
CARBON TAXATION AND ENTERPRISE STRATEGY: A BIBLIOMETRIC ANALYSIS OF GLOBAL RESEARCH FROM 2010 TO 2025 WITH POLICY IMPLICATIONS FOR VIETNAM

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Abstract:

Carbon taxation is increasingly recognized as a market-based instrument for internalizing emissions externalities and influencing firms' strategic behavior. In the context of Vietnam's net-zero commitment and evolving carbon-pricing agenda, understanding how carbon taxation relates to enterprise strategy has become increasingly important, although existing evidence remains fragmented. This study provides a bibliometric synthesis of the global literature on carbon taxation with an explicit focus on enterprise-level strategy. Based on 152 publications indexed in the Web of Science Core Collection from 2010 to 2025, with a total of 4,150 citations, the study applies performance analysis and science-mapping techniques using VOSviewer and the bibliometrix package in RStudio. The results show a marked increase in publication output after 2020, suggesting that this is a rapidly expanding yet still relatively young research field. Six dominant thematic streams emerge: carbon tax governance and instrument interactions; firm-level strategic responses; low-carbon supply-chain decisions; innovation and competitiveness under tax pressure; system- and technology-oriented modeling; and performance-oriented strategic adaptation in regulatory contexts. Based on these patterns, the study discusses implications for Vietnam's research and policy agenda, emphasizing policy coordination, sequencing, revenue recycling, and enterprise-level adjustments in production, investment, and supply-chain management. Overall, the study offers a structured knowledge base for future research and policy design in emerging economies.

Key words: Carbon taxation, enterprises, Vietnam, strategy, sustainable development.

1. Introduction

In response to intensifying global environmental challenges, carbon taxation has gained prominence as a market-based policy instrument for mitigating climate change while shaping firms' strategic behavior. For enterprises operating in developing economies such as Vietnam, strategic preparedness for carbon taxation extends beyond environmental compliance and increasingly constitutes a determinant of long-term competitiveness. This interaction between carbon tax policy and corporate strategy is particularly salient in the Vietnamese context, where economic growth is accompanied by heightened exposure to climate-related risks and a growing contribution to global greenhouse gas emissions.

Vietnam exhibits a high degree of exposure to the impacts of climate change, reflecting both its geographic characteristics and development trajectory. With a land area of 331,212 square kilometers and a population exceeding 99 million, the country ranks 58th in climate vulnerability and 93rd in readiness according to the Notre Dame Global Adaptation Initiative (ND-GAIN) Index. Located within the tropical cyclone belt, Vietnam is recurrently affected by severe natural hazards, including typhoons, floods, and droughts. Empirical evidence indicates that, over the past five decades, average temperatures have risen by approximately 0.5°C, sea levels by around 20 cm, and both the frequency and intensity of extreme weather events have increased. At the same time, Vietnam has emerged as the world's 17th-largest greenhouse gas emitter, with emissions rising from approximately 300.4 MtCO₂eq in 2020 to 344 MtCO₂eq in 2022, and projected to reach 515.8 MtCO₂eq by 2030 (Tri et al., 2023). Collectively, these dynamics underscore the urgency of effective emissions mitigation and the importance of durable policy instruments managing long-term decarbonization challenges.

Vietnam is developing both a carbon market and prospective carbon tax instruments, with a national carbon trading system expected to become operational by 2026. This evolving policy landscape necessitates proactive strategic responses from Vietnamese enterprises. By internalizing the external costs associated with greenhouse gas emissions, carbon taxation incentivizes firms to reassess production processes, cost structures, and investment decisions, thereby reducing their environmental footprint. While such regulatory measures may intensify compliance pressures, they also have the potential to create strategic opportunities, enabling firms to enhance competitiveness through innovation, adoption of cleaner technologies, and improvements in operational efficiency.

To systematically examine these issues, this study employs a bibliometric approach to synthesize the academic literature on carbon taxation and enterprise-level strategy based on publications indexed in the Web of Science Core Collection from 2010 to 2025. The study pursues two specific objectives. First, it provides a bibliometric mapping of the global literature on carbon taxation and enterprise-level strategy during the period 2010–2025. Second, informed by these bibliometric findings and the Vietnamese policy context, it discusses the implications of this literature for research, policy design, and enterprise adaptation in Vietnam and other emerging economies. To achieve these objectives, the study addresses the following research questions:

- **RQ1.** What are the publication trends and growth patterns in research on carbon taxation and enterprise-level strategy from 2010 to 2025?
- **RQ2.** Who are the most influential authors, documents, and sources in this field?
- **RQ3.** What are the dominant keywords and thematic clusters characterizing this body of literature?
- **RQ4.** Which countries have contributed most prominently to this research area over time?
- **RQ5.** What broader implications do these bibliometric patterns suggest for future research and policy discussions on carbon taxation, especially in emerging economies?

This study contributes to the literature in three ways. First, it provides an updated bibliometric synthesis of carbon taxation and enterprise-level strategy research for the period 2010–2025. Second, it clarifies the main thematic streams through which carbon taxation has been connected to firm-level strategic responses, including production and pricing decisions, technology upgrading, innovation, and low-carbon supply-chain adjustment. Third, it extends the discussion beyond descriptive global mapping by interpreting the bibliometric findings in relation to Vietnam’s emerging carbon-pricing agenda, thereby offering policy-relevant implications for an emerging economy where carbon-related fiscal and market-based instruments are still developing.

The remainder of the paper is organized as follows. Section 2 reviews the literature on carbon taxation and enterprise strategy. Section 3 describes the research methodology. Section 4 presents the empirical results. Section 5 discusses the implications of the findings. Section 6 concludes the paper.

2. Literature review

2.1. Conceptual boundaries: carbon taxes within the broader carbon pricing landscape

A carbon tax is a fiscal instrument that puts a price on greenhouse-gas emissions by charging a fee per unit of CO₂ (or CO₂-equivalent) emissions, either measured directly or proxied through the carbon content of fuels. In policy practice, carbon taxation is usually discussed within the wider carbon pricing toolbox, which also includes emissions trading systems (ETS), fuel excises framed around climate objectives, and hybrid policy packages. The World Bank’s State and Trends of Carbon Pricing reports document the steady expansion of carbon pricing instruments; by April 2023, there were 73 active carbon pricing or emissions trading mechanisms worldwide covering about 23% of global emissions (World Bank, 2023). Although such policies remain more common in high-income economies, several middle-income countries, including Brazil, Malaysia, Thailand, Turkey, and Vietnam, have actively explored carbon pricing measures in recent years (World Bank, 2023).

A practical challenge for synthesis is terminological overlap. Across economics, public finance, and management research, “carbon tax”, “carbon pricing”, “environmental tax,” and “green tax” are sometimes used interchangeably, even though they can refer to different policy architectures. To avoid ambiguity, this study uses carbon taxation to denote research that explicitly examines carbon tax mechanisms, tax design and implementation, incidence and distributional effects, revenue recycling, and strategic responses by firms and industries, while recognizing that adjacent debates (ETS and border measures such as BCA/CBAM) form part of the surrounding policy context. Clear boundary-setting is especially important in bibliometric work, where retrieval and clustering results can change materially depending on the query vocabulary and disciplinary conventions (Nazari et al., 2024).

Carbon taxes have been implemented since the early 1990s; Finland is often cited as an early adopter, including taxation applied to both households and firms (Parry & Wingender, 2021). Since then, national approaches have diverged in tax base, sector coverage, and rate trajectories. Sweden is frequently discussed as a case of sustained, high explicit carbon taxation embedded in long-run fiscal and climate policy (Government Offices of Sweden, n.d.). Cross-country comparisons also show that explicit carbon price levels vary widely across jurisdictions, from low levels in some settings to well above USD 100 per ton in others, implying that empirical findings on “carbon taxes” should be interpreted with close attention to institutional context and sectoral scope (Métivier et al., 2018).

2.2. Substantive research streams on carbon taxation and firm or industry responses

The substantive literature on carbon taxation spans several interconnected streams. One major stream examines policy design and governance, including the definition of the tax base (carbon content versus measured emissions), sector coverage, price trajectories, and interactions with other instruments. The policy-mix perspective has become increasingly important as countries combine taxes, ETS, subsidy reforms, and regulatory standards rather than relying on a single instrument (World Bank, 2024).

A second stream evaluates macroeconomic and distributional effects, including impacts on growth, competitiveness, and equity. This literature often compares revenue-recycling options (e.g., reducing distortionary taxes, targeted transfers, or green investment) and discusses how these choices affect welfare outcomes and political feasibility (Nazari et al., 2024).

