AFoSJ-LAS, Vol.5, No.2, 23 Juni 2025 (hal: 185-194) e-ISSN.2776-2408 ; p-ISSN 2798-9267

All Fields of Science J-LAS
Jurnal Penelitian
Availabel Online: https://j-las.lemkomindo.org/index.php/AFoSJ-LAS/index

The Role of Central Banks in Green Monetary Policy: A Systematic Literature Review

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Abstract

Climate change has introduced new challenges to global economic stability, prompting central banks to reconsider their roles in supporting the transition to a low-carbon economy. This study aims to evaluate the role of central banks in green monetary policy through a Systematic Literature Review (SLR) approach. By analyzing 31 selected scholarly articles from reputable international journals, this research identifies trends, instruments, and institutional dynamics related to the integration of climate policy into the monetary policy framework. The findings indicate that central banks have begun to develop instruments such as green quantitative easing, a preference for green bonds, and environmentally oriented window guidance. Nevertheless, the effectiveness of green monetary policy is significantly influenced by institutional capacity, cross-sectoral coordination, and the presence of a supportive legal framework. This review underscores the importance of evidence-based approaches, regulatory harmonization, and the strengthening of sustainability frameworks in designing climate-responsive monetary policies. The resulting policy implications are expected to serve as a reference for policymakers in enhancing the role of central banks in the era of climate change.

Keyword: Green Monetary Policy; Central Bank; Climate Change: Green Finance; Systematic Literature Review.

Peran Bank Sentral dalam Kebijakan Moneter Hijau: Tinjauan Literatur Sistematis

Abstrak

Perubahan iklim telah memunculkan tantangan baru bagi stabilitas ekonomi global, mendorong bank sentral untuk mempertimbangkan peran mereka dalam mendukung transisi menuju ekonomi rendah karbon. Studi ini bertujuan untuk mengevaluasi peran bank sentral dalam kebijakan moneter hijau melalui pendekatan Systematic Literature Review (SLR). Dengan menganalisis 31 artikel ilmiah terpilih dari jurnal bereputasi internasional, penelitian ini mengidentifikasi tren, instrumen, dan dinamika kelembagaan yang terkait dengan integrasi kebijakan iklim ke dalam kerangka kebijakan moneter. Temuan menunjukkan bahwa bank sentral mulai mengembangkan instrumen seperti green quantitative easing, preferensi terhadap obligasi hijau, dan window guidance berbasis lingkungan. Meskipun demikian, efektivitas kebijakan moneter hijau sangat dipengaruhi oleh kapasitas institusional, koordinasi lintas sektor, serta keberadaan kerangka hukum yang mendukung. Kajian ini menegaskan pentingnya pendekatan berbasis bukti, harmonisasi regulasi, dan penguatan kerangka kerja keberlanjutan dalam merancang kebijakan moneter yang adaptif terhadap risiko iklim. Implikasi kebijakan yang dihasilkan diharapkan dapat menjadi acuan bagi pengambil kebijakan dalam memperkuat peran bank sentral di era perubahan iklim.

***Kata kunci:** Kebijakan Moneter Hijau, Bank Sentral, Perubahan Iklim, Green Finance, Systematic Literature Review*

INTRODUCTION

Climate change has emerged as one of the most significant systemic risks affecting global economic stability in the 21st century. This phenomenon not only impacts the natural environment but also creates macroeconomic challenges by disrupting productivity, food security, public health, and the integrity of financial systems. In response to this complexity, there is an urgent need to integrate sustainability dimensions into the macroeconomic policy framework, including monetary policy.

Central banks, which have historically focused on price and financial stability, are increasingly being regarded as key actors in supporting the transition to a low-carbon economy. The growing urgency of the climate crisis has prompted a paradigm shift, wherein long-term economic stability is viewed as inseparable from environmental stability. Various international initiatives, including the outcomes of the COP26 conference, reflect increasing global attention to the role of central banks in addressing climate-related risks through adaptive and evidence-based policy approaches (Mustaqim, 2021).

