptive analysis was conducted using Excel and SPSS to examine the total citation by each article, research area, publisher, and publication year. The findings indicated a positive relationship between renewable energy and financial returns, with all papers reviewed supporting this conclusion. Organizations are recommended to invest in renewable energy as it aligns with sustainability goals and contributes to improved financial returns. However, limitations to the available literature highlight the need for further research to understand the full scope of the relationship between renewable energy and financial returns. This study provides important insights into the benefits of renewable energy and its positive impact on financial returns for organizations. Overall, the study contributes to the existing literature on the benefits of renewable energy for organizations looking to reduce costs, increase energy security, and enhance their reputation.

Keywords: Renewable Energy, Renewable Energy Sources, Financial Returns, Kitchenham Methodology
JEL Classifications: Q4, Q42, G3

1. INTRODUCTION

The subject of Renewable Energy concerns both experts and the general public with increasing interest. Research on Renewable Energy Sources has experienced growth in recent years, both in absolute and relative terms (Rizzi et al., 2014). These sources can play a crucial role in addressing the issues of finite fossil fuels and global warming (Momete, 2018). The three primary sources of energy are fossil fuels, nuclear resources, and renewable resources. Renewable Energy Sources, such as solar, wind, biomass, geothermal, and hydropower, are utilized to generate energy and are thus highly valuable in combating energy crises (Ashfaq and Ianakiev, 2018; Raheem et al., 2016).

A study Paravantis et al. (2018) conducted in Western Greece focused on the public's attitude and willingness to pay for electricity generated from renewable sources. Renewable Energy Sources are considered clean energy sources (Yu et al., 2022) and are of critical importance due to their environmentally-friendly nature (Ferreira et al., 2023; Saleh et al., 2014). With increased awareness of the need for a clean environment, there is a growing belief that traditional reliance on fossil fuels has resulted in carbon dioxide (CO_2) emissions, greenhouse gas (GHG) problems, and environmental pollution (Lucas et al., 2018; Wojuola and Alant, 2019). Renewable Energy Sources have the potential to meet domestic energy requirements with zero or nearly zero emission of air pollutants and GHGs (Fornara et al., 2016; Masrahi et al., 2021).

Tasks of paramount importance, such as sustainable development in remote desert and mountainous regions and fulfilling international agreements on environmental protection, are expected to be addressed through the development of Renewable Energy (Szeberényi et al., 2022; Tsagarakis et al., 2018). To meet the growing energy demand, there is currently a global trend towards

replacing conventional fuels with Renewable Energy Sources (Szeberényi et al., 2022). There are many challenges, such as GHG emissions, CO_2 emissions, climate change, and energy security, that have resulted in a growing need for Renewable Energy in today's environment (Bayulgen and Benegal, 2019). Unlike fossil fuels, Renewable Energy Sources provide environmental protection, a pollution-free environment, energy security, and economic benefits (Assadi et al., 2022; Bhowmik et al., 2017). As a result, it is crucial for current and future generations to rely on Renewable Energy Sources in order to meet their energy needs.

So, the increasing concern over renewable energy (RE) has led to increased studies on renewable energy sources (RES) in recent years. RES, including solar, wind, biomass, geothermal, and hydro-power, play a crucial role in addressing fossil fuel depletion and global warming. The clean and environmentally-friendly nature of RES has led to a growing need to replace conventional fuels with RES to address challenges such as GHG emissions, CO_2 emissions, climate change, and energy security. It is important for current and future generations to rely on RES to meet energy needs and achieve environmental protection, a pollution-free environment, energy security, and economic benefits.

2. RENEWABLE ENERGY AND FINANCIAL RETURNS

Efficient capital markets are crucial for society's growth and development. They allow for the effective matching of those seeking capital with those who want to invest their assets in profitable ventures. A well-connected global market system is essential for the efficient allocation of resources and capital flows between countries. This allows for the funding of goods and services production, innovation, job creation, and improvement of living standards. Additionally, connected markets lead to better resource allocation, improved market robustness, and enhanced price discovery. Investors also benefit from access to a variety of markets to build diversified portfolios.

