Information Transparency Drives Supply Chain Green Shift

CITI Index Ten Year Review (2014-2023)

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1 Introduction

For more than 50 years, with economic globalization, supply chains have been migrating and expanding on a large scale, bringing economic development and income growth to many regions of the world, but also causing serious pollution transfer, damaging the ecological environment in countries and regions that host major global supply chains, and even affecting the health and safety of local communities.

2006

To address the serious environmental pollution and promote information transparency and multi-stakeholder participation, the Institute of Public and Environmental Affairs (IPE) was established in Beijing in 2006 and launched the Water Pollution Map in the same year.

2007

In 2007, in response to the supply chain pollution problems identified in the data collection, IPE, in collaboration with 20 environmental groups, launched the Green Choice Initiative, calling on major brands to strengthen environmental management of their supply chains, to screen their list of suppliers against a list of environmental violators, and to call on consumers to pay attention to brands' environmental performance.

2010

In 2010, in response to the environmental and health risks posed by heavy metal pollution, IPE worked with partner organizations and conducted supply chain investigations in the IT industry and began communicating with 29 IT brands; in 2012, to address the serious impacts of printing and dyeing and other processes on water, IPE and its partner organizations expanded the supply chain pollution investigations to the textile industry.

2013

In 2013, China launched action plans for air pollution prevention and control, followed by action plans for water and soil pollution prevention and control. In the same year, IPE collaborated with the Natural Resources Defense Council (NRDC) to develop the Green Supply Chain CITI Index.

2014

In 2014, APEC adopted the proposal *on Establishing an APEC Cooperation Network on Green Supply Chain,* which for the first time highlighted the issue of green supply chain development. In the same year, IPE released the Green Supply Chain CITI Index for the first time and conducted the CITI evaluations for ten consecutive years.

Supply chain environmental management has its own characteristics: with global sourcing and layers of outsourcing, brand companies are often no longer the primary direct polluters; many suppliers no longer have a direct legal relationship with brands; brands' inherent environmental management method has little control over pollution in the upstream value chain; and relying solely on third-party factory auditing is often inefficient and therefore can often be caught in a cat-and-mouse game predicament.

Through the practice of the Green Choice Initiative in the early years, we see that the environmental supervision records, publicly disclosed by Chinese government agencies, can provide an entry point for all parties to dive directly into the supply chain pollution problems. To solve the problems, it is necessary for companies, especially the leading companies, to strengthen their environmental information disclosure and extend effective management to the upstream of their supply chain and the whole value chain. Based on this idea, we developed the green supply chain evaluation index - the Corporate Information Transparency Index (CITI).

Looking back over the past decade, we have witnessed historic progress in China's environmental information transparency, which has provided a crucial data infrastructure for companies to strengthen environmental management in their supply chains. The new *Environmental Protection Law*, which came into effect in 2015, unprecedentedly established a special chapter on "Information Disclosure and Public Participation," which represents a social consensus on this issue. The number of environmental supervision records of pollution sources collected and collated by the Blue Map database has also increased from 150,000 in 2014, when the first CITI Index evaluation was conducted, to a total of nearly 3 million by September 2023.

Looking back over the past decade, we have witnessed how environmental information disclosure has gradually broken down information barriers between upstream and downstream market players, and between market players and regulators and the public, helping all parties to join forces to build an environmental and carbon data infrastructure and develop a data-driven evaluation system and digital solutions. The green supply chain system built on this foundation integrates environmental and climate standards into procurement, creating a positive constraint and incentive mechanism and pushing suppliers to improve their environmental and climate performance through fair competition and a level playing field.

Looking back over the past decade, we have seen awareness of the need for supply chain environmental management gradually become mainstream: from the first evaluation in 2014, when only 37% of companies committed to green procurement, to 73% of companies now, under the situation of a significant expansion of the evaluation scope, disclosing requirements for environmental and climate risk management in the supply chain through their supplier code of conduct or annual reports;[1] we have seen leading companies using public information to push large numbers of suppliers to improve: From the first assessment period, when companies pushed only more than 500 suppliers to respond, to today's cumulative total of more than 25,000 suppliers to communicate, remediate or disclose.

Looking back over the past decade, we see that leading companies have moved from promoting environmental compliance to progressively going beyond compliance: From suppliers only responding to violations in the first evaluation period, to tens of thousands of Pollutant Release and Transfer Registry (PRTR) datasets completed and publicly disclosed in recent years; from remediating environmental violations in the first evaluation period, to accounting and disclosing carbon emissions and product carbon footprints, and setting emission reduction targets and disclosing progress in recent years; from passively responding in the beginning, to proactively paying attention to their own environmental performance. With the joint promotion of Green Jiangnan and other partner organizations, more than 32,000 enterprises now track their own environmental risks using the Blue Ecochain tool to improve the efficiency of supply chain environmental management.

1. Note: See Table 2-1 in Chapter 2 of this report for changes in the scope of the CITI Index evaluation, evaluation requirements and the number of companies evaluated from 2014 to 2023.

Looking back over the past decade, we can see that the construction of green supply chain coincides with the tide of China's continuous strengthening of environmental governance. In the process of pollution prevention and control, government authorities have actively promoted the construction of green supply chain, with the departments of ecology and environment establishing the Alliance of Green Consumption and Green Supply Chain, and the department of industry and information technology establishing the China Green Supply Chain Alliance and launching programs such as "Green Supply Chain Services for Enterprises". These alliances and programs have helped enterprises build and improve green supply chain management systems, guide positive multi-stakeholder interactions, and introduce positive market innovations through green procurement to promote supply chain pollution reduction, contributing to the significant improvement of China's air and surface water quality over the past decade.

Looking back over the past decade, we can see that the topics covered by the green supply chain have expanded. Against the backdrop of the UN Sustainable Development Goals (SDGs), 194 parties joining the Paris Agreement,[2] and China's announcement of the "dual carbon" target, the indicators of the CITI Index have also gradually expanded from environmental pollution to climate action, plastic reduction, biodiversity conversation, green consumption, and other issues. Among them, the weight of the climate action indicator has been greatly increased, and the Corporate Climate Action Transparency Index (CATI) has been developed to evaluate climate action.

Looking back over the past decade, we can see that positive progress has been made in supply chain environmental management, but we are also very aware that the current construction of the green supply chain is still at an early stage, and there are still many industry leading companies in the supply chain that have failed to effectively implement supply chain environmental management; green supply chain management still needs to be further extended to the upstream of the industrial chain, where environmental impact is large and resource and energy intensive; many companies that have made public environmental and climate commitments have not yet implemented them in the supply chains where the largest environmental and climate footprints are located; and some brands have stopped requiring suppliers to publicly disclose carbon emissions data while publicizing their carbon neutral products.

2. United Nations. Climate Action [EB/OL]. [2023-10-09]. https://www.un.org/zh/climatechange/paris-agreement.

Looking ahead to the next decade, the world is facing a triple planetary crisis of climate change, pollution, and biodiversity loss; major economies are facing challenges of energy security, food security and supply chain security; and geopolitical tensions are rising. We believe that the green supply chain can serve as an important starting point for the joint implementation of the "dual carbon" strategy, carbon reduction and pollution reduction in China's industrial sector. From the State Council's *Guiding Opinions on Accelerating the Establishment of a Green and Low-Carbon Circular Economic Development System*[3], which proposes building a green supply chain and achieving greening of the whole product cycle, to the "14th Five-Year Plan" for green industrial development and the policy documents of many ministries and commissions, all have proposed building a green supply chain as an important part of building a green and circular economic development system.

At the international level, supply chain due diligence and environmental information disclosure are changing from a voluntary social responsibility to a mandatory obligation. The EU *Corporate Sustainability Reporting Directive (CSRD)*[4] requires that the due diligence content of a corporate sustainability report should disclose value chain pollutant emission transfers, Scope 3 greenhouse gas emissions, etc.; and the *International Financial Reporting Standards (IFRS) S2 Climate-related Disclosures*[5] published in June 2023 also requires reporting entities to disclose their full value chain (Scope 1, 2 and 3) GHG emissions.

At the local level, we have seen corporate environmental disclosure in China continue to strengthen. The implementation of the emission permit system has given strong impetus to the standardization of corporate environmental information disclosure. The *Measures for the Administration of National Carbon Emission Trading (Trial)* and the *Measures for the Administration of Legal Disclosure of Enterprise Environmental Information* have effectively promoted the disclosure of annual carbon emission information by companies included in the ETS. The China Securities Regulatory Commission (CSRC)'s *Standards for the Contents and Formats of Information Disclosure by Companies Offering Securities to the Public No.2 — Contents and Formats of Annual Reports (2021 Revision)*[6] also encourages companies to disclose carbon emission reduction measures and effectiveness. Driven by these policies and regulations, corporate environmental disclosure information included in the Blue Map database has expanded significantly, with the number of carbon data publicly disclosed by enterprises reaching 11,600.

Looking ahead to the next decade, we call on all parties to improve environmental information transparency, strengthen corporate information disclosure, and consolidate the environmental, ecological and climate data infrastructure; conduct scientific evaluations, promote green procurement by leading companies, and transfer positive constraints and incentives upstream along the supply chain; and drive low-carbon transformation through digital innovation, provide efficient solutions for accounting, disclosure and verification of environmental footprints on both the corporate and product sides through technologies such as big data, cloud computing, AI, IoT, and blockchain, and empower buyers, investors and consumers with environmental and climate information to help them make green choices.

Looking ahead to the next decade, we expect China to continue to play an extremely important role in the global supply chain, and the construction of green supply chains should receive more attention and be strengthened. At the same time, a new round of global supply chain shifts is taking place, with some labor-intensive industries moving to Southeast Asia and South Asia, and raw material extraction related to the new energy industry expanding to Africa and South America, posing serious challenges to local environmental supervision and infrastructure. We propose to promote the expansion of green supply chain construction to a larger region and even globally, strengthen global corporate accountability, and urge major brand companies and financial institutions to truly implement their emission reduction commitments in the core areas of the supply chain; at the same time, to facilitate emerging supply chain areas to improve their environmental management capabilities and enhance supply chain climate resilience by building a regional and even global corporate environmental accountability platform, create a level playing field, avoid a new round of pollution transfer and ecological damage, and build an environmentally and climate-friendly, ecologically sustainable global supply chain to protect our only planet home.

3. State Council. Guiding Opinions on Accelerating the Establishment of a Green and Low-Carbon Circular Economic Development System [EB/OL].2021-02-22:[2023-10-09].https://www.gov.cn/zhengce/content/2021-02/22/content_5588274.htm?5xyFrom =site-NT.

4. THE EUROPEAN PARLIAMENT AND THE COUNCIL. Corporate Sustainability Reporting Directive [EB/OL].2022:[2023-10-09]. https://www.consilium.europa.eu/en/press/press-releases/2022/11/28/council-gives-final-green-light-to-corporate-sustainability- reporting-directive/.

