

Exploring the Role of Artificial Intelligence in Combatting Greenwashing: A Bibliometric Analysis

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Abstract

Artificial Intelligence (AI) offers significant potential for companies aiming to adopt eco-friendly business practices. By leveraging AI for energy-efficient operations, businesses are increasingly focusing on reducing the environmental impact of their digital infrastructures. This paper explores the ways AI can improve environmental outcomes across multiple industries. However, some corporations use exaggerated marketing claims about the environmental benefits of their AI applications, resulting in misleading narratives.

This research uncovers the rise of "AI hype" within corporate environmental reporting. AI hype refers to the overstatement or misrepresentation of the environmental advantages of AI, which leads to "greenwashing." This occurs when companies exaggerate the ecological benefits of their AI and machine learning implementations. Our findings indicate that companies engaging in AI hype are more likely to mention environmental topics in their reports, while simultaneously contributing to rising levels of pollution at their plants. This pattern is observed across various sectors, demonstrating that the issue of AI hype is widespread. Such actions could erode public trust and damage reputations, potentially leading to legal challenges and hindering future innovation efforts. As more resources are funnelled into AI research and development, it is crucial for regulators, leaders, and investors to be mindful of the potential dangers posed by AI hype.

Keywords- Artificial Intelligence, Greenwashing, AI, Environment, Bibliometric Analysis

Introduction

The integration of greenwashing and artificial intelligence (AI) represents a significant area of study, focusing on the intersection of deceptive environmental marketing practices and technological advancements. Greenwashing, the practice by which organizations exaggerate their environmental efforts to mislead consumers, has gained prominence amid increasing scrutiny of corporate social responsibility (CSR) claims.

Greenwashing is a deceptive marketing practice that undermines genuine sustainability efforts. According to recent surveys, over 70% of executives believe that many organizations would be found guilty of greenwashing if thoroughly investigated, highlighting the urgency for effective detection methods (CFA Institute, 2024). AI plays a crucial role in identifying misleading claims and promoting authentic corporate responsibility.

This Current Study focus on consolidate existing research on how AI influences the dynamics of greenwashing, revealing both potential benefits and pitfalls in the context of corporate environmental claims. Greenwashing has evolved over decades, with scholars documenting various tactics employed by companies to create a facade of environmental responsibility.

Following high-profile conferences such as COP27 (UNFCCC), calls for accountability and transparency in corporate sustainability practices have intensified, prompting a surge in allegations against companies that have

misrepresented their ecological initiatives. The implications of greenwashing extend beyond consumer deception, affecting corporate reputation and financial performance, particularly as public awareness of environmental issues grows.

Background

Greenwashing is a marketing strategy where organizations exaggerate their environmental efforts to mislead consumers, often presenting a false image of being environmentally friendly while failing to take substantial actions to minimize their ecological impact. The term was first coined by environmentalist Jay Westerveld in 1986, inspired by the irony of hotel initiatives aimed at saving laundry costs under the guise of environmental concern. This deceptive practice has evolved significantly over the years and is now recognized as a sophisticated form of reputational laundering, particularly in the context of increasing public scrutiny and awareness regarding corporate social responsibility (CSR).

Evolution of Greenwashing

Greenwashing is a deceptive practice where companies falsely market their products or services as environmentally friendly to appeal to eco-conscious consumers, despite their actual practices being less sustainable. This tactic often involves misleading labels, vague or exaggerated claims, and even false assertions to make a brand appear greener than it is (Verma & Bharti, 2023; Şenyapar, 2024). The rise of consumer demand for sustainable products has made greenwashing a growing concern among both businesses and researchers, as it manipulates consumers into believing a company is more eco-friendly than it actually is (Budzanowska-Drzewiecka & Proszowska, 2024).

Several studies have explored the impact of greenwashing. Research shows that when consumers detect greenwashing, their attitudes toward the brand suffer, leading to reduced interest in purchasing so-called eco-friendly products (Shojaei et al., 2024). Additionally, consumers may develop negative emotions, like “flight shame,” toward brands that falsely claim sustainability (Neureiter & Matthes, 2022). Greenwashing erodes trust and makes it harder for consumers to support genuinely sustainable efforts (Şenyapar, 2024). Interestingly, those with more knowledge about environmental issues can more easily identify greenwashing, even in detailed compensation claims (Neureiter & Matthes, 2022).

To tackle greenwashing, experts recommend several solutions. These include stricter regulations, better consumer education, and the use of advanced technology like blockchain and IoT to ensure transparency in environmental claims (Şenyapar, 2024). Companies should also consider third-party certifications, independent audits, and focus on clear, honest communication about their sustainability efforts (Verma & Bharti, 2023). Looking ahead, researchers suggest examining how environmental, social, and governance (ESG) factors should be considered in greenwashing studies and exploring how corporate greenwashing affects different stakeholders (Liu et al., 2023).

Historically, discussions about greenwashing have highlighted various tactics employed by companies, including executional greenwashing, where brands evoke nature through imagery. The literature surrounding greenwashing is multidisciplinary, drawing from fields such as business, communication, and environmental management, yet no universally accepted. Researchers have documented a shift in focus towards greenwashing, especially after the COP27 conference in late 2022, where there was a call for zero tolerance towards such practices. This has resulted in an uptick in allegations and case studies across various sectors, particularly in energy and utilities, where companies like Shell and ENI have faced significant scrutiny.

Greenwashing and Its Implications

The concept of greenwashing can also encompass the "hidden trade-off" fallacy, where companies promote one environmentally friendly attribute of a product while neglecting other harmful aspects. For instance, the promotion of paper products as 'green' solely based on sustainable sourcing overlooks other detrimental practices in production, such as emissions from manufacturing processes. This deceptive marketing tactic not only undermines genuine efforts toward sustainability but can also mislead consumers who are increasingly inclined to support eco-conscious brands. As public awareness of environmental issues continues to grow, academic interest in greenwashing has expanded, resulting in a substantial body of literature that evaluates the implications of such practices on both consumer behaviour and corporate reputation. The complexities surrounding greenwashing necessitate ongoing research to explore its evolution and the role of technological advancements, including artificial intelligence, in combating or perpetuating these deceptive practices.