Studies have shown an increasing trend of interdependence between financial markets (Arshanapalli and Doukas, 1993). While earlier research mainly focused on the interconnectedness between markets in advanced industrial countries, more recent attention has been given to the relationship between emerging and developed economies. Bekaert and Harvey (1995) were among the first to examine the integration between major emerging markets and world equity markets and found evidence that contradicts the notion that world capital markets are highly integrated (Bekaert and Harvey, 1995). The globalization and financial liberalization of the late 20th century led to an increase in cross-border and cross-market transactions in assets, currencies, and securities (Bekaert and Harvey, 2003; Gkillas et al., 2019). Recent studies generally document a growing connectedness between emerging and developed markets, indicating that financial markets in emerging economies are becoming integrated into the global financial market and participating in global capital allocation (Abbas et al., 2019; Spulbar et al., 2020). This integration through capital inflows has a positive impact on economic development in these regions.

The growing interconnectedness of economies and financial markets worldwide is also contributing to the transmission of shocks from one economy to another (Bekaert et al., 2007). This type of transmission can be seen as a spillover effect, where if two markets are strongly linked, any shocks in one market can cause significant disruptions in the other. Empirical evidence shows that cross-border and cross-market correlations tend to be especially high during times of crisis, when this kind of connectedness is least desired (Gulzar et al., 2019). For example, the 2008 Global Financial Crisis (GFC) began in the US real estate market and quickly spread to other markets, such as stock markets, and then to the rest of the world, resulting in the most severe financial crisis since the Great Depression. However, it's important to note that this connectedness primarily refers to the transmission of volatility. Despite this, having a connection to the world financial market is seen as a sign of market maturity, and as Levine (1997) argues, this connection supports more efficient capital allocation and offers greater investment and growth opportunities (Levine, 1997).

Kose et al. (2009) also demonstrate that connections to major world markets allow local markets to access a wider pool of capital, which can drive the growth of the local, developing market. Capital flows from developed economies or markets with surplus capital to developing economies or markets with limited capital can reduce the latter's cost of capital, leading to increased investment and a more robust market. Additionally, market interconnectedness offers opportunities for risk hedging and international risk sharing (Lewis, 1999).

The growing popularity of renewable energy and carbon markets has captured the attention of the public in recent years. These markets are critical in addressing climate change and their development is crucial for the welfare of society. Although these markets are relatively new compared to traditional markets such as stocks, bonds, and commodities, they have experienced rapid growth. In recent years, global investments in renewable energy capacity have skyrocketed, reaching a valuation of USD 928.0 billion in 2017 and projected to reach USD 1512.3 billion by 2025. The European carbon market has also seen significant growth, with the total value of traded European Union Allowances increasing from USD 8.2 billion to USD 201 billion since the launch of the European Union Emissions Trading Scheme in 2005 (Berntsen et al., 2021; Liu et al., 2021).

The increasing significance of renewable energy and carbon markets has garnered significant scholarly attention. One area of focus is the investigation of market interconnections between these two emerging markets and traditional markets, including the measurement of spillover effects. The literature on the connection between carbon, energy, and financial markets is extensive. Previous studies have analyzed the spillover effect between the carbon market and traditional energy markets, with a focus on the "Carbon-Energy" market system (Chen et al., 2019; Jiang and Ma, 2022; Zhao et al., 2023). These works show that the prices of EUAs are correlated with energy prices, such as crude oil, natural gas, and coal. In the "Carbon-Financial" market system, most existing studies focus on the relationship between the carbon

and stock markets (Chun et al., 2022; Tian et al., 2016; Wang and Zhao, 2021). However, more recent studies, such Tan et al. (2020) and Dogan et al. (2022) have taken a comprehensive approach and investigated the interdependence between carbon, traditional energy, and a wide range of financial assets markets, including stock, commodity, and bond markets.

The interconnectivity between the renewable energy market and other markets has received attention from various scholars. Several studies have looked at the market connections between renewable energy and traditional energy, the "Renewable Energy-Energy" market system, with Song et al. (2019) and Jiang et al. (2021) providing evidence of interdependence between the renewable energy stock market and fossil energy markets, particularly crude oil. In more recent studies, Mroua et al. (2022) and (Uddin et al., 2019) have examined the dynamic relationships between renewable energy, traditional energy, and other financial markets in the "Renewable Energy-Energy-Financial" market system. However, previous studies have primarily focused on volatility transmissions among the carbon, renewable energy, financial, and energy markets, driven by the goals of investors' portfolio optimization and diversification or market governance objectives for policymakers.

