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Carbon tax implementation for SDGs in ASEAN: Systematic literature review and synthesis Analysis

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Abstract

This study aims to analyze carbon tax regulations and their implementation in ASEAN countries, focusing on their alignment with Sustainable Development Goal (SDG) 13: Climate Action. Using a systematic literature review method supported by the Watase application, relevant and recent studies were gathered from the Scopus database to ensure the currency and validity of the findings. The research explores both the conceptual basis and practical challenges of implementing carbon taxes as tools to achieve net-zero emissions. The findings reveal that significant efforts have been made by Indonesia, Malaysia, and Thailand, three key players in the Southeast Asian region, that have introduced carbon taxation mechanisms to reduce greenhouse gas (GHG) emissions and address climate change. However, these policies have not yet been fully implemented due to various obstacles, including a lack of clear execution plans, limited institutional resources, and difficulties in determining appropriate tax rates. Ultimately, this study provides a comprehensive and comparative analysis of the environmental, policy, and economic dimensions of carbon tax initiatives in ASEAN, offering insights into their potential effectiveness and areas requiring further development.

Keywords: ASEAN, Climate Change, SDGs, Tax Carbon.

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1. Introduction

Carbon tax refers to an additional charge imposed on fuels, products, or services based on their carbon content or emissions, providing a financial incentive to reduce emissions [1]. Alongside emissions trading systems, one of the most widely used economic instruments to cut CO2 emissions and combat climate change is defined as a carbon tax [1]. Carbon taxation has emerged as an effective policy tool to incentivize emission reductions by imposing financial costs on carbon emitters [2]. Climate change issues have been a growing concern, but many nations in Asia have yet to implement necessary policies to address the problem effectively. Emphasizing the need for stronger governmental commitments to reducing carbon emissions and promoting sustainable environmental practices across the region. Only a few countries in Asia have implemented carbon taxes [3]. Climate change poses a critical threat globally, necessitating concerted efforts to reduce carbon emissions [4, 5].

Carbon taxes have become an increasingly important policy instrument in climate change mitigation due to their ability to internalize the external costs of greenhouse gas (GHG) emissions into the economic decisions of communities and industries. By placing a price on carbon emissions, these taxes create economic incentives to reduce carbon footprints and simultaneously align private interests with social welfare [6, 7]. In addition to its environmental benefits, carbon taxes have also been shown to encourage technological innovation and facilitate the transition to a low-carbon economy [8] while potentially reducing social inequality if accompanied by fair compensation schemes [9]. From a political perspective, empirical studies show that policy transparency and the reuse of tax revenues also affect public revenues [10, 11]. The replication study Yang et al. [12] even confirms the real impact of this policy on reducing CO_2 emissions in various countries. In this context, systematic studies are urgently needed to map the evolution of scientific knowledge on carbon taxes, especially in underexplored regions such as ASEAN, in order to support evidence-based and regionally relevant policies.

Indonesia and Malaysia, as developing economies with substantial industrial activities, have recognized the importance of carbon taxes in their environmental policies. Research shows that the palm oil industry in Indonesia and Malaysia, the two largest producers in the ASEAN region, significantly contributes to carbon emissions. As the top two palm oil-producing countries, they are also among the largest carbon emitters associated with this industry [13, 14]. Research shows that Indonesia is the highest country producing carbon in ASEAN, followed by Malaysia, Thailand, and Vietnam [15].

A review of the literature on carbon tax shows a diversity of methodological and thematic approaches. This reflects the complexity of this instrument in climate policy. Previous studies have not only highlighted the effectiveness of carbon taxes in reducing emissions but also addressed the various social, political, technological, and fiscal dimensions that influence its success. Rhodes and Jaccard [10] explore the economic-political dynamics of carbon tax implementation in British Columbia and demonstrate how public perceptions and political constellations can strengthen or weaken the effectiveness of such policies. Furthermore, Engström and Gars [6] developed an approach within a macroeconomic framework to assess the optimal rate of carbon taxes that balance economic efficiency and environmental effectiveness. In the fiscal aspect, Fawcett et al. [16], through the EMF 32 study, it is show how carbon tax policies can be designed to support the stability of state revenues while significantly reducing carbon emissions. The social justice aspect is studied in depth [9], who asserts that the design of the carbon tax must consider distributional implications so as not to exacerbate social inequality. In the dimension of public revenue, [11] shows that transparency and the reuse of tax revenue (revenue recycling) are key to increasing policy legitimacy. In terms of technological innovation, Lilliestam et al. [8] provide evidence that incentives from carbon taxes are able to accelerate the development of clean energy technologies more effectively than cap-and-trade systems.

More recent studies Nazari et al. [17] conducted bibliometric analyses and found an increase in research trends and social acceptance of carbon pricing mechanisms, suggesting a change in public perception over the past decade. Meanwhile, Sibdari and Asayesh [18] conducted another study that broadens the scope by exploring the influence of carbon taxes on consumer behavior, particularly in the selection of low-emission vehicles, reflecting the potential influence of this policy on long-term market transformation. However, important gaps were identified in the existing literature. Most studies are still centered on the context of developed countries in the North American and European regions [8, 10, 16] while the Global South region, including ASEAN, has not received much adequate attention [17]. In fact, ASEAN countries face unique dynamics ranging from dependence on fossil energy, political sensitivity to environmental fiscal policies, to weak institutional capacity that can affect the effectiveness and acceptance of carbon taxes [19, 20]. In addition, thematic and systematic reviews that specifically map the context, challenges, and design of carbon tax implementation in the ASEAN region are still very limited or not even comprehensively available. Some individual studies from countries such as Indonesia, Malaysia, Thailand, or Vietnam only address specific aspects and have not provided a comprehensive synthesis across countries [21].

This study aims to compare the regulatory approaches and implementation experiences of carbon taxes in ASEAN countries, particularly in the context of achieving SDG 13, Climate Action. The research also explores the economic and social implications of carbon taxation in Southeast Asia and evaluates potential policy refinements. An international research initiative, the Deep Decarbonization Pathways Project (DDPP), aimed to chart a pathway for achieving the 2050 emissions reduction target using backcasting methods aligned with the Paris Agreement and identified carbon pricing as a cornerstone of all policy strategies.