5. ISSB.IFRS S2 Climate-related Disclosures[S/OL].2023:[2023-10-09].https://www.ifrs.org/projects/completed-projects/2023/climate- related-disclosures/.

6. China Securities Regulatory Commission. Standards for the Contents and Formats of Information Disclosure by Companies Offering Securities to the Public No.2 — Contents and Formats of Annual Reports [EB/OL].2021:[2023-10-09].http://www.sse.com.cn/lawandrules/regulations/csrcannoun/c /5533573.pdf.

2 Green Supply Chain CITI Index

Since the reform and opening-up policy, and especially after the WTO accession in the early 21st century, China has actively integrated into the global supply chain system and become the "factory of the world". However, corporate environmental responsibility has not been effectively extended to the product manufacturing process for a long time. Due to the complexity of global supply chains, the environmental management of supply chains has rarely been covered by sustainable development ratings and indices.

In 2014, based on years of research and practice in green supply chain work, the Institute of Public and Environmental Affairs (IPE) and the Natural Resources Defense Council (NRDC) jointly developed the world's first quantitative evaluation system based on the environmental management performance of corporate supply chains in China - the Green Supply Chain CITI Index (hereinafter referred to as the "CITI Index"). Based on benchmarking against mainstream international sustainable development mechanisms, the CITI Index focuses on how Chinese and international companies sourcing in China can reduce the negative environmental and climate impacts of their supply chains, especially in product production and upstream and downstream transportation, and encourages suppliers to continuously improve their environmental performance, reduce their energy and resource consumption, greenhouse gas and pollutant emissions, conduct environmental and carbon disclosure, and build trust with stakeholders (Figure 2-1).

Figure 2-1 Green Supply Chain CITI Index evaluation dimensions

The CITI Index also serves as a roadmap for data and disclosure-based green supply chain management to guide companies operating and sourcing in China to

- Integrate supply chain into environmental management and climate governance, improve management efficiency with the help of environmental big data, and comprehensively manage supply chain environmental and climate risks in China;
- Screen suppliers' environmental compliance performance with the aim of achieving environmental compliance throughout the product lifecycle, and gradually extend environmental and carbon management to upstream energy-intensive and emission-intensive segments of the supply chain;
- Encourage suppliers to fulfil their primary responsibility for environmental protection, take measures to save energy and reduce emissions, and reduce their environmental impact and carbon footprint;
- Encourage suppliers to actively communicate with stakeholders and build trust through full disclosure;
- Guide suppliers to manage the environmental performance and greenhouse gas emissions of their own supply chains, and drive the industry chain to accelerate green and low carbon transformation.

Since the release of the CITI Index in 2014, IPE has conducted the CITI Index evaluation for ten consecutive years, continuously upgrading the evaluation criteria based on the actual needs and key issues of global environmental governance, and gradually incorporating dimensions such as climate action, plastic reduction, biodiversity conservation, eco-friendly product design and green consumption promotion (Table 2-1).

Table 2-1 Changes in the Green Supply Chain CITI Index

Year	CITI Version	No. of industries evaluated	No. of companies evaluated	Core changes
2014	1.0	8	147	Established evaluation dimensions of responsiveness and transparency, compliance and corrective actions, extend green supply chain practices upstream, target setting and data disclosure, and recycling and reuse.
2015	2.0	9	167	Added indicator for "promote management of wastewater discharged to centralized treatment facilities".
2016	3.0	9	198	Released the first-ever CITI top 30.
2017	4.0	14	267	Added the indicators “promote transparent supply chains” and “promote public green choices”.
2018	5.0	16	306	Added requirements for timely disclosure of environmental information by suppliers.
2019	6.0	19	438	Added the indicator “responsible management of solid waste”; First integration of the CATI evaluation results into the CITI evaluation.
2020	7.0	20	584	Added the indicator “responsible management of logistics suppliers”.
2021	8.0	21	613	Significantly increased the weighting of the “climate action” indicator.
2022	9.0	20	650	Increased the weighting of indicators related to extending green supply chain management upstream, guiding companies to pay attention to the environmental impact and carbon footprints of the entire lifecycle of their products.
2023	10.0	22	742	Increased the weighting of recycling and reuse of waste product and resources, guiding the public to participate in resources recycling and reuse.

After 10 years of development, the CITI Index is highly compatible with the UN Sustainable Development Goals (Figure 2-2) and is aligned with the Global Reporting Initiative (GRI) *Sustainability Reporting Standards*, the EU *Corporate Sustainability Reporting Directive* (CSRD), and the *Proposal for a Directive on Corporate Sustainability Due Diligence*. It is also in line with the *Implementation Plan for Synergizing Reduction of Pollution and Carbon Emissions*, the *Measures for the Administration of Legal Disclosure of Enterprise Environmental Information*, the *Guideline on Green Manufacturing - Green Supply Chain Management in Manufacturing Enterprises* (GB/T 33635-2017), and other Chinese national standards and policies.

CITI Evaluation Dimensions	CITI Evaluation Objectives	The UN Sustainable Development Goals (SDGs)
Responsiveness and Transparency	Guiding companies to pay attention to the impact of their supply chain production processes on the local environment, establish green supply chain management mechanisms, and respond to stakeholder concerns.	
Compliance and Corrective Actions	Guiding companies to focus on supply chain environmental compliance to minimize the impact of product manufacturing on air, water, soil and ecosystems.	
Extend Green Supply Chain Practices to Upstream	Guiding companies to reduce the environmental impact of supply chain chemical use, wastewater discharge, waste disposal and other processes, and to improve resource efficiency; Guiding companies to promote environmental performance technologies and management approaches to the suppliers.	
Energy Conservation and Emissions Reduction	Guiding companies to take action on climate change; Guiding companies to reduce pollutant emissions from the supply chain.	
Promoting Public Green Choice	Guiding companies to build positive relationships with the public and assist the public to participate in green consumption and waste reuse and recycling.	

Figure 2-2 CITI Index in line with the United Nations Sustainable Development Goals

3 A Decade of CITI Index Evaluation (2014-2023)

3.1 2023 CITI Evaluation Result

3.2 CITI Index Ten Year Review

3.1 2023 CITI Evaluation Result

CITI TOP50

See Appendix II for a full list of 2023 CITI scores

01 LEVI STRAUSS & CO. 88.6	02 adidas 84.54	03 INDITEX 83.78	04 cisco 78.62	05 PUMA 77.76	06 77.06	07 76.32	08 FOXCONN 75.1	09 PRIMARK 74.88	10 new balance 74.76
11 LUXSHARE ICT 72.4	12 M&S EST. 1884 71.32	13 C&A 70.48	14 BESTSELLER 68.06	15 Microsoft 67.78	16 AVARY HOLDING 67.4	17 LINDEX 64.86	18 KONTOOR 64.16	19 TESCO 63.28	20 Gap Inc. 62.9
21 TARGET 60.58	22 HUAWEI 57.82	23 DANONE 54.46	24 SCHAEFFLER 53.62	25 Kao 53.56	26 ANTA 53.22	27 intel. 50.04	28 H&M Group 49.22	28 DECATHLON 49.22	30 SAMSUNG 48.68
31 P&G 47.66	32 Carrefour 47.32	33 极星 Polestar 47.2	34 Lenovo 46.44	35 UNIQLO 45.34	36 ESPRIT 44.46	37 ARCHROMA 41.56	38 AEO 41.38	39 LI-NING 39.46	40 Canon 39.18
41 雀巢 Nestlé 38.86	42 THE VERY GROUP 38.1	43 维他奶 Vitasoy 37.96	44 Panasonic 37.8	45 领取新未来 OJI 37.68	46 hp 35.08	47 IKEA 34.66	48 KERSEN 科丽科技 34.6	49 PHILIPS 33.54	50 SUITSUPPLY 33.3

2023 CITI Index Evaluation Result Comparative Analysis

The 2023 evaluation covers 742 companies across 22 industries, with Levi Strauss & Co., Adidas, Inditex, Cisco, PUMA, Nike, VF, Foxconn, Primark, and New Balance ranked in the top10. Dell and Apple remain CITI Masters.

Comparing the scores of the companies evaluated in each region, companies in Europe and the US maintain a relative lead in terms of both the highest and average scores. Companies in the Asian-Pacific region (excluding Greater China) perform at an average level, but the gap between their highest scores and those of North American and European companies is more pronounced. Companies in Greater China with high scores, notably Foxconn, Luxshare Precision, Avary Holding, Huawei, Anta Sports, Lenovo, Li Ning, Vitasoy, etc., follow closely behind companies in Europe and the US, but there is still a large gap between the average level and that of the other three regions, indicating that a significant number of companies in this region need to strengthen their supply chain environmental management.

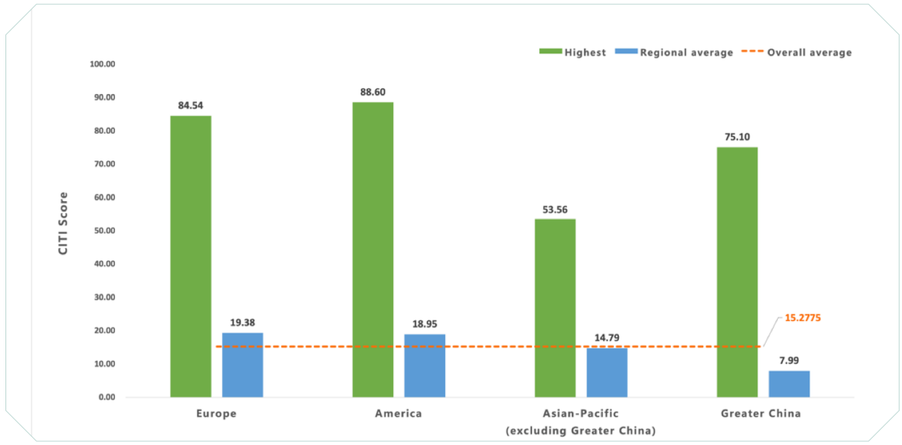


Figure 3-1 Comparison of regional CITI scores

The overall performance gap in green supply chain management across industries is relatively small (Figure 3-2). Even in the Textiles & Leather and IT/ICT industries, where several companies are in the top 50, the average score is still around 20, with no significant progress from 2022, and there is still a lot of room for improvement in the overall performance of the industries. The top and average scores of Food & Beverage, Pharmaceuticals, Brewing, Liquor, Bicycle/Moped and Interior Decoration industries are still relatively low and their overall performance is relatively lagging.

Within the same industry, the gap between leaders and laggards in green supply chain management is gradually widening, with the polarization particularly pronounced in industries such as IT/ICT, Textile & Leather, Retail, Internet Platform, and Household & Personal Care. Although some leading companies have emerged in recent years in industries such as Food & Beverage, Household Appliances, Dairy, Household & Personal Care, and Real Estate, most of the other companies have not disclosed any progress on green and low carbon sourcing for years, and there is an urgent need to take action and improve the level of disclosure.