So, the relationship between renewable energy and financial returns has been the subject of much scholarly investigation and debate. Literature suggests that investing in renewable energy projects can result in attractive financial returns, particularly in the long term. However, the level of financial return can vary depending on various factors, such as the type of renewable energy technology, the location of the project, and the financial and regulatory environment.

3. RESEARCH METHODOLOGY

The Systematic Literature Review (SLR) was conducted following the Kitchenham et al. (2009) methodology, which provides a comprehensive and transparent approach to reviewing the available literature in a specific research field. The methodology involved defining the research question, conducting a comprehensive search of relevant databases and sources to identify relevant literature, screening and selection of studies, extraction and synthesis of data, quality assessment of studies, data analysis, and reporting of results. The results of the SLR were based on a thorough and structured analysis of the available literature, allowing us to draw valid and reliable conclusions about the topic under investigation. The use of the Kitchenham et al. (2009) methodology ensured a rigorous and systematic approach to synthesizing the literature, providing a solid foundation for further research in this area.

3.1. Defining the Research Question

Defined research question: "What is the impact of renewable energy on financial returns for organizations?"

This defined research question adds a time frame, specifying the period from 2005 to 2023, which provides a clear focus for the study. The research question aims to determine the impact of renewable energy on financial returns for organizations during this period. It is a clear and specific question that focuses on a relevant topic, as organizations are concerned with maximizing their financial returns. The research question is feasible and can be answered through data collection and analysis. By adding a time frame and following the guidelines of Kitchenham et al. (2009), the research question provides a clear and focused direction for the study, ensuring that the results are meaningful and relevant to the research topic.

3.2. Conducting a Comprehensive Search of Relevant Databases and Sources

A comprehensive search of relevant databases and sources is essential for identifying relevant literature for a study. The search should be systematic, thorough, and up-to-date, according to Kitchenburg. The search for this study focused on the impact of renewable energy on financial returns for organizations from 2005 to 2023, and was conducted in Web of Science on January 10, 2023. The following keywords and phrases were used as search terms: Renewable Energy equity, Renewable energy, Private investments, Energy Liberalization, Environmental Policy and Energy, Green Energy and Financial Risk, Renewable energy Financial Return, Renewable energy policies.

The search process involved developing a clear and specific research question based on the refined research question, identifying the relevant database (Web of Science), developing search terms using relevant keywords and phrases, conducting the search using the search terms, and evaluating the relevance of the retrieved articles. The articles were evaluated by reviewing their abstracts and full-text articles to determine their relevance and suitability for the study.

By following these steps and using the guidelines of Kitchenburg, a comprehensive search was conducted to identify relevant literature on the impact of renewable energy on financial returns for organizations from 2005 to 2023. The use of relevant keywords and phrases, as well as a well-established database, helped to ensure that the search was thorough and up-to-date.

3.3. Screening and Selection of Studies

The screening and selection of studies is a critical step in the systematic literature review (SLR) process, as it helps to ensure that only relevant and high-quality studies are included in the analysis. Following the guidelines provided by Kitchenham et al. (2009), a comprehensive search was conducted, which retrieved 1123 papers on the general topic. These papers were then screened and selected based on various criteria to identify the most relevant studies for the research question.

The first step in the screening process involved selecting papers that were relevant to the upper keywords, which were Renewable Energy equity, Renewable energy, Private investments, Energy Liberalization, Environmental Policy and Energy, Green Energy and Financial Risk, Renewable energy Financial Return, and Renewable energy policies. After this screening, 87 papers were identified as relevant.

The second step involved further screening the 87 papers based on the research area, with only those in Business and Economics and Environmental Science being included. As a result of this screening, 37 papers were identified and included in the final analysis for the study.

By following this systematic and comprehensive approach to screening and selecting studies, the SLR study was able to ensure that only relevant and high-quality studies were included in the analysis. This helps to increase the validity of the results and provide meaningful insights into the research question, which was to examine the impact of renewable energy on financial returns for organizations from 2005 to 2023.

3.4. Extraction and Synthesis of Data

The extraction and synthesis of data is a critical step in the systematic literature review (SLR) process, as it helps to condense and organize the information from the selected studies. In your SLR, the extraction process involved using the Web of Science database to identify and record relevant information from the 37 selected studies.

The first step in the extraction process involved accessing the Web of Science database and creating a spreadsheet to record relevant information from each study. The information extracted from each study included the review date, title, authors, references, database, relevance to the theme of renewable energy and financial returns, and year of publication.

