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## SPECIALTY SECTION

This article was submitted to  
Environmental Informatics and Remote  
Sensing,  
a section of the journal  
Frontiers in Environmental Science

RECEIVED 06 June 2022  
ACCEPTED 07 July 2022  
PUBLISHED 28 September 2022

CITATION  
Zeng L, Li RYM, Mao Y, Chen H and  
Zeng H (2022), A comparative study on  
LinkedIn and Sina Weibo users'  
perceptions of the carbon-neutral city.  
*Front. Environ. Sci.* 10:962367.  
doi: 10.3389/fenvs.2022.962367

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# A comparative study on LinkedIn and Sina Weibo users' perceptions of the carbon-neutral city

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A carbon-neutral city is one of the most critical topics in carbon neutrality. To study the general public and professionals' focus, we analysed the posts on Weibo and LinkedIn through Pycharm, Navicat Premium, KHCoder, and Tableau. This study included 1908 microposts (14,668 sentences) on Weibo and 533 posts (3733 sentences) on LinkedIn. On Weibo, the most influential users were governments and organisations; for example, Baotou Daily, Beijing Ecological Environment, 922 Green Travel, Baotou Evening News, and Baoding Evening News. On LinkedIn, the most influential person was the co-director of Carbon Neutral Cities Alliance. The most popular topics on LinkedIn included "city," "carbon," "climate," "neutral," "energy," "emission," "sustainability," "sustainable," "neutrality" and the keywords of "world"; while "carbon," "city," "energy," "development," "new," "green," "promote," "neutrality," "construction" and "industry" are more prevalent in Weibo. Both LinkedIn and Weibo users focus on "energy" and related issues. LinkedIn users mentioned "climate" and "sustainability" most in their posts, but Weibo users concerned about green development in the construction industry.

## KEYWORDS

carbon neutral city, LinkedIn, Weibo, python, data analysis

## Introduction

Climate change is one of the serious problems facing humankind today. It affects almost all natural processes and threatens the species and biodiversity (Demirhan, 2020). Driven by excessive carbon dioxide emissions, global warming has seriously threatened human society's sustainable development (Shi and Feng, 2021). Carbon dioxide remains in the atmosphere for hundreds of years, longer than typical air pollutants, typically hours to days (Dryden et al., 2018). Reducing greenhouse gas emissions, especially carbon dioxide emissions from fossil fuel combustion, is an effective way to minimise climate change and avoid global temperature increases (Zhang et al., 2017; Moomaw et al., 2020). Reducing carbon dioxide emissions has

become a common goal in the global community (Shi and Feng, 2021). Some scholars have explored the impact of climate change due to carbon emissions from fossil fuel combustion, cement production, land-use change emissions, and land and ocean carbon sinks (Redlin and Gries, 2021). Human activities raise carbon dioxide in the atmosphere to an unprecedented high level in human history (Karnauskas et al., 2020). Societies have recognised the need to rapidly reduce artificial carbon dioxide emissions to avoid potentially catastrophic impacts (Keller et al., 2019). However, confusion about the causes and consequences of climate change could have far-reaching implications in reducing carbon dioxide and other greenhouse gas emissions (Dryden et al., 2018).

## WTO's suggestions for controlling carbon dioxide emissions

As carbon dioxide emissions are mainly driven by consumption, countries that accept the Paris Climate Agreement should focus on consumption-based but not production-based carbon emissions (Su et al., 2020). To meet consumers' needs, developing countries turn on their production engines which emit much carbon dioxide as a side product. If developed countries continue to consume at the present levels, importing products with a large carbon footprint, developing countries are encouraged to produce. All these mean that developed countries shall continue transferring carbon dioxide emissions to developing countries.

Actions to reduce emissions since 1990 have not led to significant improvements. Only five countries (Russia, Germany, UK, Italy and France) achieved carbon reductions. Factors affecting carbon dioxide emissions vary from country to country. In most developing countries, the reduction in carbon dioxide emissions is due to poverty (Kang et al., 2020).

Some scholars examine the carbon dioxide emissions per capita and their components, such as coal, oil, and natural gas, in 53 countries between 1980 and 2016. Results show that natural gas is the main component driving the carbon emissions (Haider and Akram, 2019). Carbon intensity, energy mix, and intensity negatively impact carbon dioxide emissions, while affluence and population raise carbon dioxide level (Kone and Buke, 2019).

