

A Corpus-Based Comparative Study on the Low-carbon Image Construction of Chinese and American Banks

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Abstract

The global transition to low-carbon development has elevated commercial banks to a pivotal role in advancing carbon finance and national sustainability agendas. China's "dual-carbon" targets (carbon peaking by 2030 and carbon neutrality by 2060) underscore the strategic importance of green finance, prompting banks to leverage carbon finance initiatives for enhancing corporate social responsibility (CSR) images and market competitiveness. This study employs a corpus-based discourse analysis to compare CSR and ESG reports of major Chinese and American commercial banks from 2019 to 2022. It investigates two core dimensions: (1) the low-carbon images projected by banks and (2) the linguistic strategies underpinning these images. By analyzing high-frequency lexical clusters, keyword-in-context (KWIC) patterns, and discursive frameworks, the research reveals distinct cross-cultural narratives: Chinese banks emphasize policy alignment and green financial products (e.g., "green finance," "sustainable development"), while American banks prioritize global climate governance (e.g., "Paris Agreement," "climate risk") and market-led sustainability commitments. The findings offer actionable insights for banks to refine their CSR narratives, aligning with both international climate frameworks and domestic policy imperatives. This comparative analysis bridges the gap between quantitative ESG research and qualitative discourse studies, shedding light on how language shapes corporate environmental identities in global financial sectors.

Keywords: low-carbon image, corpus-based discourse analysis, image construction, Chinese and American banks

1 Introduction

The global shift toward low-carbon development is accelerating, especially as countries pursue climate change mitigation and sustainable development goals. China's 'dual-carbon' targets—carbon peaking by 2030 and carbon neutrality by 2060—highlight the critical role of carbon finance in both national and international financial competition. Commercial banks are central to this transition, as their engagement in carbon finance not only shapes resource allocation but also enhances their market position and brand image. Carbon finance, including green bonds and other financial instruments, is essential for channeling capital into green and low-carbon projects, supporting China's dual-carbon goals and driving sustainable economic transformation (Guo, 2025; Cong, 2023; Hua & Zhang, 2025; Wang et al., 2024; Zhang et al., 2022). Commercial banks are key players in this process, as they provide funding, manage risks, and innovate financial products to support green development (Guo, 2025; Li, 2023; Wang et al., 2024; Xu, 2025). The adoption of green finance by banks promotes technological innovation, supports green industries, and encourages enterprises to pursue low-carbon development paths (Fu et al., 2025; Wang et al., 2024; Xu, 2025). Banks' active participation in carbon finance and green finance initiatives strengthens their corporate social responsibility (CSR) image, enhances competitiveness, and positively influences public perception (Zhang, 2024; Li, 2023).

In the context of corporate social responsibility (CSR), cultivating a low-carbon image has become a crucial indicator of a bank's dedication to environmental responsibility. This image not only highlights proactive sustainability efforts but also enhances public trust and market reputation (Zhang, 2024). However, most existing studies have concentrated on environmental discourse within general corporate settings, leaving a gap in research focused on how financial institutions strategically construct their low-carbon identities through discursive practices (Liu & Zhang, 2024). This research seeks to supplement existing literature by investigating the low-carbon image construction of Chinese and American commercial banks. Through the application of corpus linguistics and discourse analysis, this study examines how these banks articulate their environmental identities in CSR/ESG reports from 2019 to 2022. The research addresses two key questions: (1) What low-carbon image have Chinese and American commercial banks been constructing respectively? (2) How do Chinese and American commercial banks construct their low-carbon image respectively? In other words, the study attempts to understand how language is used by banks to create specific perceptions and associations in the minds of consumers. By analyzing the linguistic techniques utilized by these banks, we can gain insight into the ways in which they craft their public low-carbon image.

The study offers both theoretical and practical contributions. Theoretically, it enhances the interdisciplinary study of corporate environmental discourse by applying corpus-based methods to analyze cross-cultural differences in sustainability communication. Practically, it provides empirical insights that can help banks refine their low-carbon discourse strategies, aligning with global climate governance frameworks such as the Paris Agreement while addressing domestic policy requirements. By comparing discursive patterns between Chinese and American banking sectors, this research also contributes to broader discussions on international low-carbon discourse influence and corporate social responsibility practices.

2 Literature Review

2.1 A Review of Studies on CSR/ESG Reports of Chinese and American Banks

Many studies examine how CSR/ESG disclosures relate to profitability, risk, cost of debt, and stock price crash risk, often using statistical models and financial indicators (Yuan et al., 2021; Hu et al., 2023; Feng et al., 2021; Sun et al., 2022). Some research explores how firm size, ownership, board characteristics, and regulatory environments influence the extent and quality of CSR/ESG reporting (Ervits, 2021; Fu et al., 2023). Some studies use quantitative or mixed-methods content analysis to assess the thematic focus and homogeneity of CSR reports, especially in the context of state-owned versus private banks (Chen et al., 2021;



Ervits, 2021).The effects of ESG ratings and rating disagreements on bank loan availability and market efficiency are also key topics (Hu et al., 2023; Qin & Wang, 2025; Zhang et al., 2024; Sun et al., 2022).The following table in particular presents the research focuses and methodologies of the current studies.