How AI Addresses Greenwashing

- **Data Analysis and Pattern Recognition:** AI utilizes advanced algorithms and machine learning to analyze vast datasets quickly. This capability allows organizations to identify patterns indicative of greenwashing, such as discrepancies between reported ESG practices and actual performance. Techniques like anomaly detection can highlight inconsistencies in claims made by companies
- **Real-Time Monitoring:** AI enables continuous monitoring of ESG data, allowing organizations to detect deviations from their commitments promptly. This real-time analysis facilitates immediate corrective actions, thereby enhancing accountability and transparency.

- **Natural Language Processing (NLP):** NLP techniques allow AI to scrutinize textual data from various sources, including sustainability reports and marketing materials. By understanding the context and sentiment behind these texts, AI can assess the authenticity of environmental claims made by companies.
- **Image and Video Recognition:** AI-powered image recognition technologies can analyse visual content used in advertisements and product packaging for misleading eco-friendly claims. This capability helps organizations identify deceptive imagery that may contribute to greenwashing.
- **Predictive Analytics:** AI can leverage historical data to predict future performance regarding sustainability initiatives. By forecasting potential outcomes based on current practices, organizations can align their strategies with genuine sustainability goals.

Literature Review

The intersection of artificial intelligence (AI) and corporate sustainability practices, particularly in the context of greenwashing, presents a complex landscape. Greenwashing, defined as the practice of misleading stakeholders about the environmental benefits of a company's products or practices, poses significant challenges to the integrity of sustainability reporting and corporate accountability. AI technologies have the potential to both exacerbate and alleviate these challenges.

AI can enhance the detection of greenwashing by analysing vast amounts of textual data from sustainability reports and corporate communications. Moodaley and Telukdarie (2023) highlight that advancements in AI allow for the rapid and accurate analysis of sustainability disclosures, which can help identify discrepancies between reported and actual environmental practices. This capability is crucial as the textual and qualitative nature of these disclosures often obscures the truth, making it difficult for stakeholders to discern genuine sustainability efforts from mere marketing tactics (Moodaley, 2023). Furthermore, Villiers emphasizes that AI text generation and processing can significantly impact sustainability reporting by providing tools to detect and analyse greenwashing, thus improving the reliability of such reports (Villiers, 2023).

However, the misuse of AI can also contribute to greenwashing. Companies may employ AI to craft misleading narratives that enhance their public image while masking unsustainable practices. For instance, the phenomenon of "machine-washing," where organizations engage in deceptive practices regarding ethical AI, parallels traditional greenwashing and raises concerns about the authenticity of corporate claims (Seele & Schultz, 2022). This duality underscores the importance of ethical AI practices, as highlighted by Peukert and Kloker, who discuss how ethicswashing—akin to greenwashing—can undermine consumer trust (Peukert & Kloker, 2020).

Moreover, the rise in stakeholder demand for transparency in sustainability practices has led to increased scrutiny of corporate disclosures. As noted by Mu, greenwashing not only disrupts market order but also negatively impacts a firm's financial health and reputation (Mao, 2023). This scrutiny is further amplified by the growing capabilities of AI in analysing environmental, social, and governance (ESG) data, which investors increasingly rely on to assess corporate sustainability. The lack of standardized reporting frameworks complicates this landscape, as companies may exploit these gaps to present favourable but misleading information (Antonicic, 2020).

Oppong-Tawiah & Webster (2023) in their paper investigates corporate sustainability communication on Twitter, focusing on greenwashing practices. It explores how firms use deceptive tactics in their environmental sustainability messages, drawing on theories from CSR, greenwashing, fake news, and deception detection. The study develops a method to analyse linguistic cues in tweets related to environmental sustainability to distinguish between truthful and deceptive communications, ultimately aiming to relate greenwashing to organizational financial market performance.

Another study by Abdeldayem & Aldulaimi (2022) explores the broader implications of integrating AI with green ideology in corporate and marketing strategies. It suggests that while AI can offer significant advantages in terms of efficiency and accuracy, it must also be aligned with sustainable practices to avoid contributing to greenwashing. The paper discusses practical implications for strengthening corporate image through sustainability strategies and addressing scandals related to greenwashing. By embedding AI and green ideology into corporate strategies, firms can better align their technological advancements with their sustainability goals, thereby enhancing consumer trust and corporate reputation.

Therefore, AI holds significant promise for enhancing the detection and prevention of greenwashing, it also poses risks if misused. The challenge lies in ensuring that AI technologies are employed ethically and transparently to support genuine sustainability efforts rather than facilitating deceptive practices. As organizations navigate this complex interplay, the establishment of robust regulatory frameworks and ethical guidelines will be essential to foster trust and accountability in corporate sustainability initiatives.

Methodology

To conduct the bibliometric analysis a multistep approach is used. First, we retrieved relevant data from the Scopus database, which is a comprehensive and widely-used source for academic and scientific publications (Liao & Wang, 2020). The search query was designed to capture literature at the intersection of artificial intelligence, sustainability, and greenwashing. The initial search yielded a dataset of relevant publications, which was then

cleaned, filtered, and organized for further analysis. Leveraging the capabilities of the R programming language, a powerful tool for statistical computing and data visualization, we then proceeded to analyse the retrieved data. The analysis involved various bibliometric techniques, including citation analysis, co-citation analysis, and keyword co-occurrence analysis, to uncover the intellectual structure, research trends, and influential works in this domain. The citation analysis allowed us to identify the most impactful publications, authors, and institutions contributing to the research on AI and sustainability, particularly in the context of addressing greenwashing. Co-citation analysis helped us understand the intellectual linkages and thematic clusters within the research landscape, while keyword co-occurrence analysis revealed the emerging concepts and areas of focus. The findings from this bibliometric analysis provide insights into the current state of research, the evolving role of AI in combatting greenwashing, and the potential future directions for this field of study.