## Research question, aim, potential theoretical contribution and structure

We selected Sina Weibo and LinkedIn users as two primary research samples to study the public concern about carbon-neutral cities. The research questions included: 1) what were the most popular words mentioned, word clusters and influential

users on Sina Weibo and LinkedIn in a carbon-neutral city; 2) what the differences between influential users were and focuses between Weibo and LinkedIn in the carbon-neutral city. Studying the public perception on Sina Weibo and LinkedIn about carbon-neutral cities shall provide helpful information to government officials who wish to share related information and policy makers when they plan and implement the policies.

This article comprises five sections: Section 2 reviews and summarises the relevant literature. Section 3 covers research methods and data descriptions. Section 4 shows the results and discussion, and Section 5 summarises the results and provides conclusions, practical implications, limitations, and further research directions.

## Literature review

In view of the ever increases in carbon emissions, the green energy revolution is needed to combat global climate change and ensure the sustainable development of all humankind (Kang et al., 2020). The adjustment of energy and industrial structure is the main way for reducing carbon emissions, while economic growth and urbanisation are the two main reasons for the increase in carbon emissions. This section mainly goes through previous research on carbon dioxide emissions, the means to control it, and the carbon-neutral city, as well as Weibo and LinkedIn. It also highlights the research gaps.

## Carbon dioxide emission and gross domestic product (GDP)

A long-run equilibrium exists between regional economic development and per capita carbon dioxide emissions. Exports and consumption-based carbon emissions are negatively correlated (Su et al., 2020). In contrast, imports and GDP are positively correlated with consumption-based carbon emissions (Su et al., 2020). In the short run, carbon emission reduction impacts GDP growth, but the degree of impact is uncertain. Due to the differences in regional economic development, the degree of correlation between per capita carbon dioxide emissions and economic growth is different. Economic growth and development must be achieved by adjusting the industrial structure, supporting the tertiary industry, using clean energy, and developing a low-carbon economy (Zhao et al., 2018). The impact of carbon emission reduction on GDP in the medium and long run are gradually weakened, exhibit a decoupling trend. For example, carbon emission reduction in the carbon peak phase affects the GDP growth rate in China, and the impact of the carbon-neutral phase on China's GDP growth tends to be weakened.

## The countermeasure to control carbon dioxide emission

Clean energy development (CED) is of great practical significance in reducing carbon dioxide emission (CDE), ensuring energy security, and achieving green economic growth (Jia et al., 2022). Coal procurement, blending, and distribution strategies play an increasingly important role in large coal-fired power plants due to the need to reduce carbon dioxide emissions and operating costs (Xu et al., 2020). Technological innovation reduces the adverse effects of carbon dioxide growth (Su et al., 2020).

The modern coal chemical industry is essential in ensuring national energy security. The primary sources of carbon emissions are process and combustion emissions (Wang and Xu, 2022). Process emissions can be solved by improving product structure with hydrogen for energy production, while combustion emissions can be driven by electric drive (Wang and Xu, 2022). It is recommended that the industry explore ways to reduce emissions intensity through innovative processes (Wang and Xu, 2022). Alternative solutions such as steam flooding can reduce overall carbon emissions by more than 90% (Wang and Xu, 2022). The government can attract more investors to explore and implement renewable energy technologies by developing other renewable energy policies and related institutions. This, in turn, will promote the use of renewable energy (Wang and Zhang, 2021). It can also reduce risk due to oil price volatility.

## Tools that control carbon dioxide emission

Scholars conducted modelling research and data analysis for exploring means to reduce carbon dioxide emissions. Previous studies compared simple and complex models of the global carbon and climate system (Thompson, 2018). The analysis studied how these models could be used for estimating the monetary costs of future damage due to an increase in carbon dioxide emissions (Thompson, 2018). Scholars have studied the impact of climate change on technological innovation by collecting panel data from 67 countries (regions) from 1980 to 2016 (Qin et al., 2019). They indicated that there were more climate technology innovation among countries with higher carbon dioxide emission. Yet, government investment in projects such as energy does not always promote the development of climate technology innovation (Qin et al., 2019).