Integrating climate considerations into monetary policy involves the development of innovative instruments such as green asset purchases, incentives for green bonds, and the strengthening of climate risk-based analytical frameworks. Studies by (Fikri, 2021) and (Meiyenti et al., 2023) emphasize the importance of synergy between monetary and fiscal policies in achieving a sustainable economic transition, especially in developing countries such as Indonesia. On the other hand, policy instruments like carbon taxes and green taxonomies are also considered strategic in balancing environmental and economic objectives simultaneously (Tjoanto & Tambunan, 2022).

However, this transformation in the role of central banks is not without challenges. The uncertainty surrounding the long-term impacts of climate change on key economic indicators, limited legal mandates, and potential tensions between monetary independence and climate objectives are critical issues that require thorough analysis. Moreover, the success of green monetary policy is strongly influenced by public legitimacy, inter-agency coordination, and the central bank's ability to communicate effectively with market participants and the broader public (Fitrianto et al., 2021) (Firmansyah & Mu'ammal, 2023).

Against this backdrop, this study aims to systematically review the scholarly literature on the role of central banks in green monetary policy. Using a Systematic Literature Review (SLR) approach, this research evaluates how central banks respond to climate change challenges, both through modified conventional instruments and through innovative policy solutions. The core focus is placed on policy integration, instrument effectiveness, institutional dynamics, and the macroeconomic implications of environmentally driven transition policies.

RESEARCH METHOD

This study employs a Systematic Literature Review (SLR) approach to identify, evaluate, and synthesize relevant literature concerning the role of central banks in green monetary policy. This approach is adopted to ensure replicability, transparency, and objectivity in the process of collecting and analyzing literature, as recommended in the SLR framework (Shaffril et al., 2021).

1. Data Sources and Search Strategy

Literature data were collected using the Publish or Perish (PoP) software, with Google Scholar serving as the primary database. The literature search strategy employed a combination of the keywords: "green monetary". These keywords were selected to capture the scope of research addressing the relationship between central banks, monetary policy, and environmental sustainability. The initial search yielded 966 articles, which were then exported in bibliographic data format for further analysis.

2. Inclusion and Exclusion Criteria

To maintain the quality and relevance of the selected literature, a two-stage screening process was conducted:

Stage 1: Selection Based on Journal Quality

From the initial 966 articles, a quality screening was performed by assessing the reputation of the publisher. Only articles published in reputable, peer-reviewed journals indexed internationally and managed by major academic publishers - Elsevier, Springer, Emerald, Taylor & Francis, and Wiley - were included. This filtering process resulted in 225 articles from high-quality academic journals.

Stage 2: Selection Based on Relevance and Research Focus

Further evaluation was conducted on the titles, abstracts, and contents of the articles to determine their alignment with the study's focus - namely, the role of central banks in monetary policy related to climate change, the integration of climate risks into financial stability frameworks, and the use of monetary instruments that support green finance.

Based on this relevance screening, 31 articles were selected for in-depth analysis in this study.

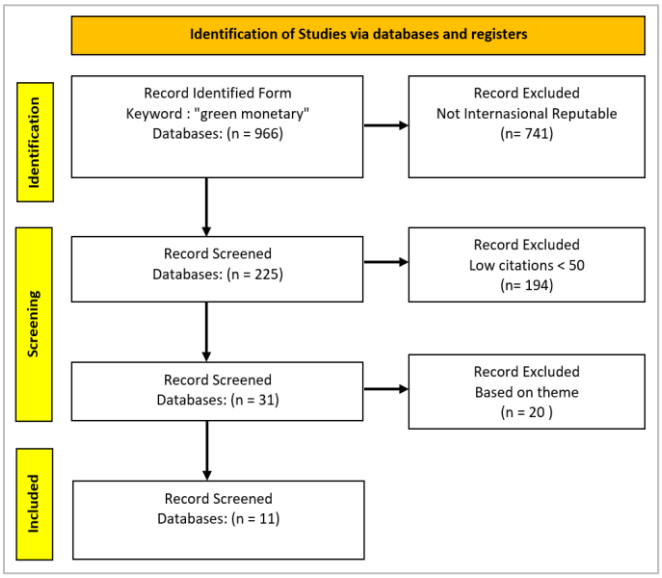

Figure 1 : Prisma Diagram

RESULTS AND DISCUSSIONS

Publication Trends and Journal Distribution

From the 31 articles reviewed, it is evident that the number of publications has increased significantly over the past five years. This trend reflects the growing attention