Selection Process

The selection process comprised two primary stages. In the first stage, documents were initially screened based on titles and abstracts to identify those that met the selection criteria. This stage was performed in pairs to mitigate potential bias. Following individual assessments, researchers compared their findings; any divergences were resolved through consensus or by consulting a third researcher if necessary. The second stage involved a deeper analysis of the introductions and conclusions of the selected documents to further refine the list of relevant publications.

Data Extraction and Tools

Data extraction was conducted to gather pertinent information from the selected studies. The search strategy utilized databases such as Web of Science and Scopus, where specific keywords, including "greenwashing," "Greenwash," and "Greenwasher," were applied. The Scopus database provided a more detailed search capability, resulting in the identification of 263 publications across both databases

Analysis of Publication

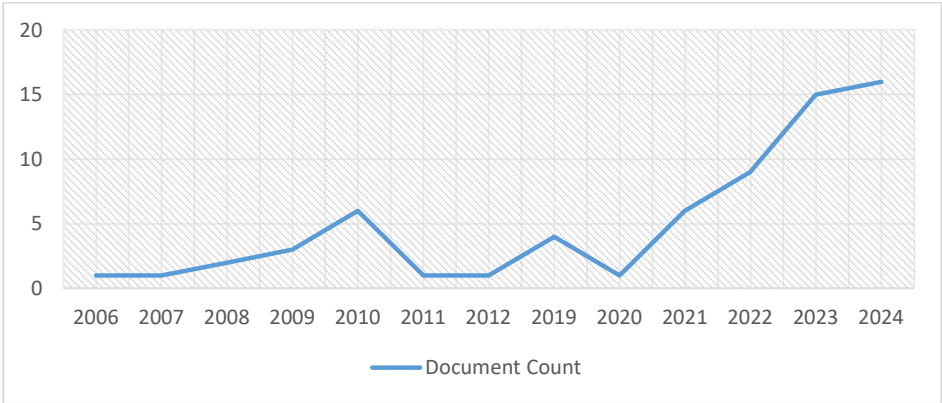


Figure 1: Scholarly Articles Published Annually

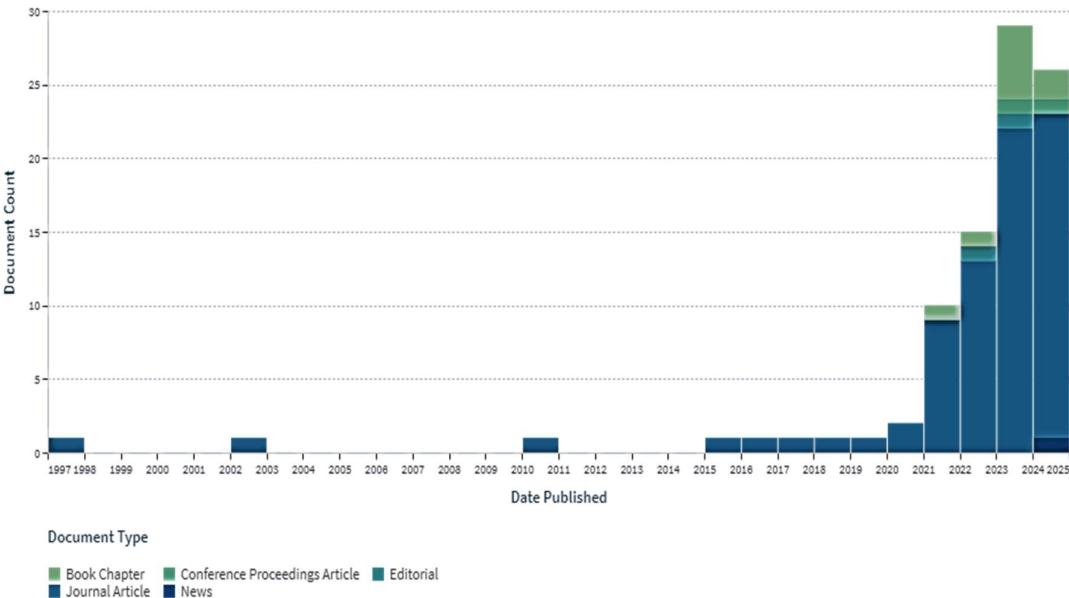


Figure 2: Segregation of Document Type

The number of publications remained consistently low, with only one publication each year in 1997, 2002, 2010, and annually from 2015 to 2019. There was a noticeable increase starting in 2020 with 2 publications, followed by a significant rise in 2021 with 10 publications. This upward trend continued with 15 publications in 2022, peaking at 29 in 2023, and slightly decreasing to 26 in 2024 (Figure 1). The line chart clearly illustrates a sharp increase in the number of publications starting from 2020, with the most dramatic growth occurring between 2021 and 2023. The trend shows a slight decline in 2024 but remains significantly higher than in previous years. Overall, the data indicates a substantial increase in the number of publications from 2020 onwards, suggesting a growing interest or focus in the subject matter during these years (Figure 1 and Figure 2). The Potential reason for sharp rise in publications could be attributed to increased research activity, funding, or interest in specific topics during this period. Further investigation into external factors during these years could provide additional insights.