The rising dependence on fossil fuels is a worldwide concern, as the excessive carbon emissions generated contribute to global climate change. The sharp increase in fossil fuel consumption began during the First Industrial Revolution (1760–1850), when these fuels became a key driver of economic activity, bringing unprecedented prosperity to humanity (5).

Despite being finite, fossil fuel reserves are still being consumed at an increasing rate. Environmentalists urge reducing their use due to the negative effects on the environment, regardless of whether the reserves run out or not [22].

The combustion of fossil fuels has generated 37.15 billion tons of CO_2, making it the dominant source of greenhouse gas emissions, which accounted for 75.01% of the total in 2022 [23]. The increase in CO concentration has been a growing concern due to its impact on air quality and climate change. The swift rise in global temperatures has the potential to intensify climate change and contribute to rising sea levels, endangering marine ecosystems and impacting human activities and livelihoods [24]. The effects of climate change have triggered various serious threats, such as the increasing occurrence of natural disasters, ecosystem deterioration, food production disruptions, declining quality and availability of clean water, along with extreme heat waves and severe winters, all of which threaten human survival [25]

Considering the severe environmental damage caused by fossil fuels, transitioning to renewable energy is essential. Renewable energy is regarded as a sustainable, reliable, clean, and eco-friendly alternative that helps reduce and offset global carbon emissions [26]. In contrast to fossil fuels that harm the environment, renewable energy is emission-free and offers long-term, sustainable solutions without causing ecosystem damage [27]. The government must develop and implement strategic policies to promote renewable energy adoption, decrease fossil fuel dependency, and support a sustainable energy transition that benefits both the environment and future generations.

2. Literature Review

A study analyzed the impact of carbon tax policies on CO2 mitigation and economic growth in China using a dynamic computable general equilibrium (CGE) model that integrates energy, environmental, and economic factors. The results indicate that carbon tax rates of 30, 60, and 90 RMB per ton of CO2 would lead to emission reductions of 4.52%, 8.59%, and 12.26%, respectively, while causing GDP to decline by 0.11%, 0.25%, and 0.39% in 2020 if the tax revenue remains with the government. Additionally, with improvements in energy efficiency, CO2 emissions per unit of GDP would decrease by 34.79%, 37.49%, and 39.92%, respectively. However, the negative effects on industries and households could be mitigated if the tax revenues are redistributed to these sectors [28]. A carbon tax plays a crucial role not only within the environmental taxation system but also as a key instrument of environmental economic policy. Its fundamental principle is to internalize external costs, preventing the Tragedy of the Commons in the atmosphere. By implementing a carbon tax, CO2 emissions can be significantly reduced [5, 29].

Research indicates that implementing a carbon tax in the energy sector is an effective environmental measure, as higher tax rates contribute to lowering greenhouse gas emissions. This reduction is statistically significant and closely linked to fossil fuel consumption [30]. In alignment with the goals set in the 2016 Paris Agreement, there is a necessity to reduce carbon dioxide (CO_2) and other greenhouse gas emissions by 25% by 2030. Achieving this target will require comprehensive climate policy measures that drive substantial transformations in both production and consumption patterns. Although many developed nations have declared their commitment to achieving emission neutrality by 2030, their current practices remain inconsistent with these long-term objectives, including Indonesia and Malaysia. Consequently, much stronger policy interventions are essential. As of 2021, Indonesia and Malaysia have less than a decade to meet the global target of cutting carbon dioxide emissions in half by 2030 [3].

Indonesia introduced its carbon tax through Law No. 7 of 2021 on the Harmonization of Tax Regulations (HPP Law), enacted on October 29, 2021 (Ministry of Finance Indonesia). The law stipulates a carbon tax rate of IDR 30 per kilogram of CO_2 equivalent (approximately USD 2 per ton) [21]. The tax applies to individuals and entities purchasing goods containing carbon and those conducting activities resulting in carbon emissions. The tax rate is considered among the lowest globally, raising concerns about its effectiveness in driving significant emission reductions.

Malaysia's approach emphasizes incentivizing voluntary reductions in carbon emissions through financial support and tax incentives for green investments. The government has also explored the potential for a carbon pricing mechanism, including a possible carbon tax, but concrete policies have yet to be established [31]. The National Low Carbon Cities Framework (NLCF) has been instrumental in shaping Malaysia’s sustainability initiatives by promoting energy efficiency and sustainable urban planning. To support sustainable investments, the government offers various incentives, including the Green Investment Tax Allowance (GITA), which grants tax allowances for businesses investing in eco-friendly technology and equipment. Furthermore, income earned from eligible green activities may be exempt from income tax, encouraging participation in sustainable initiatives. In addition, the Accelerated Capital Allowance (ACA) allows businesses investing in energy-efficient machinery or equipment to benefit from accelerated depreciation for tax purposes [31].

3. Methodology

Here is the method for the Systematic Literature Review (SLR) article based on the details provided and the PRISMA guidelines [32].

3.1. Method

The search was conducted in the selected Scopus database due to its excellence in providing high-quality scientific articles through a rigorous indexation process [33, 34]. The selection of Scopus compared to Google Scholar is based on several reasons: Article Quality: Scopus provides articles from journals that have been verified and have a good academic reputation. Duplication: Scopus has a better mechanism for reducing article duplication compared to Google Scholar. Article Inclusion from Predator Journals: Google Scholar has the potential to include articles from predatory journals, which do not always have strict standards of assessment [35].

3.1.1. Search and Screening Process

The article search process for SLR materials is obtained from the identification stage in the Scopus database as well as from other methods, such as the Watase System [35, 36]. The number of articles obtained from the initial search was 217. Of these, 21 articles were removed because they were duplicates, 30 articles were marked as ineligible by automated tools (2015–2025 period), and 15 articles were removed for other reasons, such as inappropriate tier levels (Tier: Q1, Q2, Q3, Q4). No articles were deleted because they lacked abstracts for screening.