Previous studies also focused on the relationship between carbon intensity, energy mix, energy intensity, affluence, and demographic effects. A disaggregated analysis of historical and projected carbon dioxide emissions from fossil fuel combustion in Turkey was performed by using the Logarithmic Mean Divisia Index (Kone and Buke, 2019). It included carbon intensity,

energy mix, energy intensity, affluence, and population as variables for projecting carbon emissions (Kone and Buke, 2019).

While achieving this goal solely by reducing emissions could be very difficult (Keller et al., 2019). Carbon dioxide removal has been proposed to supplement and compensate for insufficient emission reductions by adding and designing new carbon sinks or combining natural absorption with engineered storage (Keller et al., 2019). Scholars reviewed the responses of the carbon cycle to different carbon dioxide removal approaches and highlighted factors that determined carbon dioxide removal efficacy (Keller et al., 2019). Results indicated that carbon intensity, energy mix, and intensity effects on carbon dioxide emissions were negative, while affluence and population were positive.

## Carbon neutral city

Cities are the protagonists of anthropogenic greenhouse gas emissions (Qiu, 2021). Some studies found that carbon dioxide emissions in urban areas accounted for more than 60% of the total carbon emissions. The urban development model of disorderly expansion has caused damage to the urban ecological environment, traffic congestion, and dense population in central urban areas. Carbon neutrality goals are the “new norm” in cities and regions worldwide. These goals require rapid transformation outside the ordinary traditional urban regional planning. Through research into carbon neutrality in Greater Manchester, academics demonstrated that “collaborative scenario planning” dramatically contributes to “new norms” in cities and regions (Ravetz et al., 2020). Academic research showed that better urban and transport planning could result in carbon-neutral, healthy cities, mainly through land-use change, a shift from private motorised transport to public and active transport, and urban greening (Nieuwenhuijsen, 2020). Carbon neutral city required five main changes in urban energy, industry, construction, transportation, and consumption. In Melbourne, for example, the carbon-neutral route includes the utilisation of 100% renewable energy such as solar energy, wind energy, hydropower, LED energy-saving street lamp renovation, zero-carbon buildings, shared bicycles and shared cars, etc. to achieve zero-carbon transportation and reduce waste carbon emissions. The research results show that the city’s annual carbon emissions consist of 67.6% of building carbon emissions, 30.5% of transportation carbon emissions and -1.9% of carbon sink absorption (Chang et al., 2019).

In the EU, buildings accounted for 40% of energy consumption and 36% of greenhouse gas emissions, mainly caused by construction, use, renovation and demolition (Bonoli et al., 2021). Scholars conducted a case study for a low-carbon demonstration city in China and showed that carbon emissions mainly result from the buildings’ electricity use (79%), followed by refrigerant release emissions (12%) in

Shenzhen (Wang et al., 2021). The building factor is important in achieving a carbon-neutral city (Qiu, 2021). Some scholars researched carbon dioxide emissions evaluations and mitigations in the building and traffic sectors in the Taichung metropolitan area of Taiwan (Chang et al., 2019). Green buildings can not only achieve energy, land, water, and material saving in the whole life cycle and coexist harmoniously with nature. Under the support of existing renewable energy technologies, buildings can be transformed from pure energy consumers into renewable energy providers, which play an indispensable and essential role in the urban carbon neutrality (Qiu, 2021).

Scholars estimated that New York City can eliminate the carbon footprint of its buildings by 2050 (Wright et al., 2015). Based on city documents and national statistics, a significant measure directly controlled by New York is the elimination of carbon emissions from municipal district heating, which may account for up to 30% of New York city's reported carbon emissions and 58% of the energy-related carbon emissions (Laine et al., 2020). Tozer and Klenk (2019) applied textual network analysis to interpret the socio-technical configuration of planned mobilisation to constitute a carbon-neutral built environment. They analysed three essential building and energy configurations: 1) district energy cities, 2) zero net energy cities and 3) natural gas transition cities. Scholars used scenario analysis to explore opportunities for decarbonized development and carbon neutrality potential through case studies of residential redevelopment. The results showed that buildings redevelopment with higher energy efficiency and increased penetration of renewable energy contributed to a long-term positive impact on the carbon performance of urban areas (Huang et al., 2020). Chang et al. (2019) used a multiple regression model to calculate the floor area of each building and showed the multi-scale carbon reduction hotspots, which could help government agencies formulate follow-up priority carbon reduction strategies and urban carbon neutrality policies. Using computer modelling, citywide data, and insights from experts in the construction industry, technology available today, Wright et al. (2015) showed how New York City (NYC) could mitigate climate change by improving building sector efficiency (accounted for 75% of its greenhouse gas emissions) by 2050.

