

HSBC GBA ESG Index Report

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HSBC

Opening up a world of opportunity

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Executive Summary



Executive Summary

This report is the quarterly update on the HSBC GBA ESG Index (the Index), which analyses the ESG and sustainable development performance of the Guangdong-Hong Kong-Macao Greater Bay Area (GBA) in Q3 2024.

The GBA ESG Regional Index recorded

a year-on-year increase of

3% in Q3 2024, reaching a value of


121.68

1



In Q3 2024, the State Council proposed the construction of “a world-class green and low-carbon industrial cluster”. Over the three months, the GBA strove to foster the development of a such cluster through a variety of actions such as setting up low-carbon demonstration zones and improving energy digitalisation.

The GBA is at the forefront of green and low-carbon industries. For example, according to the latest public data, by the end of 2023, Guangdong Province was ranked 2nd in the country in terms of cumulative installed capacity of offshore wind power.¹ In Q3, the GBA took steps to expand the industrial chain and accelerate the development of green and low-carbon technologies. The Guangzhou “dual-carbon” Headquarters Demonstration Zone, which was unveiled in Q3, encompasses headquarters from both upstream and downstream enterprises in the “dual-carbon” industry chain. Additionally, cities in the GBA held fairs and exhibitions over the three months, engaging the local and international communities in the exchange of ideas and experiences in green and low-carbon technology.

2  Sci-tech innovation and consumer goods trade-in were two key areas of focus in Q3 2024. There was increasing financing support in the GBA for the development of its sci-tech industries and an increase in the consumption of green products.

According to public data, loans issued by financial institutions to support sci-tech industries have been increased. For example, in Q3 2024, mid- and long-term loans to the scientific research and technology services sector increased 23% year-on-year in Guangdong Province.² At the end of August 2024, Guangdong Province rolled out a policy to further support the trade-in of green products, which successfully boosted the consumption of green products. For example, by the end of September, over the space of one month, the number of applications to qualify for the household appliance trade-in subsidy exceeded 9.30 million, with more than 1.45 million household appliances being replaced.³

3



In Q3 2024, Shenzhen and Hong Kong took steps to perfect their ESG standards, with a focus on the ESG-related disclosure requirement for small and medium-sized enterprises (SMEs) and alignment with international ESG reporting standards, respectively.

Shenzhen published guidelines on environmental information disclosure for SMEs in Q3. The guidelines help SMEs improve their environmental performance by providing a clear reporting framework, and also strengthen SMEs’ awareness of ESG disclosure. At the same time, Hong Kong issued drafts of two inaugural Hong Kong Sustainability Disclosure Standards for public consultation, contributing to the city’s goal of being among the first jurisdictions to align local sustainability disclosure requirements with the International Financial Reporting Standards Sustainability Disclosure Standards (ISSB Standards).

4



The GSSS bondⁱ market within the GBA recovered in Q3 2024, with the governments accounting for 60%ⁱⁱ of the total issuance volume of GSSS bonds within the GBA.

Our study observed that the volume of GSSS bonds issued by the GBAⁱⁱⁱ was RMB54.31 billion in Q3 2024 representing a quarter-on-quarter increase of 11%. According to our data, in Q3, governments within the GBA were the most significant source of GSSS bonds, followed by the financial sector. Furthermore, over the same period, the Hong Kong government issued a large volume of green bonds under the Government Sustainable Bond Programme, accounting for around 46% of the total issuance volume of green bonds within the GBA.

In Q3 2024, the average value of the GBA ESG Industry Sub-indices recorded a year-on-year increase of

20%

reaching a value of

211.67

5



This report contains a detailed analysis of the development of the hydrogen industry in the GBA from the perspective of the industrial chain as a whole. It also discusses ways to increase synergies to further the complementary development of the hydrogen industry within cities in the GBA.

As one of the first regions to develop the hydrogen industry, the GBA now has a large number of hydrogen energy companies, with comprehensive industrial coverage and a broad range of applications. The Pearl River Delta (PRD) cities have actively explored the production of green hydrogen to broaden the scope of the application of hydrogen energy. At the same time, Hong Kong is looking for opportunities to tap into the decarbonisation potential of hydrogen within the context of existing infrastructure.

This report also discusses the green and sustainable financing opportunities for the hydrogen industrial chain. Certain activities within the hydrogen supply chain have been recognised as potential green project types by the leading green and sustainable taxonomies in the market. These commonalities could provide consensus on green and sustainable financing for the hydrogen sector across the market. Differences in the taxonomies create increasing financing opportunities for potential issuers and borrowers from the industrial chain.

i. GSSS bonds include green bonds, social bonds, sustainability bonds and sustainability-linked bonds.

ii. In our study, the data covers the issuance volume of GSSS bonds issued by The People’s Government of Guangdong Province, if any.

iii. GSSS bonds issued by issuers in the GBA or a specific GBA city in this report refer to both onshore and offshore GSSS bonds issued by entities registered or primarily operating in the GBA or a specific GBA city.

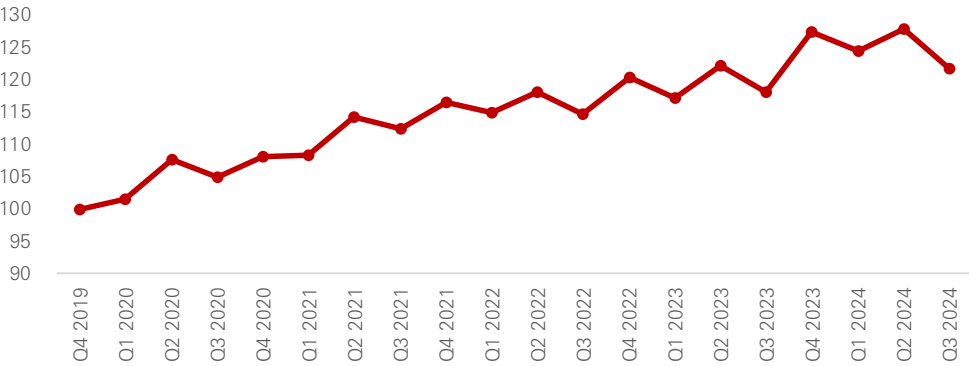
GBA ESG Regional Index



GBA ESG Regional Index

Figure 1. The GBA ESG Regional Index

The GBA ESG Regional Index recorded a year-on-year increase of 3% in Q3 2024, reaching a value of 121.68



Source: China's official statistical database, public disclosure of listed companies, public information from relevant third-party databases, other public sources, CECEPEC

Figure 2. Breakdown of the GBA's performance in the five areas



Note: The values are normalised. The base values were 100.00 for Q4 2019 (base period). Source: China's official statistical database, public disclosures of listed companies, other public sources, CECEPEC





Our study observed that the Chinese central government and the GBA government have provided continuous strong policy support for the region's sustainable development since Q2 2023. However, the number of policies related to sustainability unveiled by the government decreased in Q3 2024, which led to a decline in the value of the policy area in that period.

The areas of environment and corporate governance remained relatively stable in Q3 2024. At the same time, the area of economic and social development experienced a decrease, in line with its normal cyclical behaviour.

With regard to the area of green and sustainable finance, the GBA experienced slight growth as compared with Q2 2024, with a quarter-on-quarter increase of 2%. According to our study, the volume of GSSS bonds issued by the GBA increased in Q3, up 11% quarter-on-quarter.

Policy

According to the policies issued in Q3 2024, the green and low-carbon industries and the low-altitude economy are the focused ESG-related areas within the GBA.

In August, the Central Committee and the State Council issued *Opinions on Accelerating Comprehensive Green Transformation of Economic and Social Development*, which states that it is necessary to further promote the construction of the GBA and create a “world-class green and low-carbon industrial cluster”. In February 2024, Guangdong Province released the *Action Plan for Cultivating and Developing Green and Low-carbon Industries Cluster in Guangdong Province* (“*The Plan*”). The Plan calls for the construction of internationally competitive green and low-carbon industrial clusters, highlighting eight key cutting-edge projects, such as deep sea offshore wind power, new energy storage, hydrogen, etc. Our study observed that provincial and municipal governments within the GBA provided significant policy support for this initiative in Q3 2024, echoing the national and provincial calls.

- ♦ In Q3 2024, Guangdong Province launched a policy document entitled *Opinions on Supporting Huizhou to Accelerate the Construction of a Green and Low Carbon Industrial System and Build a New Growth Pole for Guangdong's High-Quality Development* (“*The Opinions*”). The Opinions set out six key proposals to support Huizhou in accelerating high-quality development in Guangdong. One of proposals which was establishing a benchmark for green and low-carbon, highlighted several areas such as the development of the new-type energy storage sector, new technology and programs for energy saving and carbon reduction, and the green and circular development of industrial parks, among others.
- ♦ Shenzhen unveiled its *Measures for Strengthening Ecological Environment Protection to Promote High-Quality Economic Development in Shenzhen(2024-2027)* in Q3. The policy highlighted the promotion of environment-related sectors such as ecological and environmental manufacturing and carbon management and ecological restoration services.

Green finance, an essential approach to promoting the green and low-carbon development of industries and society, has been increasingly highlighted by the government in recent years. In Q3 2024, in the 20th Central Committee of the Communist Party of China the Chinese central government emphasised the need for greater efforts in the five areas^{iv} of the financial sector. Green finance is one of the key areas. Our study observed that the GBA has launched policies to support green finance within the region and highlighted the importance of increasing the ESG-related disclosure of relevant market players.

iv. Five areas include technology finance, green finance, inclusive finance, pension finance, and digital finance.