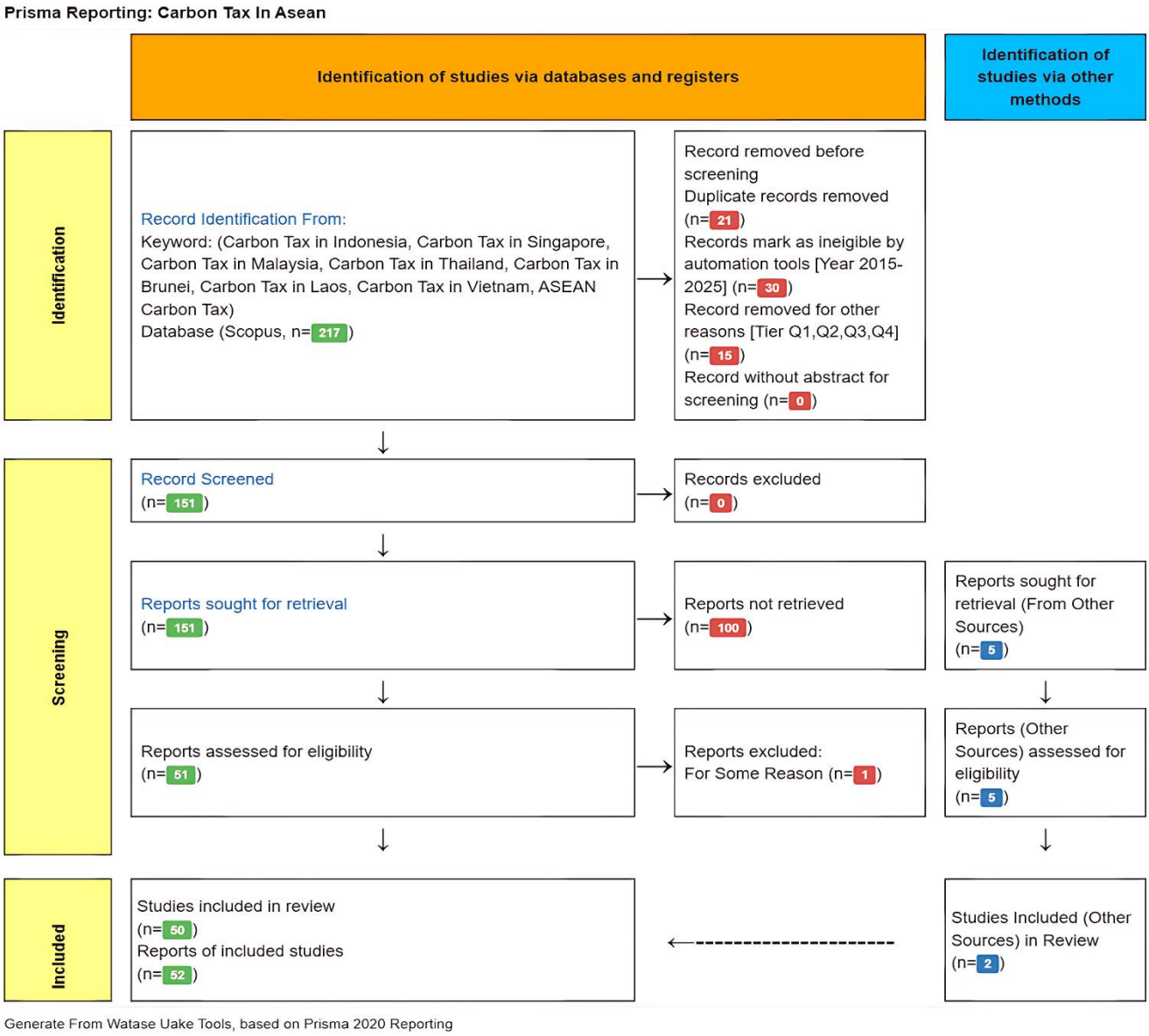

Figure 1.
Prisma Reporting.

3.1.2. Quality Screening and Assessment

After the identification stage, 151 articles were obtained for screening. All of these articles were researched, and 100 articles could not be retrieved (2.4. Screening - Reports not retrieved). Additionally, 5 articles were sourced from other sources (2.5. Screening - Reports sought for retrieval from other sources). Of the 151 articles obtained, 51 were checked for eligibility, and 1 article was rejected for specific reasons (2.7. Screening - Reports excluded for specific reasons). Furthermore, 5 articles from other sources were also assessed for eligibility (2.8. Screening - Reports from other sources assessed for eligibility).

3.1.3. Inclusion

From the screening process, 50 articles were included in the final review (3.1. Included - Studies included in review), and 2 additional articles from other sources were also included (3.2. Screening - Studies Included (Other Sources) in Review). Therefore, the total number of articles included in the final review is 52 (3.3. Screening - Reports of included studies).

3.1.4. Analysis

Once the relevant and valid articles are determined, thematic analysis is applied in accordance with the PRISMA protocol. This thematic analysis aims to identify the main patterns and findings of the collected literature. This analysis process is also produced from the Watase Uake System [36].

3.1.5. Conclusion

This study follows the PRISMA guidelines, which are standards for improving the quality of reporting and systematic review methodologies and have been widely used in various disciplines [37]. The method used in this study ensures that the process of identification, screening, and inclusion of articles is carried out carefully and systematically, so that the results can be accounted for and applied in various cross-disciplinary research contexts. The above explanations are systematically compiled and written in a neutral manner, so that they can be applied in a variety of cross-disciplinary research contexts.

3.2. Statistical and Qualitative Analysis

To identify the synthesis and publication trends of the data that has been collected in Table 1 of Prisma Reporting Details, we can follow the following analysis method:

3.2.1. Data Cleaning and Organizing

First, we need to ensure that all the data collected is accurate and consistent. This includes checking for and fixing data duplication, removing irrelevant data, and correcting input errors. Organize data by categories such as identification, screening, and review. This will facilitate further analysis.

3.2.2. Identification Analysis

Data Analysis: An analysis of the data sources used, including the amount of data from Scopus and the amount of data identified from keywords. Data Deletion: Identify the reasons why some records were deleted before screening (e.g., duplicates, irrelevant records, no abstracts). Conclusion: Draw conclusions about the effectiveness of the data sources and the data deletion process.