Table 1: The major studies on CSR/ESG reports of banks

Research Focus	Methodology Used	Example Studies
Financial/Market Impact Statistical	Financial/Market Impact Statistical	Tunio et al., 2020; Yuan et al., 2021; Hu et al., 2023; Feng et al., 2021; Sun et al., 2022
Disclosure Determinants	fsQCA/Regression	Ervits, 2021; Fu et al., 2023
Content/Thematic Analysis	Quantitative/Qualitative Coding	Chen et al., 2021; Ervits, 2021
ESG Ratings & Credit Mar- kets	Data Analysis	Hu et al., 2023; Qin & Wang, 2025; Zhang et al., 2024; Sun et al., 2022

As discussed above, most research focuses on quantitative metrics, governance structures, and financial outcomes, rather than the linguistic or discursive construction of low-carbon narratives. Furthermore, existing studies rarely use corpus linguistics methods such as high-frequency words, word clusters, KWIC, or detailed discourse analysis to examine the language and framing of CSR/ESG reports. Applying corpus linguistics and discourse analysis offers new insights into how banks linguistically construct low-carbon and sustainability narratives, revealing patterns and strategies not captured by traditional quantitative or thematic analyses.This approach in the study can uncover subtle differences in language use, framing, and context between Chinese and American banks, contributing to a deeper understanding of CSR/ESG communication and its potential influence on stakeholders.This also makes such an approach valuable for revealing new dimensions of how low-carbon and sustainability themes are communicated in banking CSR/ESG reports.

2.2 A Review of Studies on Image Construction in Chinese and American Banks

Existing research on the image construction of Chinese banks reveals a multifaceted approach that combines metaphorical, discursive, and visual strategies. Scholars have identified that Chinese banks often employ mechanisms and soil-related metaphors to frame themselves as loyal adherents to national policies, authoritative leaders, and adaptable controllers, emphasizing collective effort (Wang, Hu, & Xu, 2024). In their discursive strategies, Chinese banks highlight historical development, industry rankings, and organizational structures, utilizing numerical data and superlative adjectives to assert their leadership, reflecting a ‘corporate ability’ strategy (Shi & Cheng, 2021). On social media, Chinese banks prioritize entertainment, operational updates, and product promotions, adopting direct and authoritative communication styles. They present themselves as friendly companions, authoritative spokespeople, and innovative competitors, aligning with collectivist cultural values (Sun et al., 2021). In their corporate social responsibility (CSR) discourse, these banks leverage green finance and sustainable development narratives to construct a low-carbon image, consistent with national policy directions (Zhang, 2024). Visual communication in promotional materials frequently employs metaphors, such as depicting banks as ‘strong rescuers’ in news discourse, symbolizing resilience and recovery (Qin, 2023; Yu, 2011).

Previous research on American banks’ image construction also reveals a multidimensional approach, encompassing metaphorical frameworks, discursive strategies, and social media communications to project identities as competitive, service-oriented, and socially responsible entities.American banks rely on different metaphorical frameworks, such as ‘seeding,’ ‘hurt & pain,’ and ‘outcome of game,’ to project identities as competitive winners and proactive stakeholders (Wang et al., 2024). Their discursive strategies focus on employee care, community engagement, and environmental responsibility, using performative verbs to

highlight social contributions—a ‘corporate responsibility’ approach (Shi & Cheng, 2021). On social media, American banks emphasize service-oriented content with indirect, expressive, and involvement-focused communication, reflecting customer-oriented and individualistic values. They position themselves as service providers rather than authoritative figures, though both Chinese and American banks claim the identity of ‘good corporate citizens’ (Sun et al., 2021). In news discourse, they are metaphorically depicted as ‘kings’ and ‘doctors,’ signifying high social status and self-diagnostic capabilities (Qin, 2023). Unlike Chinese banks, they rarely use visual metaphors in promotional materials, relying more on direct service narratives (Yu, 2011).

The comparative research examines the image construction strategies of Chinese and American banks, focusing on metaphorical representation, discursive strategies, social media communication, visual and CSR discourse, and cultural drivers. Chinese banks commonly use mechanistic and soil-based metaphors, such as ‘policy followers’ and ‘resilient rescuers,’ to underscore collectivism and state alignment (Wang et al., 2024; Qin, 2023). In contrast, American banks favor competitive and organic metaphors like ‘game winners’ and ‘self-diagnostic doctors’ to highlight individualism and market leadership (Wang et al., 2024; Qin, 2023). In terms of discursive strategies, Chinese banks prioritize historical achievements and industry dominance, often employing quantitative data to assert their authority (Shi & Cheng, 2021). Meanwhile, American banks emphasize social responsibility and stakeholder care, using qualitative narratives to demonstrate their ethical commitments (Shi & Cheng, 2021). When communicating via social media, Chinese banks adopt direct and authoritative tones with product-focused content, reflecting high-power distance cultures (Sun et al., 2021). Conversely, American banks use indirect and engaging styles with service-oriented content, aligning with low-power distance and individualistic norms (Sun et al., 2021). Regarding visual and CSR discourse, Chinese banks employ visual metaphors in their promotions and link CSR initiatives to national low-carbon policies (Qin, 2023; Zhang, 2024). American banks, on the other hand, minimize the use of visual metaphors and frame CSR as voluntary social contributions (Yu, 2011; Du, 2023). In the context of culture difference, the strategies of Chinese banks reflect collectivist and high-power distance values, while the approaches of American banks align with individualism and low-power distance norms (Shi & Cheng, 2021; Sun et al., 2021). This comparative analysis highlights the influence of cultural drivers on the image construction practices of banks in different national contexts.

Previous investigations into the image construction of Chinese and American banks have primarily focused on metaphorical frameworks, discursive strategies, and cultural drivers. However, they fall short in elucidating the linguistic mechanisms underlying the construction of low-carbon identities. Furthermore, the previous analyses lack systematic, corpus-based approaches to decode the linguistic structure of low-carbon discourses. This study addresses critical gaps by employing corpus linguistics to examine CSR/ESG reports of banks, bridging quantitative and qualitative methods, enhancing cross-cultural comparisons of environmental discourse, and informing practical applications in corporate communication.