- ♦ The Guangdong Provincial Branch of the People's Bank of China(PBOC) has unveiled the *Three Year Special Action Plan for the Development of Five Major Areas* in Q3. At the same time, the Guangdong Provincial Branch of the PBOC proposed four working areas in the next step, including strengthening the environmental data disclosure of the financial sector.
- ♦ In Q3, Shenzhen launched a policy to manage Shenzhen's entity database for green financing, which will increase the efficiency of green financing activities between the enterprises and the financial sector. The policy emphasises the requirements for the entities to disclose their environmental data. Our study noticed that Shenzhen also released a guidance document for environmental information disclosure for SMEs.

The low-altitude economy, a strategic emerging industry, has been highlighted within the GBA. Our study observed that in Q3 2024, Dongguan, Foshan and Zhongshan published policies to support the development of this industry. As of Q3 2024, almost all of PRD cities within the GBA had issued action plans promoting the high-quality development of the low-altitude economy by accelerating the commercial use of low-altitude aircraft, infrastructure development, and so on.

Environment

In Q3 2024, the GBA strove to foster the development of green and low-carbon industrial clusters by setting up low-carbon demonstration zones and improving energy digitalisation.

As previously mentioned, the Chinese central government proposed creating a “world-class green and low-carbon industrial cluster” in the GBA, and governments within the GBA have set out policies which support the development of green and low-carbon industries within the GBA. As the province with the largest economy, Guangdong Province is at the forefront of green and low-carbon industries. For example, by the end of 2023, the cumulative installed capacity of offshore wind power exceeded 10 million kilowatts in the province, ranking it 2nd in the country.⁴ Guangdong Province has been at the leading edge of the electrochemical energy storage technology and ranked 1st in the country in the number of hydrogen fuel cell vehicles register^v.

In Q3, the GBA accelerated the development of green and low-carbon industrial sectors. In August 2024, the Guangzhou “dual-carbon” Headquarters Demonstration Zone was unveiled, encompassing company headquarters from both upstream and downstream enterprises in the “dual-carbon” industry chain. By integrating government, industry, academia, research and application, the demonstration zone cultivates new growth of the dual-carbon industry. It aims to demonstrate the achievements of efforts towards dual-carbon in Guangzhou and the effectiveness of the industry chain, as well as creating a focal point for company headquarters.

Additionally, cities in the GBA held fairs and exhibitions in Q3, engaging the local and international communities in the exchange of ideas and experiences in green and low-carbon technology.

v. Refers to the hydrogen fuel cell vehicles registered at the national Electronic Vehicle Surveillance and Monitoring Center ([Source](#)).

IE Expo Shenzhen:

IE Expo China in Shenzhen was held at the end of September. It is considered South China’s leading trade fair for environmental technologies and an essential platform for international companies looking to tap into the dynamic Chinese market. It showcased practical solutions in key areas such as water supply, wastewater treatment, waste management, recycling, air purification, and energy efficiency. During the exhibition, 317 exhibitors from nine countries participated and more than 50 kinds of new technologies made their debut.⁶

2024 International Digital Energy Exhibition in Shenzhen:

- ◆ *Shenzhen Energy Digitalisation Pioneer City Construction Plan* (“The Plan”) was launched at the opening ceremony in September. The Plan states that the digital energy industry will become a new pillar to support the city’s economic growth.
- ◆ As a first-tier city in the country with the lowest energy consumption per unit of GDP, Shenzhen has entered a new era as regards digital energy.⁷ A large number of entities in Shenzhen have participated in the field of digital energy and shared their solutions, which are both viable in the market and technologically feasible. The Virtual Power Plant launched by the power supply company in Shenzhen is a case in point.

Virtual Power Plant

Shenzhen Virtual Power Plant released the “Regulation Management Cloud Platform 3”, which now includes low-carbon scheduling technology, at the opening ceremony. The new “power + algorithm”, incorporating green power tracking and remote sensing technology, enables the 3.0 platform to calculate and monitor the “carbon trajectory” of power transmission from the very start. By synthesising carbon emissions and the supply and demand of power, it can reduce peaks and fill in off-peaks to minimise carbon emissions. The platform is expected to reduce carbon dioxide emissions by 3,000 tonnes by the end of this year.⁸

In our study, we keep track of the science-based climate commitments and targets of GBA companies. We observed that in Q3 2024, a total of 32 companies set emission reduction targets or made commitments via Science Based Target initiatives(SBTi), representing a quarter-on-quarter increase of 33%. Specifically, 19 companies set targets, while 13 companies made commitments. When taking a closer look at the differences within the GBA, we found that companies in Hong Kong and Shenzhen are more ambitious. Specifically, Hong Kong and Shenzhen accounted for 38% and 28%, respectively, of the companies that set targets and made commitments.



Economic and Social Development

In Q3 2024, sci-tech innovation, the labour market and the consumer goods trade-in were the key areas of focus within the GBA.

As mentioned above, within the financial sector, technology finance is one of the five areas highlighted by the Chinese central government. The GBA, the technology and innovation hub of the country, has continuously supported the development of the region’s sci-tech industries by leveraging financial instruments.

Figure 3. Loans issued by financial institutions to support sci-tech and innovation development.

	Types of Loan	Outstanding Loans (year-on-year increase)
Guangdong Province	Mid-and long-term loans to the scientific research and technology services sector	23% (as of Q3 2024)
	Mid-and long-term loans to the high-tech manufacturing sector	16% (as of Q2 2024)
Shenzhen (As of May 2024)	Loans to high-tech enterprises	17%

Source: Public information

Innovative financial supporting products in Shenzhen

Shenzhen launched innovative products for sci-tech enterprises at different stages of their development, aiming to promote a virtuous cycle of “technology - industry – finance”.

- ◆ At the end of 2023, Shenzhen launched a new loan program, “Take-off Loan”(腾飞贷), aimed at mid-stage sci-tech enterprises. In Q3 2024, Shenzhen upgraded the “Take-off Loan” with increased incentives for enterprises. As of the middle of July 2024, 14 banks in Shenzhen have signed “Take-off loans” with 33 enterprises, with a total contract amount of RMB810 million, and a cumulative total of RMB720 million of loans have been issued.⁹
- ◆ Shenzhen also focused on sci-tech start-up enterprises and in June 2024 officially launched the “Science and Technology Startup Pass”(科技初创通, “the Pass”), the first of its kind in China. Using digital technology, the Pass helps banks identify the development potential of startups and, at the same time, solve start-ups’ “first mile” problems with regard to financing. By the end of June, the “Pass” had served ten sci-tech start-up enterprises and granted credit to the value of RMB25.07 million since the Pass was first piloted in March 2024.¹⁰

The GBA governments have established projects to promote co-operation in sci-tech and innovation within the region and demonstrated progress in cultivating new productive forces.

The “Future Manufacturing Hall” (FM Hall) which was set up in July 2024 by the Hong Kong Productive Council showcases numerous successful cases from the GBA. It underscores Hong Kong’s competitive edge in industrial development and its remarkable achievements in industrial transformation and upgrade. As a demonstration platform for “New Productive Forces” in South China, the FM Hall will play a critical role in fostering deeper exchanges and cooperation between Hong Kong, mainland China and various sectors, embracing the new era of “Hong Kong Got Industries” and “Made in Hong Kong”.¹¹

The Hetao Shenzhen-Hong Kong Innovation and Technology Co-operation Zone(Co-operation Zone) is one of many co-operation projects in innovation and technology within the GBA. Over the past year, the Zone has experienced an increasing concentration of innovative resources and talents. Specifically, the Zone has gathered together over 440 sci-tech enterprises and over 160 high-end sci-tech projects.¹² The number of scientific research talents has so far increased from 4,300 to over 15,000.¹³



In Q3 2024, the GBA supported the employment and/or career development of young and aged people by launching pilot programs, providing policy support, and so on.

In July, Hong Kong announced the launch of the Re-employment Allowance Pilot Scheme (REA Scheme), which encourages elderly and middle-aged people to rejoin the labour force. The aim of the REA Scheme is to address the acute labour shortage in Hong Kong.

With regard to support for young people, in Q3 2024, GBA governments set out policies to facilitate the mobility of talents between employment markets and encourage entrepreneurship in the region.

- ◆ The Regulations of Guangdong Province on Promoting the Employment and Entrepreneurship of Hong Kong and Macao Youth in the Nine Municipalities in the Greater Bay Area (“the Regulation”) come into effect from 1st September 2024. The Regulation aims to address the inconvenience in cross-boundary professional practice and difficulties in financing start-ups business, and to provide employment and entrepreneurship services in support of the development of youth from Hong Kong and Macao in the GBA.
- ◆ The 16 Measures for Supporting and Encouraging Hong Kong and Macao Youth to Develop in Zhuhai were released. These measures focus on youth groups in Hong Kong and Macao and highlight the development opportunities in Zhuhai with the aim of making Zhuhai the first place of choice for entrepreneurship in mainland China.

In Q3 2024, Shenzhen launched a set of measures to encourage young entrepreneurs from Hong Kong and Macao to start their businesses and live in Qianhai.