Analysis of Author

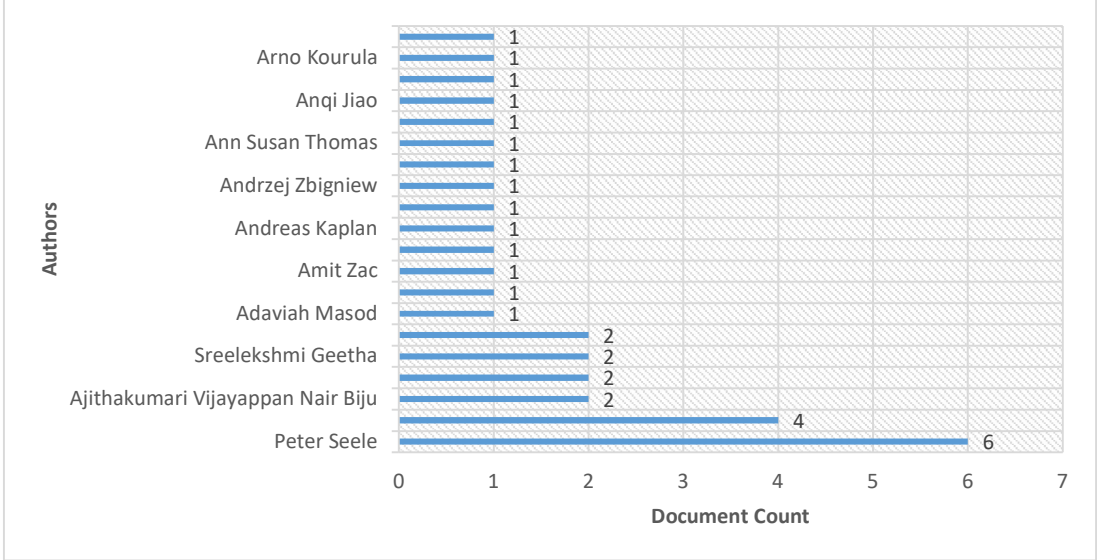


Figure 3: Most Productive Author writing in AI and Greenwashing

The bar graph illustrates the document count for the most active authors in a given research domain (Figure 3). The x-axis denotes the document count, while the y-axis lists the author names in descending order of their contributions. Peter Steele emerges as the most prolific contributor, with nearly 6 publications attributed to his name, highlighting his significant role in the domain. Mario D Schulz and Konid Bhardwaj follow closely, with each author contributing over 4 documents, indicating a consistent output in their respective areas of expertise. Ludovico Giacomo Conti and Mirdha Younis complete the top five, with document counts slightly exceeding 3.5, further underscoring their impactful participation in the research corpus. Authors such as Sreelakshmi Geetha, AgthalakshmiVijayappan Mali Biju, and Amit Zaa have moderate contributions, each author having contributed between 2 and 3 documents. The remaining authors, including Anderson Ingram, Anuj Rao, and Arno Kornulla, among others, exhibit a document count ranging from 1 to 2, reflecting their emerging but growing presence in the field. The average citations per year also peak between 2019 and 2023 (Figure 4).

Analysis of Citation

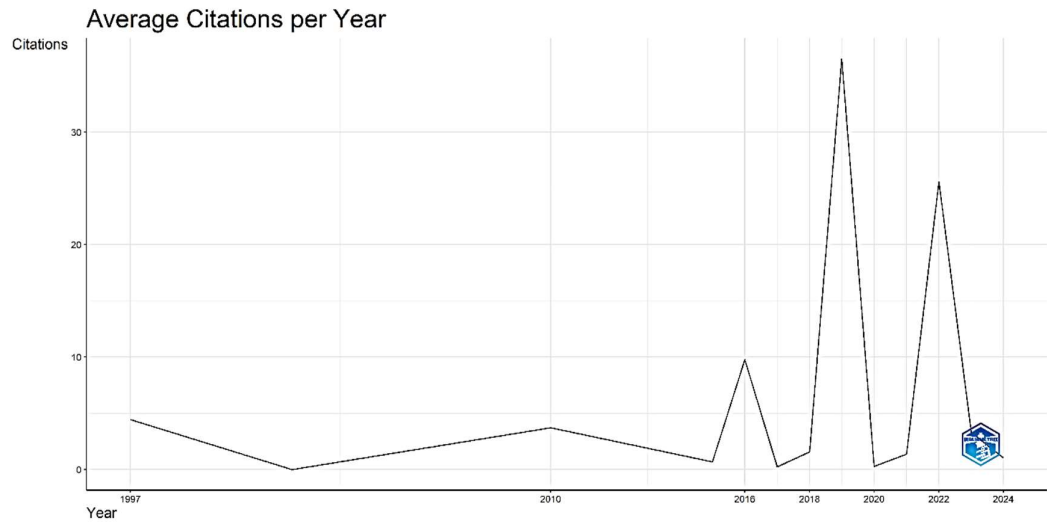


Figure 4: Average Citations per year

Table 1.1 presents key bibliometric indicators of the most globally cited documents in the context of AI and greenwashing. Bibliometric indicators such as total citations, citations per year, and normalized total citations help in identifying influential papers and understanding trends in the field.

Table 1.1: Key Bibliometric Indicators of the most Globally Cited Documents

Paper	DOI	Total Citation s	TC per Year	Normali zed TC
ROSENBOOM JG, 2022, NATURE REVIEWS. MATERIALS	10.1038/s41578-021-00407- 8	830	276.67	4.54
FLORIDI L, 2019, PHILOSOPHY & TECHNOLOGY	10.1007/s13347-019-00354- x	219	36.50	1.00
HEISKANEN E, 1997, JOURNAL OF CONSUMER POLICY	10.1023/a:1006862631698	125	4.46	1.00
KUMAR S, 2022, ANNALS OF OPERATIONS RESEARCH	10.1007/s10479-021-04410- 8	117	39.00	0.64
BURRITT R, 2016, ASIAN JOURNAL OF SUSTAINABILITY AND SOCIAL RESPONSIBILITY	10.1186/s41180-016-0007-y	88	9.78	1.00
LEE M, 2010, JOURNAL OF BUSINESS ETHICS	10.1007/s10551-010-0444-y	56	3.73	1.00
SEELE P, 2022, JOURNAL OF BUSINESS ETHICS	10.1007/s10551-022-05054- 9	53	17.67	0.29
FENG S, 2022, ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH INTERNATIONAL	10.1007/s11356-022-21826- 2	46	15.33	0.25
BARBOSA AS, 2023, HUMANITIES AND SOCIAL SCIENCES COMMUNICATIONS	10.1057/s41599-023-01919- 0	36	18.00	4.76
BÖHM S, 2022, JOURNAL OF BUSINESS ETHICS: JBE	10.1007/s10551-022-05239- 2	36	12.00	0.20