A third stream addresses firm-level and sectoral strategic responses, such as technology upgrading, energy-efficiency investment, supply-chain reconfiguration, product pricing, and location decisions under carbon taxation. These studies frequently intersect with operations management and industrial economics, especially when analyzing carbon taxes alongside cap-and-trade mechanisms and when modeling strategic interaction among firms (Nazari et al., 2024).

A fourth stream links carbon taxation to international spillovers, most notably carbon leakage and competitiveness concerns and increasingly to border measures such

as BCA/CBAM. As BCA research expands, it connects fiscal policy, trade, and firm strategy, making it a relevant adjacent domain for interpreting scholarship on carbon taxes (Bao & Jin, 2025).

Across these streams, the literature repeatedly highlights recurring trade-offs. On the one hand, carbon taxes can strengthen incentives for firms and households to shift toward cleaner energy, improve energy efficiency, and identify cost-effective abatement pathways; they may also generate public revenue that can be recycled to support households, fund low-carbon investment, or offset regressive impacts. On the other hand, practical implementation challenges are frequently noted: the political acceptability of higher energy prices, measurement and monitoring issues for emissions (or proxies), and concerns about competitiveness, leakage, and avoidance. These tensions help explain why research clusters around policy design choices, distributional debates, and firm strategy and why knowledge mapping is useful for clarifying how these themes connect across disciplines and over time.

2.3. Related bibliometric and knowledge-mapping studies in carbon-related fields

A growing body of bibliometric research has examined carbon-related scholarship from different conceptual angles, including environmental taxes, green taxation, carbon finance, carbon-pricing acceptance, border carbon adjustment, and supply-chain management under carbon taxes. These studies provide a useful foundation for understanding the development of carbon-related policy and management research. However, they also show that existing bibliometric work often adopts broader conceptual categories or focuses on adjacent domains rather than directly examining the intersection between carbon taxation and enterprise-level strategy.

To clarify the positioning of the present study, Table 1 summarizes selected bibliometric studies that are most closely related to carbon taxation, carbon-related fiscal instruments, carbon pricing, and enterprise-level strategic responses. Table 1 is not intended to provide an exhaustive list of all carbon-related bibliometric studies, but rather to identify representative studies that help define the research gap addressed in this paper.

Table 1. Selected prior bibliometric studies and positioning of the present study

Study	Scope	Database / period	Main contribution	Limitation relative to the present study
Bashir et al. (2021)	Environmental taxes	Web of Science, 1999–2019	Provides a bibliometric and systematic review of environmental tax publications, including influential countries, authors, journals, and research trends.	Covers environmental taxes broadly; carbon taxation and enterprise-level strategic responses are not examined as a focused intersection.
Nobanee and Ullah (2023)	Green tax research	Scopus, 2015–2022	Maps green tax research and identifies trends related to pollution reduction, economic growth, and sustainable practices.	“Green tax” is broader than carbon taxation; the study does not focus specifically on carbon tax as a fiscal instrument affecting enterprise strategy.

Su et al. (2023)	Carbon finance	Web of Science Core Collection, 1992–2021	Maps carbon-finance research, including publication growth, major journals, country contributions, and collaboration patterns.	Focuses on carbon finance rather than carbon taxation; firm-level strategic responses to carbon tax are outside the main scope.
Nazari et al. (2024)	Public acceptance of carbon pricing	Carbon-pricing acceptance literature	Examines public acceptance of carbon pricing and identifies themes related to attitudes, resistance, policy legitimacy, and implementation.	Focuses on public acceptance and policy legitimacy rather than enterprise-level strategic responses to carbon taxation.
Bao and Jin (2025)	Border carbon adjustment / CBAM	WOSCC, CNKI and arXiv, 2009–2024	Visualizes BCA/CBAM literature and its links with trade, competitiveness, and policy coordination.	Focuses on border carbon adjustment, an adjacent domain, rather than domestic carbon taxation and firm-level strategic adaptation.
Zhou et al. (2020)	Supply-chain management under carbon taxes	Carbon-tax-related supply-chain literature	Reviews and maps research on supply-chain management under carbon taxes, emphasizing operational, coordination, and decision-making issues.	Focuses mainly on supply-chain management; it does not provide a broader bibliometric mapping of carbon taxation, enterprise strategy, and Vietnam/emerging-economy policy implications.
Present study	Carbon taxation and enterprise-level strategy	Web of Science Core Collection, 2010–2025	Maps global carbon taxation research through the lens of enterprise-level strategy and interprets the findings for Vietnam's emerging carbon-pricing agenda.	Provides a focused and contextualized contribution by linking bibliometric evidence, enterprise strategy, and Vietnam/emerging-economy policy implications.

Source: Authors' own synthesis

As shown in Table 1, prior bibliometric studies have made important contributions to adjacent areas of carbon-related research. Bashir et al. (2021) and Nobanee and Ullah (2023) provide broad mappings of environmental and green tax research. These studies are useful for locating carbon taxation within wider fiscal and environmental-policy debates, but their broader scope may dilute the specific mechanisms of carbon taxation and its implications for enterprise strategy. Su et al. (2023) examine carbon finance, while Nazari et al. (2024) focus on public acceptance of carbon pricing. These studies are relevant to carbon-pricing debates, but they do not place firm-level strategic responses to carbon taxation at the center of analysis.

Other studies address more specific adjacent domains. Bao and Jin (2025) map border carbon adjustment research, which is relevant to trade, competitiveness, and policy coordination. Zhou et al. (2020) focus more directly on supply-chain management under carbon taxes and therefore provide an important reference for understanding operational responses to carbon-related regulation. However, this stream remains primarily oriented toward supply-chain decision-making and does not fully capture the broader strategic implications of carbon taxation for enterprises, including production and pricing decisions, technology upgrading, innovation, competitiveness, and performance adjustment.

Taken together, these studies confirm that carbon-related bibliometric research has expanded considerably, but several gaps remain. First, many prior reviews adopt broad categories such as environmental tax, green tax, carbon finance, or carbon pricing,

which may obscure the specific role of carbon taxation as a fiscal instrument. Second, studies that focus on operational or supply-chain issues do not fully cover the wider enterprise-strategy dimension. Third, existing global syntheses provide limited discussion of how bibliometric patterns can inform emerging economies where carbon-pricing instruments are still developing. The present study addresses these gaps by focusing on the intersection of carbon taxation, enterprise-level strategy, and Vietnam's emerging carbon-pricing context.

3. Methodology

3.1. Research design

Bibliometric analysis is considered a standardized approach for presenting an overview of various constituents in one place, which provides uniqueness (Donthu et al., 2020). When paired with network analysis software such as VOSviewer, the techniques yield illustrations of the bibliometric and intellectual frameworks (Donthu et al., 2021). Bibliometrics has been applied in agriculture (Yuan & Sun, 2020), food industry blockchain studies (Niknejad et al., 2021), the bio-circular economy (Sganzerla et al., 2021), supply chain management, and carbon taxes (Zhou et al., 2020).

Data were systematically sourced from the Web of Science Core Collection. Web of Science was selected because it offers several advantages for bibliometric research over other databases. First, it provides curated source selection, standardized bibliographic records, and robust cited-reference indexing, which improve the consistency and reproducibility of citation-based analyses. Second, Web of Science covers a broad range of high-quality journals, conference proceedings, and books across more than 250 research areas, enabling the study to capture a diverse yet carefully screened body of literature relevant to the research topic. Finally, Web of Science data can be readily exported and processed in specialized bibliometric tools, which facilitates efficient analysis and visualization. To conduct this study, the authors used Microsoft Excel, VOSviewer 1.6.20 (Van Eck & Waltman, 2010), and RStudio 4.5.2 with the bibliometrix package via the Biblioshiny interface (Aria & Cuccurullo, 2017). These tools supported data cleaning, mapping, and visualization, thereby enabling clear identification of the intellectual structure and research trends in the field.

This study applies performance analysis and science-mapping techniques to examine publication trends, citation patterns, influential documents and sources, author productivity, keyword co-occurrence, thematic structures, and country-level contributions. These analytical dimensions provide a systematic basis for identifying how research on carbon taxation and enterprise-level strategy has developed during the period 2010–2025.

3.2. Data Collection

Among the major academic databases, Google Scholar, Scopus, and Web of Science are commonly used in bibliometric research. While Google Scholar provides

extensive coverage (Martín-Martín et al., 2020), Web of Science Core Collection is particularly suitable for bibliometric analysis because it offers carefully curated source selection, standardized metadata, and comprehensive cited-reference indexing (Pranckutė, 2021). These features improve the reliability, consistency, and reproducibility of bibliometric results. Although Scopus may provide broader source coverage, Web of Science is more appropriate when a selective and methodologically robust dataset is required. Accordingly, Web of Science Core Collection was chosen as the primary database for this study.