2.3 A Review of Studies on Environmental Image Construction in Chinese and American Banks

The existing literature has laid a solid foundation for understanding low-carbon or environmental image construction in banking sectors, yet notable gaps persist, underscoring the value of this study. Little research has systematically analyzed the discursive strategies employed in the CSR reports of Chinese banks, particularly in terms of how high-frequency lexical clusters (e.g., ‘green finance,’ ‘sustainable development’) and metadiscursive elements contribute to shaping a policy-aligned environmental identity (Zhang, 2024; Liu & Zhang, 2024). Some research focuses on the impact of regulatory policies and green finance initiatives on the low-carbon transition and environmental image construction of Chinese banks. It highlights how these factors influence lending decisions and corporate environmental responsibility (CER), particularly in the context of banking competition and transition risks to the financial system. Research on Chinese banks indicates that regulatory policies and green finance initiatives are primary drivers of low-carbon and



environmental image construction. The People's Bank of China's integration of green finance into the Macro-Prudential Assessment framework incentivizes banks to support environmentally responsible enterprises, resulting in lower debt costs for firms with high ESG ratings (Hu, Hong, & Li, 2023). Empirically, banks increasingly incorporate firms' carbon emissions into their lending decisions: higher emissions restrict access to new loans and shorten loan terms, particularly for state-owned enterprises and those subject to strict environmental enforcement (Ren et al., 2023). Low-carbon economic policies also enhance corporate environmental responsibility (CER) by alleviating financial constraints, while bank agglomeration further promotes green practices—especially among private enterprises in market-oriented regions (Liu et al., 2025; Shen et al., 2023). However, the effects of banking competition are mixed: it may increase carbon emissions through fixed asset investments, yet it can also stimulate green innovation and manufacturing servitization when aligned with strong government support for green initiatives (Xiang et al., 2023; Anwar et al., 2024). Transition risks to the financial system are apparent, as stricter regulations elevate default rates among high-polluting firms. Joint equity commercial banks with superior corporate governance manage these risks more effectively than state-owned banks (Punzi, Wu, & Huang, 2021). Although the low-carbon city pilot policy reduces air pollution, it has been shown to hinder regional banking growth by increasing enterprise credit risk (Wang, Liao, & Li, 2022).

American banks are increasingly adopting environmental management strategies, with enhanced environmental performance linked to a reduction in financial tail risk. This relationship is influenced by factors such as corporate governance, CSR committees, and institutional ownership, and is particularly robust during crises (Chaudhry, Ahmed, & Saeed, 2021). The banking sector plays a critical role in addressing climate change through green banking practices, which include eco-friendly programs and green financial products. However, effective regulation and incentives are essential for their adoption (Saif-Alyousfi & Alshammari, 2025). In the US, green finance products encompass green securities, investments, and credit, shaped by environmental policies, risk considerations, and banking regulations (Tenakwah et al., 2021). Major banks, such as Bank of America, have shifted towards sustainability since the early 2000s, driven by public pressure and activism, including a reduction in fossil fuel investments (Elmore, 2021). Voluntary climate disclosures are employed to project a positive institutional image; however, the quality of these disclosures varies with bank size and profitability (Lamarque, Ziane, & Caby, 2020). While American banks have integrated carbon risk pricing into syndicated loans following the Paris Agreement, the risk premium remains low, and 'green' banks do not show significant differences in this approach (Ehlers, de Greiff, & Packer, 2021). Strategies such as online banking, green loans, and sustainable infrastructure aim to enhance green brand images, despite facing implementation challenges (Bansal et al., 2024).

The summary table below outlines key contrasts between Chinese and American banks in low-carbon or environmental image construction. Chinese banks demonstrate a strong regulatory-driven approach, with green finance policies integrated into risk assessment frameworks, leading to lower debt costs for environmentally compliant firms and strict carbon emission-linked lending decisions. Bank agglomeration and low-carbon policies enhance corporate environmental responsibility (CER), though banking competition yields mixed emission effects. Transition risks from stricter regulations are managed differently based on bank ownership. In contrast, American banks adopt green practices driven by sustainability goals and voluntary disclosures, with limited carbon risk pricing in loans. CER is linked to corporate governance and institutional ownership, and banks prioritize green branding and climate disclosure over regulatory mandates.

Table 2: A Comparative Analysis of Low-carbon Image Construction Between Chinese and American Banks

Aspect	Chinese Banks	American Banks
Green Finance Policies	Strong regulatory push, integration into risk assessment, lower debt costs for green firms (Saif-Alyousfi & Alshammari, 2025)	Banks adopt green-banking practices, driven by sustainability goals and regulatory incentives (Saif-Alyousfi & Alshammari, 2025; Tenakwah et al., 2021).
Lending & Carbon Emissions	Higher emissions reduce loan access and terms; credit rating moderates effect (Tenakwah et al., 2021; Bansal et al., 2024)	Some carbon risk is priced into loans post-Paris Agreement, but risk premium is low and limited in scope (Ehlers et al., 2021).
Corporate Environmental Responsibility (CER)	Enhanced by low-carbon policies and bank agglomeration (Elmore, 2021; Lamarque et al., 2020)	Environmental strategies reduce financial risk; influenced by governance, CSR, and institutional ownership (Chaudhry et al., 2021).
Banking Competition	Mixed effects: can increase emissions via investment, but also promote green innovation (Ehlers et al., 2021; Ahmed et al., 2025)	Not a major focus; more emphasis on voluntary climate disclosure and green brand image (Lamarque et al., 2020; Bansal et al., 2024).
Transition Risks	Stricter regulations increase default risk for polluters; governance matters (Chaudhry et al., 2021)	Banks face challenges in implementing green strategies but are pivotal in climate transition (Saif-Alyousfi & Alshammari, 2025; Bansal et al., 2024)