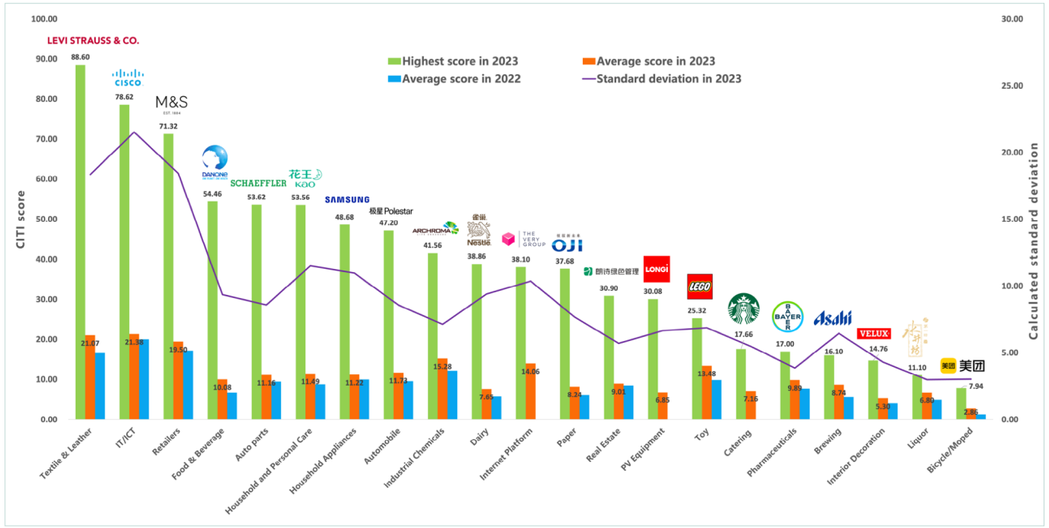


Figure 3-2 2022 and 2023 CITI evaluation industry score comparison[7]

During the 2023 evaluation period, evaluated companies promoted 4,619 suppliers to communicate with environmental groups about environmental violations, corrective actions, and disclosure of environmental information (Figure 3-3); 1,605 suppliers disclosed information about remediation of violations; and nearly 5,000 suppliers registered to use the Blue EcoChain system to track their own environmental risks and achieve long-term supply chain environmental management.

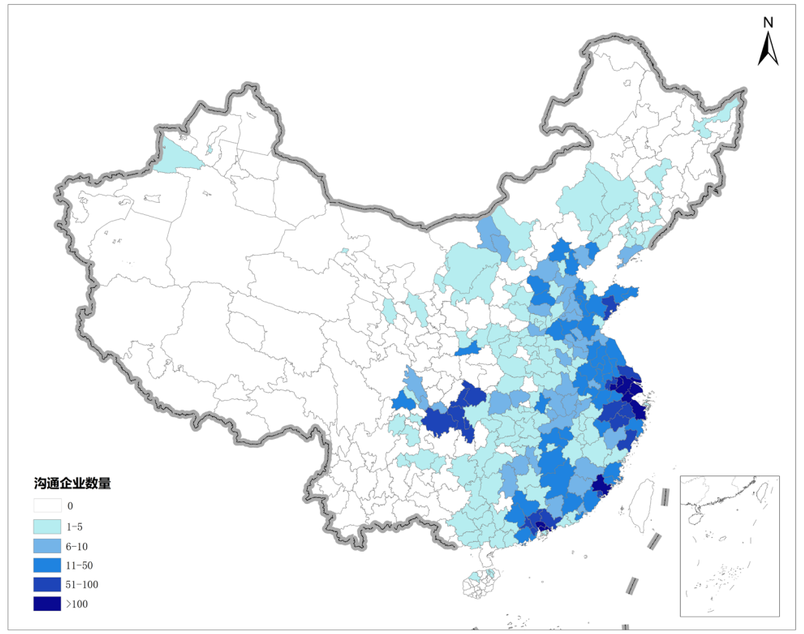


Figure 3-3 Distribution of suppliers that communicated with environmental groups about corrective actions and environmental information disclosure driven by companies during the 2023 evaluation period (Legend: number of suppliers)

7. Note: Since more companies belong to both textile and leather industries, they are analyzed together.

3.2 CITI Index Ten Year Review

Ten years of memorable moments with the CITI Index evaluations and report releases.

Figure 3-4
2014 CITI evaluation report release

Figure 3-6 2016 CITI evaluation report release

Figure 3-8 2018 CITI evaluation report release

Figure 3-10 2020 CITI evaluation report release

Figure 3-11 2021 CITI evaluation report release

Figure 3-12 2022 CITI evaluation report release

Figure 3-9 2019 CITI evaluation report release

Figure 3-5 2015 CITI evaluation report release

Figure 3-7 2017 CITI evaluation report release

2014 2015 2016 2017 2018 2019 2020 2021 2022

No. of appearances in the Top50	Company logo
10	adidas, Apple, Canon, C&A, ESPRIT, Foxconn, H&M Group, HP, HUAWEI, 花王 KAO, Microsoft, Nike, Panasonic, PUMA, SAMSUNG, UNIQLO
9	BURBERRY, CISCO, DELL Technologies, Gap Inc., HITACHI Inspire the Next, LI-NING, IKEA, OJI, PHILIPS
8	Carrefour, ESQUEL GROUP, INDITEX, Levi's, M&S EST. 1884, PRIMARK, TESCO
7	BESTSELLER, DANONE, LINDEX, new balance
6	Columbia Sportswear Company, GE, KONTOOR, TOYOTA, VF, Walmart
5	Coca-Cola, HONDA, 朗诗绿色管理, Lenovo, P&G, SUITSUPPLY, TOSHIBA
4	AEO, asics, AVARY HOLDING, intel, NOKIA, SCHAEFFLER, SIEMENS, TCL
3	ERICSSON, MIZUNO, mothercare, THE VERY GROUP, Unilever
2	alcatel, amazon, ANN TAYLOR, ARCHROMA, DECATHLON, 瀚蓝 grandblue, LUXSHARE-ICT, 极星 Polestar, 三峡环境, SCA Care of Life, SMIC, Starbucks, 万科 让建筑更美生命
1	ANTA, APP, Disney, 光大国际 Everbright International, Ford, KERSEN 科森 教育, Lenovo, Nestlé, NINE WEST, oppo, SHARP, SONY, TOMMY HILFIGER, TOREAD, 维他奶 Vitasoy, vodafone, YOUNGOR

Figure 3-13 Number of appearances of companies in the Top 50

Since the first evaluation in 2014, the evaluation dimensions of the CITI Index have continued to expand and the evaluation requirements have become more stringent, but the average scores of the TOP 50 companies have gradually increased and competition has become more intense (Figure 3-14). Over the past decade, 92 Chinese and international companies from 14 industries have entered the CITI TOP 50, demonstrating that a group of leading companies have actively responded to global environmental challenges and are striving to build green supply chains.

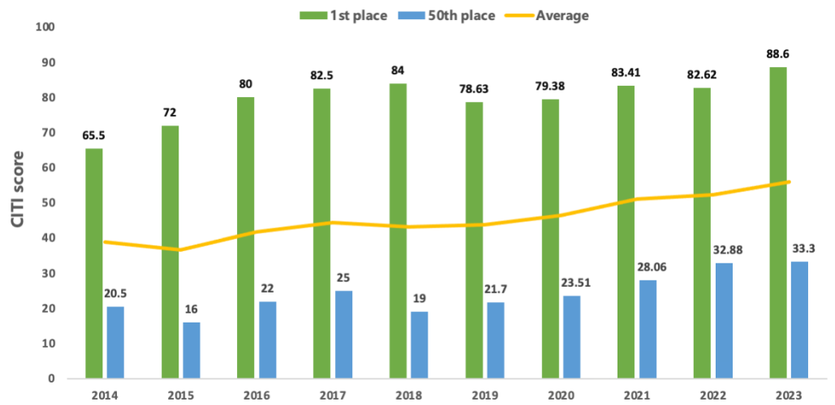


Figure 3-14 Changes in TOP 50 scores from 2014 to 2023

TOP 50 Industry Distribution (2014-2023)

In the first evaluation in 2014, the TOP 50 came from only 6 industries: Textile & Leather, IT/ICT, Automotive, Household & Personal Care, Food & Beverage, and Paper. Over the decade, Textile & Leather industry companies have prominently dominated the TOP 50, with Adidas, C&A, Esprit, Gap, H&M, Inditex, Levi Strauss & Co., Marks & Spencer, Nike, Primark, PUMA, and Uniqlo appearing in the TOP 50 for eight consecutive years or more (Figures 3-13, 3-15).

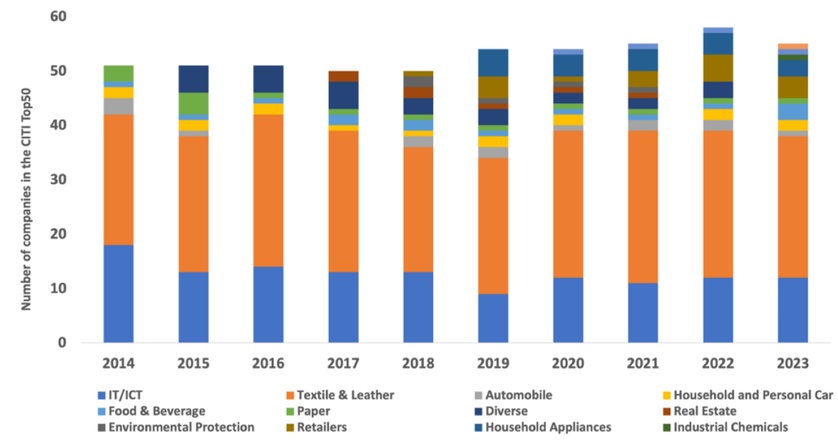


Figure 3-15 Changes in TOP 50 industries and number of companies from 2014 to 2023[8]

8. Note: Companies may belong to 2 industries at the same time, there are duplicate counts in the industry distribution, and the total number of TOP 50 companies may be more than 50 in some years.

The IT/ICT industry follows closely behind: in addition to Canon, Foxconn, Huawei, Microsoft, Royal Philips, and Samsung entering the TOP 50 several times in a row, Apple and Dell became the CITI Master in 2019 and 2020, respectively, and have maintained the title to date (Figure 3-16).

Figure 3-16 CITI Maste

The relatively leading performance of these two industries is not only the result of the efforts of the companies in the industries themselves, but also the attention and promotion of various stakeholders such as consumers, as well as environmental groups that have been conducting supply chain pollution investigations in China since 2010. After a decade of development, the leading companies in these two industries have leveraged environmental information disclosure, actively engaged with stakeholders, and extended their supply chain environmental management to include high environmental impact and high carbon emissions processes further upstream in the supply chain, taking the lead in green supply chain management.