Based on these considerations, this study uses Web of Science as the primary source of bibliographic data to ensure comprehensive coverage and consistency of citation information. To identify relevant publications, a structured search query was developed using keywords related to carbon taxation and firm-level strategic responses. The search was conducted in the Web of Science Core Collection using the Topic field (TS): "TS=((\"carbon tax*\" OR \"carbon taxation\" OR \"CO2 tax*\" OR \"carbon dioxide tax*\" OR \"carbon levy\" OR \"carbon fee\" OR \"carbon charge\") AND (firm* OR company OR companies OR corporate OR enterprise* OR business* OR \"firm-level\" OR \"company-level\") AND (strateg* OR \"strategic response*\" OR \"tax* planning\"))". The initial data were retrieved from the Web of Science Core Collection on 6 March 2026. The search was conducted using the Web of Science advanced search interface, yielding 464 initial records.

The screening procedure followed the PRISMA framework, which provides standardized guidelines for transparent and systematic literature selection (Page et al., 2021). The process consisted of several sequential filtering steps. First, automatic filters available in Web of Science were applied to refine the dataset. The selection criteria included: Document type: articles and review articles; Subject areas: Environmental Science; Business, Management and Accounting; Social Sciences; Decision Sciences; Economics, Econometrics and Finance; Language: English; Publication period: 2010–2025. After applying these criteria, the dataset was reduced to 156 documents, while 308 records were excluded during this initial filtering stage.

In the next stage, the titles and abstracts of the remaining articles were manually reviewed to assess their relevance to the research scope. Publications that did not directly address both carbon taxation and firm-level strategic responses were removed. This step resulted in the exclusion of four additional documents. Consequently, the final dataset comprised 152 publications, which were retained for subsequent bibliometric analysis and science mapping.

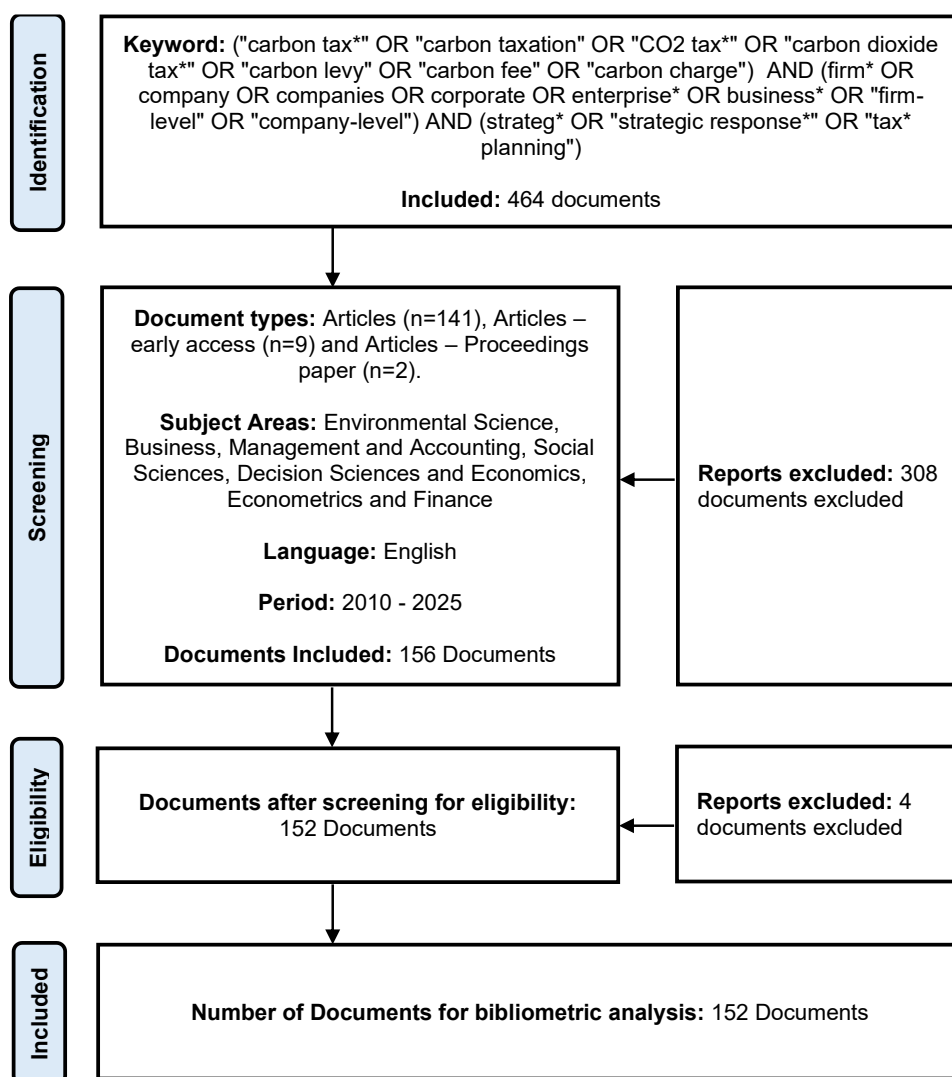


Figure 1. The PRISMA diagram illustrates the narrowing of the research landscape dataset for carbon taxation and enterprise-level strategy

4. Results/findings

The dataset comprises 152 documents published between 2010 and 2025 from 76 sources. The annual growth rate of 28.5% indicates a rapidly expanding field, while the average of 27.3 citations per document suggests a moderate level of academic influence. With an average document age of 4.05 years, the literature is relatively recent. A total of 465 authors contributed to the sample, including 13 authors of single-authored documents, and the average of 3.24 co-authors per document points to a collaborative publication pattern. The presence of 391 Keywords Plus and 560 author keywords further reflects the conceptual diversity of the field.

4.1. Trend of academic research

The Web of Science database yielded a total number of publications examining carbon tax, enterprise-level implications, and strategic responses over the period 2010–2025, with 4,150 citations for the selected papers ($N = 152$). Figure 2 presents the annual evolution of publications and citations related to global carbon tax research, with a particular focus on enterprise strategies.

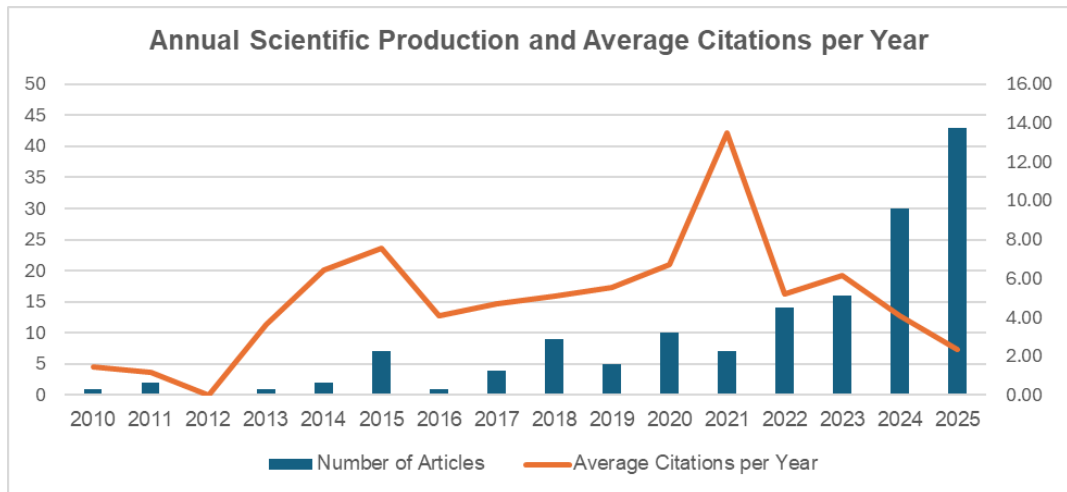


Figure 2. Number of articles per year and citation trend (2010-2025)

Source: Authors' own elaboration

According to the data, 2025 recorded the highest level of scholarly activity, with 43 publications, indicating a sharp increase in academic attention to carbon tax-related issues in recent years. This was preceded by 2024, with 30 publications, and 2023, with 16 publications, reflecting a clear upward trend in research output, especially from 2021 onward. In terms of citation impact, 2021 shows the highest average citations per year (13.50), followed by 2015 (7.56) and 2020 (6.74). This suggests that while recent years have seen rapid growth in publication volume, some earlier studies have had stronger citation influence on an annual basis. The relatively lower average citations per year in 2024 and 2025 can be explained by the shorter time available for these publications to accumulate citations. Overall, the steady rise in the number of articles since 2018, and particularly after 2020, indicates that research on carbon tax and enterprise strategy is expanding rapidly, likely driven by growing policy and managerial interest in carbon-related regulation. Based on Web of Science data, Table 2 highlights the most cited articles in the field.