2.4 Conclusion and Critical Review

The current study makes significant contributions to the literature by analyzing high-frequency low-carbon terms, low-carbon word clusters, and employing keyword-in-context (KWIC) analysis. It reveals the discursive construction of low-carbon narratives, demonstrating how Chinese and American banks shape their environmental images through the strategic use of specific terminology. For example, KWIC analysis reveals whether the term “low carbon” is portrayed in Chinese policy documents as a regulatory requirement, such as “mandatory emission reductions,” while in US bank disclosures it is presented as a voluntary commitment, as seen in “sustainability initiatives” (Hu et al., 2023; Saif-Alyousfi & Alshammari, 2025). Additionally, this study bridges the gap between quantitative and qualitative research, which typically focuses on the numerical effects of policies or financial results, such as loan terms and default rates, but often neglects the qualitative intricacies of how “low carbon” is defined and put into action. By employing discourse analysis, this study decodes the semantic frameworks and ideological disparities in environmental discourses, such as the contrast between the ‘state-driven sustainability’ prioritized by Chinese banks and the ‘market-led green innovation’ emphasized by their US counterparts (Elmore, 2021; Xiang et al., 2023). Additionally, the contextual dynamics of policy implementation are uncovered through KWIC and word cluster analysis, revealing that in Chinese banks, ‘carbon risk’ frequently co-occurs with terms like ‘regulatory compliance’ and ‘state-owned enterprises,’ whereas in US banks, it aligns more with ‘voluntary disclosure’.



sure’ and ‘brand reputation’ (Punzi et al., 2021; Lamarque et al., 2020). Lastly, by systematically comparing discursive patterns, this research offers a deeper understanding of how cultural and institutional differences influence the construction of environmental images. It highlights that Chinese discourses often emphasize collective responsibility and state-led initiatives, while US discourses focus on individual enterprise agency and market mechanisms (Liu et al., 2025; Chaudhry et al., 2021). These insights are vital for informing global sustainability strategies, illustrating the distinct linguistic and ideological constructions of ‘low carbon’ across varying contexts.

3 Methodology and Research Design

3.1 Research Data

This study relies on the 2023 Fortune 500 Companies ranking. In order to reduce industry-heterogeneous interference, samples were selected from similar listed banks, including the top four banks in China and the United States, to serve as a representation of the banks in both countries. This was done to minimize the large bias in text discourse that can arise from differences in report types. In the process of selecting a corpus and excluding the diversified Banks of America corpus of the CSR column among the top banks in the two countries, the final corpus came from the English websites of the four major banks of China including Industrial and Commercial Bank of China, China Construction Bank, Agricultural Bank of China, and Bank of China, and four American banks including JPMorgan Chase, Citibank, Wells Fargo, U.S. Bank. During the data screening process, it was discovered that the banks in the two countries have different names for their corporate social responsibility reports. For instance, in the English version of the report, the majority of the four major banks in China are titled “Corporate Social Responsibility Report” (CSR Report). In comparison, the four banks in the United States tend to name the unified statement Environmental, Social, and Governance (ESG Report), which will be referred to as the report from now on.

Among them, the existing reports of Wells Fargo and Citibank can be traced back to 2019. In accordance with the principles of integrity and time-series alignment, the starting year of the reports is kept consistent to enhance the timeliness and representativeness of the analysis. The reports of 2019-2022 including CSR or ESG reports are downloaded from the official websites of these major banks mentioned above. Finally, we collected 33 PDF documents and the detailed data are listed in table 3.

Table 3: The Corpus Data

Corpus	The report source	Number of reports	Number of articles	Number of characters
The Chinese bank corpus	Industrial and Commercial Bank of China (ICBC)	4	16	518079
	China Construction Bank (CCB)	4		
	Agricultural Bank of China (ABC)	4		
	Bank of China (BOA)	4		
The US bank corpus	J.P. Morgan Chase & Co. (JPMorgan Chase)	4	17	401319
	The United States Bank (U.S.Bancorp)	5		
	Citibank (Citigroup)	4		
	Wells Fargo Bank (Wells Fargo)	4		
Total		33	33	919398

3.2 Research Questions

This study employs both quantitative and qualitative methods to investigate the low-carbon image of Chinese and American commercial banks. The research is designed to address the following questions:

What low-carbon image have Chinese and American commercial banks been constructing respectively?

How do Chinese and American commercial banks construct their low-carbon image respectively?

3.3 Research Procedure

To facilitate linguistic analysis, all collected PDF documents are converted into plain text (TXT) format. A text-cleaning procedure is then applied to remove formatting inconsistencies, interfering metadata, and non-textual elements etc., ensuring the accuracy and consistency of the data set.

This study adopts a combined qualitative and quantitative approach including corpus data analysis and discourse analysis and the subsequent steps are outlined in the following figure.

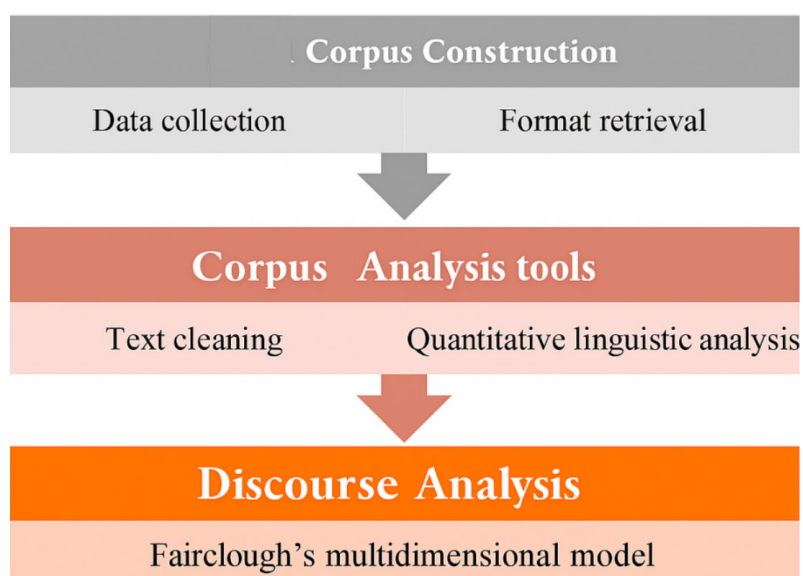


Figure 1. Flow chart of the research procedure

At the textual level, the analysis focuses on linguistic features such as lexical choices, modality, evaluative language, and metaphorical expressions used to frame low-carbon initiatives. This helps reveal how banks position themselves in relation to environmental responsibility.