## Sina Weibo and LinkedIn

As social network development promotes scientific research in various fields, online social networking has become very popular in recent years, and online information sharing has become important during COVID-19 and lockdown (Cheng and Fu, 2017; Yue et al., 2020). Sina Weibo is the largest microblogging network among these sites in China (Cheng and Fu, 2017), with millions of users (Ye et al., 2021). It has a tremendous amount of information that reflects all aspects of social life (Liu et al., 2015). Sina Weibo's platform is popular for its real-time information and has become a new communication

method and research tool for public opinion topics (Li, 2021). Wu et al. (2021) extracted disaster information based on Sina Weibo in China and conducted a case study on Typhoon Lekima. Some other researchers studied the public concerns based on Sina Weibo, such as the human papillomavirus vaccine (Xiang and Feng, 2021), urban spatial patterns and functional zones (Miao et al., 2021), low-carbon cities' popularity (Yang et al., 2017), and construction safety (Zeng and Li, 2022) etc. Among them, users play an essential role in influencing other users, promoting network information dissemination, and leading the trend of public opinion (Ye et al., 2021). Thus, some identified influential users on social networks-cases from Sina Weibo (Ma and Ma, 2021).

Compared with Sina Weibo, LinkedIn is the leading social network site focusing on the professional field (Andres et al., 2022) with over 500 million customers. However, it has received far less research attention than Facebook and other personal networks (Brewer, 2018). People with more informational advantages are more likely to use LinkedIn (Utz and Breuer, 2019). It is commonly associated with utilitarian career-oriented motives rather than socialising (Brewer, 2018). LinkedIn is also considered as the most effective social network website for recruiters (Fernandez et al., 2021). For the past few decades, it has been the website for connecting freelancers and recruiters (Fernandez et al., 2021). LinkedIn users use it to connect to different industries and keep them informed about current events (Hoda et al., 2022). This paper aims to analyse the data of carbon-neutral cities on LinkedIn and obtain research hot topics, users, and institutions related to carbon-neutral cities by obtaining posts from LinkedIn and Weibo.

## Research gap

Some researchers compared Twitter to Sina Weibo, LinkedIn and Facebook, or among three social networks. Alsini et al. (2021) reviewed hashtags recommendation methods for Twitter and Sina Weibo. Stokes et al. (2019) used Facebook and LinkedIn to recruit nurses for an online survey. Some academics studied users' profiles on social network websites, such as LinkedIn and Sina Weibo, which allowed users to tag themselves as parts of their profiles (Zhou et al., 2021). Previous research utilised Facebook, YouTube, Twitter, Flickr, Instagram, Pinterest, Google+, LinkedIn and Sina Weibo for examining the role of social media in the marketing of the world's top airlines (Zelenka and Hruska, 2018). Scholars used not only users' self-tags but also their friend relationships (often not hidden) on Sina Weibo and LinkedIn to expand the tag list and measure the effectiveness of different types of friendship links and their self-tags (Liang et al., 2014). Yet, research that compared Sina Weibo and LinkedIn in the context of a carbon-neutral city is scarce. It is the first of its kind that used quantitative semantics to explore clusters of words in LinkedIn and Sina Weibo regarding carbon-neutral cities.

## Research method

Social media is an emerging tool researchers use (Stokes et al., 2019). This study obtained data from Sina Weibo and LinkedIn. It compared Sina Weibo and LinkedIn's contents in carbon-neutral cities.