within the academic community to the importance of integrating environmental sustainability into monetary policy frameworks. These articles were predominantly published in leading journals such as Energy Economics, Renewable Energy, Ecological Economics, Journal of Sustainable Finance & Investment, and Environmental Economics and Policy Studies. The dominance of journals published by Elsevier indicates a strong contribution from the fields of economics and energy in advancing the discourse on green monetary policy.

The meta-analysis component of this study reveals that the theme of green monetary policy has experienced a notable rise in international academic interest in recent years. Based on data from reputable international journal publications, the number of articles addressing this topic has surged dramatically since 2019 - from only 2 articles to 81 in 2024. Moreover, as of May 2025, 35 articles have already been published. This consistent year-on-year increase highlights the global growth of interest in the role of monetary policy in supporting the environmental sustainability agenda - the so-called green agenda.

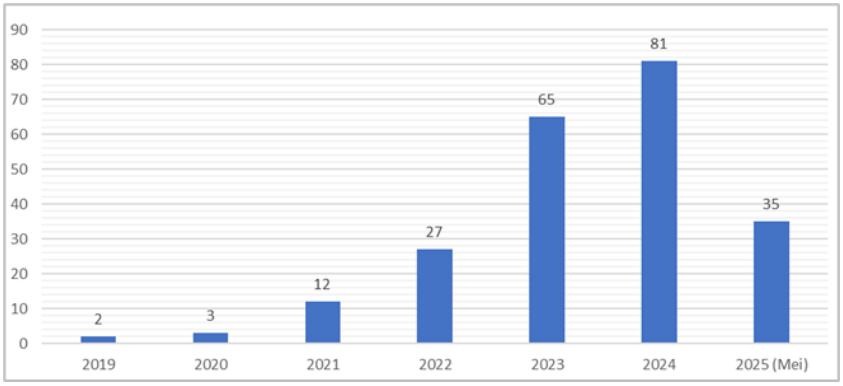

Figure 2 : Article distribution by year

From the perspective of publishers, the reviewed articles were predominantly published in high-impact journals from well-established academic publishers such as Elsevier (78 articles), Springer (74), and Taylor & Francis (50) - all widely recognized within the global academic community. The dominance of these major publishers indicates that the issue of green monetary policy has entered the mainstream of scholarly discourse, rather than remaining a peripheral topic. This finding affirms that the literature on green monetary policy is developing not only in terms of quantity but also in terms of quality and scholarly influence.