The number of companies in the TOP 50 in other industries has not changed much over the decade, with the number of finalists generally ranging from 1 to 4 (Figure 3-15). Among them, Danone in the Food & Beverage industry, Oji in the Paper industry, and Procter & Gamble in the Household & Personal Care industry have been consistently in the TOP 50 over the past 3 years; Polestar in the Automotive industry has risen to the top and entered the TOP 50 for the first time in 2022; and newcomers in green supply chain management have emerged in the Auto Parts, Industrial Chemicals, and Photovoltaic Equipment industries, such as Schaeffler, Archroma, and LONGi Green Energy. We hope that, driven by industry leaders, more companies will emerge with better performance in supply chain environmental management.

TOP50 Regional Distribution (2014-2023)

Companies in the US and Europe are early adopters of green supply chain management, and the number of companies in the TOP 50 has remained high over the past decade (Figure 3-17). Among them, the average scores of American companies are significantly higher than those of other regions, and the average scores of European companies are basically the same as the average scores of the TOP 50 (Figure 3-18).

In the early years, the gap between the performance of companies in the Asian-Pacific region (excluding Greater China) and leading companies in the US and Europe wasn't that significant; however, after 2020, their presence and average score in the TOP 50 gradually pulls away from those in the US and Europe, mainly due to insufficient promotion of supply chain environmental management in upstream high-impact segments, which has led to a decline in their overall CITI scores.

Companies in the Greater China region have a late start in green supply chain management. However, with the improvement of China's environmental enforcement and information disclosure, the implementation of the "dual carbon" target and strategy of synergistic reduction of pollution and carbon emissions, and the green barriers in international trade, the number of Greater China companies entering the TOP 50 has increased in the past two years. Among them, Foxconn, Avary Holding, Luxshare Precision and other large corporations or listed companies that are part of the core supply chain of the global IT/ICT industry have begun to manage the environmental performance and GHG emissions of their own supply chains under the influence of their brand customers, and are driving the IT/ICT industry chain to accelerate its green and low-carbon transformation. Global market-oriented companies such as Anta Sports, Huawei, Li Ning, Lenovo, TCL, Vitasoy, and Esquel have greatly improved their green supply chain management requirements and influence in recent years, and have successively entered the TOP 50. Based on the centralized/joint procurement platform of the real estate industry, Landsea and Vanke have started to promote and accelerate the green and low-carbon transformation of the construction and building materials industry chain.

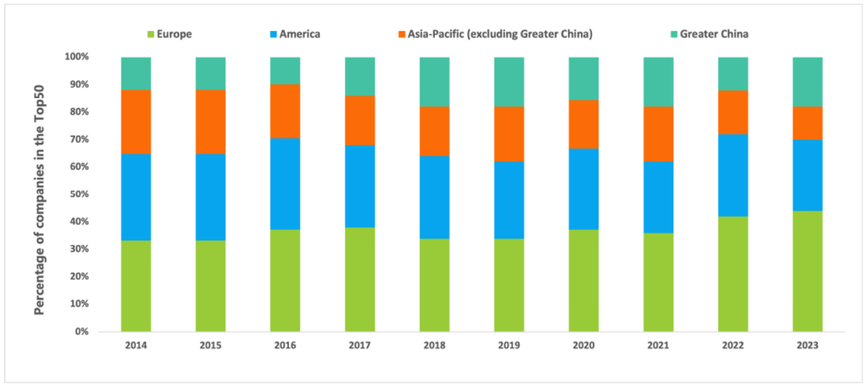


Figure 3-17 Regional distribution of the CITI TOP 50 (2014-2023)

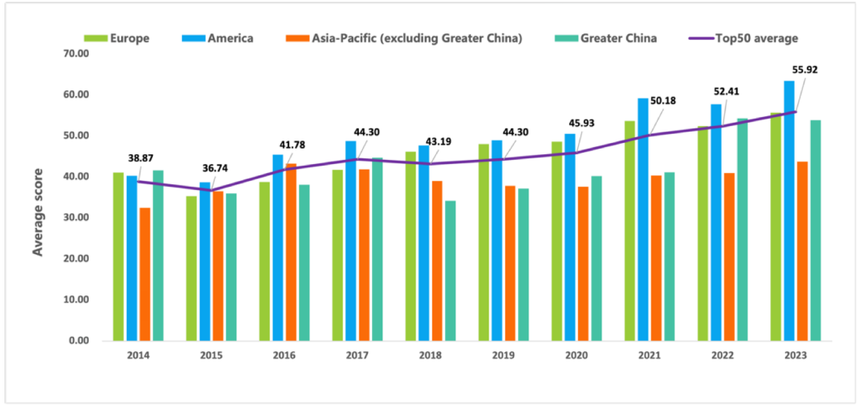


Figure 3-18 Average score of the CITI TOP 50 (2014-2023)

4 CITI Index Ten Year Observations

4.1 China's Environmental Governance and Information Disclosure Provide Strong Support for Promoting Green Supply Chain Construction

4.2 Significant Progress in Green Supply Chain Construction

For more than 50 years, with the wave of economic globalization, supply chains have been shifting and expanding on a large scale, bringing economic development and income growth to many regions of the world, but also causing serious pollution transfers, damaging the ecological environment in the areas where global supply chains are located, and even affecting the health and safety of local communities.

Against this backdrop, the Institute of Public and Environmental Affairs (IPE) published the Water Pollution Map in 2006, which was later upgraded to the Blue Map. In 2007, in response to the supply chain pollution issues identified in the data collection, IPE, in collaboration with 20 environmental groups, launched the Green Choice Initiative, which calls on large companies to take the initiative to strengthen the environmental management of their supply chains by screening their list of suppliers against a list of environmental violators. The initiative also calls on consumers to pay attention to the environmental performance of brands. In 2013, IPE and the Natural Resources Defense Council (NRDC) jointly developed the Green Supply Chain CITI Index, and in 2014, IPE released the CITI Index evaluation for the first time and has conducted the evaluations for ten consecutive years.

During the evaluations over the past decade, we have witnessed the significant strengthening of China's environmental governance and the historic expansion of environmental information disclosure, which has played a crucial role in promoting the construction of green supply chains in China. Chinese and international leading brands and suppliers have made use of the environmental information disclosed by government agencies, made their own disclosures, and worked closely with various stakeholders to improve green business practices, which has helped their supply chains in China achieve green and low-carbon transformation. The Chinese government has successively issued policies, regulations and standards related to green manufacturing and green supply chain, the EU has recently issued new regulations related to supply chain environmental due diligence and sustainability reporting and disclosure, and financial institutions and investors have continued to pay attention to corporate ESG, especially supply chain ESG performance, which has transformed green supply chain management from a "plus" to a "must".

4.1 China's Environmental Governance and Information Disclosure Provide Strong Support for Promoting Green Supply Chain Construction

For brands, emissions from supply chains often account for the majority of their emissions. However, reducing supply chain emissions is both a priority and a challenge due to the unique characteristics of supply chains: with global sourcing and layers of outsourcing, brands are often no longer the primary direct polluters; many suppliers no longer have a direct legal relationship with brands; and brands' own environmental management practices have little control over pollution in the upstream value chain.

More than a decade ago, some supply chain pollution problems began to be exposed, and some multinational companies tried to extend their labor rights-based CSR audits to environmental compliance in the supply chain. However, the traditional way of relying only on third-party audits is costly and inefficient, and market-based factory audits are often difficult to effectively identify problems and even falsify the results, falling into the cat-and-mouse game dilemma.

Environmental Information Disclosure Providing Critical Data Infrastructure

In 2007, IPE launched the Green Choice Initiative with 20 Chinese environmental groups, suggesting that attention should be paid to supervision records published by government agencies as an entry point for ensuring environmental compliance. Subsequently, IPE worked with partner organizations to conduct investigations and began promoting supply chains in the IT and textile industries, and expanded supply chain information screening to include officially confirmed public petitions and complaints. However, at that time, some local regions still prioritized GDP growth over environmental protection, and environmental enforcement was lax, which made the information disclosure-based solution a bottleneck and not significant enough to support green supply chain construction.

In 2013, in response to the public's strong demand for clean air, China began to build a national air quality monitoring network and simultaneously launched an action plan for the prevention and control of air pollution, followed by an action plan for the prevention and control of water and soil pollution. In 2016, central environmental inspections were rolled out across the country. In 2018, the *Decisions on Comprehensively Strengthening Environmental Protection and Resolutely Winning the Battle Against Pollution* further put forward the three major battles for blue skies, clear water and clean soil.

In September 2020, China announced that it would "strive to peak carbon dioxide emissions by 2030 and achieve carbon neutrality by 2060". Meanwhile, the battle for blue skies and pollution prevention and control continues. In 2022, the report to the 20th CPC National Congress proposed to coordinate industrial restructuring, pollution control, ecological protection and climate response, and synergistically promote carbon reduction, pollution reduction, expand green development, and pursue economic growth.

With the large-scale implementation of pollution control and the development and promotion of the “dual carbon” strategy, China's environmental information disclosure has been greatly strengthened in both depth and breadth. In 2013, IPE, together with 25 civil society organizations, launched an initiative for full disclosure of information on pollution sources and called for the disclosure of real-time online monitoring data. On July 31 that year, the former Ministry of Environmental Protection (MEP) issued the *Measures on Self-Monitoring and Information Disclosure for State-Monitored Key Polluting Enterprises (Trail)*[9], which required state-monitored key air and water pollution sources to disclose online monitoring data on an hourly and bi-hourly basis, respectively, starting in 2014, which is the first large-scale realization of real-time online monitoring data disclosure in the world.

The new *Environmental Protection Law* implemented in 2015 clarified the information disclosure requirements in the form of a special chapter, and the subsequent revision of the *Air Pollution Prevention and Control Law*, the *Water Pollution Prevention and Control Law* and other laws and regulations further clarified the main responsibility of key monitoring entities to install online monitoring equipment and connect to the system of relevant government agencies, and the construction of China's automatic pollution source monitoring system and data application have developed rapidly. The Pollution Information Transparency Index (PITI) evaluations over the past ten years have witnessed the historic progress of the Chinese government in environmental regulation and information disclosure. The principle of "disclosure as the norm and non-disclosure as the exception" for environmental information on pollution sources has become a widely accepted principle for the government and all sectors of society.

9. Ministry of Environmental Protection. Notice on the Issuance of Measures on Self-Monitoring and Information Disclosure of State Monitored Key Polluting Enterprises (Trial) and Measures for Supervisory Monitoring of Pollution Sources and Information Disclosure of State Monitored Key Enterprises (Trial) [EB/OL]. 2013-07-30:[2023-10-14].https://www.mee.gov.cn/gkml/hbb/bwj/201308/t20130801_256772.htm.

In this context, the number of pollution source environmental supervision records collected by the Blue Map database has also increased from a cumulative total of less than 200,000 from 2006 to 2014 to a total of nearly 3 million by September 2023 (Figure 4-1).