- ◆ RMB1 Innovation Workshop
Hong Kong teams that meet the selection criteria will only be required to pay a service fee of RMB1 per square metre per month to be admitted to the Dream Workshop.
- ◆ RMB500 million Dream Factory Fund
Qianhai allocated RMB500 million to set up the Dream Factory Fund, and cooperated with fund companies in Shenzhen to introduce long-term capital to support sci-tech enterprises.
- ◆ Hong Kong Youth Hostel
In response to the difficulties experience by young people from Hong Kong who have just arrived in Shenzhen in finding suitable accommodation, the “Hong Kong Youth Hostel” of DreamWorks will provide free transitional accommodation for a maximum of one month.

Encouraging consumer goods trade-in is an essential measure by Chinese governments to bolster consumption recovery and stimulate economic development. At the end of August, the Guangdong Province rolled out a policy to further support the trade-in of green products, such as green household appliances, and the trade-in of traditional fuel vehicles for electric vehicles. By the end of September, over the space of one month, the number of applications to qualify for the household appliance trade-in subsidy exceeded 9.30 million, with more than 1.45 million household appliances being replaced.³ The policy successfully boosted consumption of green products, which in turn, supported the growth of the manufacturing sector.



Corporate Governance

State-owned enterprises (SOEs) within the GBA have actively responded to national policies to enhance ESG-related disclosure.

Since 2022, the State-owned Assets Supervision and Administration Commission of the State Council (SASAC) has accelerated the ESG development of SOEs and the listed companies majority-owned by SOEs. The GBA has been actively responding to national policies and established the Social Responsibility Bureau under the SASAC of Guangdong Province, which is in charge of promoting policies related to the social value of SOEs and guiding SOEs to carry out ESG-related work.¹⁴

In August 2024, the fourth State-Owned Enterprise Social Value Forum was held in Guangzhou, during which three documents were published:¹⁵

- ◆ The first *GBA ESG Action Report* systematically evaluates the ESG performance of listed companies in the GBA and summarises the experience and essential features of ESG development.
- ◆ The fourth *GBA SOEs Social Value Blue Book* comprehensively demonstrates the remarkable achievements of SOEs in the GBA with regard to responsibility and value creation.
- ◆ The second *GBA Listed Companies Owned by SOEs ESG Blue Book* integrates excellent ESG practices and achievements of listed companies owned by SOEs in the GBA.

In addition to SOEs, the GBA is committed to promoting ESG-related disclosure for SMEs. In September, the guidelines on environmental information disclosure for SMEs, *Guidance on Environmental Information Disclosure for Small and Medium-sized Enterprises*, was published by the Shenzhen Green Finance Association and made available for comment. The guidelines can effectively help SMEs improve their environmental performance by providing a clear reporting framework for enterprises, and help strengthen SMEs’ awareness of ESG disclosure.

Hong Kong is committed to being among the first jurisdictions to align local sustainability disclosure requirements with ISSB Standards.¹⁶

In September, the Hong Kong Institute of Certified Public Accountants (HKICPA) issued drafts of two inaugural Hong Kong Sustainability Disclosure Standards for public consultation, namely Hong Kong Financial Reporting Standard (HKFRS) S1 *General Requirements for Disclosure of Sustainability-related Financial Information* and HKFRS S2 *Climate-related Disclosures* for public consultation. The HKICPA proposed full convergence of HKFRS S1 and HKFRS S2 with ISSB’s two related standards, IFRS S1 *General Requirements for Disclosure of Sustainability-related Financial Information* and IFRS S2 *Climate-related Disclosures*. HKICPA sought comments on the first draft of the HKFRS before 27 October 2024, with the full version of the HKFRS expected to be effective from 1 August 2025. As indicated in the Government’s *Vision Statement on Turning Obligations into Opportunities in Developing the Sustainability Disclosure Ecosystem in Hong Kong* in March 2024, the two standards would be prioritised for listed companies and regulated financial institutions in Hong Kong.¹⁷





Green and Sustainable Finance

GSSS bond market within the GBA recovered in Q3 2024.

Our study observed that the volume of GSSS bonds issued by the GBA increased in Q3 2024, reaching RMB54.31 billion; an 11% increase quarter-on-quarter. According to our data, in Q3 2024, governments within the GBA were the most significant source of GSSS bonds, followed by the financial sector. Specifically, governments accounted for approximately 60%^{vi} of the total issuance volume within the GBA, while the financials sector accounted for 28%.

Figure 4. Volume of GSSS bonds issued by the GBA in Q3 2024 (RMB billions)

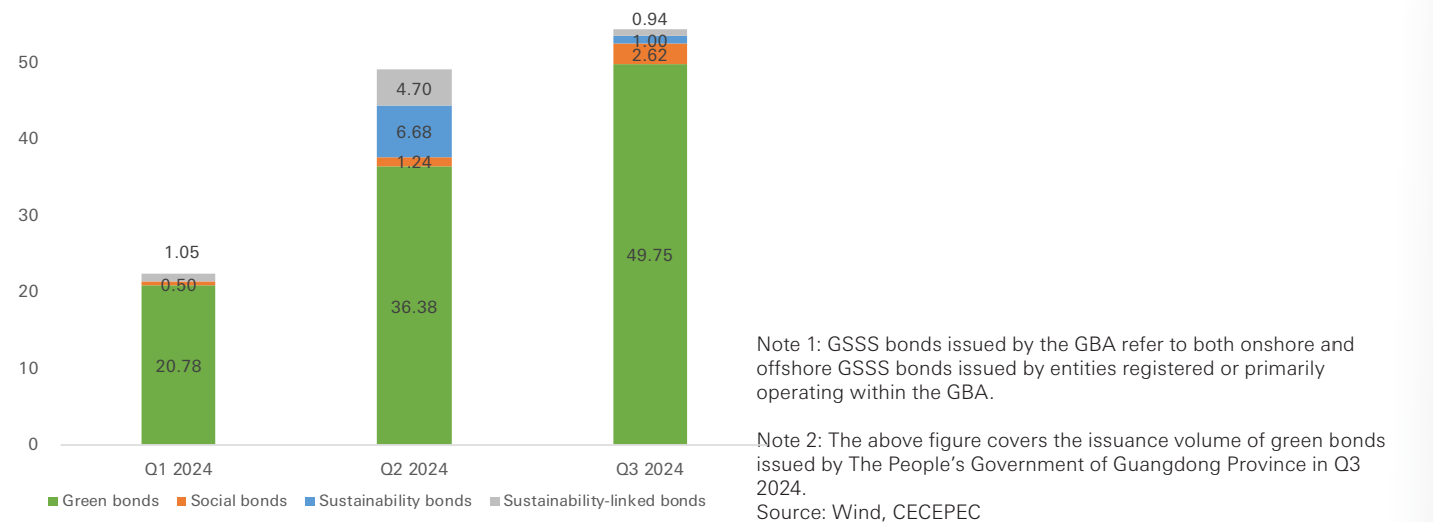


Figure 5. GSSS bonds issued by the governments within the GBA in Q3 2024

Issuer	Type and Size	Comment
The Government of the Hong Kong Special Administrative Region	Approximately HKD25 billion worth of green bonds denominated in RMB, USD, and EUR.	<ul style="list-style-type: none">The green bonds were issued under the Government Sustainable Bond Programme.The proceeds will be allocated to eligible green projects aligned with the government's Green Bond Framework.
The People's Government of Guangdong Province	RMB5.0 billion worth of green bonds	<ul style="list-style-type: none">It was the first time the People's Government of Guangdong Province issued bonds in Hong Kong.
The People's Government of Shenzhen Municipality	RMB0.9 billion worth of social bonds RMB2.7 billion worth of green bonds RMB1.0 billion worth of sustainability bonds	<ul style="list-style-type: none">It was the fourth consecutive year that Shenzhen issued bonds in Hong Kong.The proceeds will be allocated to the areas of healthcare, education, basic infrastructure, and transportation.

Source: Wind, public sources

vi. In our study, the data covers the issuance volume of GSSS bonds issued by The People's Government of Guangdong Province, if any.

As shown in Figure 5, in Q3 2024, the Hong Kong government issued a large volume of green bonds under the Government Sustainable Bond Programme. According to our data, the Hong Kong government accounted for around 46% of the total issuance volume of green bonds within the GBA in Q3. In September 2024, the Hong Kong government released its Green Bond Report 2024, which sets out the allocation of the proceeds raised from green bond issuances and the expected environmental benefits of the projects financed. According to the Green Bond Report 2024, the government has issued green bonds totalling close to HK\$220 billion to fund numerous green projects in Hong Kong.¹⁸

The green loans market has grown continuously. As of Q2 2024, Guangzhou's outstanding green loans reached RMB1.23 trillion, accounting for over 15% of the total amount of all loans; Shenzhen's outstanding green loans were RMB1.06 trillion; a year-on-year increase of 28%.¹⁹ According to public data, over USD22 billion of GSS+ loans (green, social, and sustainability-linked) were issued in Hong Kong in 2023.²⁰

With regard to the sustainable investment market, our study observed that the market was not very active in Q3 2024. According to our data, there was no new signatory to the Principles for Responsible Investment (PRI) in Q3. At the same time, our study observed that nine new ESG mutual funds were launched by fund management companies from the GBA in Q3, representing a decrease of 25% from Q2 2024. Furthermore, all new ESG mutual funds were launched by Shenzhen. The types of new ESG mutual funds in Q3 were as follows:

Figure 6. Types of ESG mutual funds launched by GBA's fund management companies in Q3 2024