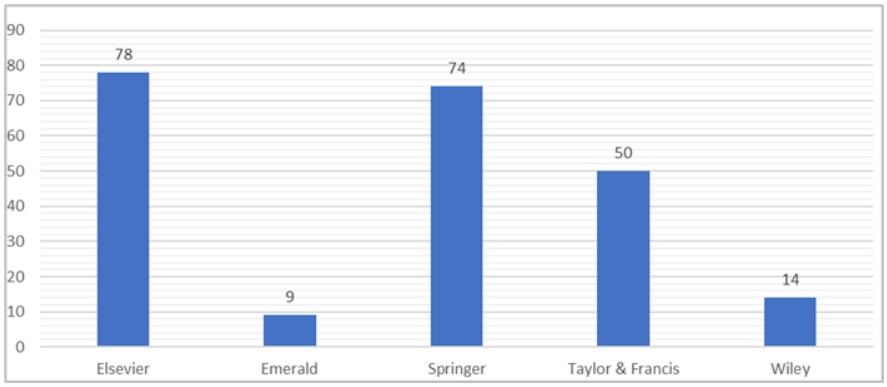

Figure 3 : Article distribution by journal

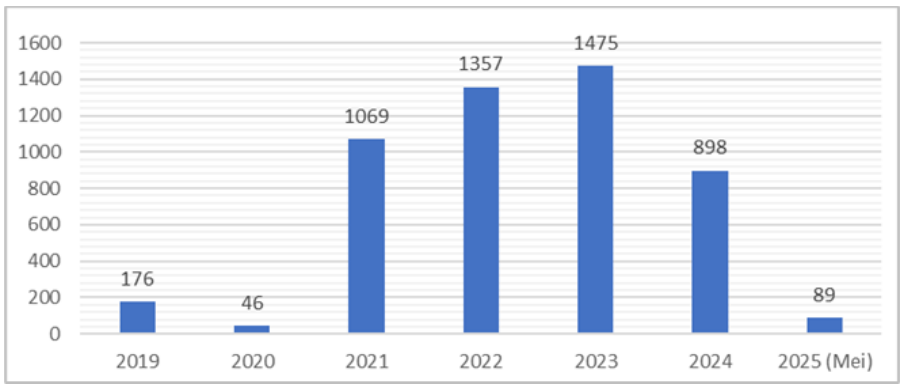

Figure 4 : Article citations by year

Beyond the number of articles, the impact of this theme is also evident in the growing number of citations. Citations increased sharply from 176 in 2019 to 1,475 in 2023. Although there was a slight decline in 2024, the citation count remained high at 898, and it had already reached 89 by May 2025. A total of 5,110 citations over a six-year period demonstrates that the topic of green monetary policy is not only widely studied but also frequently cited by other researchers. This reinforces its position as a critical and influential subject in the fields of economics and modern monetary policy.

Discussion

The systematic review of the selected articles reveals that the role of central banks in green monetary policy is evolving and becoming increasingly significant in supporting the transition toward a low-carbon economy. This discussion is organized around four major thematic areas identified in the literature:

1. Integration of Monetary and Climate Policy

Climate change has compelled central banks to reconsider their role in maintaining long-term economic stability. Several studies, such as those by (Chen et al., 2021) and (Boneva et al., 2022), emphasize that climate change can affect the transmission mechanism of monetary policy, create inflationary pressures, and alter the structure of financial risks. As a result, central banks can no longer ignore environmental factors in the formulation of monetary policy. The majority of the literature also suggests that there is potential to align climate objectives with macroeconomic goals, provided such alignment remains within the legitimate boundaries of central bank mandates. In this context, integrating climate policy into monetary policy is viewed as a systemic responsibility of central banks to uphold national and global economic resilience.

However, approaches to this integration vary widely across countries. In Europe, climate considerations have been formally embedded into central bank strategies-for example, in the European Central Bank (ECB)'s post-2021 strategic framework. In contrast, in many developing countries, the narrower scope of central bank mandates and limited inter-agency coordination have resulted in a more implicit approach to climate integration. Additionally, concerns have been raised that expanding central bank responsibilities could compromise monetary independence and draw central banks too far into fiscal or political

domains. Therefore, it is crucial for countries to tailor their integration strategies to domestic legal and institutional contexts, while ensuring that the green transition does not undermine the credibility and effectiveness of monetary policy.

2. Innovation in Green Monetary Policy Instruments

As the need to support the transition toward a green economy intensifies, various innovations in monetary policy instruments have emerged. Countries such as China and the European Union have adopted innovative approaches, including the integration of green bonds into monetary operations and the development of environment-based credit allocation incentives. (Macaire & Naef, 2023) found that the People's Bank of China's (PBoC) preferential treatment of green bonds increased the spread between green and conventional bonds, indicating a favorable bias toward environmentally friendly projects. Additionally, the European Central Bank (ECB) has implemented a portfolio tilting strategy to promote green asset allocation without significantly disrupting the monetary transmission mechanism.

Beyond open market operations, several studies highlight the use of window guidance as an informal policy tool by which central banks direct financial institutions to prioritize green sectors. (Dikau & Volz, 2023) note that although window guidance has declined with the maturation of financial systems, it remains effective in developing economies where financial markets are not yet fully liberalized. Nevertheless, the effectiveness of these instruments is highly contingent upon governance quality, transparency, and their alignment with fiscal and environmental policies. Therefore, when developing green monetary instruments, central banks must carefully consider the structure of their domestic financial systems and the capacity of markets to respond effectively to green incentives.