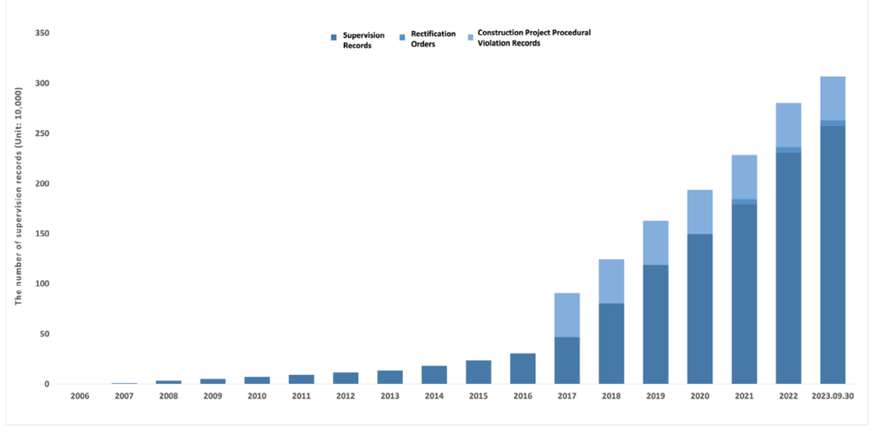


Figure 4-1 Year-on-year change in the number of pollution source supervision records collected by the Blue Map Database

While government environmental information disclosure has expanded dramatically, corporate environmental information disclosure has long lagged behind. In recent years, this situation has undergone exciting changes. The newly revised *Environmental Protection Law* confirmed the establishment of a pollutant discharge permit system, followed by the Ministry of Ecology and Environment's issuance of the *Regulation on Pollutant Discharge Permit Management* and the establishment of a national pollutant discharge permit management platform. In 2022, the *Administrative Measures for Legal Disclosure of Corporate Environmental Information* was officially implemented, which provided an important legal basis for the disclosure of corporate environmental information, marking a new era of corporate environmental information disclosure.

Based on a series of policies and regulations, such as the *Measures on Self-Monitoring and Information Disclosure for State-Monitored Key Polluting Enterprises (Trail)*, the *Guidance on Further Strengthening the Implementation of "Double Random and One Open" Supervision of the Ecological Environment*, the *Guidance on the Implementation of the "Three Lines and One List" of Ecological and Environmental Zoning Control (Trial)*, and *the Measures for Ecological Environment Supervision of Ecological Protection Red Lines (Trial)*, the types of corporate environmental data collected by the Blue Map have also continued to expand: From supervisory monitoring data to the automated monitoring data of key polluting entities, from information on stationary pollution sources to information on mobile pollution sources such as road traffic, airplanes, ships, etc., and from information on pollutants to information on carbon emissions, ecological red lines, biodiversity conservation, and more.

The expansion of carbon emission data is particularly noteworthy. Promoted by the *Measures for the Administration of National Carbon Emission Trading (Trial)* and the *Measures for the Administration of Legal Disclosure of Enterprise Environmental Information*, enterprises involved in carbon emission trading have begun to effectively disclose annual carbon emission information. The China Securities Regulatory Commission's *Standards for the Contents and Formats of Information Disclosure by Companies Offering Securities to the Public No.2 - Contents and Formats of Annual Report (2021 Revision)*[10] also encourages companies to disclose the measures and effectiveness of carbon emission reduction. Enterprise environmental information included in the Blue Map has been significantly expanded, of which the number of carbon data disclosed by companies has reached 11,600.

Efficient Solutions Based on Information Disclosure

The expansion of environmental information disclosure has greatly facilitated public oversight and market-oriented applications such as green supply chain and green finance. Based on the environmental big data integrated from thousands of data sources, IPE has been able to work with partner organizations to develop the Dynamic Environmental Performance Assessment (DEPA) index, which assists all parties to assess the environmental performance of enterprises, facilitates green supply chain and green finance, and empowers public participation and supervision. DEPA is based on the Pollutant Information Transparency Index (PITI) of the region where the enterprise is located, the level of corporate information disclosure and the degree of environmental performance remediation, etc., and dynamically assigns scores to enterprises, and color codes their performance levels into green, blue, yellow and red, from highest to lowest. Currently, dynamic environmental performance tracking has been conducted for more than 14 million enterprises.

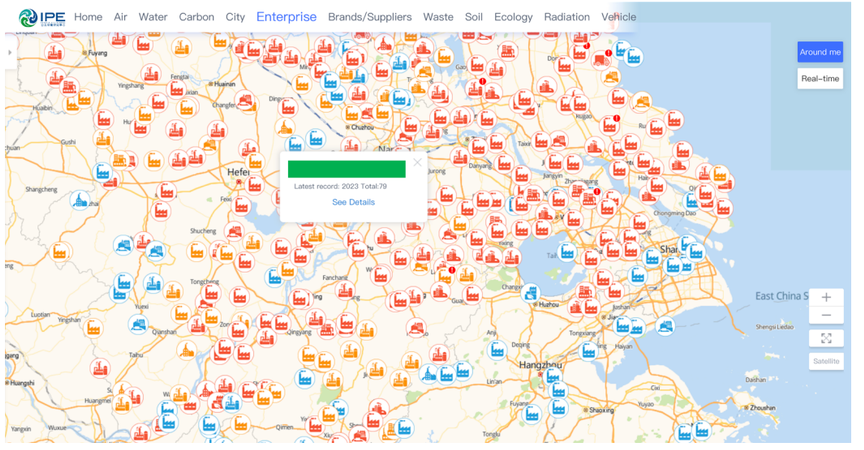


Figure 4-2 Enterprise Dynamic Environmental Performance Assessment (DEPA) Map on the Blue Map website

10. China Securities Regulatory Commission. Standards for the Contents and Formats of Information Disclosure by Companies Offering Securities to the Public No.2 - Contents and Formats of Annual Report [EB/OL].2021:[2023-10-09].http://www.sse.com.cn/lawandrules/regulations/csrcannoun/c /5533573.pdf.

The pollution source information provides an important data basis for green supply chain management. Chinese and international companies sourcing in China are using this publicly available information to extend supply chain environmental management from manufacturing suppliers (i.e., stationary pollution sources) to logistics and transportation service providers (i.e., mobile pollution sources), and from after-the-fact understanding of the causes of violations to multi-dimensional enterprise profiling through pollutant discharge permits, required rectifications, environmental credit ratings, dynamic environmental performance assessment, heavy pollution weather performance grading, exemplary list, automated monitoring data, production restrictions and exemptions, etc., to assess the environmental management capability and operation of environmental protection facilities, and reduce the occurrence of noncompliant behaviors. Brand companies are no longer limited to focusing on the impact of suppliers' pollution on the environment and communities, but also track suppliers' progress in reducing GHG emissions and their impact on local ecology and biodiversity.

Government environmental information disclosure not only provides an important data infrastructure for green supply chain management, but also helps form innovative solutions based on big data. In 2018, IPE developed an automated supply chain environmental and carbon management tool, the Blue EcoChain, based on the Blue Map database and Internet technology (Figure 4-3).

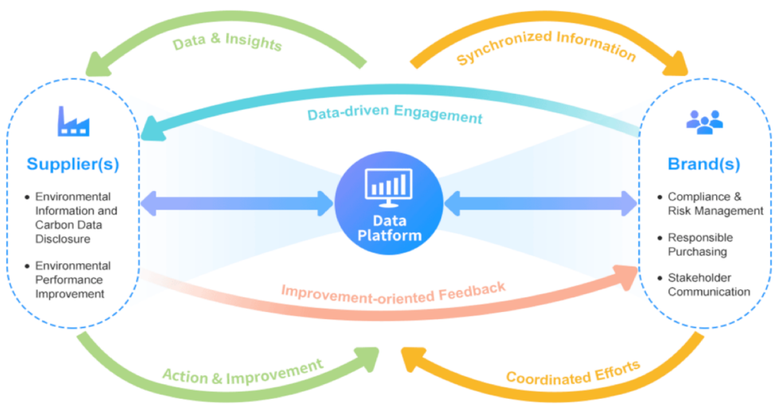


Figure 4-3 Blue EcoChain working mechanism

Brand companies can use Blue EcoChain to track the environmental performance, greenhouse gas and pollutant emissions and transfers of their supply chains in China on a large scale, and receive timely push notifications through the Blue Map app and registered emails, which can significantly improve the efficiency of supply chain management and reduce costs. Suppliers can also monitor their own environmental performance, greenhouse gas and pollutant emissions and transfers through the Blue EcoChain system, and receive push notifications in sync with their brand customers and other stakeholders, so that they can more proactively fulfill their primary responsibility of environmental protection, make timely public explanations of violations and exceedances, and become equal partners with buyers in controlling environmental and climate risks in the supply chain.

As of September 2023, more than 100 sourcing companies, industry associations, traders, and large supplier companies are using the Blue EcoChain to manage the environmental performance of their suppliers at scale.

External Requirements for Green Supply Chain Become More Refined

Since 2014, the Chinese government, especially the Ministry of Industry and Information Technology (MIIT) and the Ministry of Ecology and Environment (MEE), has paid more and more attention to the green supply chain, and the pace of policy and standard development has greatly accelerated, with a series of plans, policies and standards related to green supply chain management being introduced one after another. During the "13th Five-Year Plan" period, the Ministry of Industry and Information Technology issued the *Industrial Green Development Plan (2016-2020)*[11], which explicitly proposed to strengthen the green management of the whole life cycle of products and support enterprises to build green supply chains, and a total of 189 green supply chain demonstration enterprises were selected[12]. In 2017, China's Standardization Administration issued the national standard *GB/T 33635-2017 Guidelines for Green Manufacturing - Green Supply Chain Management in Manufacturing Enterprises*, and successively issued four supporting standards to guide and standardize enterprises to build a systematic green supply chain management system.

In China, during the "14th Five-Year Plan" period, under the strategy of synergistic reduction of pollution and carbon emission, green supply chain management has become an important starting point for carbon peak and carbon neutrality actions in the industrial field. The State Council issued the *Guiding Opinions on Accelerating the Establishment of a Green and Low-Carbon Circular Economic Development System*[13], which once again proposes to build a green supply chain, realize the greening of the whole product cycle, and encourage industries to improve the greening of the supply chain. The *14th Five-Year Plan on Green Development of the Industrial Sector,* the *Implementation Plan for Carbon Dioxide Peaking in the Industrial Sector*, the *Guidance on Strengthening Industry-Integrated Cooperation to Promote Green Industrial Development*, and many other supporting policies for peak carbon development in the industrial sector, all propose to build a green supply chain as an important part of building a green and circular development of the production system.