The dataset indicates a growing interest in the intersection of AI and sustainability, particularly in combating greenwashing, a practice where companies deceptively market themselves as environmentally friendly. The spike in recent citations suggests this is a field gaining rapid academic and practical attention. The highest cited papers, particularly those published after 2019, reflect an interdisciplinary approach—merging AI with ethics, consumer

behaviour, and operational research. The presence of papers in ethics (e.g., Floridi, 2019) and consumer behaviour (Heiskanen, 1997) shows that AI's role in addressing greenwashing is not purely technical. The discussion spans multiple disciplines, suggesting that the challenge of greenwashing requires a multi-faceted approach combining technology, policy, and public awareness.

This paper, published by Rosenboom JG in 2022, is by far the most cited paper in the dataset. The extremely high citation counts within a short period (830 total citations and 276.67 citations per year) indicate its significant impact on both the academic community and potentially industry discussions on AI and sustainability. Further the research article of Floridi, (2019), explores the ethical considerations of AI. It provides a philosophical framework that intersects AI's ethical implications with its potential misuse in greenwashing practices. Similarly, Heiskanen E (1997) work focuses on consumer policy, likely providing a foundation for understanding how AI might influence greenwashing practices in the context of consumer perceptions. Recent paper of Kumar (2022) combines AI with operational research to tackle greenwashing in a business context, suggesting that operational AI models can be instrumental in identifying and mitigating greenwashing.

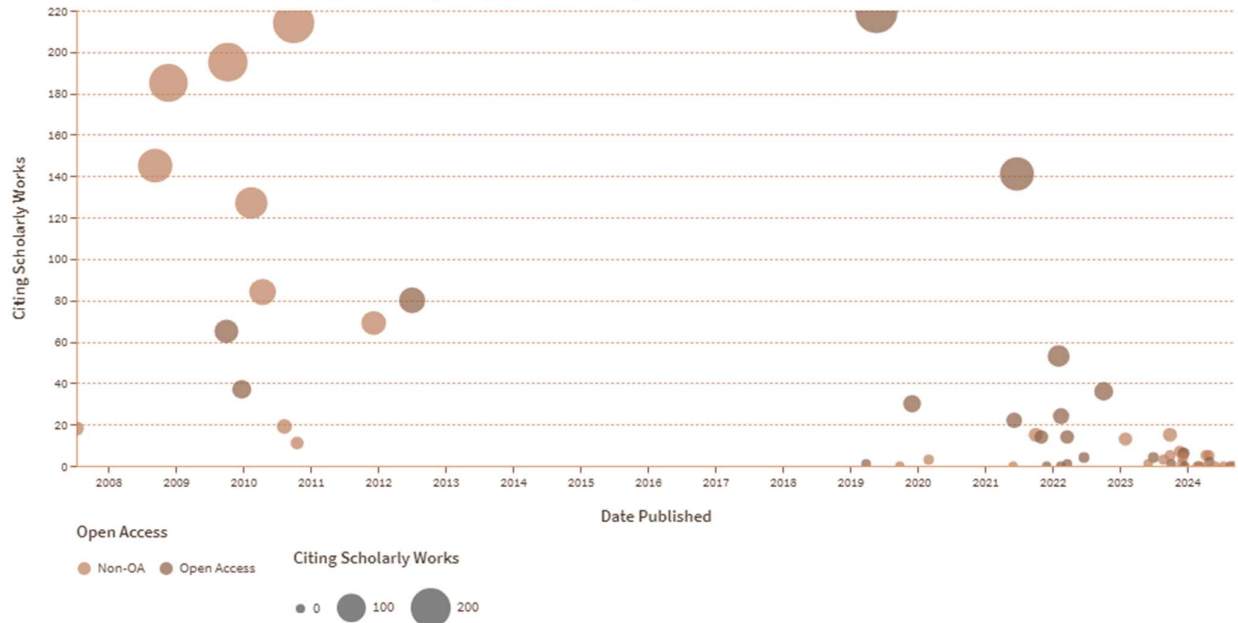


Figure 5: Analysis of citing scholarly work over years

The graph depicts an increasing trend in scholarly works citing research on AI and greenwashing over the years, especially between 2008 and 2024 (Figure 5). Notably, citations significantly rise after 2010, reaching a peak around 2011 and again around 2021, indicating heightened academic interest in those periods. The size of the circles represents the number of citing scholarly works, where larger circles suggest a higher number of citations. Post-2019, there's a resurgence in interest, potentially linked to growing global concerns around climate change, sustainability, and the role of AI in mitigating (or contributing to) greenwashing.

Light orange circles represent non-open access articles, while dark blue circles represent open-access ones. Most of the highly cited articles in earlier years (up to 2011) were non-open access. This shifted over time as open-access publications began gaining more traction in recent years (2020 onwards). The availability of open-access articles aligns with modern efforts to democratize knowledge and make research on critical issues, like environmental sustainability, more accessible.

Analysis of Journals

The analysis reveals that AI and greenwashing have garnered increasing academic attention, particularly around ethical implications, sustainable business practices, and environmental policies (Figure 6).



Figure 6: Top 20 Journals Publishing on AI and Greenwashing

The significant presence of open-access publications in recent years highlights growing accessibility and awareness, which is crucial for addressing global environmental issues. Journals like the Journal of Business Ethics lead the conversation, signaling the importance of ethical considerations in combating greenwashing practices exacerbated by AI technologies.