Table 2 presents the most cited articles in the dataset. The leading publications are concentrated in several related areas, including carbon-constrained inventory models, comparisons between carbon tax and carbon trading, low-carbon technology diffusion, sustainable pricing and production, green technology adoption, carbon tax design, and supply-chain network optimization. This pattern indicates that the most influential works in

the dataset are not limited to macro-level policy design, but also address operational, technological, and strategic issues at the firm or supply-chain level.

Table 2. Most cited articles

Article Title	DOI Link	Authors	Total citations	Citations per year
The carbon-constrained EOQ model with carbon emission dependent demand	http://dx.doi.org/10.1016/j.ijpe.2014.11.022	Hovelaque, V; Bironneau, L	211	20.10
Rethinking the choice of carbon tax and carbon trading in China	http://dx.doi.org/10.1016/j.techfore.2020.120187	Jia, ZJ; Lin, BQ	207	40.06
Signaling by early stage startups: US government research grants and venture capital funding	http://dx.doi.org/10.1016/j.jbusvent.2017.10.001	Islam, M; Fremeth, A; Marcus, A	178	22.48
Exploring the dynamics of low-carbon technology diffusion among enterprises: An evolutionary game model on a two-level heterogeneous social network	http://dx.doi.org/10.1016/j.eneco.2021.105399	Shi, YY; Wei, ZX; Shahbaz, M; Zeng, YC	140	32.94
Sustainable pricing and production policies for two competing firms with a carbon emissions tax	http://dx.doi.org/10.1080/00207543.2014.932928	Chen, X; Hao, G	132	13.09
Does implementing trade-in and green technology together benefit the environment?	http://dx.doi.org/10.1016/j.ejor.2021.03.017	Dou, GW; Choi, TM	127	31.10
Tax Policy Issues in Designing a Carbon Tax	http://dx.doi.org/10.1257/aer.104.5.563	Marron, DB; Toder, EJ	124	10.71
Fleet performance and cost evaluation of a shared autonomous electric vehicle (SAEV) fleet: A case study for Austin, Texas	http://dx.doi.org/10.1016/j.tra.2019.01.025	Loeb, B; Kockelman, KM	116	17.19
Carbon footprint and responsiveness trade-offs in supply chain network design	http://dx.doi.org/10.1016/j.ijpe.2015.04.016	Martí, JMC; Tancrez, JS; Seifert, RW	113	10.94
A carbon market-sensitive optimization model for integrated forward-reverse logistics	http://dx.doi.org/10.1016/j.ijpe.2014.08.015	Choudhary, A; Sarkar, S; Settur, S; Tiwari, MK	111	10.57

Source: Authors' own elaboration

The most cited article is Hovelaque and Bironneau's (2015) study on a carbon-constrained EOQ model, with 211 citations. Jia and Lin's (2020) comparison of carbon tax and carbon trading in China ranks second, with 207 citations and the highest citation rate per year among the top-cited articles. Islam et al. (2018) ranks third, with 178 citations, reflecting the connection between public support mechanisms, clean-energy entrepreneurship, and firm financing. Overall, the citation structure suggests that the field

has developed around two main strands: policy design and instrument comparison on the one hand, and firm- or supply-chain-level strategic responses on the other.

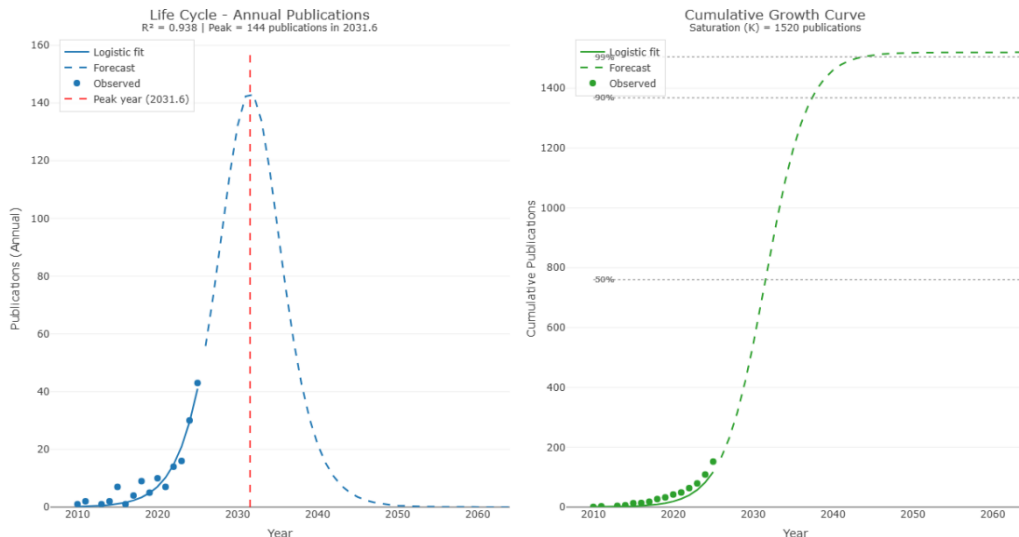


Figure 3. Life Cycle of Scientific Production

Source: Authors' own elaboration, using Biblioshiny

The life-cycle analysis suggests that research on carbon taxes and firm strategy is still in a rapid-growth stage. Based on the logistic model (Figure 3), the field is projected to reach a saturation level of approximately 1,520 publications, with an estimated peak annual output around 2032 of about 144 publications per year. The model fit is strong ($R^2 = 0.938$), although the long-term forecast should be interpreted cautiously. As of 2025, the field has recorded 152 cumulative publications, equivalent to about 10% of the estimated saturation level, confirming that the topic remains far from maturity.

The cumulative growth curve further shows that the literature is expected to expand quickly over the next decade, reaching around 50% of saturation by 2031.6, 90% by 2037.4, and 99% by 2043.7. In addition, the model projects approximately 543 cumulative publications by 2030 and 1,196 by 2035. Overall, these results indicate that carbon taxation and enterprise strategy remain an emerging and fast-developing research area, with substantial room for future academic development.

4.2. Most Relevant Sources

When analyzing the most relevant publication sources, Table 3 reports the top journals based on both local impact within the dataset and global journal-level indicators. Local impact is measured using h-index, g-index, m-index, total citations, number of publications, and citations per publication. These indicators capture the productivity and influence of each source within the selected dataset. Global impact is represented by SCImago quartile and journal H-index, which provide a broader indication of journal reputation beyond the dataset.

Table 3. Relevance of Sources' Impact

Source	Local Impact							Global Impact	
	<i>h</i>	<i>g</i>	<i>m</i>	TC	NP	C/P	PY	Quartile	H-index
Energy Policy	8	9	0.5	347	9	38.6	2011	Q1	311
International Journal of Production Economics	8	10	0.67	746	10	74.6	2015	Q1	264
International Journal of Production Research	8	8	0.67	448	8	56.0	2015	Q1	217
Energy Economics	6	7	0.75	306	7	43.7	2019	Q1	252
Annals of Operations Research	4	8	0.8	136	8	17.0	2022	Q1	143
Ecological Economics	4	4	0.44	69	4	17.3	2018	Q1	279
IEEE Transactions on Engineering Management	4	6	0.24	122	6	20.3	2010	Q1	124
Transportation Research Part E-Logistics and Transportation Review	4	5	1	86	5	17.2	2023	Q1	170
European Journal of Operational Research	3	3	0.5	266	3	88.7	2021	Q1	333
Journal of Industrial and Management Optimization	3	5	0.75	36	5	7.2	2023	Q3	46

Source: Authors' own elaboration

Note: TC = total citations; NP = number of publications; C/P = citations per publication; PY = first publication year in the dataset. SCImago (03/2026): <https://www.scimagojr.com/>.

Table 3 shows that the International Journal of Production Economics is the leading source in terms of local impact, with the highest number of publications (10), total citations (746), citations per publication (74.6), and g-index (10). Energy Policy and the International Journal of Production Research also show strong local influence, each recording an h-index of 8, with 347 and 448 total citations, respectively.

Among the remaining sources, European Journal of Operational Research has the highest citations per publication (88.7) and the highest global H-index (333), indicating strong per-article influence despite having only three publications in the dataset. Transportation Research Part E: Logistics and Transportation Review records the highest m-index (1.0), suggesting a strong recent contribution, particularly as its first publication in the dataset appeared in 2023.

Overall, the results indicate that research on carbon taxation and enterprise strategy is concentrated in reputable interdisciplinary journals, especially in energy, production economics, operations research, and transportation. Most of the leading sources are ranked Q1, confirming that this research area is mainly disseminated through high-impact academic outlets. The only Q3 journal in the table is the Journal of Industrial and Management Optimization, which has a lower citation impact compared with the Q1 sources.