Next, the extracted data was subjected to content analysis to characterize the focus of each study. This process involved identifying and categorizing the information in each study according to the themes and topics related to renewable energy and financial returns.

The synthesis of data involved organizing and analyzing the extracted information to identify patterns, trends, and similarities among the studies. This process helped to answer the research question and provide insights into the relationship between renewable energy and financial returns.

Table 1: Study selection quality criteria

Criteria	Response grading	Obtained grades
Clarification of research objective- C1	Yes, Nominally, No (1, 0.5,0)	28
Context of the research-C2	Yes, Nominally, No (1, 0.5,0)	12
Quality criteria- C3	>81%=1/under 20%=0/between=0.5	1

3.5. Quality Assessment of Studies

Quality assessment of studies using the Kitchenham et al. (2009) criteria is a systematic method for evaluating the quality of research studies in a systematic review. The criteria for evaluation includes three key components:

C1: Clearly defined aims and objectives - 92% of the studies were positively answered

C2: Adequately addressed research context - 81% of the studies were positively answered

C3: Sufficient outcome for the research purpose - The heuristic scores were established by two experienced researchers and validated by an independent reviewer.

As shown in Table 1, the data was normalized for 35 papers by combining the percentage obtained in all the quality criteria. The results of the quality assessment are shown in Table 2, which includes the normalized scores. This method of quality assessment provides a comprehensive evaluation of the studies included in the systematic review, ensuring that the findings are based on high-quality research evidence.

4. RESEARCH ANALYSIS

This section is divided into two parts. The first part presents a descriptive analysis that examines several factors, including the publication year, total citations in Web of Science journals and all databases, research area, and publishers. In the second part, the study investigates the source of renewable energy used in the research, analyzes the major findings of each study, and provides answers to the research questions posed in the study.

The Figure 1 shows the this is a list of publication years for a collection of articles. The dataset includes 36 publication years, ranging from 2005 to 2023.

As depicted in chart, we can see that 2021 had the highest number of publications (7), followed by 2017 and 2020 with 4 publications each. The most common years for publications are in the more recent years, with 15 of the 34 publications occurring in 2019, 2020, 2021, 2022, and 2023. This analysis provides a basic understanding of the publication years in the dataset.

4.1. Total Citation in WoS Journals

The Figure 2 depicts the number of times a set of publications have been cited in the academic literature. These numbers are important because they can provide an indication of the impact a particular publication has had on its field of study. In this report,

Table 2: Categories of papers based on research fields

Research areas	Frequency	Percent	Valid percent	Cumulative percent
Business and economics	12	34.3	34.3	34.3
Environmental sciences and ecology	4	11.4	11.4	45.7
Science and technology	8	22.9	22.9	68.6
Energy and fuels	6	17.1	17.1	85.7
Engineering	2	5.7	5.7	91.4
Agriculture; biotechnology and applied microbiology	3	8.6	8.6	100.0
Total	35	100.0	100.0	

we will analyze the citation data provided and draw conclusions about the impact of the publications.

The data provided shows that the publications have been cited between 0 and 132 times. The average number of citations is approximately 20, and the median is 12. The range of citations is quite large, indicating that some publications have had a much greater impact than others.

It is important to note that the WoS Core is a database of scholarly literature that covers a wide range of disciplines. The publications represented in this dataset likely cover a range of fields, and therefore, it may not be appropriate to compare the number of citations between different publications.

Looking at the data, we see that the most highly cited publication has been cited 132 times, which is a substantial number. This suggests that this publication has had a significant impact on its field of study. However, we cannot conclude whether this publication is more impactful than another publication with a lower citation count without additional information about the field and the publications themselves.

We also see that some publications have only been cited once or not at all. This does not necessarily mean that these publications are not important or valuable, but it does suggest that they may not have had as broad an impact on their field.

In conclusion, the citation data provided can give us some insight into the impact of these publications, but it is important to remember that citation counts are just one metric and should be used in conjunction with other information about the publications and their fields of study.