Twitter, Facebook and LinkedIn, *etc.*, are predominantly in English, but there are posts in other languages, while Sina Weibo is predominantly Chinese. Nevertheless, the abovementioned scholars mainly compared Twitter and Sina Weibo (Alsini et al., 2021), Facebook and LinkedIn (Stokes et al., 2019), LinkedIn and Sina Weibo (Zhou et al., 2021), *etc.* Although these social media are in different predominant languages, some scholars, for example, (Chao and Florenthal, 2016), chose English posts on Twitter to compare with the Chinese posts on Weibo. In the study, English keywords were used to collect "carbon-neutral city" or "carbon-neutral cities" on LinkedIn while Chinese keyword "碳中和城市" (same meaning as English keywords) were used for Weibo by using Python 3.6.6. This was because there were only one English Weibo microposts and four Chinese LinkedIn posts, which were negligible compared to all the posts on both Weibo and LinkedIn.

There are 533 posts on LinkedIn in English and 1908 microposts on Weibo in Chinese. The research samples are saved in MYSQL, including user name, publish time, institute, content/description, the number of likes, forwards and comments, contents through Navicat Premium 16.

The co-occurrence word network generated by the data analysis in this paper included information such as word frequency, lexical connections and sub-networks. By constructing a co-occurrence network of high-frequency words, the relationship between subjects was visualised to study the public focus on Weibo and LinkedIn about carbon-neutral cities. The size of the circle reflects the word frequency, the lexical connection and degree of the association are reflected by the connections and coefficients between the words, and the algorithm determines the sub-network. Different sub-networks are given different colours to distinguish them. Words with characteristic differences will be divided into the same sub-network.

## Data analysis

### Word frequencies, users and institutes on LinkedIn

533 LinkedIn posts (3733 sentences and 2451 paragraphs) were analysed through KHcoder 3. By choosing "Select Words to Analysis" and "Word Frequency List" in KHcoder, some unrelated words, ProperNone, PRP, Verb, and Interrogative Pronouns were excluded, such as "step," "great," "very," "today," "next," "last," "first," "still," "as," "many," "I," "am," "is," "be," "you," "not," "do," "it," "Day," "%," "more," "also," *etc.*

The top 150 most frequently mentioned keywords were selected and visualised *via* Tableau, as shown in Figure 1. The size of the texts visualises the frequencies of each word. Thus, "city" (639), "carbon" (550), "climate" (321), "neutral" (288), "energy" (185), "emission" (144), "sustainability" (143), "sustainable" (143), "neutrality" (137), "world" (127), "change" (122), "plan" (114), "new" (108), "building" (103), "business" (103), "target" (88), "action" (84) and "future" (83) are top 20 of these 150 words.

All users are visually analysed in Tableau. As shown in Figure 2, different colours indicate the different usernames on LinkedIn, and the text's size visualises the contributions of the carbon-neutral city posts made by the same usernames. The largest size is Michael Shank, PhD, the "key opinion leader" on LinkedIn in carbon-neutral cities topic. The study further analysed the position of these users, and the most authoritative was the co-director of Carbon Neutral Cities Alliance (CNCA). "The Carbon Neutral Cities Alliance (CNCA) collaborates with leading global cities working to achieve carbon neutrality in the next 10–20 years – the most aggressive GHG reduction targets undertaken anywhere by any city" (CNCA, 2022). The visualisation diagram shows that people with most LinkedIn posts are individuals. Their number of posts on this topic is quite even.