4.3. Author productivity and co-authorship patterns

Figure 4 presents the evolution of the most productive authors in the field of carbon taxation and enterprise strategy from 2015 to 2025. Overall, the results indicate that most leading authors became active mainly after 2020, which is consistent with the rapid expansion of the field in recent years. Chen, Xu shows the longest publication span, from 2015 to 2025, followed by Jubb, Christine, whose contribution extends from 2017 to

2025. Other authors, including Cárdenas-Barrón, Leopoldo Eduardo, Céspedes-Mota, Armando, Feng, Zhangwei, and Gu, Ming, appear more recently, mainly from 2022 or 2023 onward.

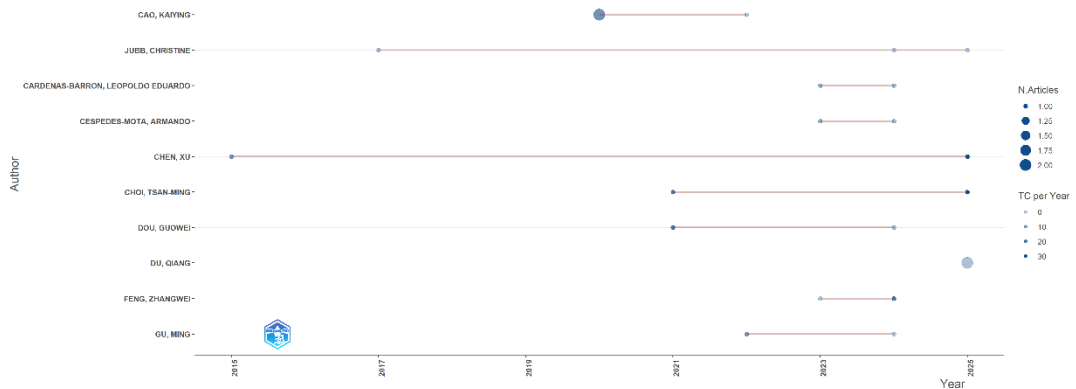


Figure 4. Authors' productivity over time

Source: Authors' own elaboration, using Biblioshiny

The size and timing of the nodes in Figure 4 suggest that author productivity has become more visible during 2023–2025. Some authors, such as Cao, Kaiying and Du, Qiang, show stronger output in specific years, as reflected by the larger circles. This pattern further supports the view that carbon taxation and enterprise-level strategic responses constitute a growing but still developing research area.

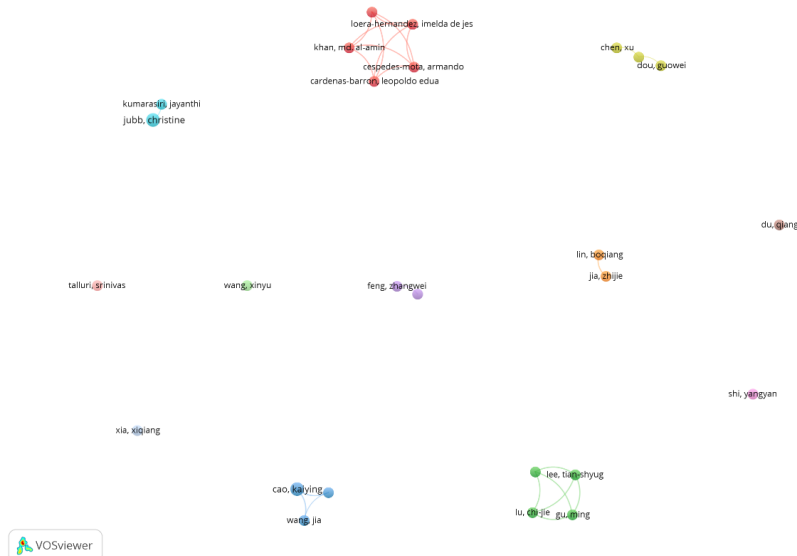


Figure 5. Network visualization of co-authorship

Source: Authors' own elaboration, using VOSviewer

Figure 5 presents the co-authorship network generated by VOSviewer. The map identifies several collaboration clusters rather than a single dominant author network. Within the red cluster, Khan and co-authors record the highest total link strength (TLS = 8),

suggesting a relatively central role in the co-authorship structure of the selected dataset. The orange cluster highlights the collaboration between Jia and Lin, whose two included articles, Jia and Lin (2020) and Lin and Jia (2019), together accumulated 266 citations. This indicates that their work has had a strong citation influence within the dataset, particularly through the paper “Rethinking the choice of carbon tax and carbon trading in China.” Overall, the author-level results show that the field is characterized by recent author entry, clustered collaboration, and a small number of highly cited contributors. This pattern is consistent with an expanding research domain that has not yet stabilized around a large, mature author community.

4.4. Most relevant keywords

To identify the main conceptual and thematic patterns in the literature, a keyword co-occurrence analysis was conducted using VOSviewer. A total of 899 keywords were initially identified. After applying a minimum threshold of three occurrences, 119 keywords were retained and grouped into six clusters, as shown in Figure 6:

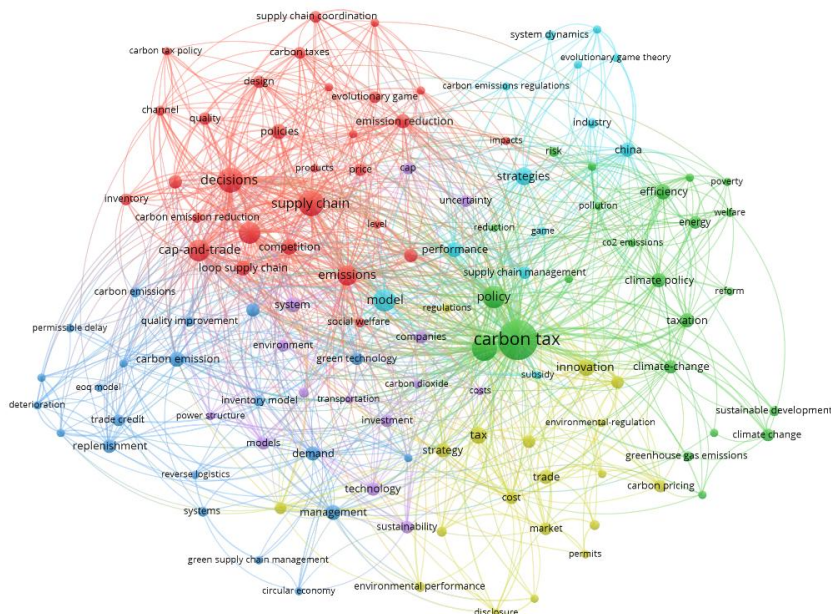


Figure 6. Overall keyword co-occurrence map

Source: Authors' own elaboration, using VOSviewer

Figure 6 reveals six keyword clusters. Cluster 1 is the largest cluster, with 29 items, and centers on supply-chain decision-making under carbon-related constraints. Its strongest terms are decisions (TLS = 149) and supply chain (TLS = 140), followed by related concepts such as cap-and-trade, coordination, emissions, and competition. Cluster 2 includes 23 items and focuses on carbon tax policy and its broader impacts, led by planned carbon tax (TLS = 296), impact (TLS = 135), and policy (TLS = 105). Cluster 3 contains 21 items and reflects operational management and optimization for carbon reduction, with management (TLS = 56) and carbon emission (TLS = 46) as central terms.

The remaining clusters represent more specialized research streams. Cluster 4 includes 19 items and links innovation, cost, strategy, competitiveness, R&D, and market responses under carbon-related pressure, with innovation (TLS = 65) as the strongest term. Cluster 5 contains 14 items and is associated with system-based and technology-oriented modeling, led by system (TLS = 60). Cluster 6, with 13 items, emphasizes performance-oriented strategic modeling in regulatory and regional contexts, particularly China, with model (TLS = 87), performance (TLS = 64), and strategies (TLS = 61) as central terms. Overall, the co-occurrence structure suggests that the literature is organized around supply-chain decisions, policy impacts, operational optimization, innovation, technology-oriented modeling, and performance-based strategic responses.