At the discursive practice level, attention is paid to how these texts are produced, distributed, and consumed. This includes examining intertextuality, the citation of national policies or international agreements (e.g., the Paris Agreement), and how banks adapt their discourse for different stakeholders such as governments, investors, and the public.

At the social practice level, the study interprets how CSR and ESG discourse reflects and reinforces broader socio-political contexts, including China's dual-carbon goals and global climate governance. This dimension explores how sustainability discourse in banking is shaped by and contributes to institutional ideologies and power relations.

By applying this model, the study provides a deeper understanding of the discursive strategies used by Chinese and American banks in constructing a low-carbon corporate image. It highlights both contextual similarities and culturally rooted differences in sustainability communication.

3.4 Research Instrument

This study employs AntConc 4.2.4, a corpus analysis software, as the research tool to systematically examine the linguistic strategies underpinning low-carbon image construction in bank reports. Specifically, the tool's word frequency statistics function is used to generate a high frequency word list table, from which the top 100 high-frequency content words related to "low carbon" are extracted for focused analysis. The collocation network function is then applied to map co-occurring word patterns, revealing semantic associations and discursive frameworks in CSR/ESG reports. Additionally, the concordance line (index line) function is utilized to analyze high-frequency "low-carbon" related terms, enabling a detailed exploration of contextual usage and discourse strategies. These tools collectively facilitate a rigorous investigation into how Chinese and American banks linguistically construct their low-carbon identities.

4 Findings and Discussions

4.1.1 The construction of low-carbon images by Chinese commercial banks

As illustrated in the table, the most frequently occurring words, such as "green" (Freq_Tar = 2891, Freq_Ref = 294), "development" (Freq_Tar = 2782, Freq_Ref = 820), "carbon" (Freq_Tar = 996, Freq_Ref = 447), and "energy" (Freq_Tar = 921, Freq_Ref = 719), highlight the essential components in the construction of a low-carbon image for Chinese banks.

Table 4. Top 20 low-carbon related words by Chinese banks

High-frequency Low-carbon Words of Chinese Bank			
Rank	Word	Freq_Tar	Freq_Ref
1	green	2891	294
2	development	2782	820
3	protection	1136	92
4	carbon	996	447
5	energy	921	719
6	environmental	854	971
7	inclusive	727	280
8	esg	715	1688
9	industry	710	308
10	construction	664	72
11	operation	661	50
12	industries	557	66
13	industrial	550	32
14	resources	445	387
15	climate	418	1284
16	water	411	179
17	sustainable	401	1251
18	transformation	395	46
19	emissions	382	593
20	environment	360	194

Note: "Freq_Tar" refers to the frequency of occurrence of the high-frequency word in the reports of Chinese banks, while "Freq_Ref" represents the frequency of occurrence in the reports of American banks.

The high frequency of the term “green” in Chinese banks’ discourse signifies that their low-carbon efforts are closely associated with the concept of greenness. This implies a strategic alignment of their initiatives with green development objectives. The frequent occurrence of the word “protection” indicates a strong emphasis on safeguarding the environment and resources, which is central to their low-carbon agenda. The prominence of “development” underscores the banks’ focus on integrating low-carbon practices with sustainable development goals, presenting low-carbon actions as drivers rather than obstacles to long-term growth for both the banks and the economy. Additionally, the recurring terms “construction” and “operation” reflect the banks’ active engagement in building and implementing low-carbon infrastructure and operational frameworks. In general, these high - frequency words collectively demonstrate that Chinese banks construct their low-carbon image by integrating low-carbon efforts into the narratives of green development, environmental protection, and practical implementation. Through the frequent use of such words in their ESG/ CSR reports, they aim to showcase their commitment to low-carbon development and establish a positive low-carbon corporate image.

To gain a more lucid insight into the specific low-carbon image crafted, a word cloud clustering of low-carbon associated terms was generated, as presented in the figure 2.

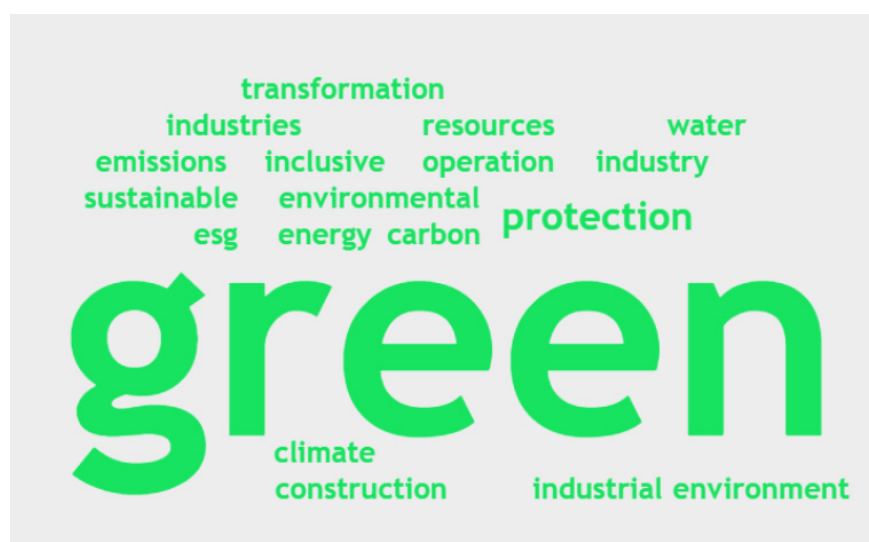


Figure 2. Low-carbon related word cloud by Chinese banks

In the word cloud, the term “green” is notably larger than other related terms such as “protection,” “carbon,” “energy,” “environmental,” “sustainable,” “ESG,” and “climate.” This visual significance of “green” suggests that Chinese commercial banks base their low-carbon image construction on the central idea of “green development.” The grouping of words like “environmental protection,” “carbon,” and “energy” around “green” indicates that banks are integrating low-carbon initiatives into a wider green ecosystem, highlighting their commitment to environmental stewardship, carbon management, and sustainable energy use.