Type	Number
Pure ESG funds	6
Environmental theme funds	2
Social funds	1

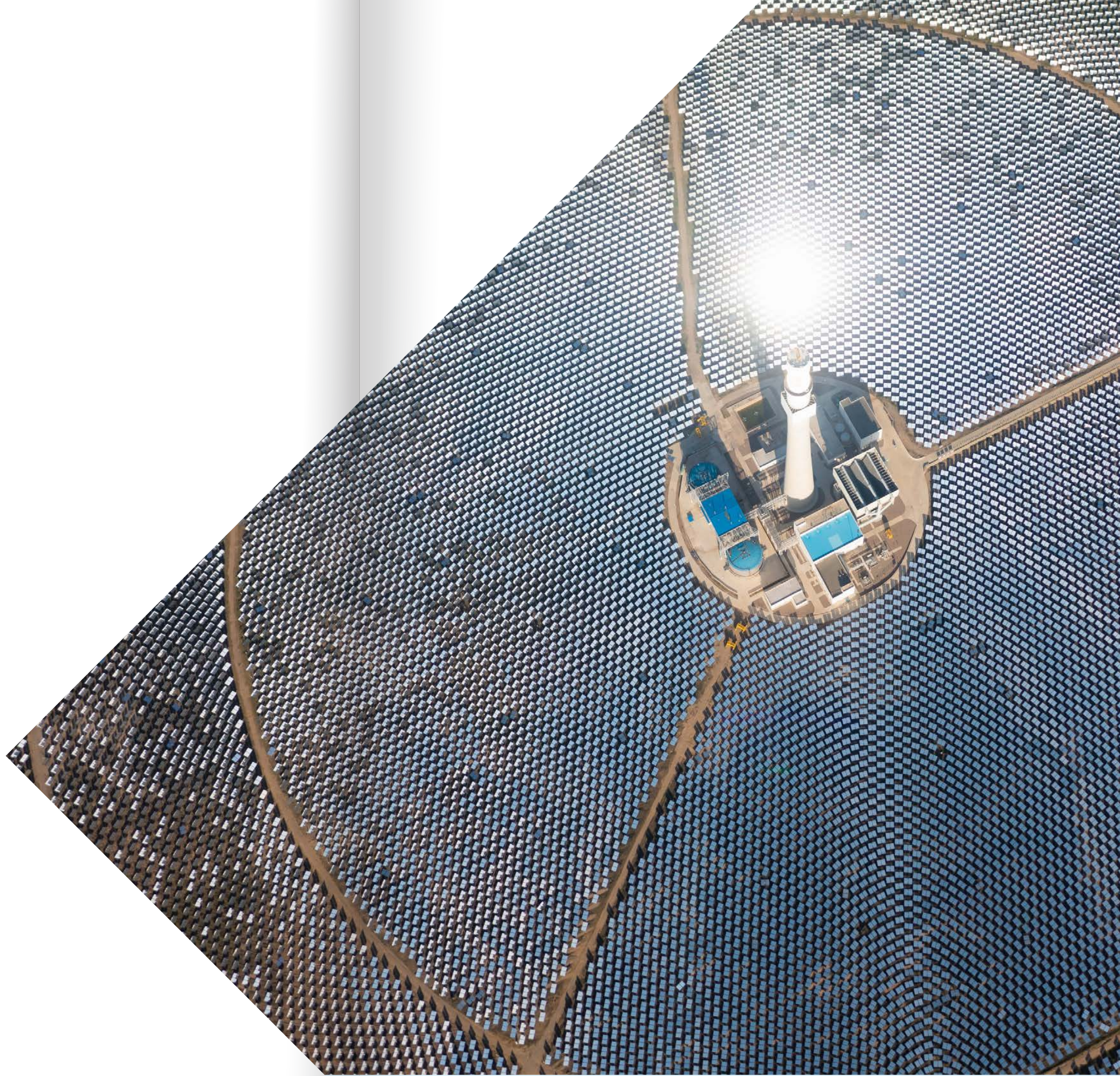
Note: Pure ESG mutual fund: Incorporate all three dimensions, i.e., environmental, social and governance, into their investment strategies. Environmental themed fund: Incorporate the environmental dimension into the investment strategies. Social themed fund: Incorporate the social dimension into the investment strategies. [\(Source\)](#)

Source: Wind, CECEPEC

The GBA has continued to strengthen communication and co-operation in the region's green and sustainable finance areas. The 2024 Annual Conference GBA Green Finance Alliance(GBA-GFA) was held in September 2024 in Guangzhou. During the annual meeting, a series of achievements were announced, such as evaluation systems for leveraging green finance to support enterprises and projects, guidance for the enterprises' carbon financing, and standards for environmental impact reporting of green bonds. Additionally, 27 organisations, including financial institutions and industry associations signed an initiative to jointly promote green leasing by developing green leasing products and strengthening their application.

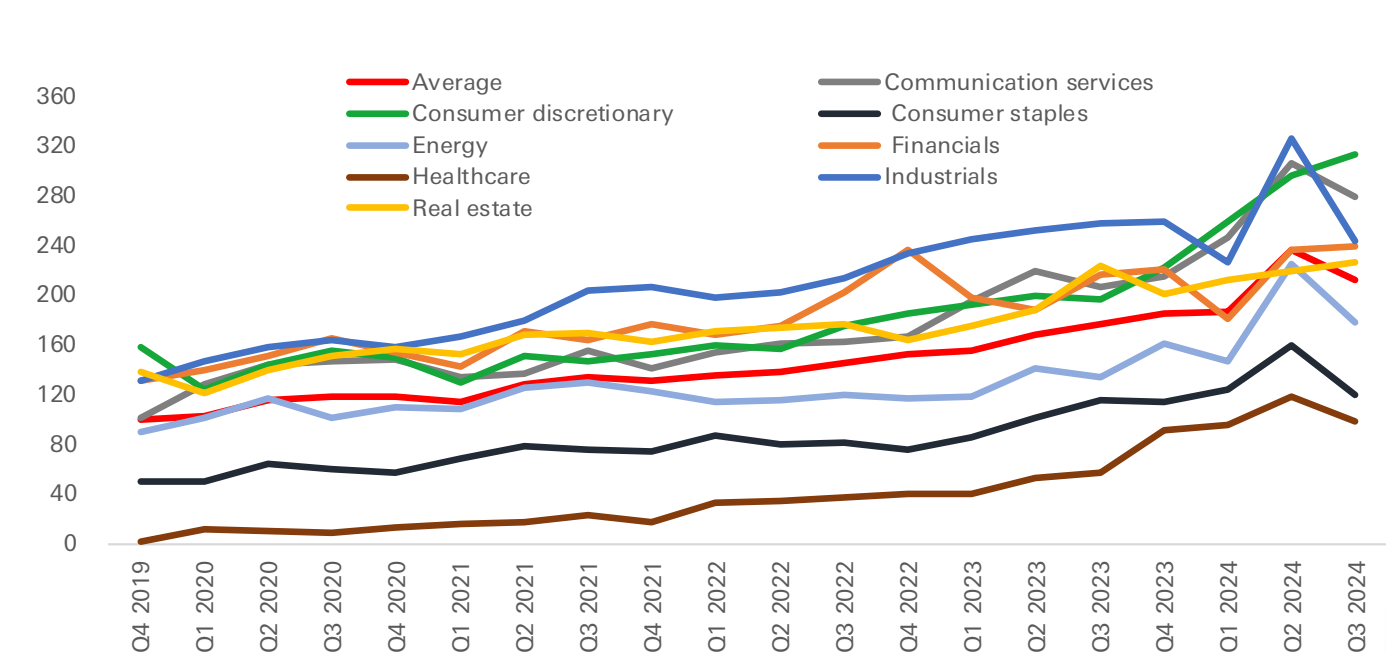


GBA ESG Industry Sub-indices



GBA ESG Industry Sub-indices

Figure 7. Relative ESG performance evolution of the eight sectors



Note: The average value of the GBA ESG Industry Sub-indices was set at 100.00 for Q4 2019 (base period), as a benchmark with which to compare each key sector's individual ESG performances as well as their average performance.

Source: China's official statistical database, public sources, CECEPEC

Our study shows that the average value of GBA ESG Industry Sub-indices decreased to 211.67 in Q3 2024, down 10%. However, it still performed better in Q3 compared with the same period last year, with a year-on-year increase of 20%.

As shown in Figure 7, of eight key sectors, five experienced poorer performance in ESG in Q3 compared with Q2 2024, due to fewer sustainability-related policies being unveiled and less issuance of GSSS bonds by sectors in Q3. As mentioned previously, the total volume of GSSS bonds issued by the GBA increased in Q3 2024, with the government being the primary contributor. However, when looking at the GSSS bonds issued by the

eight key sectors, the total issuance volume declined. According to our data, the total issuance volume of the eight key sectors in Q3 2024 was approximately RMB21.85 billion, down 54% from Q2.