Environmental Science and Pollution Research, Journal of Cleaner Production, and Energy Research all contribute multiple documents, indicating that the nexus between AI, greenwashing, and environmental concerns is cross-disciplinary. In addition, Journals like Ethics and Information Technology and Sustainability are also relevant, indicating that technological ethics and sustainable business practices are important areas for this research. The diverse spread of journals shows that AI and greenwashing are discussed not only in environmental contexts but also in fields like ethics, business, and operational research.

Analysis of Countries and University

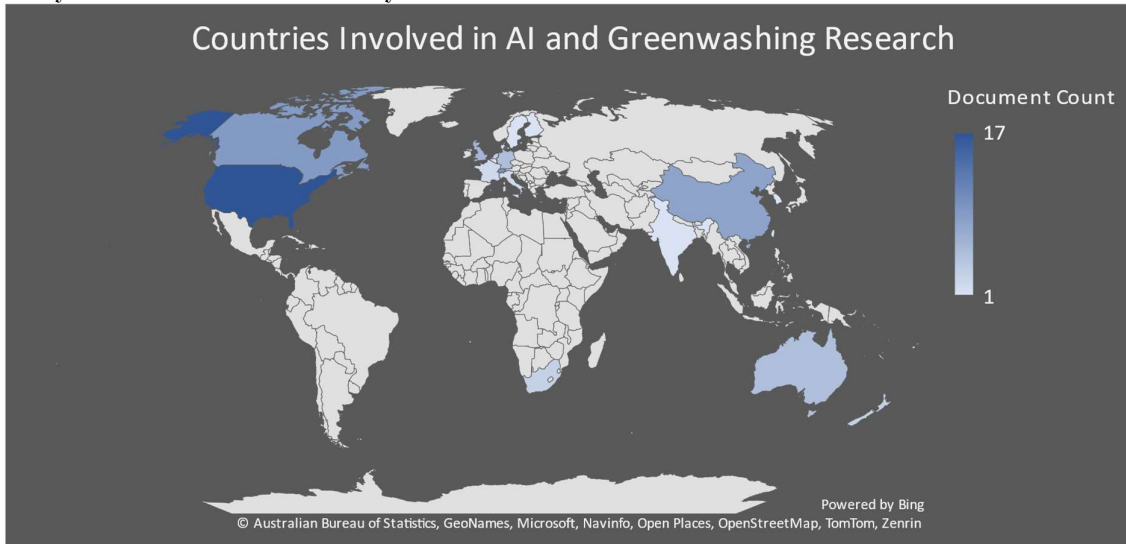


Figure 7: Productive and influential Countries involved in AI and Greenwashing research

The data reflects a concentrated effort by developed nations in researching the intersection of AI and greenwashing, particularly in regions with strong academic institutions and a commitment to ethical technology use (Figure 7). Countries like the United States, Switzerland, and Canada are at the forefront of the global conversation, emphasizing the importance of interdisciplinary approaches that involve AI, environmental science, and business ethics.

The graph indicates North America (United States and Canada) dominates the research landscape with a combined total of 26 documents. This reflects the region’s leadership in both AI technology development and environmental

research. Europe (represented by Switzerland, the United Kingdom, Germany, and others) is also a significant player, indicating its focus on ethical considerations and sustainable practices in AI applications. China, with 8 scholarly works, highlights the country's growing interest in addressing greenwashing through AI despite being a major industrial hub. China's increasing contribution reflects its policy shifts towards greener technologies.

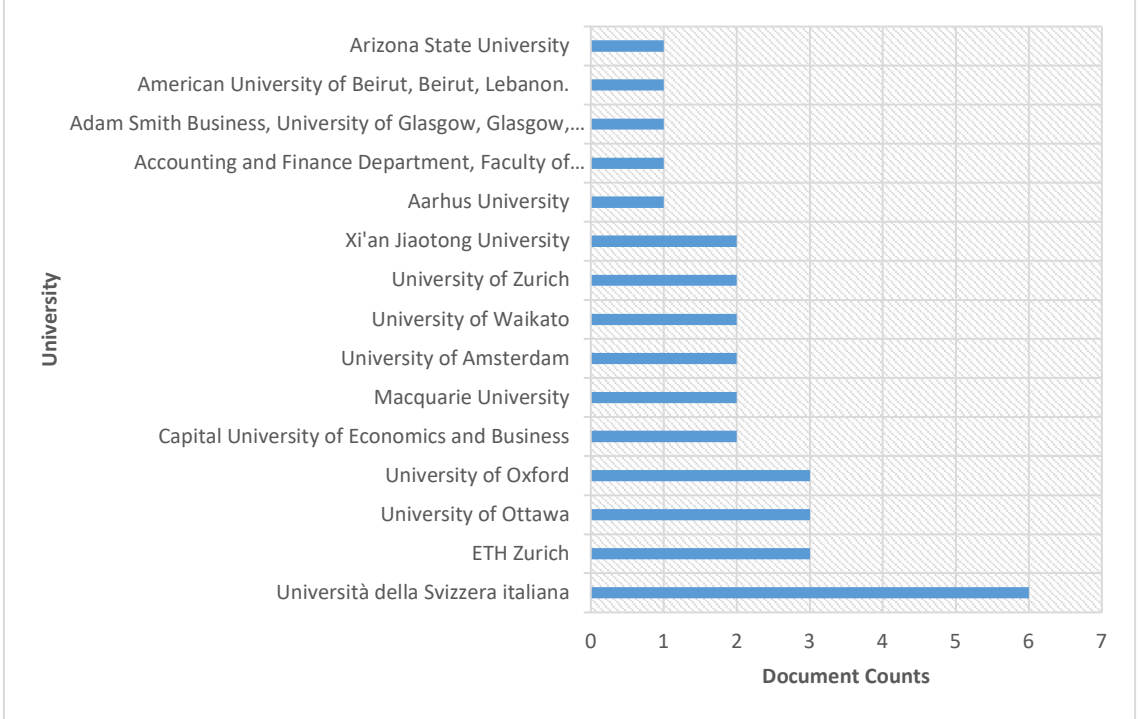


Figure 8: Top 15 Universities involved in AI and Greenwashing Research

The graph lists universities actively contributing to research on AI and greenwashing. Institutions with the highest document count, such as Università dellaSvizzeraitaliana (6 documents), ETH Zurich, and University of Ottawa (3 documents each), are notable leaders in the field. This suggests that these universities are at the forefront of investigating how AI can impact greenwashing practices.