3. Impact on Macroeconomic Stability and Inflation

The transition to a low-carbon economy has important implications for macroeconomic stability, including effects on inflation, output, and purchasing power. (Ferrari & Nispi Landi, 2022) show that increases in carbon taxes may generate short-term inflationary pressures, especially if public expectations about future income are not yet rationally formed. Conversely, strong expectations of a green transition can suppress current demand, potentially creating deflationary pressures. This indicates that the inflationary impact of green policies depends largely on how households and market participants form expectations and adjust economic behavior in response to forward-looking policy frameworks.

Beyond expectations, (Mukherjee & Ouattara, 2021) demonstrate that climate shocks - such as rising temperatures - can lead to structural inflation, particularly in developing countries with vulnerable supply chains. This complicates the central bank’s task of maintaining price stability, as inflationary sources increasingly originate not from demand-side or monetary factors, but from supply-side and ecological disruptions. As a result, central banks are required to expand their macroeconomic analytical frameworks to incorporate climate risks as a new determinant in interest rate policy and inflation control. This also signals the need for updates in macroeconomic models to more accurately reflect the realities of today’s environmental risk landscape.

4. Institutional Roles and Policy Coordination

One of the key findings in the literature is that the success of green monetary policy is strongly influenced by institutional structures and the degree of inter-agency coordination. (Baer et al., 2021) argue that gaps between political and technical authorities may lead to institutional deadlock, which hampers the implementation of progressive policy reforms. This is particularly evident in countries with a strict separation between fiscal and monetary authorities or where central bank independence is emphasized rigidly. In such contexts, only policies that align with the shared interests of both authorities can be implemented - typically conservative in nature.

In contrast, (Svartzman et al., 2021) emphasize that systemic risks such as climate change require cross-sectoral and cross-jurisdictional coordination. Central banks, in their role as guardians of financial stability, are crucial in fostering synergies between fiscal, monetary, and environmental policies. In this regard, their proposed "three-layered framework" positions central banks not only as regulators and stabilizers but also as facilitators of long-term, collaborative policy design. Consequently, the effectiveness of green monetary policy depends not only on technical instruments but also on institutional quality, governance, and the degree of institutional cohesion.

5. The Role of Green Finance as a Supporting Mechanism

Green finance has emerged as a primary transmission channel for green monetary policy to the real sector. Research by (Wang et al., 2023) and (Xiong & Sun, 2023) indicates that the implementation of green finance policies can reduce energy intensity and boost investment in green sectors. In many cases, financial incentives such as interest subsidies, tax credits, and green credit schemes serve as key drivers of industrial transformation toward more sustainable production. Furthermore, green finance contributes to environmental technology innovation and enhances private sector participation in green projects.

However, the effectiveness of green finance is highly dependent on the quality of financial institutions, environmental information systems, and the clarity of the prevailing green taxonomy. (Sun et al., 2022) show that the impact of green policies tends to be greater in regions with underdeveloped financial sectors, due to unmet financing needs. This implies that central bank interventions through green finance can be inclusively impactful when properly targeted. Therefore, the development of green finance policies should be accompanied by efforts to enhance institutional capacity, regulatory harmonization, and the creation of an investment ecosystem that supports green innovation and accurate climate risk assessment.

6. Gaps, Regional Variation, and Challenges

The reviewed literature shows that green monetary policy is evolving unevenly across regions. Countries such as China, Germany, and France demonstrate high levels of engagement in green monetary reforms, including the adoption of green taxonomies, green bonds, and climate stress testing. However, in many other developing countries - especially outside of Asia - such structured policy implementation remains limited. (D'Orazio & Thole, 2022) highlight that although emerging markets show nominal engagement, substantial disparities remain in terms of policy capacity and data availability.