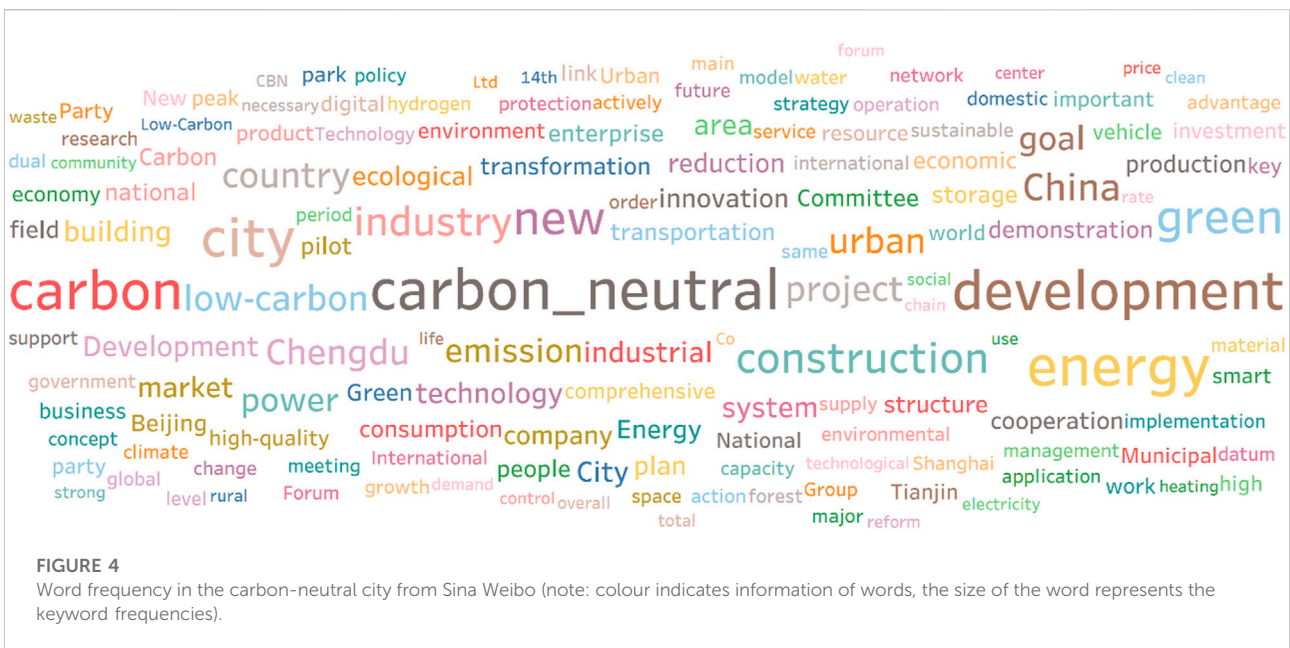
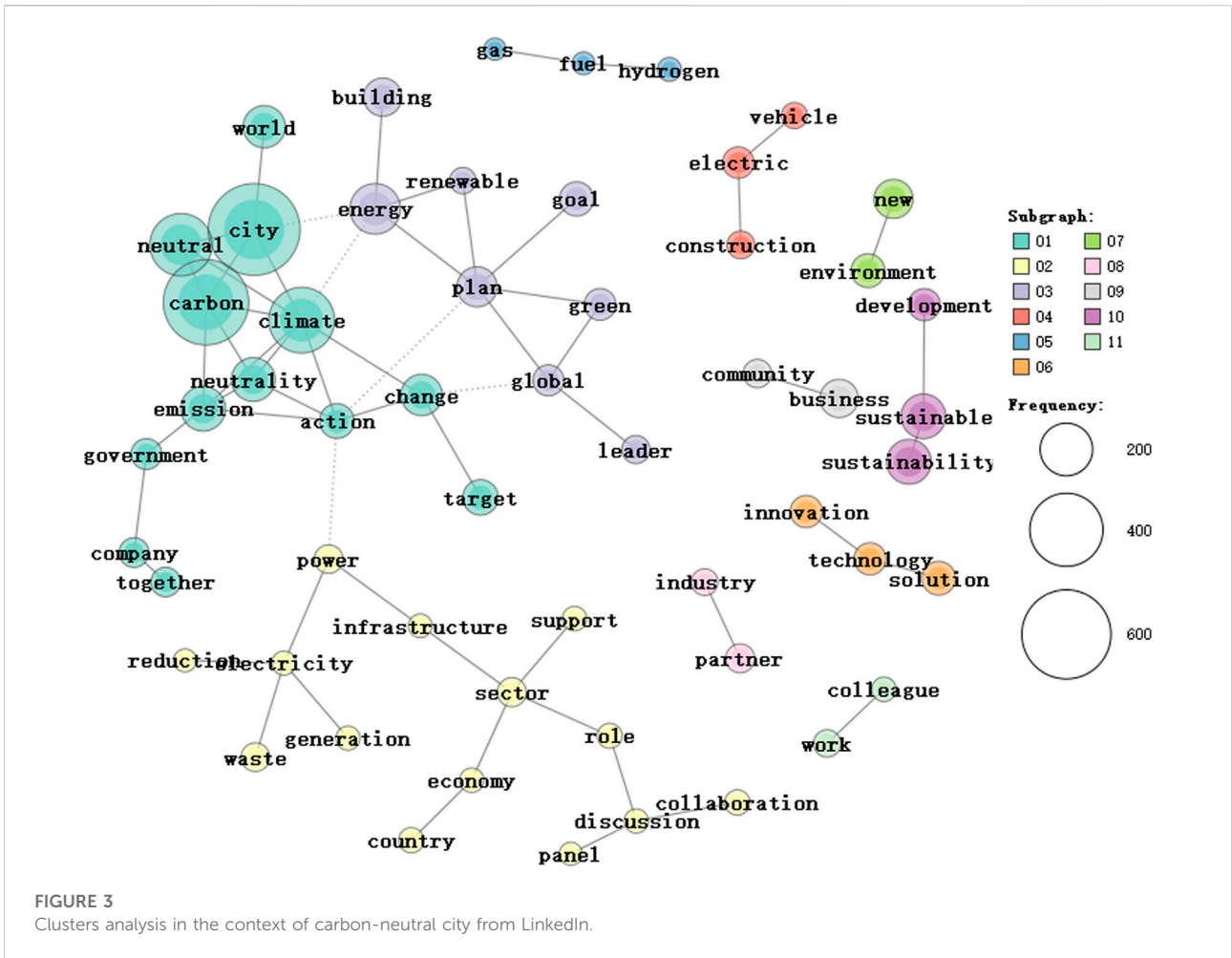
To analyse the co-occurrence network in KHcoder, minimum word frequencies was set at 30, type of edges is words – words. On LinkedIn, there are 11 clusters that are visualised in 11 colours, including themes like "city," "power," "energy," "electric, fuel," "technology," "environment," "industry," "business," "sustainability," and "work" (Figure 3).