3.2.3. Screening Analysis

Checked Records: Analyze the number of records checked and the number of records that cannot be retrieved for screening. Records Assessed: Analyze the number of records assessed for eligibility and the number of records rejected. Records from Other Sources: Analyze the number of records obtained from other sources and the number of records assessed for eligibility from these sources. Conclusion: Draw conclusions about the screening process and the eligibility of the posts.

3.2.4. Review Analysis

Included Studies: An analysis of the number of studies included in the review and the number of studies from other sources included. Submitted Reports: Analyze the number of reports included in the survey. Conclusion: Draw conclusions about the review process and the quality of the included studies.

3.2.5. Identification of Synthesis and Publication Trends

Synthesis: Make a synthesis of the findings from the included study. This includes an explanation of what was found in the study, how the results relate to each other, and what the implications are.

Publication Trends: An analysis of publication trends based on the year of publication, location (ASEAN countries), and topics discussed. This can be achieved by creating charts and diagrams to visualize these trends.

Conclusion: Make a conclusion about publication trends and how they evolve over time.

3.2.6. Presentation of Results

Reports: Create reports that include all the analysis and conclusions that have been made. Reports should be clear and easy to understand.

Presentation: If needed, make a short presentation to present the findings and conclusions.

3.2.7. Discussion and Recommendations

Discussion: Discuss the findings and conclusions that have been made. This includes a discussion of how the findings fit into the existing literature and how they can assist in future research.

Recommendations: Provide suggestions on how future research can be improved based on the findings and conclusions that have been made. By following this method of analysis, you can identify the synthesis and trends of publications that exist in the data that has been collected. This method not only helps in understanding existing data but also provides valuable insights for future research.

4. Data Analysis

4.1. Area and Scope

The analysis in Figure 1 shows that research related to climate change and renewable energy is dominant, with keywords such as "carbon tax," "renewable energy," and "climate change" having the highest frequency. Other key themes include environmental taxes, carbon pricing, economic growth, and air pollution (PM2.5, GHG emissions). These themes

are interrelated; for example, the implementation of a carbon tax has the potential to affect economic growth and reduce greenhouse gas emissions. Regional trends also reflect the focus of the research, with many keywords referring to countries in ASEAN such as Indonesia, Thailand, and Malaysia. It shows particular attention to the challenges of climate change in the region, which include deforestation, conventional energy, and economic impacts. This pattern illustrates global research priorities that emphasize the reduction of emissions and the use of renewable energy as solutions to climate change. These themes contribute significantly to the development of environmental knowledge and policy, as well as to creating more sustainable strategies for economic growth. The relevance of these themes is high to future research challenges and opportunities, especially in the context of climate change adaptation and mitigation, as well as improving energy efficiency and the use of green technologies. Further research is needed to address policy implementation challenges and maximize the benefits of renewable energy in different regions.

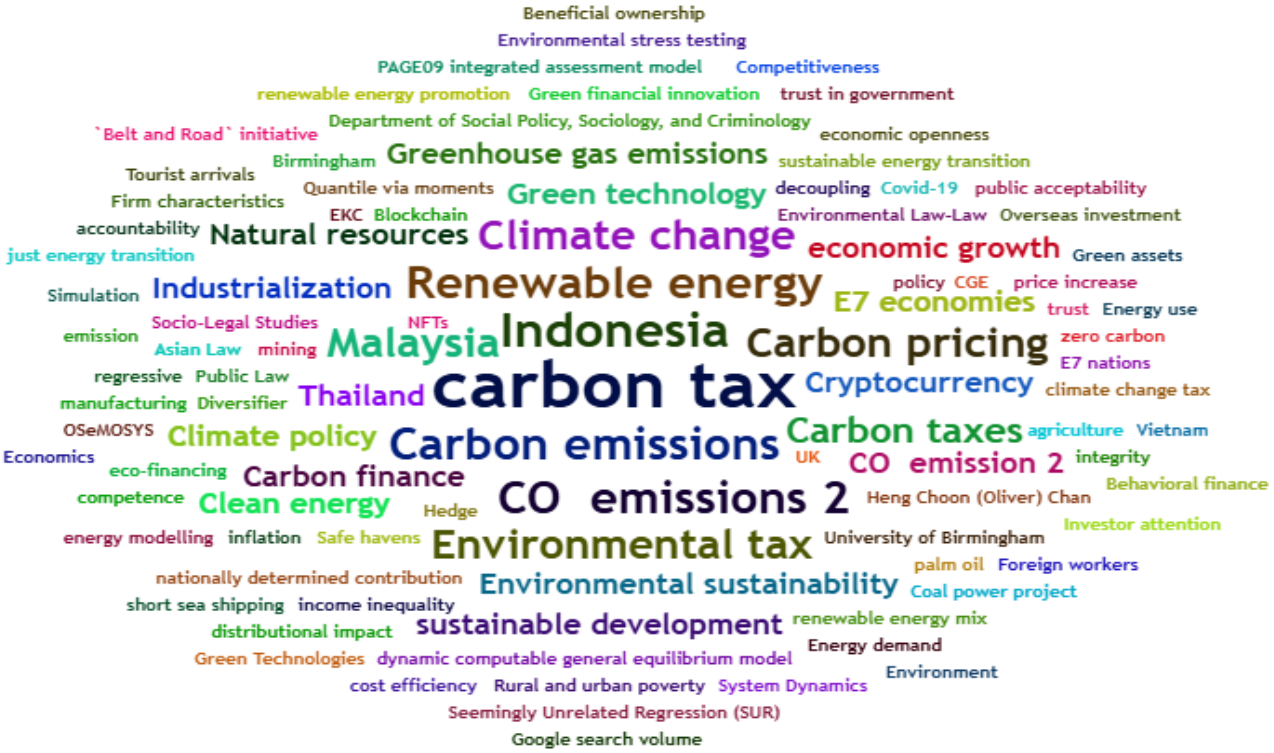

Figure 2.
Word Cloud from Article Keywords.