Other challenges include the lack of harmonized international standards, legal constraints on central bank mandates, and internal resistance to the expansion of central bank roles into climate domains. In addition, the scarcity of climate and ESG (Environmental, Social, and Governance) data poses a significant barrier to the design and evaluation of effective policies. Therefore, expanding the role of central banks in the climate agenda must be accompanied by efforts to build data infrastructure, strengthen institutional capacity, and raise awareness among both policymakers and the general public. This integrated approach enables the development of green monetary policies that are not only normatively desirable but also practically feasible and sustainable.

CONCLUSION AND RECOMENDATION

Conclusion

The systematic review of the selected literature reveals that the role of central banks in supporting green monetary policy is becoming increasingly prominent amid the escalating urgency of climate change. Nonetheless, this expanded role faces considerable challenges, both in terms of legal authority and institutional preparedness. A key finding is the tendency of central banks in many countries to broaden their mandates to incorporate climate-related issues into the monetary policy framework. This is being pursued either explicitly, through legal mandate revisions, or implicitly, by interpreting price and financial stability more broadly to include climate risks and long-term sustainability considerations.

Alongside the expansion of their role, there has also been a diversification of green monetary instruments. Several central banks have begun implementing incentive-based approaches, such as granting preferential treatment to green bonds in open market operations. Others have adopted administrative measures, such as window guidance, to direct credit flows toward environmentally friendly sectors. The choice of instruments is heavily influenced by the level of financial market maturity and institutional characteristics in each jurisdiction, leading to a high degree of policy heterogeneity across countries.

In the macroeconomic context, the green transition and the impacts of climate change introduce new challenges to price stability and monetary transmission. Central banks face short-term inflationary risks due to price adjustments during the transition to a low-carbon economy. Conversely, the systemic and long-term uncertainties of climate change may disrupt overall financial stability. Thus, the temporal dimension and the nature of climate risks must be carefully considered in the design of green monetary policy.

Ultimately, the effectiveness of green monetary policy depends critically on strong coordination among authorities, including fiscal authorities and financial regulators. Cross-sectoral synergy is key to addressing systemic and cross-border climate risks. At the same time, the development of green finance as the main transmission channel also demands transparent governance, sufficient data availability, and the capacity of domestic financial markets to absorb and allocate green capital. Without robust coordination and deep institutional reforms, the full potential of green monetary policy cannot be realized.

Recommendations

Based on the findings of this review, several strategic recommendations are proposed to enhance the role of central banks in supporting the sustainability agenda through green monetary policy. First, it is essential for governments to provide greater clarity - and where appropriate, expansion - of the legal mandates of central banks to explicitly include environmental and climate-related objectives. Clarifying this mandate will not only prevent potential role conflicts between economic stability and sustainability goals but also strengthen the legitimacy and accountability of central banks in responding to climate-related risks in a proactive and strategic manner.

Second, central banks should develop a comprehensive operational framework for green monetary policy. This includes the establishment of a clear and well-defined green taxonomy, the formulation of strict criteria for qualifying truly green assets, and the integration of climate risk management into the monetary decision-making process. A structured and transparent framework will enable central banks to ensure that their policy instruments are aligned with sustainable development objectives and capable of steering the financial system toward a low-carbon transition in a measurable, credible, and effective way.

REFERENCES

Baer, M., Campiglio, E., & Deyris, J. (2021). It takes two to dance: Institutional dynamics and climate-related financial policies. *Ecological Economics*. https://doi.org/10.1016/j.ecolecon.2021.107210

Boneva, L., Ferrucci, G., & Mongelli, F. P. (2022). Climate change and central banks: what role for monetary policy? *Climate Policy*. https://doi.org/10.1080/14693062.2022.2070119

Chen, C., Pan, D., Huang, Z., & Bleischwitz, R. (2021). Engaging central banks in climate change? The mix of monetary and climate policy. *Energy Economics*. https://doi.org/10.1016/j.eneco.2021.105531

D'Orazio, P., & Thole, S. (2022). Climate-related financial policy index: A composite index to compare the engagement in green financial policymaking at the global level. *Ecological Indicators*. https://doi.org/10.1016/j.ecolind.2022.109065