As the most popular institute, CNCA mobilised transformative climate action in cities to achieve prosperity, social equity, resilience, and a better quality of life for all on a prosperous planet. CNCA mobilises transformative, game-changing climate action (CNCA, 2022). The largest cluster, including "city," "carbon," "neutral," "neutrality," "emission," "climate," "change" and "target," suggested that the most potent idea from the public would be climate change action. The second-largest cluster included "power," "electricity," "generation," "waste," "reduction," "infrastructure," "sector," "support," "economy," "country," "role," "panel," "discussion," and "collaboration." Thus, power and electricity were hot topics in carbon-neutral cities. For example, power raw materials and fuels development and electrification improvements of key sectors are one of China's strategies to achieve carbon neutrality by 2060.

"Building," "energy," "renewable," "green," "global," "plan," "goal" and "leader" belong to the third-largest cluster. The building industry has always been a major energy consumer; it is one of the critical areas to achieving the carbon-neutral goal. For example, the construction industry is a pillar industry of the national economy and is related to more than 50 related industries such as building materials, metallurgy, lighting, and electronics in China. Decarbonising the urban built environment













It was developed by a top international development team and blockchain enthusiasts. The project party gave up ownership and is now fully autonomous in the community. It is expected that the price of the global carbon market will continue to rise in the next few years, and industry expansion, carbon futures, the introduction of institutional and individual investors, and the carbon quota market will attract much attention. We can also see a cluster including “scientific,” “technological,” and “innovation.”

Compared with the co-occurrence word network of LinkedIn, different clusters were connected weakly. The users mentioned climate change most on LinkedIn, while Sina Weibo users focused more on energy and the construction industry.

According to Figure 6, the most active users were Baotou Daily (government, with 299,000 followers), Beijing Ecological Environment (government with 2,661,000 followers), azure map (organisation, fans are 430,000), 922 Green Travel (organisation, with 160,000 followers), Baotou Evening News (government, with 739,000 followers), Baoding Evening News (government, with 804,000 followers). Most were governments or academic departments. For example, 922 Green Travel was related to the Chinese Academy of Urban Planning & Design (CAUPD).

## Conclusion

### Theoretical contribution

Increasing global industrialisation and overexploitation of fossil fuels have resulted in greenhouse gases emission, increased global temperatures and environmental problems (Chen et al., 2022). Taking cities as the principal target to carry out urban carbon neutrality strategies enables cities to meet carbon-neutrality targets and construction plans for

local market conditions and productivity levels (Qiu, 2021). This research is the first to compare public perception *via* Sina Weibo and LinkedIn in the context of a carbon-neutral city. Sina Weibo is one of China’s most popular social media platforms and microblog networks (Ye et al., 2021). LinkedIn is a professional web platform worldwide. The two databases had different foci on the carbon-neutral city. This research used the keywords, e.g. “carbon-neutral city” or “carbon-neutral cities,” to obtain the relevant content from LinkedIn and Sina Weibo. Pycharm, Navicat Premium, and Selenium are used to obtain the data. There were 1908 microposts on Weibo and 533 posts on LinkedIn. By using KHCoder and Tableau, the influential users and keywords were analysed.