4.2. Geographic Distribution of Study

Analysis of the research table shows that Indonesia is the most frequently studied location, with as many as 11 studies, followed by Malaysia with 4 studies, Thailand with 3 studies, and several other countries such as Vietnam, Laos, and other ASEAN nations. From this distribution, it appears that the research tends to focus on countries in the Southeast Asian region, which is one of the regions with rapid economic growth and is also a major contributor to global greenhouse gas emissions [38-41]. Research context trends show that many studies are related to carbon tax policies, such as the research [39] which analyzed the impact of carbon taxes in Indonesia, as well as the research of Wong et al. [42] and Wong et al. [43] which determined the ideal carbon tax for Malaysia. In addition, there are also studies that focus on the green energy transition and the use of environmentally friendly technologies, such as the research of Sharif et al. [44] which studies the relationship between environmental taxes, green investment, and economic growth in ASEAN-6, and the research [45] which explores the path of a just energy transition in Indonesia using OSeMOSYS. An interpretation of the implications of these contextual trends suggests that research often focuses on the challenges of environmental policy implementation in developing countries in Southeast Asia.

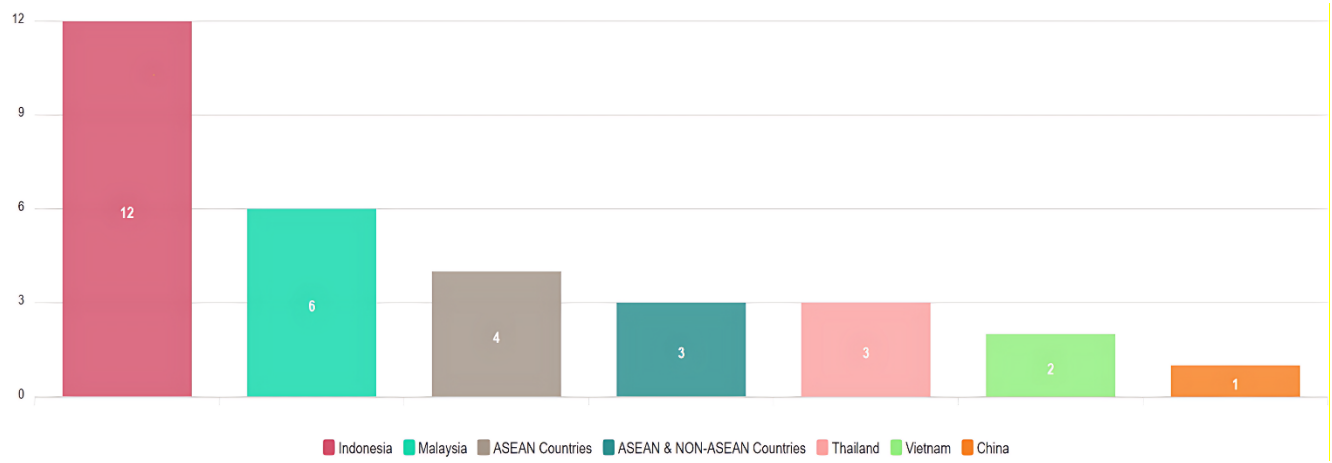

Figure 3.
Geographic Distribution of Studies.

One of the key challenges is how to design and implement effective carbon tax policies while considering their impact on the economy and society [43]. In addition, research also shows the importance of transitioning to green energy and the use of environmentally friendly technologies as key strategies to reduce greenhouse gas emissions [44]. An evaluation of the relevance of this theme to future research challenges and opportunities suggests that research still needs to be conducted to further understand how environmental policies can be adapted and implemented effectively in various cultural and economic contexts in Southeast Asia. In addition, research also needs to explore more deeply the long-term impacts of the green energy transition and the use of green technologies on the economy and the environment [46]. Thus, future research needs to focus more on developing models and strategies that can be adapted to local conditions and have the potential to positively impact the reduction of greenhouse gas emissions and sustainable economic development [47].

Table 1.
Summary of Widely Cited Journals.

No	Country	Count	Authors
11	Indonesia	15	Yusuf and Resosudarmo [39], Dissanayake et al. [48], Harrison et al. [38], Hersaputri et al. [45] and Rahma et al. [41]
22	Malaysia	7	Solaymani et al. [49], Wong et al. [42] and Rahman et al. [50]
33	ASEAN Countries	4	Sharif et al. [44], Chien et al. [51], Yunikewaty and Siswahyudi [15] and Tang [47]
44	ASEAN & Non-ASEAN Countries	3	Angelsen [52], Yu et al. [53] and Sarpong et al. [54]
55	Thailand	3	Saelim [55] and Wattanakuljarus [56]
66	Vietnam	2	Lam et al. [57] and Nguyen [46]
87	Laos	1	Boun [58]

Table 1 above shows journals that are often cited in the journals studied in this study. The highest is a journal from Indonesia, followed by a journal from Malaysia.

4.3. Recommendation

4.3.1. Recommendation Result with 3W1H Framework

What. An analysis of the literature shows that the main themes that emerge in research related to climate change and renewable energy include environmental policy, economic growth, and air pollution. Research shows that keywords such as "carbon tax", "renewable energy", and "climate change" have the highest frequency, reflecting the global focus on reducing greenhouse gas emissions [38, 39]. In addition, there is special attention to the challenges faced by countries in ASEAN, such as deforestation and the economic impacts of the energy transition [42, 44]. Relevant theories in this context include the Theory of Planned Behavior, which can explain how environmental policies can influence economic and social behavior [59].

Where. The geographical context of the reviewed studies indicates that most research focused on countries in Southeast Asia, with Indonesia being the most frequently studied location (11 studies), followed by Malaysia (4 studies) and Thailand (3 studies) [41]. The geographical gap is evident in the lack of research conducted in African and South American countries, which can offer different perspectives on the challenges of climate change [60].

How. The dominant methodology in this literature includes quantitative approaches, such as surveys and big data analysis, which are used to evaluate the impact of carbon tax policies and the energy transition [61, 62]. Some studies also use qualitative approaches, such as interviews and case studies, to understand the local context and policy implementation

challenges. Commonly used analytical tools include Structural Equation Modeling (SEM) and Exploratory Factor Analysis (EFA), with data sources varying from transaction data to social media [63].