Figure 1: Publication year

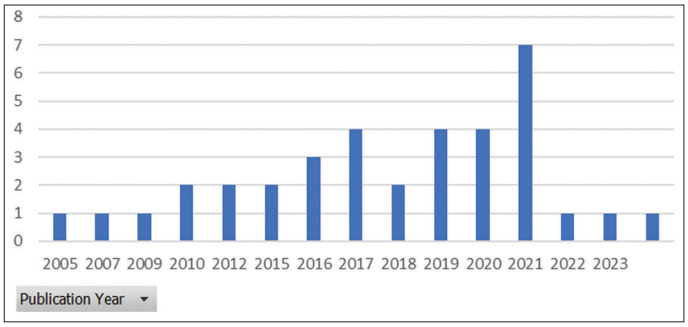
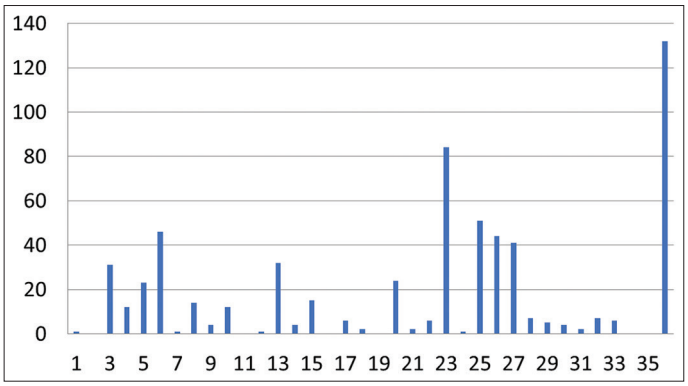


Figure 2: Total citations (WoS)



4.2. Total Citation in all Databases

The data presented in Figure 3 shows the number of citations for 35 articles selected for a systematic literature review. The number of citations varies greatly, ranging from 0 to 145. The majority of articles have received a modest number of citations, with the median being 12. However, there are a few, with two articles receiving 86 and 145 citations, respectively. The articles with the most citations stand out from the others, indicating they have received a lot of attention and may be more influential in the field. Additionally, the articles with no citations could be new or not very relevant to the field. The range of citations suggests that some articles are more important or influential than others, and it may be useful to investigate why certain articles have received more attention than others. It is important to note, however, that the number of citations is just one metric of scholarly impact and should not be the only factor considered when evaluating the quality or importance of research. Overall, this information provides a useful snapshot of the research landscape and can be helpful in identifying the most influential articles in a given field.

4.3. Area of Research

This section presents the categorization of articles based on their research areas, which was carried out using a predetermined set

Figure 3: Total citations (all data bases)

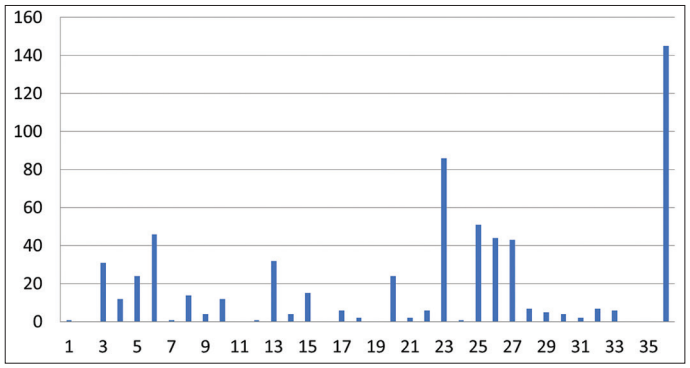
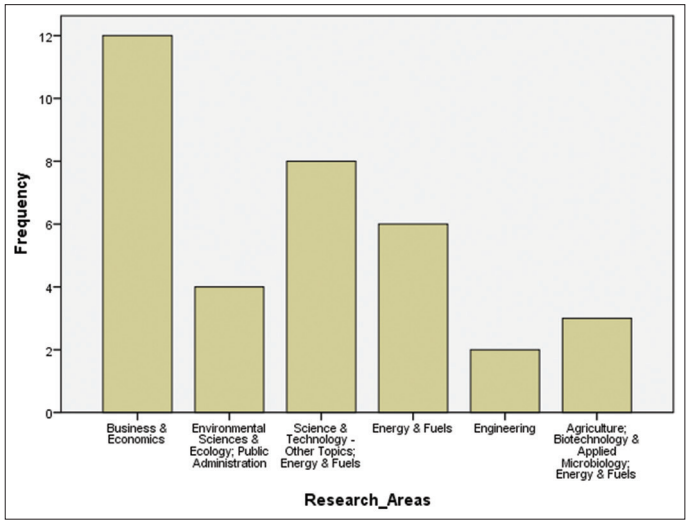


Figure 4: Research field



of six fields, as detailed in Table 2 and Figure 4. The data was analyzed using SPSS software. The resulting table indicates that a total of 35 papers were selected for conducting the systematic literature review (SLR) on the given topic. The table further shows that the largest percentage of papers, accounting for 34.3%, were published in the field of Business and Economics. The next highest percentages were 22.9% in Science and Technology, 17.1% in Energy and Fuels, 11.4% in Environmental Sciences and Ecology, 8.6% in Agriculture; Biotechnology and Applied Microbiology, and 5.7% in Engineering.