11. Ministry of Industry and Information Technology. Industrial Green Development Plan (2016-2020) [EB/OL].2016-06-30:[2023-10-09].https://wap.miit.gov.cn/zwgk/zcwj/wjfb/zh/art/2020/art_ 5f9aec0cd5584b37999c837cfa10a411.html.
12. National Development and Reform Commission of the People's Republic of China. Taking Carbon Peak as an Opportunity to Accelerate the Construction of a New Mode of Green and Low-Carbon Development for China's Industry [EB/OL].2021-11-04:[2023-10-09].https://www.ndrc.gov.cn/xxgk/jd/jd/202111/t20211104_1302999.html?code=&amp ;state=123.
13. State Council. Guiding Opinions on Accelerating the Establishment of a Green and Low-Carbon Circular Economic Development System [EB/OL].2021-02-22:[2023-10-09].https://www.gov.cn/zhengce/content/2021-02/22/content_5588274.htm?5xyFrom=site-NT.

At the international level, the EU is promoting more proactive management of environmental and climate risks in the supply chain of the procurement companies, and has formulated and introduced *the Act on Corporate Due Diligence Obligations in Supply Chains*, the *Proposal for a Directive on Corporate Sustainability Due Diligence and Annex*, the *Regulation on Batteries and Waste Batteries,* the *Corporate Sustainability Reporting Directive* (CSRD), and the *European Sustainability Reporting Standards* (ERES), etc. The management of environmental and climate risks in the supply chain has also become an indicator of supply chain sustainability in a number of mainstream ESG standards, most notably the International Sustainability Standards Board (ISSB) *International Financial Reporting Standards (IFRS) S2 Climate-related Disclosures*. The requirements of the relevant regulations are described in detail in chapter 6.2 of this report.

Multistakeholder Governance to Promote Green Supply Chains

As China's public awareness of environmental protection increases, environmental information on pollution sources is increasingly used in public supervision. Since 2010, IPE and other environmental groups, including Green Jiangnan, Friends of Nature, Nanjing Greenstone, Nature University, HuanYou Technology, Green Home of Fujian, Huaihe River Guider, and Zhaolu Environmental Protection Center, have conducted desktop supply chain pollution investigations using environmental information published by ecological and environmental authorities at all levels, combined with on-site visits.

The environmental groups have published 23 investigative reports on environmental issues in the supply chain of various industries, including IT/ICT, textile and leather, automotive, household & personal care, batteries, food and beverage, brewing, industrial chemicals, etc. They have also published 4 industry observation reports on the environmental performance of waste incineration, iron and steel and other industries. Based on the findings, the environmental groups have pushed a number of Chinese and international companies sourcing in China to publicly respond, push subsidiaries and/or suppliers with environmental violations to publicly disclose corrective measures, and regularly exchange information with environmental groups on the progress of environmental management in the supply chain to accept public supervision of green supply chain management.

In addition to conducting supply chain pollution investigations, IPE and environmental groups such as Green Jiangnan, Green Taihang, Green Qilu, Jiangxi Environment Communication Center, Wuhan Xingchu, Green Anhui, Huanyou Technology, Wuhu Ecology Center, and Friends of Nature and others supervised third-party on-site environmental audits of 600 companies, and promoted the disclosure of the audits and corrective action reports through the Blue Map website so that companies can accept continuous monitoring by all stakeholders on their environmental improvements.

Figure 4-4 Environmental groups communicate with company and community representatives on company environmental issues

Figure 4-5 On-site investigations of companies by environmental groups

Environmental groups represented by Green Jiangnan combined environmental big data and digital solutions such as drones and other technological means to conduct environmental supervision: using Blue EcoChain to carry out supervision on a large scale, improve the efficiency of supervision; and using the drone feedback to conduct multi-dimensional observation of the current situation of enterprise environmental management.

Green Jiangnan promotes enterprises to make public explanations on environmental problems with the help of Blue Map by sending letters to enterprises and reporting their violations to relevant departments, sharing information and data among various stakeholders (ecological and environmental departments, enterprises, and the public), and building trust through information disclosure. Promoted by Green Jiangnan, Jiangxi Environment Communication Center, Wuhu Ecology Center and other environmental organizations, the Blue EcoChain solution based on the environmental big data has attracted the participation of 32,000 manufacturing enterprises, environmental organizations, international and Chinese brands, financial institutions, investors and research institutions. Some local environmental departments have also expressed their willingness to join in order to monitor in real time whether enterprises with environmental problems in their jurisdictions make timely and effective disclosures and fulfil their primary responsibility of pollution control.

For two consecutive years since 2022, Green Jiangnan has organized the "Circular Economy, Carbon Neutrality and Green Supply Chain Forum" in Suzhou, the center of the global supply chain, inviting representatives from the ecology and environment departments and industry and information departments, industry experts, and representatives from brands and suppliers to discuss the creation of a high-quality green supply chain to promote China's green development.

Figure 4-6 2023 Circular Economy, Carbon Neutrality and Green Supply Chain Forum

4.2 Significant Progress in Green Supply Chain Construction

Under the favorable conditions of strengthened external regulation and expanded information disclosure, we see that the concept of green supply chain has gradually become mainstream, management has become more digitalized, the number of enterprises reached and affected tends to scale up, and leading industries and leading brands have started to extend green supply chain management to upstream hotspots, from environmental compliance to beyond compliance, and set emission reduction targets by promoting suppliers' carbon accounting and disclosure, and effectively promote green and low-carbon transformation.

Progress I

Green supply chain concepts and management go mainstream

In 2007, when IPE launched the Green Choice Initiative with 20 environmental organizations, only a handful of brand companies had a clearer policy, and even fewer were able to establish a management mechanism to ensure that the policy was put into practice.

From 2014 to 2023, we see that the green supply chain concept has gradually become mainstream among the evaluated companies. Their awareness of green supply chain management has increased significantly compared to a decade ago, and the percentage of companies that have publicly committed to green supply chain management has increased from 37% in 2014 to 89% in 2023, amidst a significant expansion of evaluated companies and industries.

More companies have established green supply chain management policies: the percentage of companies that publicly disclose their supply chain environmental and climate risk management requirements through channels such as supplier code of conduct and annual reports has increased from 37% in 2014 to 73% in 2023. 60% of the evaluated companies in the 2023 evaluation period publicly disclose specific approaches to green supply chain management, the content of supplier audits, annual management progress and effectiveness, and 254 of them explicitly include environmental compliance as one of the requirements for supplier qualification.

The level of green supply chain management of companies has been significantly improved, and the percentage of companies that have established a regular supplier screening mechanism and publicly disclosed the frequency of screening has increased from 25% to 60%. During the 2023 evaluation period, 163 procurement companies tracked the environmental performance of their suppliers using automated management tools, including Blue EcoChain, and the efficiency of their management was significantly improved.

As mentioned in Chapter 4.1, in 2018, IPE developed an automated management tool - the Blue EcoChain - based on the ecological and environmental big data in the Blue Map database and Internet technology. By the end of September 2023, 67 Chinese and international companies and joint purchasing platforms that conduct sourcing in China have explicitly proposed to use the Blue EcoChain to manage the environmental and climate risks of their supply chain in China, and have asked supplier companies to track their own performance through the Blue EcoChain.

Some procurement companies have gradually extended their green supply chain management to segments with high environmental impacts. Over the past decade, the number of companies that have publicly disclosed that the scope of supply chain environmental management has been extended from Tier 1 (direct) suppliers to Tier 2 or more upstream raw material suppliers has increased from 22 to 97. Among them, textile brands have basically extended their environmental management to dyeing, finishing and washing; and most IT brands have extended their environmental management to circuit boards, connectors and other manufacturing processes. The extended management is mainly based on two ways: first, procurement companies extend the scope of green supply chain management to upstream segments with high environmental impact, and directly carry out tracking and management; second, suppliers are informed about environmental management requirements, management methods, etc., and are empowered to independently control the environmental performance of their own suppliers, thus extending environmental management to upstream segments with high environmental impact through supply chain level-by-level control.

Figure 4-7 Companies that publicly disclose using the Blue EcoChain system for supply chain management

Progress II

Level of supply chain information disclosure and environmental performance both improved

Government supervision records and confirmed complaints and petitions, as third-party data, can be the entry point for all parties to look into the supply chain pollution problems, and effectively improve management efficiency and effectiveness. Meanwhile, to follow up and solve the environmental problems, supply chain enterprises must play the main role.

Since 2014, through the CITI Index's "Compliance and Corrective Actions" indicator, we have seen procurement companies move from pushing suppliers to provide feedback and explanations, to pushing suppliers to measure and disclose carbon emissions, set targets and initiate emission reduction actions; we have also seen this push gradually extend from direct suppliers to upstream emission hotspots.

Over the past decade, an increasing number of procurement companies have pushed suppliers to disclose remediation of non-compliance issues and environmental compliance status based on their own green supply chain management requirements. Based on supplier environmental compliance screening, the number of procurement companies that push suppliers with environmental violations to publicly disclose explanations and corrective actions taken has increased from 40 in 2014 to 102 in 2023. While many brands are not pushing for public disclosure, they are starting to leverage big data for supply chain environmental management.

Driven by procurement companies, the number of suppliers engaged in communication and exchange with environmental organizations on environmental violations, corrective actions and environmental information disclosure has surged from just over 500 in 2014 to a cumulative total of more than 25,000 in 2023[14].

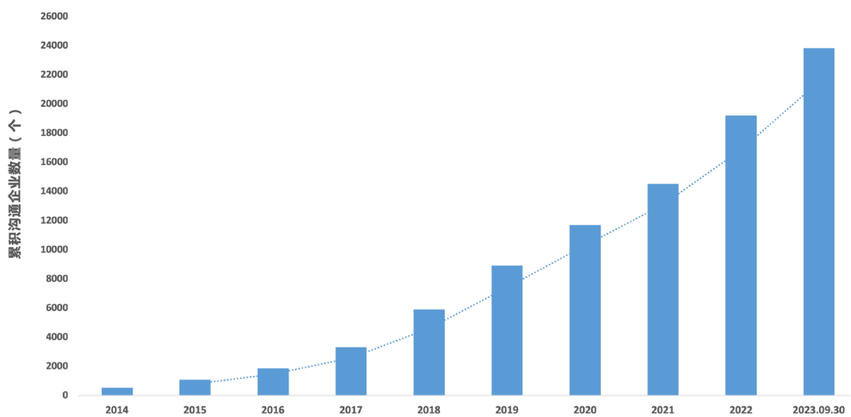


Figure 4-8 Cumulative number of suppliers communicating with environmental organizations on corrective actions and environmental information disclosure over the past ten years

14. Note: This data is cumulative of IPE's communications with companies since its establishment.

The supplier companies that provided public feedback came from 295 cities across China. Among them, the number of export processing enterprises in areas such as the Pearl River Delta and the Yangtze River Delta accounted for the largest share, and the number of enterprises in the Bohai Rim region and inland cities in the central and western parts of the country gradually increased (Figure 4-9). Under the joint promotion of Green Jiangnan and other partner organizations, more than 32,000 suppliers are using the Blue EcoChain to track their own environmental risks to achieve long-term supply chain environmental management.