Why. The relevance of this topic is significant, considering the combination of concerns about the impact of climate change and the influence of government policies that can affect people's behavior in adopting renewable energy [64-66]. However, there is a significant research gap, especially in terms of longitudinal and cross-cultural studies, which are still minimal [67]. In addition, the lack of integration of classical consumer behavior theory in this study suggests the need for a more holistic approach to understanding environmental policy dynamics [68]. The policy implications of these findings suggest that the development of locally context-adjusted models and strategies can have a positive impact on reducing greenhouse gas emissions and supporting sustainable economic growth [69].

4.3.2. Recommendation with CIMO Framework

Context (C). The context of this research focuses on the challenges of climate change and renewable energy policies in ASEAN countries, with a particular emphasis on Indonesia, Malaysia, and Thailand. These countries face significant challenges related to rapid economic growth and their contribution to global greenhouse gas emissions. External factors such as government regulations related to carbon taxes and environmental policies, as well as energy market dynamics, greatly influence this phenomenon. For example, research shows that Indonesia, as the country with the largest number of studies, has a context characterized by a high dependence on conventional energy and deforestation [38, 39].

Intervention (I). Interventions identified in this study include the implementation of carbon tax policies and the transition to green energy. These policies can be categorized as formal interventions designed to reduce greenhouse gas emissions and encourage investment in environmentally friendly technologies. Research by Wong et al. [42] shows that a well-designed carbon tax can provide an incentive for companies to switch to more sustainable practices. In addition, creative interventions such as the use of digital technology in energy management have also been identified as strategies that can improve energy efficiency [44].

Mechanism (M). The mechanism underlying the relationship between intervention and outcome in this context can be explained through stakeholder theory and the resource-based view. Stakeholder theory emphasizes the importance of involving various actors, including governments and business owners, in designing and implementing effective policies. Business owners, for example, play a key role in utilizing existing resources to adapt to new policies [70]. In addition, the resource-based view demonstrates that companies capable of effectively managing their resources can innovate and adapt more quickly to changes in environmental policies.

Outcome (O). The outcomes of these interventions include improvements in business performance and environmental sustainability. In the short term, the implementation of carbon tax policies can result in increased government revenues and encourage investment in green technologies. However, in the long term, challenges remain, such as the risk of aversion that business owners may face when investing in new technologies [71]. Research also shows that, while there is potential to reduce greenhouse gas emissions, the long-term impacts of the green energy transition on economic growth and community well-being still need to be further explored [46].

4.4. Research Gap

This CIMO Analysis research identified several research gaps that need to be addressed. First, there is still a lack of understanding of how environmental policies can be effectively adapted in various cultural and economic contexts in Southeast Asia. Second, more research is needed to explore the long-term impact of the green energy transition and the use of green technologies on the economy and the environment. Thus, future research should focus more on developing models and strategies that can be adapted to local conditions and have the potential to positively impact reducing greenhouse gas emissions and sustainable economic development [47].

4.5. Author Top Citation and Journal

The following Table 2 explains the summary of the journal, the author and the number of citations from the article.

Table 2.
Author's top citation and journal.

Rank	Journal	Tier	Author	Year	Cites	Title
1	Journal of Environmental Management	Q1	Chien et al. [51]	2021	317	A step toward reducing air pollution in top Asian economies: The role of green energy, eco-innovation, and environmental taxes
2	Gondwana Research	Q1	Sharif et al. [72]	2023	137	Demystifying the links between green technology innovation, economic growth, and environmental tax in ASEAN-6 countries: The dynamic role of green energy and green investment.
3	Review of Development Economics	Q3	Angelsen [52]	2016	122	REDD as Result-based Aid: General Lessons and Bilateral Agreements of Norway
4	Journal of Environmental Management	Q1	Sarpong et al. [54]	2023	73	A step towards carbon neutrality in E7: The role of environmental taxes, structural change, and green energy
5	Energy Policy	Q1	Dissanayake et al. [48]	2020	57	Evaluating the efficiency of carbon emissions policies in a large-emitting developing country.
6	Energy	Q1	Solaymani et al. [49]	2015	56	The impacts of climate change policies on the transportation sector
7	Environmental Science and Pollution Research	Q2	Loganathan et al. [73]	2020	50	The effects of total factor productivity, natural resources, and green taxation on CO2 emissions in Malaysia.
8	Energies	Q2	Yu et al. [53]	2022	48	Achieving the Carbon Neutrality Pledge through a Clean Energy Transition: Linking the Role of Green Innovation and Environmental Policy in E7 Countries
9	Environmental Science and Pollution Research	Q2	Ullah et al. [74]	2020	44	Examining the asymmetric effects of fiscal policy instruments on environmental quality in Asian economies.
10	Journal of Cleaner Production	Q1	Saelim [55]	2019	42	Carbon tax incidence on household demand: Effects on welfare, income inequality, and poverty incidence in Thailand

4.6. Journal and Platform Analysis

In this analysis, we will evaluate the list of authors and journals that have high citation rates in the context of research related to carbon taxes and environmental policy, as well as the factors that contribute to these achievements. Authors and journals that frequently appear in the table include Yusuf and Resosudarmo [39] and Dissanayake et al. [48] which has significant citations, namely 19, 55, and 57, respectively. Journals published in the Q1 category, such as Frontiers in Ecology and the Environment and Environmental Science and Pollution Research, have a strong reputation among academics and practitioners. This reputation is often associated with factors such as a strict peer-review process, high impact factors, and a wide international reach. These journals tend to attract the attention of researchers who want to publish relevant and impactful findings, thereby increasing the likelihood of citation [38, 48]. The relevance of the theme discussed also plays an important role in attracting the reader's attention. Research on carbon taxes and environmental policies is particularly relevant given the climate change challenges faced by many countries, especially in the ASEAN region. For example, research [39] shows that carbon taxes in Indonesia have a progressive impact, which attracts the attention of researchers and policymakers who focus on social and economic justice issues [39]. The number of articles published in these journals also contributes to visibility and citations. Journals that publish many high-quality articles tend to have more opportunities to attract citations, as they become primary sources of reference in a particular field. For example, Environmental Science and Pollution Research and Energy Policy publish numerous articles relevant to environmental and energy policy, thus attracting the attention of researchers in the field [42, 48].