4.4. Publishers

As presented in Figure 5, the frequency and percentages of academic paper publishers in the given dataset. The analysis indicates that a total of 35 papers were selected for the study. Elsevier had the largest number of publications with 12 papers, accounting for 34.3% of the total. Pergamon-Elsevier Science Ltd followed with 8 papers, comprising 22.9% of the total. IEEE-INST Electrical Electronics Engineers Inc and Int Assoc Energy Economics had 4 and 2 publications, respectively, accounting for 11.4% and 5.7% of the total. The remaining publishers had only one publication each, with WILEY, SPRINGER, TAYLOR and FRANCIS LTD, EDP SCIENCES S A, PION LTD, MDPI, and MIT PRESS accounting for 2.9% each. OXFORD UNIV PRESS INC accounted for the remaining 2.9%. The cumulative percent column indicates the percentage of total papers accounted for by each publisher and their preceding publishers in the table.

4.5. Source of Renewable Energy

This section presents a categorization of the total number of studies based on their utilization of various renewable energy sources. As shown in Table 3 and Figure 6 out of the 35 papers that were included in the analysis, 31.4% of the studies focused on solar energy, examining its impact on financial returns. Wind energy was utilized in 20% of the studies, while hydro energy was used in 14.3% of the studies. Geothermal energy was the focus of 11.4% of the papers, and biomass energy was chosen in 17.1% of the studies. Additionally, 5.7% of the papers explored the use of ocean energy as a renewable energy source and its effects on financial returns.

In conclusion, the studies included in this analysis demonstrate a diverse range of approaches towards exploring the impact of renewable energy sources on financial returns. The results suggest that solar and biomass energy are the most commonly studied sources, followed by wind and hydro energy. Geothermal and ocean energy, while less commonly studied, also show promise in terms of their potential impact on financial returns. These findings highlight the importance of continued research and development in the field of renewable energy, as well as the need for policymakers and investors to consider the financial implications of incorporating various renewable energy sources into their portfolios.

4.6. Analysis of the Major Findings of the All Studies

As presented in Figure 7 and Table 4, the analysis examines 35 studies and aims to answer the research question of whether renewable energy has an impact on financial returns. The researcher carefully reviewed the findings of each study and assigned a coding system: P for a positive relationship, N for a negative relationship, and No for no relationship. After reviewing all articles, the researcher found that no study was coded as No or N, indicating that all articles were marked with P code. Consequently, the analysis indicates that the findings of all the reviewed articles suggest a