The presence of universities from different countries (e.g., Switzerland, Canada, UK, China) reflects a global interest in exploring the intersection of AI and greenwashing. The diversity of institutions indicates that the subject is being addressed across various academic and cultural perspectives, enriching the discourse with a global viewpoint.

Conclusion

Analysis of citations reveals a growing academic and practical interest in the intersection of AI and sustainability, particularly in addressing greenwashing, where companies falsely present themselves as eco-friendly. Citations have surged since 2019, reflecting interdisciplinary research that integrates AI with ethics, consumer behavior, and operational research.

The shift from non-open access to open-access publications, particularly after 2020, aligns with efforts to make research on sustainability and AI more accessible, as global concerns around climate change and responsible AI use continue to grow.

Analysis of countries wise data underscores the regional disparities in research output and suggests potential areas for collaboration, particularly between developed and developing nations, to address global challenges related to AI and greenwashing.

The diverse spread of journals shows that AI and greenwashing are discussed not only in environmental contexts but also in fields like ethics, business, and operational research. The relationship between AI and greenwashing in firms is a nascent but promising field. AI technologies offer significant potential for analysing sustainability reports and detecting greenwashing, although this area remains underexplored. Further research is needed to develop and refine AI tools that can effectively identify different types of greenwashing in corporate communications.

The bibliometric analysis demonstrates that AI is not only a technical tool but also an ethical and operational ally in the fight against greenwashing. Moving forward, interdisciplinary research combining AI with ethics, consumer protection, and policy is essential in creating more transparent corporate sustainability practices.

This review employs a bibliometric analysis, to analyse over 236 scholarly articles on greenwashing. Key themes emerging from the literature include the role of regulatory frameworks and external monitoring in mitigating deceptive practices, as well as methodological limitations that hinder comprehensive understanding. The findings indicate a critical need for interdisciplinary approaches to explore the complexities of greenwashing, AI technologies, and their collective impact on sustainability discourse. As the relationship between greenwashing and AI continues to unfold, the literature reveals both opportunities and challenges for organizations striving for genuine environmental accountability. Future research directions emphasize the importance of developing robust frameworks and assessment tools to distinguish between authentic sustainable practices and superficial claims, ultimately enhancing consumer trust and promoting a more responsible corporate landscape.

Limitations and Considerations

Several limitations influenced this study. The specific databases chosen may restrict the comprehensiveness of the literature review, as certain journals and languages could be excluded. Moreover, while Bibliometric analysis offers robust insights, inherent limitations of each method may lead to oversimplifications and biases in interpreting themes. Finally, as the study relies on citation analysis as a proxy for impact, it is subject to citation biases, which necessitates a cautious interpretation of the findings

References

- Antonicic, M. (2020). Uncovering hidden signals for sustainable investing using Big Data: Artificial intelligence, machine learning and natural language processing. *Journal of Risk Management in Financial Institutions*, 13(2), 106. <https://doi.org/10.69554/CIKJ7477>
- Baqi, A., Abdeldayem, M. M., & Aldulaimi, S. H. (2022). Embedding artificial intelligence and green ideology in formulating corporate and marketing strategies. 2022 ASU International Conference in Emerging Technologies for Sustainability and Intelligent Systems (ICETIS), 1–4. <https://doi.org/10.1109/ICETIS55481.2022.9888893>
- Budzanowska-Drzewiecka, M., & Proszowska, A. (2024). Greenwashing. In *Reference Module in Social Sciences*. Elsevier. <https://doi.org/10.1016/b978-0-443-13701-3.00146-8>
- De Bruyn, A., Viswanathan, V., Beh, Y. S., Brock, J. K.-U., & Von Wangenheim, F. (2020). Artificial intelligence and marketing: Pitfalls and opportunities. *Journal of Interactive Marketing*, 51(1), 91–105. <https://doi.org/10.1016/j.intmar.2020.04.007>
- Dirican, C. (2015). The effects of technological development and artificial intelligence studies on marketing. *Pressacademia*, 2(3), 178–178. <https://doi.org/10.17261/Pressacademia.2015312948>
- Durmuş Şenyapar, H. N. (2024). Unveiling Greenwashing Strategies: A Comprehensive Analysis of Impacts on Consumer Trust and Environmental Sustainability. *Journal of Energy Systems*, 164–181. <https://doi.org/10.30521/jes.1436875>
- Hermann, E. (2023). Artificial intelligence in marketing: Friend or foe of sustainable consumption? *AI & SOCIETY*, 38(5), 1975–1976. <https://doi.org/10.1007/s00146-021-01227-8>
- Isensee, C., Griesse, K.-M., & Teuteberg, F. (2021). Sustainable artificial intelligence: A corporate culture perspective. *Sustainability Management Forum | Nachhaltigkeits Management Forum*, 29(3–4), 217–230. <https://doi.org/10.1007/s00550-021-00524-6>
- Javed, U., Rashid, M. A., Hussain, G., & Shafique, S. (2023). Consumers' perception of green brand attributes and its outcomes: a sustainable perspective. *Journal of Environmental Planning and Management*, 67(8), 1655–1677. <https://doi.org/10.1080/09640568.2023.2178882>
- Liu, Y., Li, W., Meng, Q., & Wang, L. (2023). Why greenwashing occurs and what happens afterwards? A systematic literature review and future research agenda. *Environmental Science and Pollution Research*, 30(56), 118102–118116. <https://doi.org/10.1007/s11356-023-30571-z>
- LUO, Xiao-xiao; WANG, Ting; and LIAO, Bin (2020) "Bibliometric analysis of hot spots and trends of industrial agglomeration in China," *Journal of Science and Technology Management: Vol. 22: Iss. 3, Article 8*. <https://doi.org/10.16315/j.stm.2020.03.001>
- Mao, Y. (2023). Current state and future development of artificial intelligence in marketing. *Applied and Computational Engineering*, 6(1), 536–541. <https://doi.org/10.54254/2755-2721/6/20230884>
- Mhlanga, D. (2021). Artificial intelligence in the industry 4.0, and its impact on poverty, innovation, infrastructure development, and the sustainable development goals: Lessons from emerging economies? *Sustainability*, 13(11), 5788. <https://doi.org/10.3390/su13115788>
- Moodaley, W., & Telukdarie, A. (2023). Greenwashing, sustainability reporting, and artificial intelligence: A systematic literature review. *Sustainability*, 15(2), 1481. <https://doi.org/10.3390/su15021481>
- Neureiter, A., & Matthes, J. (2022). Comparing the effects of greenwashing claims in environmental airline advertising: perceived greenwashing, brand evaluation, and flight shame. *International Journal of Advertising*,