The author's reputation also contributes to the citation rate. Authors who have a strong and recognized publication track record in their field tend to receive more citations. For example, authors such as Yusuf and Resosudarmo [39] have contributed to many relevant studies, thereby increasing their credibility and influence in the academic community. In terms of contribution to the research theme, these journals demonstrate multidisciplinary coverage that includes economics, environmental policy, and social studies. Journals such as Sustainability and Energy Policy not only address the technical

aspects of carbon tax policies but also the social and economic impacts, which makes them more relevant to diverse readers [43, 50]. Overall, the performance of these journals reflects trends in scientific publications in the field of environmental policy and carbon taxation. Relevant and high-quality research, published in reputable journals, tends to receive higher citations. Researchers who aim to publish research that is significant and relevant should consider targeting these journals, focusing on themes that are pertinent to current issues and global relevance. Thus, they can increase the visibility and impact of their research within the academic community and among practitioners.

5. Discussion

5.1. Key Findings Interpretation

The findings from the analysis of the research table show significant alignment with the existing literature in the field of climate change and renewable energy, especially in the context of ASEAN countries. Research highlighting themes such as carbon taxes, renewable energy, and environmental policy is in line with global trends identified by many researchers previously. For example, Harrison et al. [38] noted that developing countries, including those in Southeast Asia, face major challenges in implementing effective policies to reduce greenhouse gas emissions. This is also supported by the research of Yusuf and Resosudarmo [39], which shows the positive impact of carbon taxes in Indonesia, which is in line with the findings that carbon tax policy is the main focus of research in this region. Furthermore, the analysis indicates that Indonesia, Malaysia, and Thailand are the primary research locations, reflecting the high level of attention to climate change challenges in the region. Research by Wong et al. [42] determined the ideal carbon tax for Malaysia also showed that there are efforts to formulate policies that are appropriate to the local context, which is in line with the need to adapt environmental policies in developing countries [43]. This research highlights the importance of understanding the social and economic context in designing effective policies, which was also expressed by Sharif et al. [44] in their study of the relationship between environmental taxes and economic growth in ASEAN-6, there is harmony in the themes raised; however, some differences need to be noted. For example, although much research has focused on carbon taxes and the green energy transition, there is still a lack of research exploring the long-term impacts of these policies on local communities and economies. Research by Nguyen [46] emphasizes the need for further research to understand how environmental policies can be effectively adapted in various cultural and economic contexts. This suggests that, while there is extensive research addressing environmental policies, there remains room for deeper exploration of their social and economic impacts. Additionally, the analysis indicates that, despite a strong focus on carbon tax policies, research on green technology and the energy transition still requires improvement. Research by [45] underscores the importance of exploring equitable energy transition pathways in Indonesia, suggesting that there is a need to integrate social justice aspects into research on renewable energy. This aligns with findings that research in Southeast Asia often faces challenges in designing policies that are not only effective but also fair to all levels of society. Overall, the findings of this analysis suggest that while there is strong alignment with the existing literature, there are still challenges and opportunities that need to be explored further. Future research should focus more on developing models and strategies that can be adapted to local conditions, as well as exploring the long-term impacts of environmental policies on economies and communities. As such, more in-depth and contextual research will be essential to achieve the goals of reducing greenhouse gas emissions and sustainable economic development in the region.

5.2. Comparison with Existing Literature

Findings from a research analysis focusing on climate change and renewable energy in Southeast Asia provide significant theoretical implications for our understanding of environmental policy and economic growth. Research shows that themes such as carbon taxes, green energy transition, and the economic impact of environmental policies are the main focus, reflecting the need to develop a more comprehensive model in understanding the interaction between environmental policies and economic growth [39, 42]. One of the theoretical implications that emerges is the need for integration between economic theory and environmental theory in formulating effective policies. For example, research by Sharif et al. [44] suggests that environmental taxes can serve as incentives for green investments, which in turn can encourage sustainable economic growth. This challenges traditional models that separate economic growth from environmental considerations and demonstrates that the two can be mutually supportive if appropriate policies are implemented. Additionally, the analysis indicates that the challenges of implementing carbon tax policies in developing countries, as expressed by Wong et al. [43] require a more adaptive and contextual approach. This indicates that existing models need to be updated to include local variables that affect policy effectiveness, such as social, economic, and cultural conditions in each country. The study also highlights the importance of understanding the long-term impacts of the green energy transition, which can enrich existing frameworks by adding a temporal dimension to policy analysis [46]. Furthermore, these findings emphasize the need for more in-depth research on the relationship between environmental policies and socio-economic impacts, especially in countries with rapid economic growth such as Indonesia and Malaysia. Research by Harrison et al. [38], Kumar et al. [75] and Rahma et al. [41] shows that while there is potential for economic growth through environmental policies, there are also risks that must be managed, such as negative impacts on vulnerable communities [76]. It challenges the assumption that all environmental policies will always produce positive outcomes and demonstrates the need for a more holistic approach to policy formulation. In this context, research focused on the green energy transition and the use of environmentally friendly technologies, such as those conducted by Hersaputri et al. [45] makes an important contribution to the development of theories that link technological innovation to environmental policy. This shows that the adoption of green technology depends not only on government policies but also on the readiness of markets and societies to adapt to such changes. Therefore, existing models need to incorporate these factors to more accurately reflect the reality on the ground. Overall,

the findings of this analysis not only enrich our understanding of the dynamics between environmental policy and economic growth but also challenge us to develop more inclusive and adaptive models and frameworks. Further research is needed to explore how policies can be designed and implemented effectively in a variety of contexts, as well as to understand the long-term impacts of the green energy transition on the economy and the environment [47]. Thus, this research paves the way for the development of more robust and relevant theories in facing the challenges of climate change in the future.