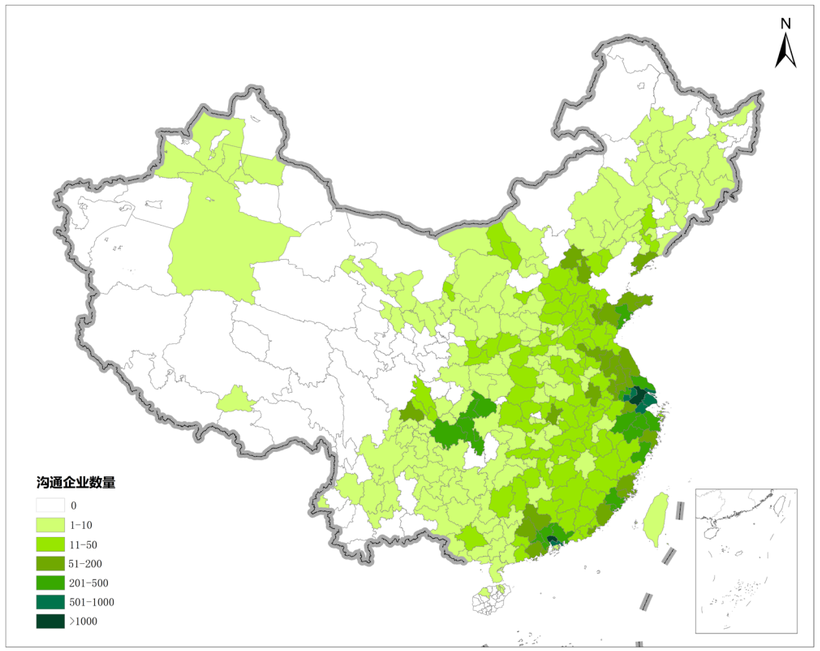


Figure 4-9 Distribution of suppliers communicating with environmental organizations regarding corrective actions and environmental disclosure (2014-2023); data as of September 30, 2023 (Legend: number of suppliers)

Over the past ten years, among the 25,000 suppliers promoted by the procurement companies, more than 8,000 suppliers have publicly disclosed explanations and corrective actions regarding past environmental violations through the Blue Map website; more than 8,500 suppliers have passed the GCA audits to provide adequate explanations on the reasons for the violations, the rectification methods, the effects of the corrective actions, and the follow-up environmental compliance status, etc., and have published the audit reports to accept public supervision. The total fines involved in the violation records amounted to more than RMB 300 million.

4-10 Number of suppliers that made public explanations and the number of suppliers that passed the GCA audits (2014 – 2023)[15]

Through the publicly disclosed explanations, supporting documents of corrective actions and audit reports of more than 8,500 suppliers, we found that from 2014 to 2023, 37% of the issues are related to exceeding standards and total discharge, and nearly 1/4 are procedural violations such as failing to conduct the required environmental impact assessment or acceptance. We also found that as China's air pollution control progresses, volatile organic compounds (VOCs) have replaced sulfur dioxide as a binding indicator of air quality during the 14th Five-Year Plan, and supervision records involving unorganized emissions of VOCs have shown an upward trend.

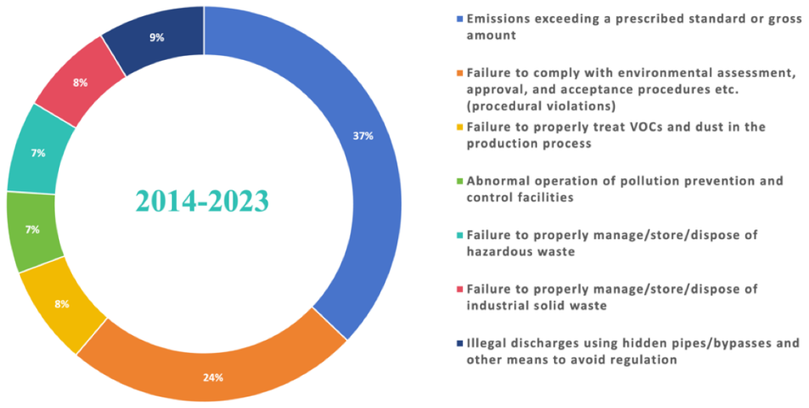


Figure 4-11 Common violation types summarized from suppliers' public explanations

15. The 2023 statistics are as of September 30, 2023, not for the full year.

As shown in Figure 4-10, the number of companies making disclosures in response to past environmental violations has stabilized since 2020. Our analysis suggests that this is related to the fact that the number of environmental violations and administrative penalties imposed on suppliers has leveled off. This reflects that after the three major pollution prevention and control action plans and several rounds of central environmental inspections, sloppy corporate management and serious pollution have been curbed, and environmental performance has improved significantly. At the same time, Chinese and international procurement companies are able to select suppliers with better environmental performance through environmental big data, and further control environmental risks in the supply chain.

On the basis of environmental compliance, Chinese and international leading brands have long wanted to go beyond compliance. Environmental inspections in China launched since 2016 have repeatedly uncovered issues such as illegal industrial wastewater discharge, landfilling and disposal of hazardous waste, highlighting the negative impact of toxic and hazardous substance management and lack of information disclosure on environmental governance. Over the past ten years, we have seen 33 leading companies, based on supplier screening and improving environmental compliance performance, further promote the disclosure of energy consumption and greenhouse gas emissions data, as well as pollutant release and transfer registry (PRTR) data, which tracks the release of toxic and hazardous substances into the atmosphere, water and other environmental media (Figure 4-12).

Over the past ten years, these companies have encouraged 8,934 supplier companies to complete and publish 10,304 sets of annual environmental data on the Blue Map website. These supplier companies come from 193 cities in 28 provinces in China and belong to 58 industries, of which more than 36.4% are from the textile industry and 23.7% are from the IT/ICT industry. Most of them are capable of doing data accounting and reporting on their own, and have been disclosing their data on the Blue Map website for many years.

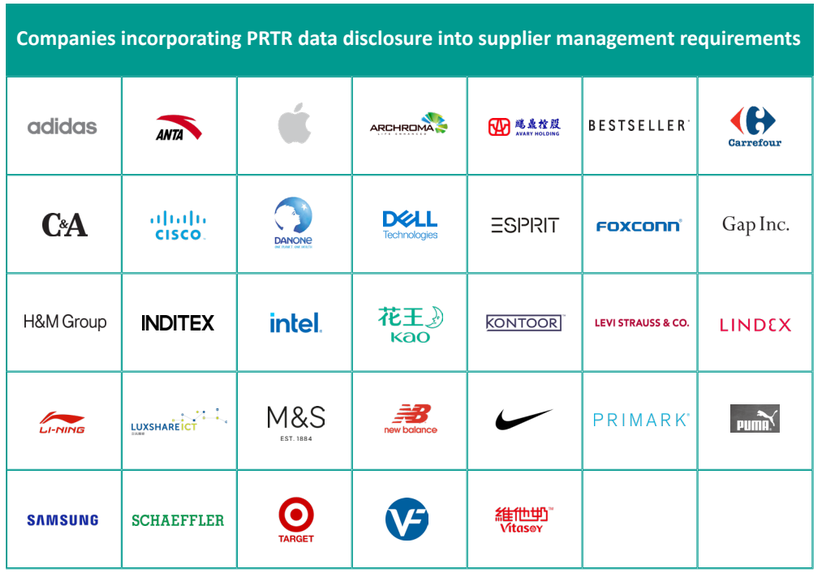


Figure 4-12 Companies incorporating PRTR data disclosure into supplier management requirements

The *13th Five-Year Plan for Environmental Protection*[16] released by the State Council in 2016 sets chemical oxygen demand (COD), ammonia nitrogen, sulfur dioxide (SO_2), and nitrogen oxides (NOx) as binding targets for reducing of the total amount of major pollutant emissions. We analyze the enterprises that have disclosed the total emissions of the above four types of pollutants through PRTR data since 2016, and the results show that among the enterprises that have disclosed the emissions of SO_2 and NOx in exhaust gases for six consecutive years from 2016 to 2021, the total emissions of the two types of pollutants have shown an overall decreasing trend. Combined with the analysis of the GCA audit process on the rectification plan of enterprises with excessive emissions, we believe that the main reason for the decline in the total emissions of SO_2 and NOx in exhaust gases is that the industrial enterprises in most major cities have gradually phased out their own small coal-fired boilers during the 13th Five-Year Plan period, and their industrial production has shifted to the use of biomass fuels and natural gas as energy sources. Among them, NOx emissions declined rapidly after 2018, at a rate significantly higher than the national average, and SO_2 emissions continued to decline from 2016 to 2020, and then leveled off.

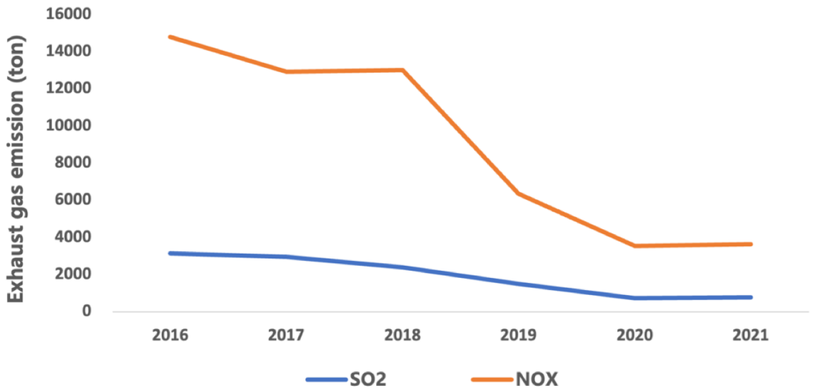


Figure 4-13 Total SO_2 and NOx emissions disclosed by enterprises via PRTR data

In terms of wastewater pollutants, among the enterprises that disclose the total amount of COD and ammonia nitrogen discharged in wastewater for seven consecutive years from 2016 to 2022, the total amount of COD and ammonia nitrogen discharged in the period before the 13th Five-Year Plan, especially between 2016 and 2018, shows an increasing trend, and maintains a higher emission level from 2018 to 2019, of which ammonia nitrogen peaks in 2019. However, both indicators show a clear downward trend from 2020, and emissions in 2022 are significantly lower than in 2016.

16. State Council. Circular of the State Council on the Issuance of the 13th Five-Year Plan for Environmental Protection [EB/OL].2016-12-05:[2023-10-16].https://www.gov.cn/zhengce/content/2016-12/05/ content_5143290.htm.