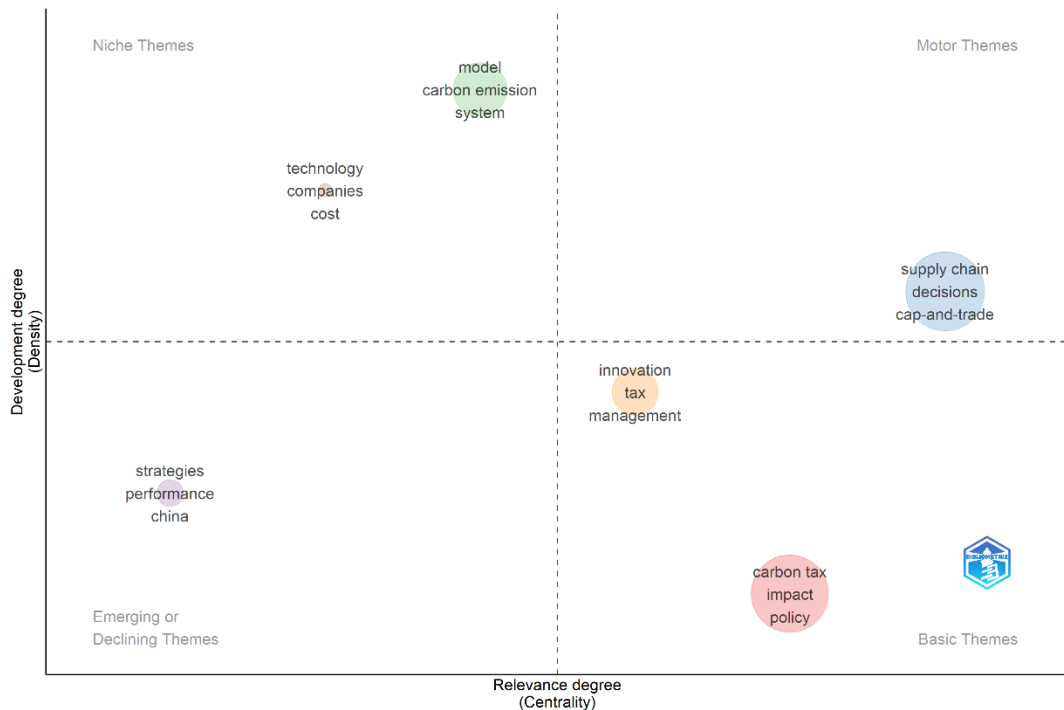


Figure 7. A visual representation of the thematic map constructed from author keywords and mapped into four themes: niche themes (upper left), motor themes (upper right), emerging or declining themes (lower left), and basic themes (lower right)

Source: Authors' own elaboration, using Biblioshiny

Figure 7 presents the thematic map based on author keyword co-occurrence, organized by density and centrality. The results show that supply chain–decisions–cap-and-trade forms the main motor theme, indicating a well-developed and highly influential research stream in the field. The basic themes are represented by carbon tax–impact–policy and innovation–tax–management, suggesting that these topics constitute the conceptual foundation of research on carbon tax and strategy. In contrast, model–carbon emission–system and technology–companies–cost appear as niche themes, reflecting more specialized but internally developed topics. Finally, strategies–performance–China is

located in the emerging or declining quadrant, indicating a theme that is still evolving and has not yet become central to the field.

Figure 8 shows that carbon tax is the most dominant keyword in the field, followed by supply chain, impact, and decisions. This pattern suggests that the literature mainly focuses on how carbon taxation affects firm decisions, supply chain activities, and policy-related outcomes. Other frequent terms, such as policy, model, cap-and-trade, coordination, and emissions, further confirm the importance of regulation, analytical approaches, and emission management in shaping research on carbon taxation and enterprise strategy.

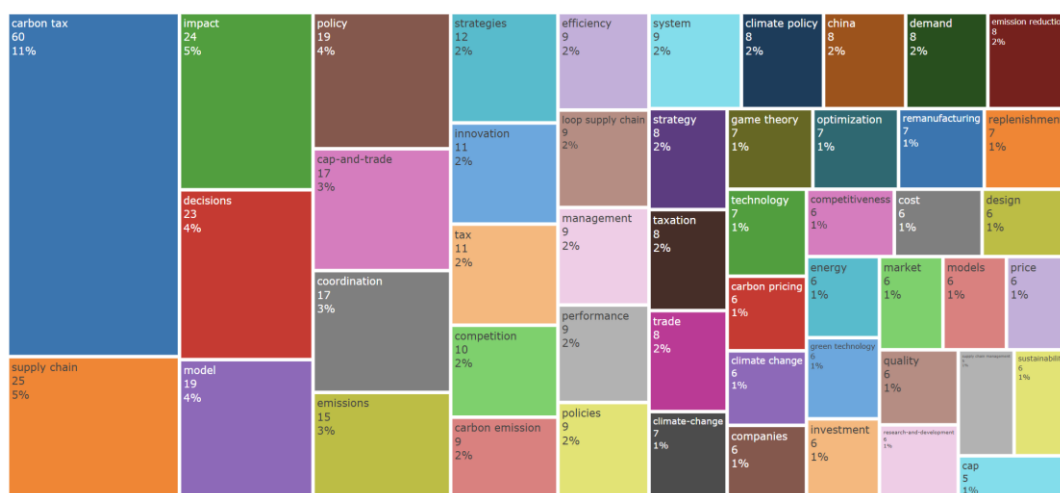


Figure 8. Treemap

Source: Authors' own elaboration, using Biblioshiny

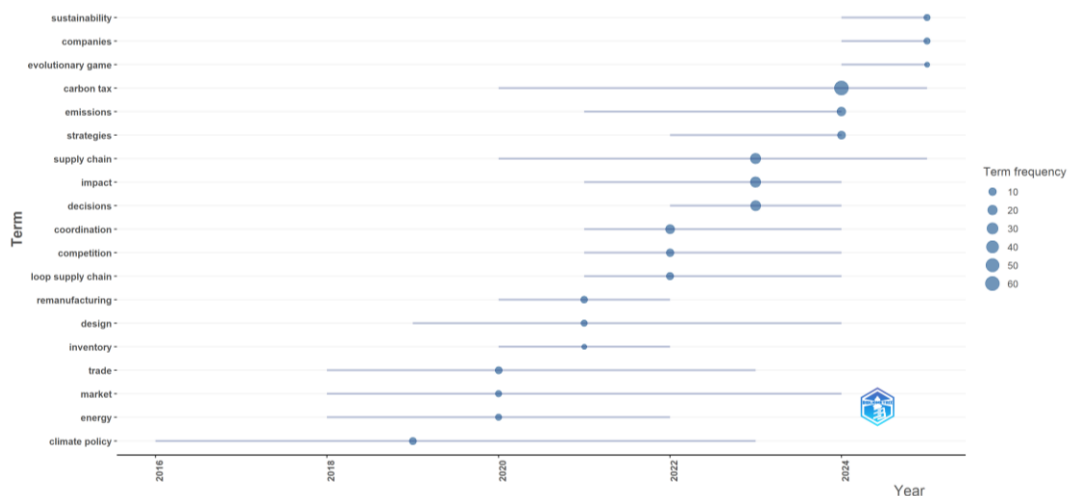


Figure 9. Trend topics of publication collection on authors' keywords

Source: Authors' own elaboration, using Biblioshiny

Figure 9 presents the topic trends in the literature on carbon taxes and strategies over time. The results show that earlier attention was given to topics such as climate policy, energy, market, and trade, which appeared mainly between 2018 and 2020. From 2020 onward, the focus shifted toward inventory, design, remanufacturing, and the loop supply chain, reflecting growing interest in operational and supply chain issues. In the more recent period, especially 2022–2024, the most visible topics are carbon tax, supply chain, impact, decisions, and strategies, indicating that the field has increasingly moved toward firm-level strategic and managerial responses to carbon-related regulation. Newer themes, such as evolutionary games and sustainability, also appear in 2024–2025, suggesting emerging directions in the literature.

4.5. Country contributions and international collaboration

To examine the geographical distribution of research and international collaboration patterns, a country-level analysis was conducted using VOSviewer and Biblioshiny. Figure 10 presents the country co-authorship network, while Figure 11 reports publications by corresponding-author country. To maintain thematic consistency, the VOSviewer network includes only countries with at least three publications.

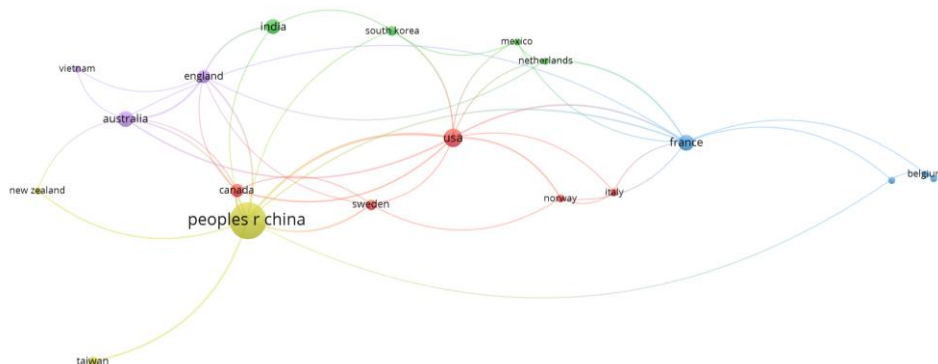


Figure 10. Network visualization of global research collaboration

Source: Authors' own elaboration, using VOSviewer

Figure 10 shows that China occupies the most central position in the country-level co-authorship network, with 72 articles. This indicates that China is the leading contributor to research on carbon taxation and enterprise strategy within the selected dataset. A second group of active contributors includes the United States, France (14 articles), Australia (14), India (13), England (10), and Canada (10), suggesting sustained scholarly engagement across Asia, Europe, North America, and Oceania.