6. Conclusion

6.1. Theoretical Contributions

Based on the analysis of the research trends and contexts identified in the table, there are several theoretical recommendations that can be made for academic researchers in the field of climate change and renewable energy. First, it is important for researchers to develop a more comprehensive theoretical framework that integrates various aspects of environmental policy, economic growth, and the social impact of the implementation of policies such as carbon taxes. Previous research has shown that carbon tax policies can significantly affect economic growth and greenhouse gas emissions [39, 42]. Therefore, the development of a model that considers the interaction between these variables will be very beneficial. Second, researchers need to pay attention to regional contexts, especially in developing countries in Southeast Asia, which face unique challenges in the implementation of environmental policies. Research shows that the transition to green energy and the use of environmentally friendly technologies must be adapted to local conditions. Therefore, the development of theories that take into account cultural, economic, and social factors in each country will provide deeper insights into the effectiveness of environmental policies. Furthermore, researchers are also advised to explore more diverse research methodologies, including qualitative and quantitative approaches, to gain a more holistic understanding of the issues at hand. Diverse methodologies can be helpful in identifying challenges and opportunities that may go undetected with a single approach. In addition, the use of more advanced data analysis technologies, such as network analysis and systems modeling, can provide new perspectives in understanding the complex dynamics between environmental policy and economic growth. Finally, researchers need to collaborate with stakeholders, including governments, the private sector, and civil society, to ensure that the research conducted is relevant and can be implemented practically. This collaboration will not only improve the quality of research but will also strengthen the impact of the resulting policies. Thus, these theoretical recommendations are expected to encourage more innovative and applicable research in facing the challenges of climate change and the energy transition in the future.

6.2. Practical Implications

Based on the analysis conducted on research trends related to climate change and renewable energy, there are several practical implications and recommendations that can be taken by practitioners in this field. First, it is important for policymakers to understand that carbon tax policies and incentives for renewable energy should be designed taking into account the economic and social context of each country, especially in developing countries in Southeast Asia such as Indonesia, Malaysia, and Thailand. Research shows that the implementation of these policies can significantly affect economic growth and the reduction of greenhouse gas emissions. Second, practitioners need to collaborate with researchers to develop models and strategies that can be adapted to local conditions. Research shows the importance of the green energy transition and the use of environmentally friendly technology as the main strategy to reduce emissions. Therefore, collaboration between the public and private sectors in green technology research and development is indispensable to create effective and sustainable solutions. Third, it is important for practitioners to pay attention to the challenges of environmental policy implementation. They must be ready to face resistance from various parties and find ways to involve the community in the decision-making process.

Education and raising public awareness about the benefits of renewable energy and environmental policies can help create broader support for the initiative. Fourth, more research is needed to explore the long-term impact of the green energy transition on the economy and the environment. This is in line with findings that suggest that research in this area still needs to be conducted to better understand the adaptation and implementation of effective environmental policies. Practitioners should encourage research focused on the development of new technologies and innovations that can improve energy efficiency and reduce emissions. Finally, practitioners in the field of environmental and renewable energy policy must continue to monitor research trends and adapt to the changes that occur. By understanding and applying the findings of recent research, they can create more effective and sustainable policies, as well as contribute to global efforts to address climate change.

6.3. Study Limitations

In conducting a systematic analysis of the existing literature, there are several limitations that need to be acknowledged. First, while the study covers a wide range of important themes related to climate change and renewable energy, a strong focus on ASEAN countries, particularly Indonesia, Malaysia, and Thailand, can lead to biases in the global understanding of these issues. Broader research outside the region may provide a different and more comprehensive perspective on the challenges and solutions faced in the context of climate change. Second, although there is a lot of research that addresses carbon tax policies and the green energy transition, it is possible that the methodologies used in these studies are not always consistent or transparent. This can affect the validity and reliability of the findings produced. For example, research that uses a qualitative approach may not be generalizable to a broader context, while quantitative research may not consider important contextual variables. Third, limitations in the available data can also affect the results of the analysis. Many studies rely on secondary data that may not always be accurate or up-to-date.

This can result in conclusions that do not fully reflect the reality on the ground, especially in rapidly changing contexts such as climate change and energy policy. In addition, the lack of longitudinal research evaluating the long-term impacts of

environmental policies and the green energy transition is also a challenge, as many studies only provide situational insights without considering the dynamics of time. Fourth, although this analysis includes a wide range of methodologies and approaches, it is possible that some of the more innovative or emergent methods are not well represented. Research that adopts new technologies or interdisciplinary approaches may provide deeper insights but are underrepresented in the existing literature. Therefore, it is important to continue to encourage more diverse and inclusive research to understand the complexity of environmental and energy issues more holistically. Thus, while this analysis provides a useful overview of research trends and contexts, it is important to be aware of existing limitations and encourage further research that can address these challenges. Future research needs to focus more on developing models that can be adapted to local conditions and have a greater positive impact on greenhouse gas emission reductions and sustainable economic development.

6.4. Future Research Direction

The purpose of this Systematic Literature Review (SLR) is to analyze and summarize research trends related to climate change and renewable energy, with a focus on environmental policy, economic growth, and air pollution. The scope of topics includes research focusing on countries in ASEAN, particularly Indonesia, Malaysia, and Thailand, which face significant challenges related to greenhouse gas emissions and the energy transition. The dominant findings in the literature suggest that research tends to focus on carbon tax policies and the transition to green energy. Keywords such as "carbon tax," "renewable energy," and "climate change" appear with high frequency, reflecting the global concern for reducing emissions and using sustainable energy. A common pattern is the linkage between environmental policies and economic growth, as well as the implementation challenges faced by developing countries in Southeast Asia. However, there are methodological limitations in previous studies, such as the lack of longitudinal research exploring the long-term impacts of environmental policies.

In addition, the gap in topics related to policy adaptation in various cultural and economic contexts still needs to be addressed. The theoretical contributions of this research can enrich the understanding of the interaction between environmental policy and economic growth, as well as provide practical implications for policymakers and industry. Recommendations for future research include the need for more in-depth studies on the long-term impacts of the green energy transition and the use of environmentally friendly technologies. Research should also explore models and strategies that can be adapted to local conditions to maximize the benefits of environmental policies and support sustainable economic development.

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