Dikau, S., & Volz, U. (2023). Out of the window? Green monetary policy in China: window guidance and the promotion of sustainable lending and investment. *Climate Policy*. https://doi.org/10.1080/14693062.2021.2012122

Ferrari, A., & Nispi Landi, V. (2022). Will the Green Transition Be Inflationary? Expectations Matter. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4226354

Fikri, A. A. H. S. (2021). Analisis Simultan Sektor Moneter Di Indonesia (Pendekatan Parsial Mundell-Fleming). *Jurnal Ekonomi Dan Pendidikan*, *18*(1). https://doi.org/10.21831/jep.v18i1.39895

Firmansyah, M., & Mu'ammal, I. (2023). Efektivitas Transmisi Kebijakan Moneter Jalur Kredit Dan Harga Aset Terhadap Pertumbuhan Ekonomi Pada Bank Sentral Di ASEAN-5. *Entrepreneurship Bisnis Manajemen Akuntansi (E-Bisma)*, 378–396. https://doi.org/10.37631/ebisma.v4i2.1206

Fitrianto, A., Rasyid, A. R., & Trisutomo, S. (2021). Indeks Keberlanjutan Kawasan Industri Ditepi Air. *Jurnal Pembangunan Wilayah Dan Kota*, *17*(3), 295–306. https://doi.org/10.14710/pwk.v17i3.34230

Macaire, C., & Naef, A. (2023). Greening monetary policy: evidence from the People's Bank of China. *Climate Policy*. https://doi.org/10.1080/14693062.2021.2013153

Meiyenti, I., Agustina, I., Primadhany, E. F., Tumija, & Nalien, E. M. (2023). Menganalisis

Kebijakan Fiskal Dan Moneter: Dampaknya Terhadap Stabilitas Ekonomi. *Jurnal Ekonomi Dan Kewirausahaan West Science*, *1*(03), 186–195. https://doi.org/10.58812/jekws.v1i03.503

Mukherjee, K., & Ouattara, B. (2021). Climate and monetary policy: do temperature shocks lead to inflationary pressures? *Climatic Change*. https://doi.org/10.1007/s10584-021-03149-2

Mustaqim, A. (2021). Pembangunan Berkelanjutan Atau Emisi Nol Persen. *Jurnal Media Penyiaran*, *1*(2), 83–92. https://doi.org/10.31294/jmp.v1i2.896

Shaffril, H. A. M., Samah, A. A., & Samsuddin, S. F. (2021). Guidelines for developing a systematic literature review for studies related to climate change adaptation. In *Environmental Science and Pollution Research*. https://doi.org/10.1007/s11356-021-13178-0

Sun, Y., Guan, W., Cao, Y., & Bao, Q. (2022). Role of green finance policy in renewable energy deployment for carbon neutrality: Evidence from China. *Renewable Energy*. https://doi.org/10.1016/j.renene.2022.07.164

Svartzman, R., Bolton, P., Despres, M., Pereira Da Silva, L. A., & Samama, F. (2021). Central banks, financial stability and policy coordination in the age of climate uncertainty: a three-layered analytical and operational framework. *Climate Policy*. https://doi.org/10.1080/14693062.2020.1862743

Tjoanto, A. K., & Tambunan, M. R. (2022). Tantangan Dan Strategi Dalam Proses Implementasi Kebijakan Pajak Karbon. *Jurnal Riset Akuntansi & Perpajakan (Jrap)*, *9*(02), 237–248. https://doi.org/10.35838/jrap.2022.009.02.20

Wang, Z., Yao-Ping Peng, M., Anser, M. K., & Chen, Z. (2023). Research on the impact of green finance and renewable energy on energy efficiency: The case study E−7 economies. *Renewable Energy*. https://doi.org/10.1016/j.renene.2022.12.077

Xiong, Q., & Sun, D. (2023). Influence analysis of green finance development impact on carbon emissions: an exploratory study based on fsQCA. In *Environmental Science and Pollution Research*. https://doi.org/10.1007/s11356-021-18351-z