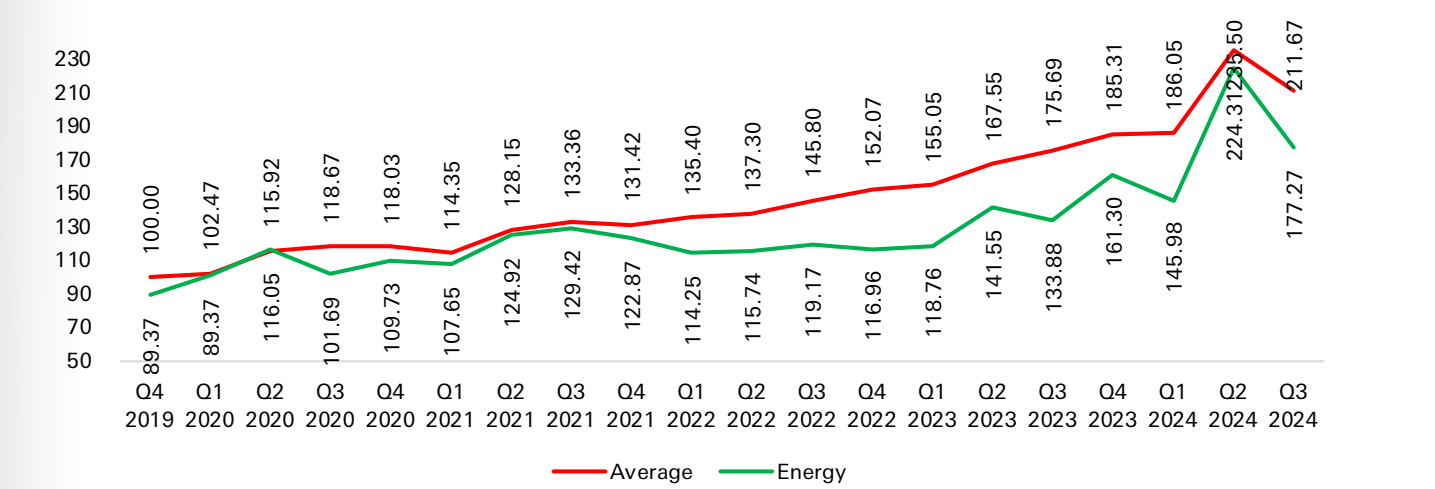
It is worth noting that the Consumer Discretionary sector experienced continuous improvement in ESG performance in Q3, ranking first among the eight key sectors. Our study found that the number of companies in the Consumer Discretionary sector that set emission reduction targets or made commitments via SBTi significantly increased in Q3 2024 compared with Q2, accounting for over 40% of the total number of companies from the eight key sectors that did so.

Case Study:

Energy

The energy sector plays a key role in the economic transition. In our previous report dated October 2023, we analysed the notable progress the GBA achieved in the area of clean energy, including clean energy production, green hydrogen, and electricity grids and storage. **Hydrogen energy has attracted increasing attention because of its significant role in constructing a clean, low-carbon, safe, and efficient energy system.** In this report, in addition to analysing the overall ESG performance of the whole energy sector, we take a closer look at the development of the hydrogen industry within the GBA.

Figure 8. GBA ESG Sub-index – Energy



Note: The line chart shows the ESG performance evolution of the energy sector. The average value of the GBA ESG Industry Sub-indices was set at 100.00 for Q4 2019 (base period).

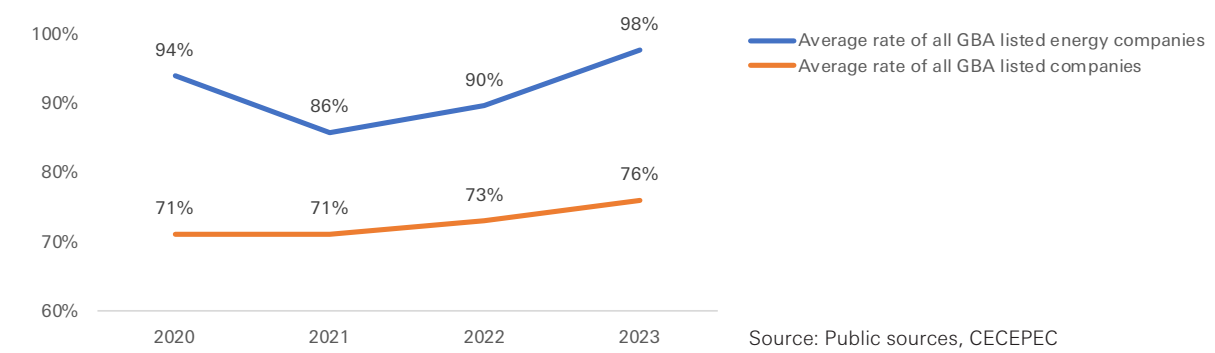
Source: China's official statistical database, Wind, public sources, public disclosures of listed companies, CECEPEC

As shown in Figure 8, the energy sector has experienced a significant improvement in ESG over the past two years, albeit with fluctuations. The slight drops experienced in certain quarters were due to decreases in the ESG disclosure rate and GSSS bond issuance. The ESG performance of the energy sector has lagged behind that of the average of eight key sectors since Q3 2020, and the gap has increased since Q4 2021, implying that the pace of improvement in the energy sector has been slower than that of most other key sectors. In Q2 2024, the sector experienced rapid growth to mirror the average performance of the eight key sectors, primarily due to increasing ESG disclosure rates and policy support, and increased activity in the GSSS bond market. However, in Q3, there was a decline in the energy sector and the average performance of eight key sectors, primarily due to fewer sustainability-related policies being unveiled and decreased issuance of GSSS bonds.

According to our study, the energy sector maintained a high ESG disclosure rate over the period studied, and recorded a rate of about **98%** for FY 2023, significantly higher than the average rate of **76%** for all GBA-listed companies.



Figure 9. The average ESG disclosure rate of the GBA’s energy sector and all GBA-listed companies



With regard to the GSSS bond market, the energy sector is one of the main contributors to GSSS bond issuance within the GBA. Our study found that the GBA energy sector was more active in issuing GSSS bonds in 2024. As shown in Figure 10, the volume of GSSS bonds issued in the first three quarters of 2024 was over the total annual volume of 2022 and 2023. It is worth noting that, the energy sector ranked third in the total issuance of GSSS bonds for both government and other sectors, accounting for over 20% and 9% of the total issuance volume within the GBA in Q2 and Q3 2024, respectively.

Figure 10. GSSS bonds issued by the GBA’s energy sector

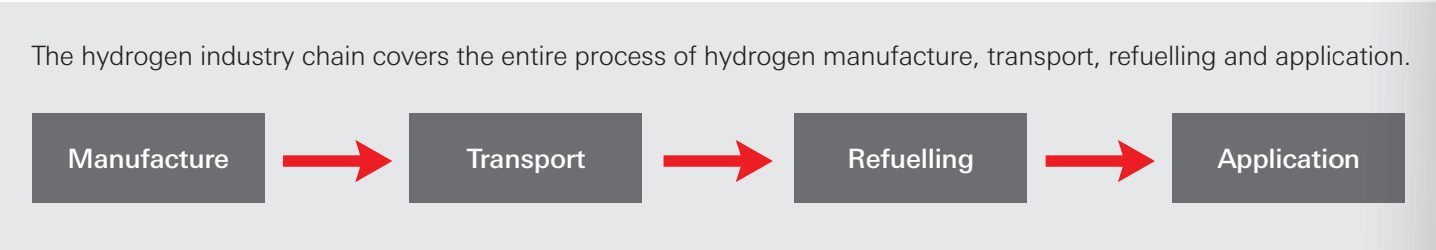
	GSSS bonds issued by the GBA’s energy sector(RMB billion)
2024 (Q1-Q3)	16.36
2023	13.08
2022	12.31
2021	21.61
2020	5.45

Source: Wind, CECEPEC

Energy Sector Close-up: Hydrogen Energy

As a form of secondary energy^{vii} with abundant sources, hydrogen energy is green, low carbon and can be widely used in various areas such as transportation, power and heat generation, and construction.

In 2022, the Chinese government launched a plan for the development of hydrogen energy for the period 2021-2035 as the country speeds toward its carbon peaking and neutrality goals. The plan highlighted the comprehensive development of the hydrogen industry chain. As mentioned in the GBA ESG Regional Index section, in the *Action Plan for Cultivating and Developing Green and Low-carbon Industries Cluster in Guangdong Province*, Guangdong Province highlighted work on eight cutting-edge projects one of which is hydrogen development. To echo the policies proposed by the central and provincial governments, the GBA cities, especially Guangzhou, Shenzhen, Foshan and Hong Kong, accelerated the deployment of a comprehensive hydrogen industry by issuing policies and guidelines, and encouraging the launch of pilot projects.



vii. Secondary energy is results from conversion and transformation of different types of primary energy sources(Source).

As one of the first regions to develop the hydrogen industry, the GBA now has a large number of hydrogen energy companies, with comprehensive industrial coverage and a broad range of applications. PRD cities have actively explored the production of green hydrogen to broaden the scope of application of hydrogen energy. At the same time, Hong Kong is looking for opportunities to tap into the decarbonisation potential of hydrogen within the context of existing infrastructure. GBA cities are actively looking at ways to increase synergies in the development of the hydrogen sector while complementing one another in the industrial chain.

Industry Chain of Hydrogen within the GBA

Hydrogen Manufacture

As a secondary carrier of energy, hydrogen can be produced (i) using fossil fuels such as coal, oil, and natural gas by steam reform, (ii) as by-products from industrial waste gas and renewable energy, such as solar and wind, and (iii) through electrolysis or biomass gasification.

- Hydrogen energy is classified into grey hydrogen, blue hydrogen and green hydrogen according to the production methods and environmental impacts.
- ♦ **Grey hydrogen:** Grey hydrogen is mainly produced as a by-product of the oil refining process or by steam reforming using natural gas or other fossil fuels. Although it is the most developed and cost-effective method, this process generates carbon emissions.
 - ♦ **Blue hydrogen:** By using carbon capture and storage technology to offset the carbon emitted in the production of hydrogen, blue hydrogen is produced in a more environmental-friendly way.
 - ♦ **Green hydrogen:** Green hydrogen is produced by electrolysis of water from renewable energy sources, or other low-emission methods such as biomass gasification.