Additionally, other clustered terms such as “transformation,” “industries,” “construction,” and “industrial environment” imply that Chinese banks associate low-carbon efforts with industrial transformation and the development of sustainable infrastructure. Words like “inclusive,” “operation,” and “resources” further suggest that the banks’ low-carbon practices are framed as all-encompassing, addressing inclusive growth, operational efficiency, and resource optimization.

After understanding that Chinese commercial banks create a low-carbon image characterized by a strong “green” narrative, we further generated a word cloud for the term “green”(figure 2) to delve deeper into the specific constructions and developments that Chinese banks focus on in relation to the “green” narrative.



Figure 3. The word cloud of “green” by Chinese banks

The word cloud prominently features “green finance” in large, surrounded by a dense network of associated terms such as “green credit”, “green bonds”, “green development”, and “green loans”. This clustering vividly illustrates that Chinese commercial banks anchor their low-carbon image construction within the framework of green financial mechanisms. The centrality of “green finance” signals that banks position themselves as key enablers of low-carbon transitions, leveraging financial instruments to drive sustainable change. Terms like “green credit” and “green bonds” highlight the banks’ role in channeling capital toward low-carbon projects, showcasing their commitment to financing low-carbon initiatives. “Green development” and “green industries” further extend this narrative, indicating that banks support industries in transitioning to low-carbon sectors to achieve China’s dual - carbon goals. Additionally, collocates such as “green procurement”, “green building”, and “green operations” reflect a holistic approach. They demonstrate that Chinese banks embed low-carbon considerations not only in financial products but also in internal processes and service offerings, from sourcing sustainable materials to designing eco - friendly workplaces.

In essence, the cluster of “green”- related terms in the word cloud reveals that Chinese commercial banks construct a low-carbon image centered on green finance as a catalyst. By emphasizing financial innovation, industrial transformation, and operational integration, they project an identity of proactive institutions driving the transition to a low-carbon economy, merging financial responsibility with environmental stewardship. This linguistic and conceptual clustering underscores their strategic communication of a comprehensive, finance - led low-carbon agenda in ESG/CSR reports.

4.1.2 The low-carbon image construction of American commercial banks and its comparison with Chinese commercial banks

To explore the low-carbon images constructed by American banks, this study extracts high - frequency low-carbon - related words from their ESG/CSR reports, with the findings presented in the following table.

Table 5. Top 20 low-carbon related words by Chinese banks

Rank	Word	Freq_Tar	Freq_Ref
1	climate	1284	418
2	sustainable	1251	401
3	sustainability	1028	148
4	environmental	971	854
5	development	820	2782
6	energy	719	921
7	impact	701	189

8	commitment	653	50
9	emissions	593	382
10	opportunities	471	106
11	carbon	477	996
12	change	459	135
13	low	420	313
14	resources	387	445
15	zero	374	35
16	framework	370	100
17	renewable	313	35
18	industry	308	710
19	green	294	2891
20	inclusive	280	727

As shown in the table, “sustainable” (Freq_Tar = 1251; Freq_Ref = 401), “climate” (Freq_Tar = 1284; Freq_Ref = 418), and “sustainability” (Freq_Tar = 1028; Freq_Ref = 148) are among the top - ranked high - frequency terms. The high prevalence of “sustainable” and “sustainability” indicates that American banks tend to embed their low-carbon initiatives within a comprehensive sustainability framework. This linguistic choice reflects their attempt to project an image of aligning with long - term environmental stewardship and ethical imperatives. The prominent frequency of “climate” suggests that these banks frame their low-carbon efforts as integral responses to climate change, positioning themselves as active participants in global climate action.

Other significant terms include “environmental” (Freq_Tar = 971; Freq_Ref = 854), “energy” (Freq_Tar = 719; Freq_Ref = 921), and “emissions” (Freq_Tar = 593; Freq_Ref = 382). The relatively high occurrence of “environmental” reinforces a broad eco - conscious narrative, while “energy” highlights a focus on energy - related low-carbon actions, such as the promotion of renewable energy. The notable frequency of “emissions” points to an explicit emphasis on carbon emissions reduction, a fundamental aspect of low-carbon strategies, which helps shape an image of banks taking concrete steps in carbon management.

Moreover, words like “commitment” (Freq_Tar = 653; Freq_Ref = 50) and “opportunities” (Freq_Tar = 471; Freq_Ref = 106) reveal a strategic communication approach. “Commitment” is used to showcase the banks’ dedication to low-carbon goals, fostering an image of responsibility and accountability. “Opportunities”, on the other hand, frames low-carbon transitions as avenues for innovation and business growth, portraying the banks as forward - looking entities that can capitalize on environmental trends.

In summary, through the high - frequency words in their ESG/CSR reports, American commercial banks construct a low-carbon image characterized by integration into sustainability and climate action narratives, emphasis on environmental responsibility, tangible efforts in emissions reduction, and a dual focus on ethical commitment and business opportunity. These linguistic patterns in their reports serve to project an identity of proactive, responsible, and innovative players in the low-carbon economic landscape.

To gain a clearer understanding of the specific low-carbon image they construct, a cluster of low - carbon - associated terms was generated, as shown in the following figure.