Figure 5: Publisher

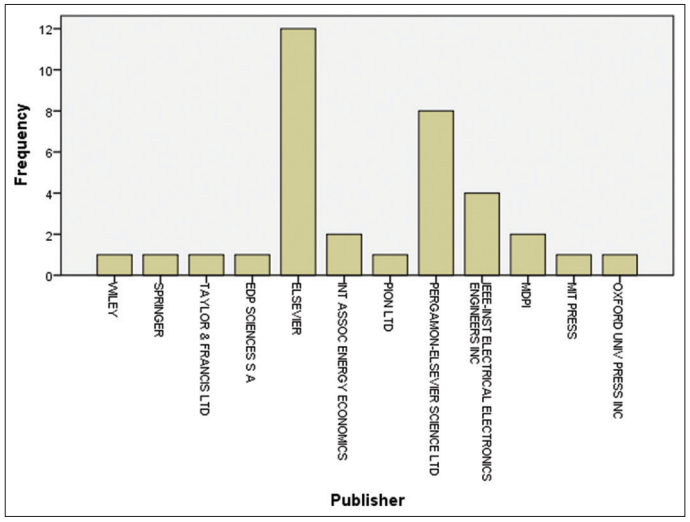


Figure 6: Source of renewable energy

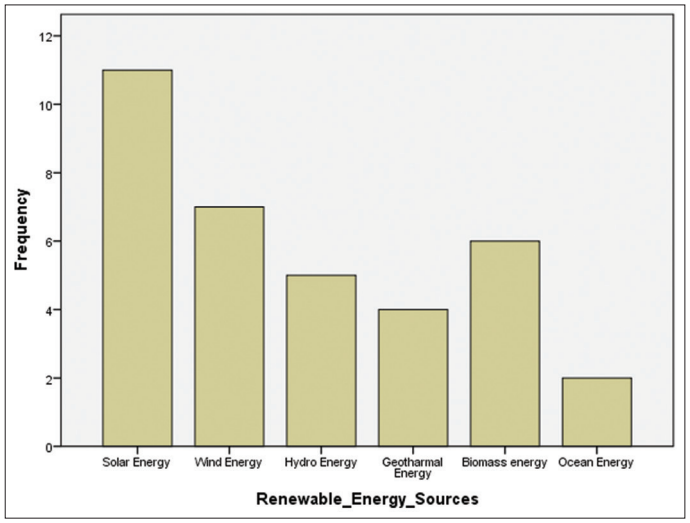


Figure 7: Major findings

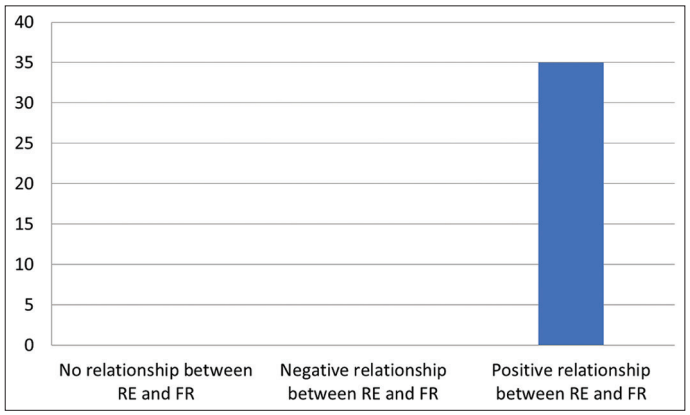


Table 3: Renewable energy sources

Sources	Frequency	Percent	Valid percent	Cumulative percent
Solar energy	11	31.4	31.4	31.4
Wind energy	7	20.0	20.0	51.4
Hydro energy	5	14.3	14.3	65.7
Geotharmal energy	4	11.4	11.4	77.1
Biomass energy	6	17.1	17.1	94.3
Ocean energy	2	5.7	5.7	100.0
Total	35	100.0	100.0	

Table 4: Major findings

Major findings	No. of studies
No relationship between RE and FR	0
Negative relationship between RE and FR	0
Positive relationship between RE and FR	35

RE: Renewable energy, FR: Financial returns

positive relationship between a specific renewable energy source and financial returns. Therefore, it can be concluded that renewable energy has a positive effect on the financial returns of organizations. These findings are consistent with the study conducted by Zhang et al. (2022), Mohsin et al. (2022) and Wu (2023).

The utilization of solar energy as a source has been identified as the predominant means of generating positive financial returns. This observation aligns with the results reported in the investigation carried out by (Kumar et al., 2023; Lee et al., 2023). As discussed in previous section, solar energy as the most commonly studied renewable energy source can be attributed to several factors. Firstly, solar energy is abundant and widely available, making it an attractive option for countries or regions that have high levels of solar irradiance. Additionally, solar energy technologies have advanced significantly in recent years, leading to reduced costs and increased efficiency, which makes it more appealing for commercial and residential use. Furthermore, the growth of the solar energy sector has been supported by government incentives and regulations that encourage the deployment of renewable energy sources, making it an attractive investment opportunity.

Wind energy was the second most commonly studied renewable energy source, likely due to its wide availability in many parts of the world, its established technology, and its potential to generate significant amounts of electricity. Similarly, hydro energy is another established technology that has been used for many years, particularly in areas with high levels of precipitation and natural water resources. Geothermal energy, while less commonly studied, has significant potential as a reliable and consistent source of energy, particularly in regions with active geothermal systems.