As the largest producer of hydrogen, China is capable of producing around 35 million tonnes of hydrogen annually.²¹ Currently, most of the hydrogen produced is grey hydrogen. According to the National Energy Administration, green hydrogen currently accounts for around 1% of total hydrogen produced in China.²² Nationwide around 60% of hydrogen is produced from coal.²³

Policy to support hydrogen manufacture
In the action plan, *Opinions on Accelerating the Innovative Development of Hydrogen Energy Industry in Guangdong Province*, three strategies were proposed to accelerate hydrogen production within Guangdong province, namely developing electrolysis technology, using by-product hydrogen effectively and promoting the production of hydrogen from renewable resources. The policy paper proposed a target of achieving a hydrogen supply of 100,000 tonnes by 2025.²⁴

Due to the lack of fossil fuel resources and the industrial structure of the PRD, resources for hydrogen production are limited, leading to a shortage of hydrogen in Guangdong Province. As a result, **hydrogen production methods are more diverse in Guangdong Province than on the national scale, with a focus on the production of green hydrogen.**²³ At the same time, as a manufacturing hub, Guangdong Province is in a leading position with regard to the manufacture of hydrogen production equipment, which lowers the cost of hydrogen production within the GBA and facilitates the development of the hydrogen industrial chain. **In the case of Hong Kong, scarcity of land resources and a dense population make it difficult for Hong Kong to become a manufacturing centre for hydrogen.** Nevertheless, to achieve carbon neutrality by 2050, it is important for the city to harness the opportunities that the hydrogen energy industry affords.

Cities within the GBA have worked on the production of green hydrogen and on bottleneck technology. Water electrolysis is one of the most promising methods of green hydrogen generation. Of the companies within the Guangdong Province that produce hydrogen, over 20% produce hydrogen via water electrolysis. Other innovative approaches to green hydrogen production are also being actively explored within the GBA.

Shenzhen

Project to Produce Hydrogen Production via Water Electrolysis

A pilot project to produce hydrogen via the electrolysis of seawater began operation in Ma Wan, Shenzhen, in 2023. As the largest such single production unit, it can produce up to 100 cubic metres of hydrogen when at full capacity.²⁵



Foshan

Project to Produce Green Hydrogen Production from Household Waste

In Nanhai District, Foshan, a project to produce hydrogen from solid waste started in early 2024. Once the project is fully operational a waste treatment plant will produce green hydrogen,²⁶ thereby turning waste into a valuable resource.



As mentioned above, it is difficult for Hong Kong to become a hydrogen manufacturing centre. However, it is worth noting that Hong Kong has explored new technologies for the production of green hydrogen.

Local Hong Kong companies have explored the local production of hydrogen by developing landfill gas for energy projects at Tseung Kwan O. Biogas will be collected from the landfill site and converted into green hydrogen using steam methane reforming technology. This pioneering green hydrogen project is expected to begin operation in 2025, with a daily production capacity of around 330 kg of hydrogen, which is sufficient to power seven to eight hydrogen buses for a full day.²⁷

Hydrogen Transport

Hydrogen can be transported in gaseous, liquid, and solid states using different modes of transportation, making it a flexible fuel source for a wide range of applications. Compressed gaseous hydrogen is the main method of hydrogen storage and transportation with low cost, flexible storage conditions, and mature technology and infrastructure in China.²⁸ By far, the most economically effective way to transport gaseous hydrogen is by pipeline.²⁹

Given the difficulty of large scale localised hydrogen production in Hong Kong and its proximity to GBA cities, it is worth investigating the possibility of transporting hydrogen from mainland China to Hong Kong. In Hong Kong, the existing natural gas pipeline system is ideally suited to transporting hydrogen in a gaseous state, giving Hong Kong a competitive advantage. According to the *Strategy of Hydrogen Development in Hong Kong*, in the long run, the government will consider importing low-carbon hydrogen energy from mainland China and other countries and regions, and will look at collaborating with cities in the GBA in connection with the supply network.

Shenzhen has also invested in hydrogen blending technology The city launched the Shenzhen Gas Hydrogen Comprehensive Experimental Platform, which integrates the production, transportation and testing of hydrogen with a hydrogen mixing ratio of up to 20%.³² The commissioning of the platform provides a replicable model for hydrogen blending using existing urban gas pipelines in China, marking a new stage in the delivery of hydrogen to households.

Hong Kong

Advanced Transportation of Hydrogen using Existing Pipeline infrastructure

Injecting hydrogen into existing pipelines is already part of the national hydrogen strategy for a number of countries, including the UK, Australia, Japan and South Korea.³⁰ The Towngas Company of Hong Kong has been involved in these initiatives and could be an important ally in Hong Kong’s quest for a suitable strategy. Towngas is committed to extracting hydrogen directly from its gas network to provide hydrogen to users across the territory via its underground pipeline network. According to Towngas, the hydrogen supply facility was successfully trialled in 2023. Half of the artificial gas produced by Towngas is composed of hydrogen gas. The hydrogen supply facility uses “pressure swing adsorption technology” to extract hydrogen from the gas network with a purity of up to 99.99%, which is suitable for hydrogen fuel cell power generation.³¹



Hydrogen Refuelling

Hydrogen refuelling infrastructure is one of the key considerations for end users when considering hydrogen fuel cell vehicles (HFC vehicles). The Guangdong Province government has set the target of establishing over 200 hydrogen refuelling stations by 2025. With 68 hydrogen refuelling stations already in operation by mid-2024, Guangdong is the province with the most hydrogen refuelling stations.³³ Within the GBA, Foshan has the largest number of hydrogen refuelling stations and is the leader as regards building advanced refuelling infrastructure.³⁴ The very first hydrogen production from natural gas and integrated refuelling station was established in Nanzhuang, Foshan, in 2021. Being an integrated station, Nanzhuang Station is equipped with photovoltaic power generation, hydrogen production, electrolysis refuelling and charging, which is in line with the global carbon reduction path of “Renewable Energy + Hydrogen”.

In Hong Kong, the development of hydrogen refuelling stations is still in its infancy. Hong Kong’s first hydrogen refuelling station for hydrogen buses commenced operation in November 2023 in West Kowloon, and the first public integrated hydrogen station is under construction at Yuen Long, New Territory. In Hong Kong, the Inter-departmental Working Group on Using Hydrogen as Fuel granted licences to four hydrogen-refuelling facility projects in June 2024.

The GBA intends to construct the GBA Hydrogen Corridor (“the Corridor”) in 2024 to provide the region with a reliable supply and transportation network. The Corridor will engage strategic downstream and upstream partners with the aim of building three hydrogen transport routes with four integrated refuelling stations at critical nodes in the transportation network. Two of the routes will integrate Hong Kong and Macao into the GBA network. The Corridor is expected to promote the mobility of hydrogen energy vehicles within the GBA.



Hydrogen Application

Expanding the market for hydrogen, and the number of applications, is critical to the expansion of the hydrogen industry. The GBA has highlighted the development of hydrogen applications, including the areas of transportation, mobile machinery, and energy storage.

According to the policy document, *Opinions on Accelerating the Innovative Development of Hydrogen Energy Industry in Guangdong Province*, issued in October 2023, Guangdong Province will focus on hydrogen fuel cell electric vehicles and encourage the use of hydrogen in other sectors, such as energy storage, industrials, and so on. As such, Guangdong will encourage pilot projects on hydrogen applications. Hong Kong has identified opportunities for local hydrogen application, according to the *Strategy of Hydrogen Development in Hong Kong* issued in June 2024. Hong Kong believes that, in the near future, hydrogen will have clear potential for use in areas such as transport and electricity supply for mobile machinery and to remote regions.³⁵

Transportation

Hydrogen can be used as a power source in the transportation sector. With high efficiency and long range, hydrogen-powered transportation is an ideal substitute for fuel-based transportation, especially in those hard-to-electrify segments, such as long-haul heavy-duty trucking, shipping, and aviation. Within the transportation sector, the most significant application of hydrogen energy is HFC vehicles.

The GBA has actively explored the application scenarios of HFC vehicles. To capitalise on the experience of GBA cities in developing HFC vehicles, Hong Kong’s Automotive Platforms and Application Systems R&D Centre (APAS) signed a strategic cooperation framework agreement with Foshan Xianhu Laboratory in 2023 on collaboration in hydrogen and new energy-related technologies.

Foshan:

As one of the first cities to focus on hydrogen energy, Foshan is interested in the application of HFC vehicles. In 2020, Foshan deployed 1,000 hydrogen fuel cell buses. To date, hydrogen fuel cell buses have travelled up to 90 million kilometres in Foshan, which is now a leader in HFC vehicles in China.³⁶

Guangzhou:

Guangzhou has increased its efforts to deploy HFC vehicles. Guangdong Province has already piloted its first batch of hydrogen fuel cell concrete mixer truckers, first batch of hydrogen fuel cell dump trucks and tractors within the Baiyun District. The emerging applications of FCEVs will drive the development of the hydrogen industry chain, giving incentives to the manufacturers of hydrogen fuel cells.