Smaller nodes, including the Netherlands, Mexico, New Zealand, the United Arab Emirates, Belgium, Switzerland, and Vietnam, each record three documents. Although their publication output is limited, their presence in the network indicates emerging participation in this research area. Overall, the geographical distribution suggests that research on carbon taxation and enterprise strategy is concentrated mainly in Asia, Europe, and North America, with China playing a particularly prominent role.

Figure 11 provides complementary evidence regarding the countries of corresponding authors. The dominance of a small number of countries, particularly China, suggests that the field is strongly influenced by national policy contexts, industrial structures, and country-specific carbon-pricing experiments. At the same time, the relatively limited level of international collaboration among corresponding-author countries indicates considerable potential for strengthening global academic networks. Greater participation from emerging economies could further enrich the field by contributing more diverse institutional, industrial, and policy perspectives.

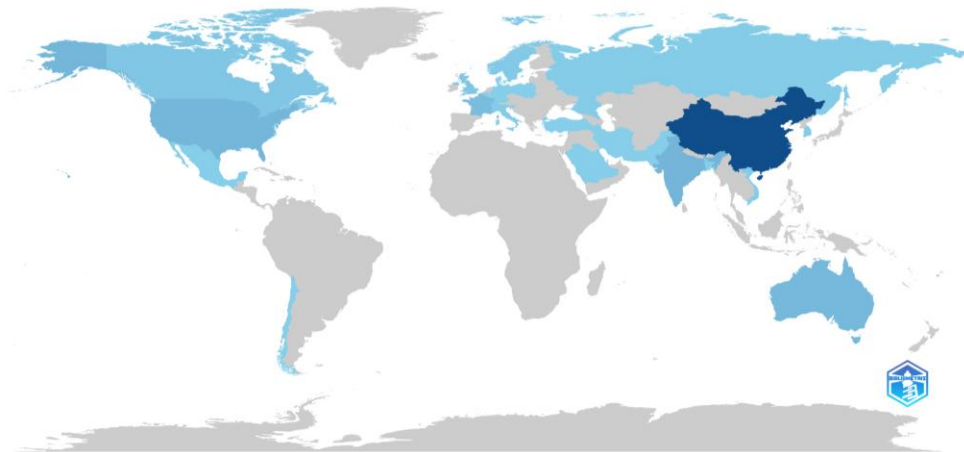


Figure 11. Publications by country of the corresponding author

Source: Authors' own elaboration, using Biblioshiny

5. Discussions

This bibliometric analysis traces the development of research on carbon taxation and enterprise-level strategy during 2010–2025. The results show that the field has expanded rapidly, particularly after 2020, and has become increasingly connected with firm-level issues such as supply-chain decisions, innovation, operational adjustment, and performance management. This pattern indicates that carbon taxation is no longer discussed only as a macro-level environmental policy instrument, but also as a factor shaping enterprise competitiveness and strategic adaptation. This interpretation is consistent with prior studies suggesting that environmental practices and carbon-pricing instruments are increasingly linked to firm performance, innovation incentives, and productivity-related outcomes (Eccles et al., 2014; Wu & Wang, 2022; Zhao et al., 2024).

The post-2020 acceleration observed in the dataset can be interpreted in light of the broader diffusion of carbon-pricing instruments worldwide. According to the World Bank (2025), carbon pricing instruments now cover about 28% of global emissions and generated more than US\$100 billion in public revenues in 2024. This broader policy context may have contributed to the growing visibility of carbon taxation in business, operations, and policy-oriented research. In particular, the prominence of supply-chain and operational themes in the results is consistent with prior bibliometric evidence showing that

carbon-tax-related supply-chain management has become an important research stream (Zhou et al., 2020).

The citation pattern suggests that highly cited publications in the dataset are concentrated around two broad strands. The first is operations-based analytical modeling, represented by studies on carbon-constrained EOQ models, supply-chain network design, sustainable pricing and production, and logistics optimization. These studies examine how carbon-related constraints influence firm-level decisions on inventory, production, responsiveness, pricing, and emission reduction. The second strand concerns policy design and instrument comparison, including studies that compare carbon taxation with carbon trading and examine tax-policy design issues. Together, these two strands indicate that the field has developed at the intersection of policy analysis and enterprise-level decision modeling.

In addition, the literature shows growing interest in strategic interaction under carbon-related regulation, including game-theoretic and evolutionary game approaches. These studies examine how government policy design, enforcement mechanisms, and firm responses may co-evolve under carbon tax or carbon-pricing regimes. For example, Wang and Fan (2022) model the strategic choices of local authorities and enterprises under a carbon-emission reduction penalty mechanism. This stream does not provide direct empirical evidence of firm behavior, but it helps explain why compliance, enforcement, and strategic response have become recurring themes in the literature.

The source analysis further suggests that carbon taxation and enterprise strategy is an interdisciplinary research field. The prominence of journals such as *International Journal of Production Economics*, *Energy Policy*, *International Journal of Production Research*, and *Energy Economics* indicates that the literature lies at the intersection of environmental economics, operations management, supply-chain management, and business strategy. This source structure is consistent with prior review evidence showing that carbon-tax research has been shaped not only by macro-level policy debates, but also by production, logistics, pricing, coordination, and policy-design problems (Zhou et al., 2020; Xu et al., 2024). The analysis of author productivity further suggests that the field is still relatively young, as many productive authors have become visible only in recent years.

The keyword analysis provides a clear view of the field's conceptual and thematic organization. The results show that supply chain–decisions–cap-and-trade functions as the main motor theme, while carbon tax–impact–policy remains a core basic theme. This pattern aligns closely with previous reviews, which identify pricing policy, inventory and production decisions, coordination, low-carbon technology choice, and closed-loop supply-chain design as central research streams under carbon taxes and cap-and-trade regulation (Zhou et al., 2020; Luo et al., 2022). The prominence of terms such as innovation, management, remanufacturing, and optimization further suggests that the literature has increasingly moved from broad discussions of carbon-pricing relevance toward more specific questions of how firms adapt strategically to carbon-related regulation.

At the same time, the thematic map suggests that some topics remain specialized or still evolving. In particular, the placement of strategies–performance–China in the emerging or declining quadrant requires careful interpretation. It indicates that country-specific and performance-oriented strategic studies are visible in the literature, but have

not yet become fully consolidated as central themes. This is important because empirical evidence on firm-level responses to carbon pricing remains mixed. Some studies find that carbon trading and related regulation are associated with green innovation and improved environmental performance, particularly in China (Yu et al., 2022), while broader reviews suggest that the effects of carbon pricing on innovation and zero-carbon investment remain limited, context-dependent, or weaker than theoretical expectations (Van Den Bergh & Savin, 2021). Overall, the results capture a field that is increasingly firm-oriented, but still lacks a strong empirical consensus on the firm-level effects of carbon-pricing instruments.

The country analysis reinforces the importance of national policy contexts in shaping this research field. China's dominant position in publication volume and corresponding-author output is consistent with the wider literature on carbon taxes, carbon trading, enterprise adaptation, and policy comparison. This prominence may partly reflect China's large industrial base and the development of its pilot and national emissions trading schemes, which have generated substantial academic interest (Jia & Lin, 2020; Jiang et al., 2016; Weng & Xu, 2018). More broadly, the concentration of publications in a limited number of countries suggests that research on carbon taxation and enterprise strategy remains strongly shaped by domestic policy environments. This is understandable because carbon-pricing instruments depend heavily on national institutions, industrial structures, energy systems, and policy credibility.

The country-level results also suggest that carbon-tax research is closely tied to national policy contexts. International experiences are therefore useful mainly as contextual references rather than as direct policy templates. Countries such as Sweden, Ireland, France, the United Kingdom, and Australia are frequently discussed in the carbon-tax literature because they illustrate different approaches to tax-rate adjustment, sectoral coverage, and policy coordination. However, the diversity of national approaches indicates that carbon taxation cannot be evaluated independently of institutional capacity, energy structure, industrial composition, and broader climate-policy frameworks. For developing and transition economies, including Vietnam, this means that carbon taxation should be interpreted within a wider set of climate-related fiscal and market-based instruments, including environmental protection taxes, carbon markets, and other mechanisms supporting low-carbon transition.