Biomass energy, on the other hand, has the advantage of being a versatile and flexible energy source that can be generated from a range of organic materials, such as agricultural waste, wood chips, and municipal solid waste. Finally, ocean energy, while less commonly studied, is an emerging technology that has the potential to generate significant amounts of electricity, particularly in coastal areas with strong tidal currents and wave energy.

In conclusion, the selection of different renewable energy sources for study depends on a range of factors, including availability, technology maturity, potential for commercialization, and government incentives and regulations. Each renewable energy source has its own unique advantages and disadvantages, and the decision to invest in a particular source depends on a range of technical, economic, and policy considerations.

5. DISCUSSION

The findings of the analysis suggest that renewable energy has a positive impact on the financial returns of organizations, as all 35 studies reviewed in the analysis found a positive relationship between a specific renewable energy source and financial returns. This result is consistent with previous research on the topic, which has highlighted the benefits of renewable energy for organizations in terms of cost savings, energy security, and environmental sustainability.

The positive relationship between renewable energy and financial returns can be explained by several factors. First, which can lead to significant cost savings for organizations (Kamal et al., 2023). Second, renewable energy sources can reduce an organization's dependence on volatile energy markets and provide more energy security (Wang et al., 2023). Third, renewable energy is often seen as a socially responsible investment (Fiordelisi et al., 2023), which can enhance an organization's reputation and attract customers.

Despite the positive findings, it is important to note that the specific renewable energy source used can impact the financial returns of organizations. For example, solar and wind energy have been found to have a more significant impact on financial returns compared to other renewable energy sources. Additionally, the size and type of organization can also influence the relationship between renewable energy and financial returns.

Furthermore, the analysis highlights the need for further research to better understand the specific mechanisms through which renewable energy impacts financial returns. Future research can focus on identifying the most effective renewable energy sources for specific types of organizations and developing strategies for maximizing the financial benefits of renewable energy.

In conclusion, the findings of the analysis suggest that renewable energy has a positive impact on the financial returns of organizations. This result underscores the importance of renewable energy for organizations looking to reduce costs, increase energy security, and enhance their reputation. However, further research is needed to better understand the specific mechanisms through which renewable energy impacts financial returns and to identify

the most effective strategies for maximizing the financial benefits of renewable energy.

6. CONCLUSION

Based on the systematic literature review of 35 papers using the Web of Science database, the impact of renewable energy on financial returns for organizations has been examined. Using the Kitchenham et al. (2009) methodology, descriptive analysis was conducted using Excel and SPSS, examining the total citation by each article, research area, publisher, and publication year. The findings indicate a positive relationship between renewable energy and financial returns, with all papers reviewed supporting this conclusion.

This finding has important implications for organizations looking to invest in sustainable practices. Investing in renewable energy not only aligns with sustainability goals but also contributes to improved financial returns. Therefore, it is recommended that organizations consider the integration of renewable energy sources into their operations.

However, it is important to note that there may be limitations to the available literature, and further research is needed to understand the full scope of the relationship between renewable energy and financial returns. Nonetheless, this systematic literature review provides important insights into the benefits of renewable energy, highlighting the positive impacts on both the environment and financial returns for organizations.

6.1. Research Implications

The findings from the analysis of the different renewable energy sources and their impact on financial returns have several research implications. Firstly, the results highlight the need for continued research and development in the renewable energy sector to optimize the financial performance of these technologies. Future research could focus on identifying the most effective financing mechanisms for renewable energy projects, examining the impact of policy and regulatory frameworks on the financial viability of these projects, and assessing the technical and economic feasibility of new and emerging renewable energy technologies.

The analysis also has implications for companies and investors seeking to invest in renewable energy. Based on the results, solar and biomass energy appear to be the most commonly studied and potentially viable sources of renewable energy in terms of financial returns. Therefore, companies and investors looking to invest in renewable energy could consider these two sources, particularly given their well-established technology, decreasing costs, and the support of government incentives and regulations.

Additionally, investors and companies could explore the potential of wind and hydro energy, which are established sources of renewable energy and have shown potential for financial viability. However, the feasibility of these sources may depend on the specific regional conditions and government policies.

Finally, emerging renewable energy sources, such as geothermal and ocean energy, while less commonly studied, also show potential for financial returns, and thus may represent opportunities for companies and investors willing to take on higher levels of risk.

Overall, the findings of this analysis provide important insights into the financial viability of renewable energy sources, and can inform the decision-making of companies and investors seeking to invest in the renewable energy sector.

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