Shenzhen:

Shenzhen has actively encouraged the application of HFC vehicles across various domains including public transport, medium-to-heavy-duty trucks, and cold-chain logistics. Specifically, in 2023, China’s largest fleet of commercial hydrogen-powered commuter buses was delivered in Shenzhen. A total of 200 buses will be deployed, with the first batch of 60 being used to provide efficient commuting services for employees of companies located within the Shenzhen Hi-Tech Industrial Park.

Hong Kong:

As Hong Kong is compact, the daily travel distance of most vehicles within the city is relatively short. Therefore, Hong Kong has focused more on fuel-intensive heavy hydrogen vehicles and hydrogen vehicles for cross-boundary passenger and freight services.³⁵ Examples of trial projects implemented by various entities in Hong Kong, including Citybus, MTR Corporation, the Food and Environmental Hygiene Department, are:

- February 2024: The first hydrogen fuel cell double-deck bus entered into passenger service.
- Second half of 2024: The Food and Environmental Hygiene Department plans to deploy hydrogen fuel cell street-washing vehicles.
- By end of 2024: The MTR Corporation Limited plans to conduct a test run of a hydrogen-fuelled light rail vehicle without passengers.

Additionally, Hong Kong is exploring the use of hydrogen power charging piles for new energy vehicles. 48 sets of hydrogen power charging piles with a capacity of seven kilowatts are expected to be installed in the Hong Kong Academy of Science in 2026, with an annual hydrogen fuel usage of 30 tonnes.

Power Generation

Hydrogen energy, being transportable and highly energy-efficient, is suitable for application in areas, such as mobile machinery.³⁵ The construction industry in Hong Kong has begun to explore the feasibility of distributing electricity using hydrogen to replace traditional diesel generators to supply electricity to construction sites.

According to the Hydrogen Trial Project list published by the Hong Kong government, as of June 2024, there are plans for three trial projects of hydrogen power generation on construction sites.

- Two trial projects will be carried out by a construction company, a company from the hydrogen industry chain and an energy company at construction sites in Sheung Shui and Lok Ma Chau, both in Hong Kong.
- A Hong Kong company plans to produce hydrogen to provide electricity at a public housing construction site in Hong Kong.



Energy Storage

Hydrogen energy storage is in its infancy in China. This application can provide a solution to the problems commonly associated with renewable energy, namely long-term and cross-season power balance in the new power system, intermittency and uncertainty of renewable energy.³⁷ Our study observes that the GBA has initiated a number of hydrogen energy storage projects.

A Guangzhou company will set up a hydrogen-based microgrid in a Hydrogen Fuel Cell and Hydrogen Industry Demonstration Park. Hydrogen will be produced by photovoltaic cells, wind power, and surplus electricity from the power grid. At the same time, a hydrogen fuel cell system will be used to generate electricity to power the Park.



Green and Sustainable Financing for the Hydrogen Energy

There are tremendous opportunities for the industrial chain of hydrogen within the green and sustainable finance market, given the low carbon emissions and broad application of hydrogen, especially green hydrogen. Based on research on green and sustainable taxonomies across the market, we noticed that various activities within the hydrogen supply chain have been recognised as potential green project types, as shown in Figure 11.

Figure 11. Potential green project types recognised by the leading green and sustainable taxonomies in the market

Four links of the hydrogen industry chain	China Green Bond Endorsed Projects Catalogue (2021 Edition)	Hong Kong Taxonomy for Sustainable Finance	Common Ground Taxonomy	EU Taxonomy
Hydrogen Manufacture	<ul style="list-style-type: none">Clean hydrogen manufacture		<ul style="list-style-type: none">Manufacture of hydrogen and hydrogen-based synthetic fuels	<ul style="list-style-type: none">Manufacture of hydrogen and hydrogen-based synthetic fuelsManufacture of equipment for the production of hydrogenConstruction and safe operation of nuclear power plants for hydrogen production using the best-available technologies
Hydrogen Transport	<ul style="list-style-type: none">Safe and efficient storage of hydrogen		<ul style="list-style-type: none">Construction and operation of facilities that store hydrogen and return it at a later time	<ul style="list-style-type: none">Construction and operation of facilities that store hydrogen and return it at a later time
Hydrogen Refuelling	<ul style="list-style-type: none">The construction and operation of hydrogen refuellingBlending hydrogen with natural gas		<ul style="list-style-type: none">Construction and operation of new energy vehicle hydrogenationConstruction, modernisation, operation and maintenance of hydrogen-based refuelling infrastructure that is dedicated to the operation of vessels or aircraft with zero direct CO2 emissions or the zero direct emissions performance of the airport’s own operations	
Hydrogen Application	<ul style="list-style-type: none">Manufacture of hydrogen fuel-cell vehiclesManufacture of Hydrogen fuel cell electric power	<ul style="list-style-type: none">Selling, purchasing, financing, leasing, renting and operation of private hydrogen vehicles	<ul style="list-style-type: none">Hydrogen electricity storage (re-electrification of hydrogen is also considered part of the activity)	<ul style="list-style-type: none">Manufacture of equipment for the use of hydrogen

Note: Hong Kong Taxonomy for Sustainable Finance(Hong Kong Taxonomy) currently encompasses 12 economic activities under four sectors, namely, power generation, transportation, construction, and water and waste management. The eligible economic activities and sectors covered by the Hong Kong Taxonomy are less than the other three taxonomies.
Source: China Green Bond Endorsed Projects Catalogue(2021 Edition), Hong Kong Taxonomy for Sustainable Finance, Common Ground Taxonomy, EU Taxonomy, CECEPEC

As shown in the previous figure, differences and commonalities exist in the eligible green project types between the above four taxonomies. These commonalities could provide consensus on green financing for the hydrogen sector across the market. At the same time, the differences create increasing financing opportunities for potential issuers and borrowers from the hydrogen industrial chain. For example, the activity of selling, purchasing, financing, leasing, renting and operation of private hydrogen vehicles is recognised by the Hong Kong Taxonomy, while the other three do not cover these activities. Issuers or borrowers from mainland China can seek green financing in Hong Kong to support the selling, purchasing, financing, leasing, renting and operation of private hydrogen vehicles in or outside Hong Kong.

Hydrogen energy can make a significant contribution to the transition to clean energy. In light of this, cities within the GBA have enhanced their ESG product toolbox by launching hydrogen-related indices to support the development of a hydrogen economy.

Hydrogen-related indices

- Shenzhen Stock Exchange (SZSE) Hydrogen Energy Index
- In August 2024, Shenzhen Securities Information Co., Ltd. Launched the SZSE Hydrogen Energy Index. The SZSE Hydrogen Energy Index selects 50 companies listed on the Shenzhen Stock Exchange with good liquidity, large market capitalisation and high hydrogen energy business relevance from companies classified in the hydrogen energy field.³⁸ The launch of the SZSE Hydrogen Energy Index encourages an increasing number of investors to invest in the hydrogen sector, which in turn, promotes the rapid development of research and application in the hydrogen sector.
- Hang Seng Stock Connect Hydrogen Energy Index
- In February 2023, Hang Seng Indexes Company launched the Hang Seng Stock Connect Hydrogen Energy Index to help decarbonisation-minded investors capture the investment opportunities arising from the low-carbon transition. The Hang Seng Stock Connect Hydrogen Energy Index, which is a cross-market ESG-themed index, tracks the performance of companies involved in the production, transmission, distribution and storage of hydrogen.³⁹



Appendices

Glossary

Term/Acronym/Abbreviation	Interpretation
AI	Artificial intelligence
APAS	Automotive Platforms and Application Systems R&D Centre
GBA	Guangdong-Hong Kong-Macao Greater Bay Area
GHG	Greenhouse gas
GSSS bonds	Green, social, sustainability and sustainability-linked bonds
HFC vehicles	hydrogen fuel cell vehicles
HKICPA	Hong Kong Institute of Certified Public Accountants
HKFRS	Hong Kong Financial Reporting Standard
HKMA	Hong Kong Monetary Authority
HKPC	Hong Kong Productivity Council
HKSAFC	Hong Kong Sustainable Aviation Fuel Coalition
ISSB	International Sustainability Standards Board
PBOC	People’s Bank of China
PRD	Pearl River Delta
PRI	Principles for Responsible Investment
REA Scheme	Re-employment Allowance Pilot Scheme
R&D	Research and development
SAF	Sustainable aviation fuel
SASAC	State-owned Assets Supervision and Administration Commission of the State Council
SBTs	Science-based targets
SBTi	Science-Based Targets initiative
SMEs	small and medium-sized enterprises
SOE	State-owned enterprise
SZSE	Shenzhen Stock Exchange
The Index	HSBC Greater Bay Area ESG Index

Note: In alphabetical order

References

¹ Chinese Wind Energy Association. (2024). 中国海上风电市场现状
<https://wind.in-en.com/html/wind-2452415.shtml>

² 中国人民银行广东省分行. (2024). 中国人民银行广东省分行举行2024年三季度广东省金融运行形势新闻发布会
<http://guangzhou.pbc.gov.cn/guangzhou/129136/5488437/index.html>

³ Yangcheng News (2024). 广东申领家电以旧换新补贴超930万人次，汽车报废更新和置换更新近3万辆
<https://new.qq.com/rain/a/20240925A05A5900>

⁴ Chinese Wind Energy Association. (2024). 中国海上风电市场现状
<https://wind.in-en.com/html/wind-2452415.shtml>

⁵ Guangdong Provincial Development and Reform Commission. (2024). 【专家解读】前瞻布局未来绿色低碳产业 在双碳进程中培育新质生产力
https://drc.gd.gov.cn/gkmlpt/content/4/4395/post_4395523.html#3364