Building on these bibliometric findings, the Vietnam-focused discussion is used as a contextual policy extension rather than as a standalone case study. The preceding results show that the global literature is organized around several recurring themes, including carbon-pricing design, policy coordination, supply-chain decisions, innovation, performance, and country-specific policy contexts. Vietnam provides a relevant emerging-economy setting in which these themes can be interpreted, because its carbon-pricing architecture is still evolving and its existing environmental fiscal instruments do not yet constitute an explicit carbon tax regime.

To provide a practical illustration of this policy context, this study translates Vietnam's 2025 environmental protection tax into implicit carbon-price equivalents. In Vietnam, the legal framework imposes specific unit-based environmental taxes on the sales volumes of coal, gasoline, other fossil fuels, and pesticides. Using prevailing market

prices, these taxes can be expressed as firm-level cost equivalents, thereby allowing the policy burden to be incorporated into enterprise cost structures. Table 4 summarizes the baseline information for the two principal taxed product groups in this illustration: coal and refined fuels.

Table 4. Vietnam's 2025 environmental protection tax rates and estimated tax burden for selected fuels

Product	Domestic base price	Legislated environmental protection tax	Environmental protection tax as % of domestic base price
Coal (all types)	VND 2,455,680–2,609,160 per tonne	VND 15,000–30,000 per tonne	Minimum: 0.575%; Median: 0.889%
Gasoline	VND 20,590–22,070 per litre	VND 1,000–2,000 per litre	Minimum: 4.531%; Median: 6.999%
Diesel	VND 19,070–19,860 per litre	VND 600–1,000 per litre	Minimum: 3.021%; Median: 4.069%

Source: Authors' calculations based on Resolution No. 60/2024/UBTVQH15, Vietnam National Coal – Mineral Industries Group (TKV), and Vietnam National Petroleum Group (Petrolimex).

Note: Domestic base prices are reported as of February 14, 2025. The percentage tax burden is calculated by dividing the statutory environmental protection tax by the corresponding domestic base price. Median values are used as benchmark parameters for the subsequent illustrative conversion into implicit carbon-price equivalents.

The statutory environmental protection tax rates are based on Resolution No. 60/2024/UBTVQH15. Coal prices were obtained from Vietnam National Coal – Mineral Industries Group (TKV), while gasoline and diesel prices were sourced from Vietnam National Petroleum Group (Petrolimex). All prices are reported as of February 14, 2025 and are used for illustrative comparison. The implicit carbon-price equivalent is calculated as follows:

$$Tax\ (USD/tCO_2e) = \frac{Tax\ (VND/unit)}{Emission\ (tCO_2e/unit) \times Rate\ (VND/USD)}$$

Since Vietnam's environmental protection tax is not legally designed as an explicit carbon tax, the conversion into implicit carbon-price equivalents should be interpreted with caution. Using an exchange rate of VND 25,580 per US dollar and emissions coefficients from the U.S. Energy Information Administration, the statutory tax rates are equivalent to approximately USD 0.302–0.603 per tCO₂e for coal, USD 8.73–14.54 per tCO₂e for diesel, and USD 16.85–33.70 per tCO₂e for gasoline. These estimates show a clear disparity across fuel types, suggesting that Vietnam's current environmental protection tax structure does not yet provide a consistent carbon-price signal across major fossil fuels.

The Vietnam policy illustration therefore reinforces one of the central themes emerging from the bibliometric results: carbon-related fiscal instruments need to provide coherent and credible price signals if they are to influence enterprise strategy. Vietnam's current environmental protection tax remains an indirect tax on environmentally harmful goods rather than an explicit carbon tax. The estimated implicit carbon-price equivalents suggest that refined fuels face a much higher carbon-related tax burden than coal, which may weaken the consistency of incentives for least-cost emission reduction. This finding is

consistent with the broader literature emphasizing that carbon tax design, rate adjustment, and policy sequencing are closely linked to enterprise investment, technology adoption, production planning, and competitiveness (De Bruin & Yakut, 2024; Coxhead et al., 2013; Do & Burke, 2021; Nong et al., 2021; Timilsina et al., 2024).

Vietnam is therefore better understood as an emerging carbon-pricing context rather than as a mature carbon-tax regime. Existing studies often discuss Vietnam in relation to carbon market development and carbon-credit mechanisms, including CDM, JCM, VERs, and REDD+ initiatives, while also noting institutional and financial challenges in developing a comprehensive framework for carbon-credit trading. This reinforces the relevance of the bibliometric findings for Vietnam: the key policy issue is not only whether to introduce carbon taxation, but how to coordinate environmental taxes, carbon markets, credit mechanisms, and enterprise-level adjustment within a coherent transition framework.

Taken together, the findings suggest that the literature on carbon taxation and enterprise strategy is no longer confined to macroeconomic debates on carbon pricing. It increasingly examines how firms adapt through supply-chain redesign, pricing, innovation, remanufacturing, and performance management. However, three gaps remain visible. First, the field still relies heavily on modeling studies, while robust firm-level empirical evidence remains comparatively limited. Second, the literature is geographically concentrated, particularly in China, raising questions about the transferability of existing findings to other institutional settings. Third, for emerging economies such as Vietnam, the main policy challenge is not only whether carbon should be priced, but how carbon-pricing instruments can be designed, sequenced, and coordinated to provide coherent signals to firms while limiting adverse effects on competitiveness and welfare.

6. Conclusions

This study provides a bibliometric synthesis of global research on carbon taxation and enterprise-level strategy over the period 2010–2025. Based on 152 publications indexed in the Web of Science Core Collection and using performance analysis and science-mapping techniques, the study shows that this research field has expanded rapidly, particularly after 2020. The results reveal several dominant thematic streams, including carbon tax policy and impact assessment, decision-making and coordination in carbon-constrained supply chains, operational optimization for emission reduction, innovation and competitiveness under carbon-related pressures, technology-oriented modeling, and performance-oriented strategic responses in specific regulatory contexts.

The findings indicate that carbon taxation is increasingly discussed not only as an environmental or fiscal policy instrument, but also as a factor shaping enterprise adaptation, competitiveness, and long-term strategic adjustment. Across the literature, firms are examined in relation to pricing decisions, production planning, supply-chain redesign, technology adoption, innovation incentives, remanufacturing, and performance management under carbon constraints. At the same time, the field remains uneven. Much of the existing research still relies on analytical, simulation-based, or modeling approaches, while firm-level empirical evidence remains comparatively limited. The

literature is also geographically concentrated, especially in China, suggesting that current knowledge is shaped substantially by specific national policy and institutional contexts.

The study contributes to the literature in three main ways. Methodologically, it provides an updated bibliometric map of carbon taxation and enterprise strategy research for 2010–2025. Conceptually, it clarifies how the literature has evolved from macro-level discussions of carbon pricing toward more enterprise-oriented questions of strategic response, operational adjustment, and supply-chain transformation. Contextually, it links global bibliometric patterns with Vietnam's emerging carbon-pricing agenda, not as a standalone case study, but as a policy illustration of how the identified research themes may inform emerging economies where carbon-pricing instruments are still developing.

The Vietnam-focused policy illustration suggests that the country's current environmental protection tax functions as an indirect tax on environmentally harmful goods rather than as an explicit carbon tax. When translated into implicit carbon-price equivalents, the tax burden differs substantially across fuel types, with refined fuels facing a much higher implicit carbon-price equivalent than coal. This indicates that the current structure does not yet provide a consistent economy-wide carbon-price signal. For Vietnam and similar emerging economies, the key policy issue is therefore not only whether carbon should be priced, but how carbon-related fiscal instruments, carbon markets, credit mechanisms, and enterprise-level adjustment can be coordinated to support low-carbon transition while limiting adverse competitiveness and welfare effects.

Several limitations should be acknowledged. The study relies on a single bibliographic database and on a specific search strategy, meaning that relevant studies indexed elsewhere may not be fully captured. The results are also sensitive to keyword selection, database coverage, and metadata quality. In addition, the bibliometric approach identifies publication patterns and thematic structures, but does not measure causal effects or direct firm-level outcomes. Future research could extend the analysis by incorporating multiple databases, combining bibliometric mapping with systematic review or meta-analysis, and conducting more empirical studies on how firms respond to carbon taxation and carbon-pricing instruments across sectors, institutional environments, and stages of policy implementation. Such work would help strengthen the evidence base on how carbon taxation shapes enterprise strategy in practice, particularly in emerging economies where policy frameworks are still evolving.

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