- 42(3), 461–487. <https://doi.org/10.1080/02650487.2022.2076510>
- Oppong-Tawiah, D., & Webster, J. (2023). Corporate sustainability communication as ‘fake news’: Firms’ greenwashing on twitter. *Sustainability*, 15(8), 6683. <https://doi.org/10.3390/su15086683>
- Peukert, Christian & Kloker, Simon. (2020). Trustworthy AI: How Ethicswashing Undermines Consumer Trust. 10.30844/wi_2020_j11-peukert.
- Sætra, H. S. (2021a). A framework for evaluating and disclosing the ESG related impacts of ai with the SDGS. *Sustainability*, 13(15), 8503. <https://doi.org/10.3390/su13158503>
- Sætra, H. S. (2021b). Ai in context and the sustainable development goals: Factoring in the unsustainability of the sociotechnical system. *Sustainability*, 13(4), 1738. <https://doi.org/10.3390/su13041738>
- Sanders, N. R., Boone, T., Ganeshan, R., & Wood, J. D. (2019). Sustainable supply chains in the age of AI and digitization: Research challenges and opportunities. *Journal of Business Logistics*, 40(3), 229–240. <https://doi.org/10.1111/jbl.12224>
- Seberíni, A., Tokovská, M., & Izáková, K. (2024). Greenwashing – The Dark Side of Eco-Friendly Marketing. A Case Study from Slovakia. *Studia Ecologiae et Bioethicae*, 22(1), 83–95. <https://doi.org/10.21697/seb.5800>
- Seele, P., & Schultz, M. D. (2022). From greenwashing to machinewashing: A model and future directions derived from reasoning by analogy. *Journal of Business Ethics*, 178(4), 1063–1089. <https://doi.org/10.1007/s10551-022-05054-9>
- Shojaei, A. S., Barbosa, B., Oliveira, Z., & Coelho, A. M. R. (2024). Perceived greenwashing and its impact on eco-friendly product purchase. *Tourism & Management Studies*, 20(2), 1–12. <https://doi.org/10.18089/tms.20240201>
- Sova, O., Bieliaieva, N., Antypenko, N., & Drozd, N. (2023). Impact of artificial intelligence and digital HRM on the resource consumption within sustainable development perspective. *E3S Web of Conferences*, 408, 01006. <https://doi.org/10.1051/e3sconf/202340801006>
- Sthorm. (n.d.). How artificial intelligence can help combat greenwashing. LinkedIn. Retrieved from <https://www.linkedin.com/pulse/how-artificial-intelligence-can-help-combat-greenwashing-sthorm/>
- Szabo, S., & Webster, J. (2020). Perceived Greenwashing: The Effects of Green Marketing on Environmental and Product Perceptions. *Journal of Business Ethics*, 171(4). <https://doi.org/10.1007/s10551-020-04461->
- Van Wynsberghe, A. (2021). Sustainable ai: Ai for sustainability and the sustainability of ai. *AI and Ethics*, 1(3), 213–218. <https://doi.org/10.1007/s43681-021-00043-6>
- Verma, M., & Bharti, U. (2023). Combating Greenwashing Tactics and Embracing the Economic Success of Sustainability. *VEETHIKA-An International Interdisciplinary Research Journal*, 9(3), 6–12. <https://doi.org/10.48001/veethika.2023.09.03.002>
- Villiers, Charl & Dimes, Ruth & Molinari, Matteo. (2024). How will AI text generation and processing impact sustainability reporting? Critical analysis, a conceptual framework, and avenues for future research. *Sustainability Accounting Management and Policy Journal*. 15. 96-118. 10.1108/SAMPJ-02-2023-0097.
- Vinuesa, R., Azizpour, H., Leite, I., Balaam, M., Dignum, V., Domisch, S., Felländer, A., Langhans, S. D., Tegmark, M., & Fuso Nerini, F. (2020). The role of artificial intelligence in achieving the Sustainable Development Goals. *Nature Communications*, 11(1), 233. <https://doi.org/10.1038/s41467-019-14108-y>
- Ying, Y., Cui, X., & Jin, S. (2023). Artificial intelligence and green total factor productivity: The moderating effect of slack resources. *Systems*, 11(7), 356. <https://doi.org/10.3390/systems11070356>
- www.uncff.int
- https://www.ey.com/en_no/digital/can-artificial-intelligence-uncover-greenwashing
- <https://www.cfainstitute.org/en/professional-insights-stories/how-ai-combats-greenwashing>
- <https://www.reblueventures.com/blog/combating-greenwashing-with-ai>