⁶ Shenzhen News (2024). 2024中国环博会深圳展开幕 超5000项环境污染治理技术与解决方案亮相
https://www.sznews.com/news/content/2024-09/24/content_31232074.htm

⁷ Shenzhen News (2024). 深圳挺进低碳绿色数字能源新赛道
https://www.sznews.com/news/content/2024-09/11/content_31205408.htm#:~:text=%E6%B7%B1%E5%9C%B3%E6%96%B0%E9%97%BB%E7%BD%912

⁸ 21st Century Business Herald. (2024). 深圳虚拟电厂上线低碳调度功能，数字化能力革新
<https://www.21jingji.com/article/20240909/herald/bedc4ddf67f4f2eb72a9735d20f09bbf.html>

⁹ SZNEWS.COM. (2024). “腾飞贷” 2.0版落地 科技企业再迎利好 新增“当期优惠贷款+未来贷款优先权”模式，已发放贷款7.2亿元
https://www.sznews.com/news/content/2024-07/17/content_31087578.htm

¹⁰ 南方都市报. (2024). 深圳首个“科技初创通”上线，初创型企业贷款更便捷
<https://baijiahao.baidu.com/s?id=1801937156767507047&wfr=spider&for=pc>

¹¹ Hong Kong Productive Council. (2024). Hong Kong’s First “Future Manufacturing Hall” Grand Opening HKPC Heralds a New Era of Industrial Transformation Promoting “Microfactory” to Enhance New Productive Forces Aiding Hong Kong’s Development as an International I&T Centre
<https://www.hkpc.org/en/about-us/media-centre/press-releases/2024/fm-hall-grand-opening>

¹² Guangdong-Hong Kong-Macao Greater Bay Area. (2024). 河套合作区：跨小河，开先河
https://www.cnbayarea.org.cn/news/focus/content/post_1255674.html

¹³ SZNEW.COM. (2024). 《河套深圳园区规划》一周年交卷：迈向世界级科研枢纽
https://www.sznews.com/news/content/2024-08/08/content_31135904.htm

¹⁴ 21st Century Business Herald. (2024). 近95%湾区国企已发或拟发社会责任报告，深化改革、绿色发展等是重点
<https://m.21jingji.com/article/20240828/herald/198147e010336b5398e89c0301606780.html>

¹⁵ SASAC of Guangdong Province. (2024). 全景式呈现ESG成果！第四届国企社会价值论坛在广州召开
https://gzw.gd.gov.cn/gzyw/content/post_4486037.html

¹⁶ News.gov.hk. (2024). Sustainability disclosure vision set
https://www.news.gov.hk/eng/2024/03/20240325/20240325_173927_096.html

¹⁷ HKICPA. (2024). HKICPA issues the exposure drafts of two inaugural Hong Kong Sustainability Disclosure Standards for public consultation
https://www.hkicpa.org.hk/en/News/News-Release/20240916_HKFRS-S1_S2

¹⁸ Hong Kong Special Administrative Region of the People’s Republic of China. (2024). Green Bond Report 2024
https://www.hkgb.gov.hk/en/others/documents/FSTB_GreenBond24_eBooklet_EN.pdf

¹⁹ 21经济网. (2024). “绿动力” 赋能大湾区高质量发展 2024粤港澳大湾区绿金联盟年会在广州成功举办
<https://www.21jingji.com/article/20240928/herald/540cbb5a921fb90d5e89edad8d2eda94.html>

²⁰ Climate Bonds Initiative. (2024). Hong Kong Green Market Briefing 2023
<https://www.climatebonds.net/resources/reports/hong-kong-sustainable-debt-market-briefing-2023>

²¹ Department of Science and Technology, National Energy Administration. (2024). China Hydrogen Energy Development Report 2023.
<https://tech.chinadaily.com.cn/a/202407/26/WS66a34878a3107cd55d26cbbb.html>

²² National Energy Administration. (2024). 我国氢能产业发展步入快车道
https://www.nea.gov.cn/2024-05/31/c_1310776690.htm

²³ Guangdong Provincial Survey and Research Centre.(2024).氢风起粤：广东氢能发展“绿”意盎然
<https://mp.weixin.qq.com/s/ZBHYJJiMS75Bse4rFTVR0A>

²⁴ Guangdong Provincial Development and Reform Commision. (2023).广东省发展改革委等部门关于印发广东省加快氢能产业创新发展意见的通知
https://drc.gd.gov.cn/ywtz/content/post_4274976.html

²⁵ Jiaxing Yangtze River Delta Hydrogen Industry Promotion Association. (2024). 全球单体规模最大、首个百标方级电解海水制氢示范工程在深圳妈湾电厂开展示范应用
<https://mp.weixin.qq.com/s/04heezwBkbSs0srpmVxdsg>

²⁶ 澎湃新闻. (2024). 垃圾变绿氢！全国首个生活垃圾制氢项目落地佛山
https://www.thepaper.cn/newsDetail_forward_26479446

²⁷ Towngas. (2024). Towngas and Veolia join hands to launch Hong Kong’s first green hydrogen production project.
<https://www.towngas.com/en/Media-Resources/Press-Releases/2024/%E2%80%8B全港首個「綠氫」生產項目開展%C2%A0煤氣公司與威立雅全力推動>

²⁸ Boston Consulting Group & the Team of Academician Minggao Ouyang. (2023). China Hydrogen Industry Outlook
<https://web-assets.bcg.com/d4/2a/657fc0544c4e85a6c7533aed18fa/bcgxouyang-minggao-china-hydrogen-industry-outlook-en.pdf>

²⁹ Christopher Findlay. (2020). Can gas lines and other existing infrastructure handle hydrogen
<https://www.siemens-energy.com/global/en/home/stories/repurposing-natural-gas-infrastructure-for-hydrogen.html>

³⁰ City University of Hong Kong and APAS, (2023). Hong Kong Hydrogen Economy Study and Report. Market Study on the Use of Hydrogen in Green Transportation in Hong Kong
<https://campaigns.hkpc.org/hubfs/APAS/Report - Market Study on the Use of Hydrogen in Green Transportation in Hong Kong Complete.pdf>

³¹ Towngas. (2023). Towngas sets up Hong Kong’s first hydrogen extraction system from gas network, providing efficient and safe hydrogen supply solution
<https://www.towngas.com/en/Media-Resources/Press-Releases/2023/Towngas-sets-up-Hong-Kong’s-first-hydrogen-extract>

³² State-owned Assets Supervision and Administration Commission of Shenzhen Municipal People’s Government. (2024). 深圳建成全国首个城镇燃气掺氢综合科技实验平台一
http://gzw.sz.gov.cn/gkmlpt/content/11/11103/post_11103385.html#1904

³³ Yicai. (2024). 中国加氢站建设不断加速，广东最多、山东河北江苏等地紧随其后
<https://www.163.com/dy/article/IT0T2TOC0514810F.html>

³⁴ Foshan News. (2024). 佛山为全省加氢站突发事件应急处置提供参考模板
<https://www.foshannews.net/h/175/20240927/742705.html>

³⁵ Environment and Ecology Bureau of the Government of the Hong Kong Special Administrative Region of the People’s Republic of China. (2024). The Strategy of Hydrogen Development in Hong Kong
[strategy-of-hydrogen-development-in-hong-kong_booklet_en.pdf](https://www.eeb.gov.hk/en/strategy-of-hydrogen-development-in-hong-kong_booklet_en.pdf) ([sharepoint.com](https://www.sharepoint.com))

³⁶ Department of Transport of Guangdong Province. (2024). 广东省交通强国建设试点成果展览-佛山市氢燃料电池公交车推广应用 央视网. (2024). 海关总署：2023年我国汽车出口量522.1万辆，同比增加57.4%
https://td.gd.gov.cn/ztzl/jtqgjszl/cgzs/content/post_4458133.html

³⁷ Xinrong Yan. Wenguang Zheng, Yajuan Wei, et al. (2024). Current Status and Economic Analysis of Green Hydrogen Energy Industry Chain
<https://www.mdpi.com/2227-9717/12/2/315>

³⁸ CNI Index. (2024). SZSE Hydrogen Energy Index and SZSE Green Agriculture and Graziery Index Will Be Launched
http://www.cnindex.com.cn/eng/information/notices_news/2024y/202408/t20240812_18498.html?act_menu=2

³⁹ Hang Seng Indexes. (2023). Hang Seng Indexes Company Launches Hang Seng Stock Connect Hydrogen Energy Index
<https://www.hsi.com.hk/static/uploads/contents/en/news/pressRelease/20230220T000000.pdf>

Table of Indicators

Figure 12. Indicators for regional/cities and industry level

First-level Indicator	Second-level Indicator
Environment	Corporate CDP disclosure performance
	Corporate science-based climate commitments
	Air quality
	Energy use efficiency
	Water use efficiency
	Electricity use efficiency
	Public sector’s contribution to environmental protection
	Urban greenness
Economic and Social Development	Economic development
	Economic contribution of tertiary industry
	Employment situation
	Public sector’s contribution to education
	Innovation and technological advancement
Corporate Governance	Activeness of market players
	Corporate ESG disclosure performance
Green and Sustainable Finance	Activeness of market players
	Investor commitment to sustainable investing
	Volume of sustainable debt instruments
	Number of ESG mutual funds
Policy	Policies related to sustainable development in the GBA

Source: CECEPEC

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