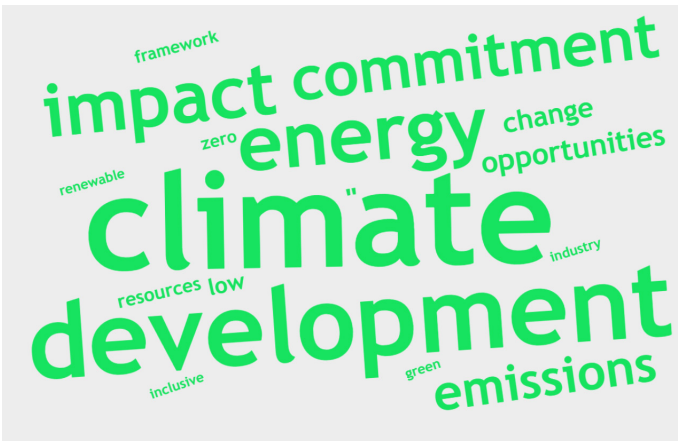


Figure 4. Low-carbon related word cloud by American banks

In this word cloud, “climate” and “development” are prominently displayed in large fonts, surrounded by terms like “energy”, “impact”, “commitment”, “opportunities”, and “emissions”. The central position of “climate” and “development” indicates that American commercial banks anchor their low-carbon image construction around the core concept of climate - centered sustainable development. The clustering of “energy” reflects a focus on energy - related low-carbon initiatives, such as the promotion of renewable energy (implied by the term “renewable” in the cloud).

“Commitment” suggests that these banks aim to project an image of being dedicated to low-carbon goals, while “opportunities” implies that they frame low-carbon transitions as avenues for business growth and innovation. “Emissions” highlights an emphasis on addressing carbon emissions, a fundamental aspect of low-carbon strategies. Terms like “framework” and “change” indicate that American banks may be positioning their low-carbon efforts within structured plans and as part of broader transformative processes.

Collectively, this word cloud reveals that American commercial banks construct a low-carbon image characterized by a strong focus on climate - related sustainable development. They communicate their engagement in energy transition, emission reduction, and the pursuit of business opportunities within the low-carbon economy, while also showcasing their commitment to climate - related responsibilities. This linguistic clustering in the ESG/CSR reports helps shape an image of American banks as proactive participants in global climate action and sustainable development.

It was found that “sustainable” emerged as the most frequently occurring term, signifying its centrality as a core concept in shaping the low-carbon narrative of American banks. To further unpack its significance, AntConc 4.2.4 was utilized to generate a collocate cluster (figure) for “sustainable”, with the resulting word cloud presented in the attached image.



Figure 5. Word cloud of “sustainable” by American banks

The word cloud prominently features “sustainable development”, “sustainable finance”, and “sustainable operations” in large, bold fonts, surrounded by a dense network of associated phrases such as “sustainable progress”, “sustainable investing”, and “sustainable business”. This clustering vividly illustrates that American commercial banks anchor their low-carbon image construction within a comprehensive sustainability - centered framework. The prominence of “sustainable development” signals a strategic emphasis on long - term, holistic growth that integrates environmental stewardship as a fundamental pillar.

Terms like “sustainable finance” and related expressions (e.g., “sustainable investing”, “sustainable bonds”) highlight the banks’ role in leveraging financial mechanisms to drive low-carbon transitions. By positioning themselves as facilitators of sustainable financial flows, these banks project an image of institutions that balance profit - seeking with environmental responsibility. “Sustainable operations” and “sustainable business” extend this narrative to internal processes, demonstrating a commitment to embedding low-carbon principles in day - to - day activities and overarching corporate strategies.

Additionally, collocates such as “sustainable cities”, “sustainable agriculture”, and “sustainable transport” reflect a broad, ecosystem - level perspective. They indicate that American banks frame their low-carbon efforts as contributing to large - scale, multi - sectoral sustainability goals, transcending the boundaries of mere internal operations.

In essence, the cluster of “sustainable” - related terms in the word cloud reveals that American commercial banks construct a low-carbon image centered on sustainability as a core ethos. By emphasizing sustainable development, finance, and operations, they project an identity of proactive institutions driving systemic change toward a low-carbon economy. This linguistic and conceptual clustering in ESG/CSR reports underscores their strategic communication of a comprehensive, sustainability - led low-carbon agenda, positioning themselves as key players in the global transition to net - zero while aligning with broader societal sustainability aspirations.

4.2 Three-Dimensional Model of construction of low-carbon image by Chinese and American banks

The corpus consists of 33 ESG/CSR reports published between 2019 and 2022 by four leading Chinese and American commercial banks.

Every word tends to occur in clusters with other words, providing valuable insights for collocation, association and semantic resonance studies (Yang, 2002). From a linguistic perspective, the study focuses on the collocations, semantic prosody, and evaluative stance expressed in low-carbon-related discourse. Drawing on corpus tools, we examined the keywords “carbon” (Chinese banks) and “net-zero” (American banks) using concordance lines to identify recurring patterns, such as co-occurring words and collocational clusters. These clusters, referred to as “co-text” (Li & Pu, 2001), reveal underlying semantic associations and emotional coloring (Qian, 2010), offering insights into how banks signal commitment or responsibility in environmental discourse.

4.2.1 Textual Analysis

Words often appear in clusters, offering insights for studying collocations, associations, and semantic resonances (Yang, 2002). Using corpus tools, we focused on low-carbon related collocations and clusters in the reports of Chinese and American banks. For Chinese banks, we examined the keyword “carbon,” and for American banks, the keyword “net-zero.” By analyzing concordance lines, we identified recurring patterns such as co-occurring words and collocational clusters. These clusters, or “co-text” (Li & Pu, 2001), reveal underlying semantic associations and emotional coloring (Qian, 2010), shedding light on how banks express their commitment to environmental responsibility.