Governments and organisations were popular users on Sina Weibo, while famous persons were receiving more attention on LinkedIn on a carbon-neutral city topic. On Weibo, the most influential users are governments and organisations, for example, Baotou Daily, Beijing Ecological Environment, azure map, 922 Green Travel, Baotou Evening News, and Baoding Evening News. On LinkedIn, the most influential person is Dr Michael Shank, the co-director of Carbon Neutral Cities Alliance. The most popular topics on LinkedIn were “city,” “carbon,” “climate,” “neutral,” “energy,” “emission,” “sustainability,” “sustainable,” “neutrality,” “world,” while “carbon,” “city,” “energy,” “development,” “new,” “green,” “promote,” “neutrality,” “construction,” “industry” are more prevalent on Weibo. Both focused on energy, worldwide carbon emission problems, LinkedIn focused more on climate and sustainability. Furthermore, Sina Weibo bloggers focused more on green development in the construction industry. Analysing social media data on Sina Weibo and LinkedIn provides insights to members

of the public, enterprises and governments when they wish to share knowledge and information effectively.

## Practical contribution

This study offers practical contribution: 1) data analysis from different social media allows government officials and policy makers to learn more about the public perception in carbon-neutral city, benefit them to plan and implement relevant measures for carbon-neutral city; 2) Content analysis of social media offer insights on public concerns, for example, the green development in construction, climate change, sustainable development, new and green energy were the major concerns on Weibo and LinkedIn regarding a carbon-neutral city; 3) Weibo and LinkedIn users share the information can encourage and help the members of public pay more attention on low-carbon travel and green infrastructure, *etc.*; 4) Both Sina Weibo and LinkedIn focused on “energy,” the enterprise could produce and design more green products with new energy, for example, photovoltaic applied on the buildings, with products advantage, competitiveness, market potential, market standard.

## Limitations and further research direction

### Limitations

The study researched the two leading social media, Sina Weibo and LinkedIn. As far as we know, LinkedIn is predominantly in English, but there are posts in other languages, while Weibo is predominantly Chinese. This study only used English keywords to collect data from LinkedIn as there were four Chinese carbon-neutral city LinkedIn posts. On the other hand, it only used Chinese word of carbon neutral city to collect data from Weibo microposts as there was only one post in English on this topic. Although some scholars use a similar method to collect data from social media, it probably has implications for the demographics of the posters.

### Further research direction

In this study, we only collected data from two social media, Sina Weibo and LinkedIn. Others might shed light on social media such as Facebook, Instagram or Twitter. Crowdsourcing that outsources tasks to the crowd in analysing and interpreting the data may contribute to citizen science (Moltchanova et al., 2022). Besides, studying traditional media with a strong focus on climate and carbon neutrality could be the next step. A comparison between social media and traditional Chinese

media like Xinhua or People’s Daily may offer us a meaningful and a new research direction. Furthermore, as compliance is related to statutory measures (Lai et al, 2007), other topics might include people’s perceptions on carbon neutrality laws and regulations.

## Data availability statement

Publicly available datasets were analyzed in this study. This data can be found here: [Weibo.com](https://www.weibo.com); LinkedIn.

## Author contributions

Conceptualisation, LZ, RL, YM; methodology, LZ and HZ; software, LZ; validation, LZ, RL, and YM; formal analysis, LZ; investigation, LZ and YM; resources, LZ; data curation, LZ; writing—original draft preparation, LZ, RL, HZ; writing—review and editing, LZ, RL, and HC; visualisation, LZ; project administration, LZ and RL. All authors have read and agreed to the submitted version of the manuscript.

## Funding

The authors would like to thank the support of the Social Science Foundation of Anhui Province of China (AHSKY 2020D44), the major project of Social Science Foundation of Anhui Province of China (AHSKZD 2019D04), and the Ministry of Education of China (18YJA790065).

## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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