The high-frequency clusters in the Chinese bank corpus are dominated by the term “green,” along with words like “environmental,” “protection,” “transformation,” “resources,” and “industry.” This pattern reflects a discourse closely aligned with national policies and collective responsibility. Chinese banks tend to construct their low-carbon image through policy-driven and collectively framed language, using terms such as “green solution.” The prominence of keywords like “green,” “protection,” “transformation,” and “industry” indicates a systematic approach where environmental concerns are integrated into narratives of national development and industrial change.

In contrast, American banks emphasize terms like “sustainable development” and “sustainable finance.” The keyword “net-zero” is central to their discourse, reflecting a focus on achieving a balance between carbon emissions and removals. This difference suggests that while Chinese banks highlight green initiatives within a national policy framework, American banks stress sustainable development and specific carbon neutrality goals.

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4.2.2 Discursive Practice

At the level of discursive practice, differences between Chinese and American banks become evident in how low-carbon discourse is produced, distributed, and consumed. These processes reflect varying institutional pressures, audience expectations, and sociopolitical contexts.

Chinese banks produce CSR and ESG reports in response to government policies and national strategic plans such as the “Dual Carbon” goals. Their language is intertextual with state documents and policy frameworks, positioning them as responsible actors aligned with national objectives. For example, they emphasize aligning national policies with economic development to enhance public awareness of sustainability. Internally, they integrate low-carbon awareness into daily operations, and socially, they support green projects that contribute to both economic growth and societal well-being. These practices reflect a top-down communicative logic that mirrors state priorities, emphasizing institutional compliance and collective responsibility.

American banks generate reports primarily in response to pressures from the public, investors, and international policy frameworks, resulting in a market-oriented and brand-driven discourse. Their intended audience includes investors, ESG rating agencies, and the general public. American banks use lexical choices like “challenges,” “COVID-19,” and “rise to” to highlight their proactive stance during global disruptions. They also employ international frameworks such as the SDGs and the Paris Agreement to build symbolic authority, enhancing their legitimacy and corporate image. Furthermore, they link sustainability to profitability, framing ESG engagement as a win-win proposition that combines financial performance with social and environmental values.

4.2.3 Social Practice

The differences in discursive practices between Chinese and American banks reflect their distinct socio-institutional environments.

In China, low-carbon discourse is integrated within a top-down governance framework where banks actively participate in and support national strategic priorities. Their ESG language closely aligns with initiatives such as the “Dual Carbon” goals, reflecting a commitment to sustainability that is deeply rooted in national development strategies. This discourse emphasizes coordination with government objectives and policies, highlighting the banks’ role in promoting sustainable economic growth and environmental protec-

tion. It underscores the banks' proactive engagement in achieving national targets, demonstrating their responsibility and dedication to the holistic advancement of the economy, society, and environment. This approach reflects a comprehensive and collaborative effort to achieve sustainable development, where banks contribute to and align with the nation's strategic goals.

In contrast, American banks operate within a liberal market economy where ESG discourse is shaped by the expectations of investors, ESG rating agencies, international organizations, and a socially conscious public. Their language adopts a corporate, forward-looking tone, often invoking global governance frameworks such as the UN Sustainable Development Goals (SDGs) and the Paris Climate Agreement. Unlike the policy-aligned narrative of Chinese banks, American discourse focuses on strategic branding, profitability, and stakeholder engagement. Sustainability is both a moral imperative and a competitive advantage, reflecting the dominance of neoliberal ideology where corporations are seen as autonomous agents responsible for self-regulation and innovation in addressing climate change.

In summary, the analysis of Chinese and American banks' low-carbon image construction through Fairclough's Three-Dimensional Model reveals how textual and discursive choices are deeply rooted in each country's governance structures, economic orientations, and sociopolitical contexts.

5 Conclusion

This study has provided a comprehensively comparative analysis of the low-carbon image construction by Chinese and American commercial banks, examining the language used in their CSR/ESG reports from 2019 to 2022 through corpus linguistics and discourse analysis. The research addressed two fundamental questions: (1) What kind of low-carbon image have Chinese and American commercial banks respectively constructed? (2) How do these banks construct their low-carbon image? The corpus tool, AntConc 4.2.4 was employed to examine the linguistic features in the reports and three-dimensional discourse analysis model is deployed to examine the strategies of constructing low-carbon image. The findings reveal that Chinese banks have constructed a low-carbon image centered on green development and policy alignment, emphasizing their role in supporting national goals such as China's "dual-carbon" targets. They achieve this by integrating green narratives with national development strategies and utilizing green financial instruments like "green finance" and "green bonds." In contrast, American banks have built a low-carbon image focused on global climate governance and sustainability, highlighting their participation in international climate initiatives and commitments to sustainable development. They employ a market-oriented approach, leveraging global frameworks such as the Paris Agreement and SDGs to enhance their corporate image and engage stakeholders. Although, both banks effectively communicate their dedication to low-carbon development, their strategies reflect their distinct socio-political and economic contexts.

This research offers a substantial theoretical advancement within the interdisciplinary realm of corporate environmental discourse by employing corpus-based methodologies to investigate the cross-cultural variances in sustainability communication. This approach enhances our comprehension of how environmental identities are linguistically constructed, unveiling subtle linguistic trends that traditional analyses often overlook, thereby enriching the dialogue surrounding CSR and ESG communication. On a practical level, the insights gained equip banks with strategies to refine their low-carbon communication efforts in accordance with global climate governance frameworks, highlighting the distinctive ways in which Chinese and American banks present their sustainability narratives. This understanding is essential for effectively communicating sustainability pledges and positively influencing stakeholder perceptions. Future inquiries could expand their focus by incorporating additional countries and banking sectors. Furthermore, it is crucial to explore how these discursive strategies impact stakeholder behavior and investment decisions.



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