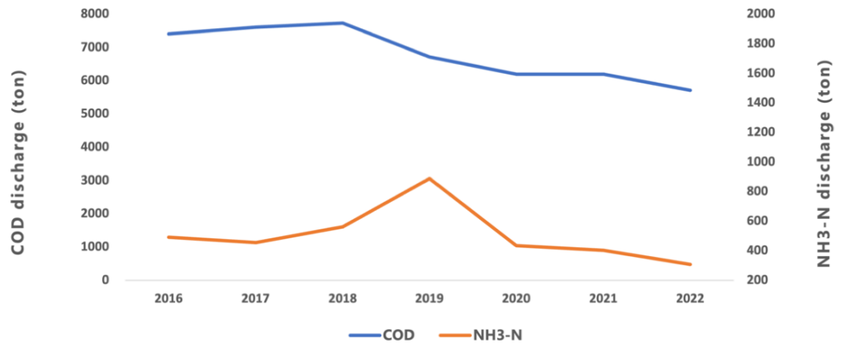


Figure 4-14 Total wastewater COD and ammonia nitrogen discharge disclosed by enterprises via PRTR data

In addition to common pollutants, the types of pollutants tracked and disclosed by supplier enterprises have been gradually expanded over the decade to include characteristic pollutants, priority control chemicals, toxic and hazardous substances, and new pollutants. As of September 2023, a total of 2,670 enterprises have disclosed releases and transfers of the above pollutants through PRTR, of which nitrobenzene, sulfides and anilines are the top three hazardous substances in wastewater disclosed by enterprises; hydrogen sulfide, benzene and fluoride are the top three disclosed hazardous substances in exhaust gas.

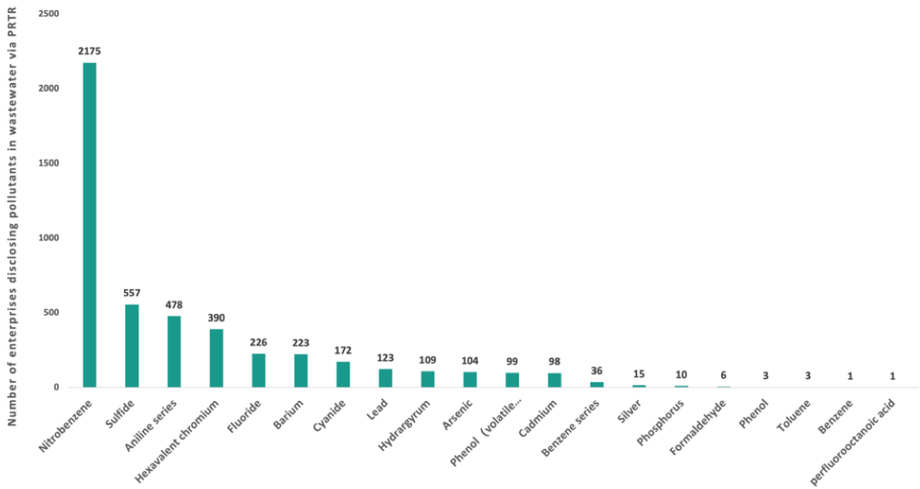


Figure 4-15 Number of enterprises disclosing priority control chemicals, toxic and hazardous substances, and new pollutants in wastewater via PRTR over the past decade

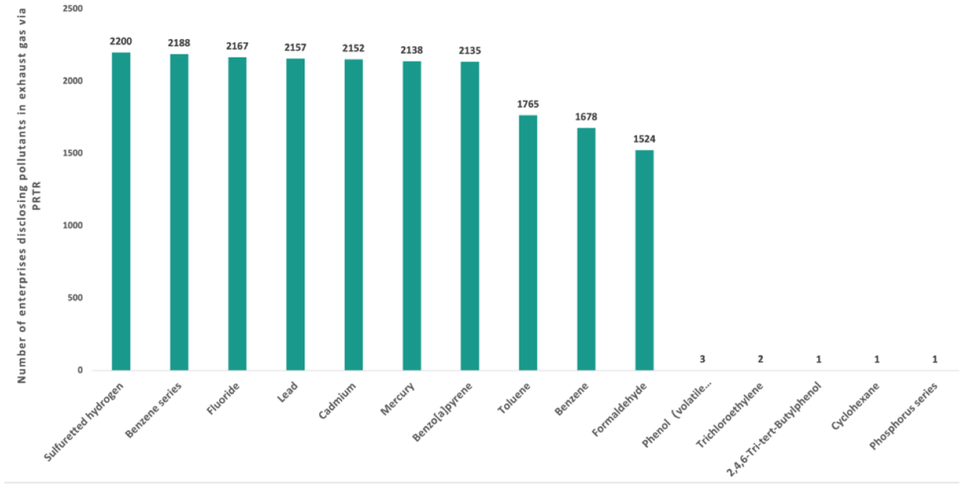


Figure 4-16 Number of companies disclosing priority control chemicals, toxic and hazardous substances, and new pollutants in exhaust gas via PRTR over the past decade

Progress III

Transparent supply chains help sourcing companies build stakeholder trust

In 2015, the CITI Index added supply chain transparency indicators for the first time. In nine years, the number of companies publicly disclosing their supplier lists has increased from 9 in 2015 to 174 in the current evaluation period, indicating that the concept of the need to improve supply chain transparency is being recognized by more and more companies.

In 2018, the Natural Resources Defense Council (NRDC) and IPE jointly developed the Green Supply Chain Map, which is the world's first interactive platform dedicated to showcase leading brand companies' commitment to transparent supply chains and environmental management. The Green Supply Chain Map links brand companies' supplier lists in China with official-sourced automated monitoring data on the companies' wastewater and emissions, as well as their self-reported annual resource and energy consumption, pollutants, and greenhouse gas emissions. Brand companies can demonstrate their supply chain transparency and the effectiveness of their supply chain environmental and carbon management to stakeholders through visualization, while motivating their suppliers to fulfill their primary responsibility for ecological and environmental protection, reduce the environmental impact of their supply chains, and accept public scrutiny.

As of September 2023, a total of 30 Chinese and international companies have disclosed the environmental performance of 3,036 suppliers through the Green Supply Chain Map, covering 8 industries, including textile and leather, IT/ICT, food and beverage, paper, household and personal care, auto parts and components, retail, and machinery and equipment. In addition to Europe and the United States, where green supply chain management started earlier, companies in Greater China have also begun to improve supply chain transparency in recent years: Anta Sports became the first Chinese textile company to disclose supplier environmental information, and Luxshare Precision became the second Chinese IT/ICT company to join the Green Supply Chain Map after Lenovo.

The foundation for supply chain transparency to reach such a disruptive level remains the disclosure of environmental information by governments and companies, as well as advances in IT technology. The application of technologies such as big data, cloud computing, mobile Internet, digital maps, artificial intelligence and the Internet of Things can enable the integration of a large number of dispersed data sources, in particular the parsing and extraction of a large number of different categories of text, while connecting companies sourcing in China and their suppliers through a data chain, distributing information in a timely manner, collecting feedback in accordance with a standardized format, and realizing highly efficient information disclosure so as to effectively control related risks.

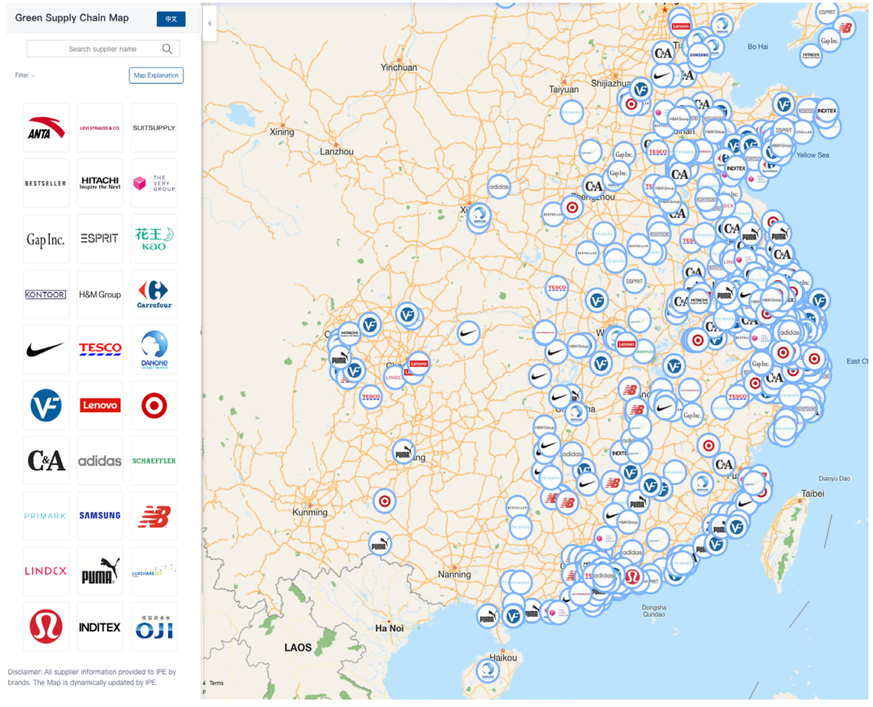


Figure 4-17 The Green Supply Chain Map on the Blue Map website

Progress IV

Supply chain climate action in focus

Since the signing of the Paris Agreement, some 150 countries and regions and 1,000 large enterprises and financial institutions around the world have committed to carbon neutrality. In 2020, China has proposed a "dual carbon" target and gradually established a "1+N" policy system, and the climate action of Chinese enterprises has also started to accelerate. The focus of green supply chain management of Chinese and international companies has also shifted from environmental compliance to synergistic reduction of pollution and carbon emissions.

With globalization and the deepening division of labor in industry, most companies are involved in the purchase of products and services, which means that GHG emissions from the supply chain typically account for a large share of a company's total emissions. To achieve net-zero emissions across the entire value chain, companies need to identify and measure Scope 3 emission hotspots and work with value chain stakeholders, especially suppliers, to reduce emissions and accelerate the low-carbon transition of the supply chain.

To encourage companies to implement supply chain emission reduction measures and deeply participate in global climate change governance, IPE developed the Supply Chain Climate Action SCTI Index in 2018, and the SCTI evaluation results were incorporated into the CITI Index starting in 2019. In 2021, IPE upgraded the SCTI into the Corporate Climate Action Transparency Index (CATI) with the technical support of the Chinese Research Academy of Environmental Sciences, and at the same time, the CATI evaluation results were converted with a 20% coefficient and added to the CITI Index.

From 2018 to 2023, evaluated companies have made positive progress in measuring, disclosing, and reducing GHG emissions from their supply chains, as evidenced by the progress made:

- The percentage of companies measuring and disclosing Scope 3 emissions increased from 19.5% to 44.2%;
- The percentage of companies disclosing Scope 3 reduction targets increased from 14.4% to 30.2%, and the percentage of companies committing to Scope 3 reductions more than doubled;
- The number of companies promoting supplier self-reporting and disclosure of GHG emissions data and setting and disclosing carbon reduction/carbon neutrality targets increased from 16 to 33;
- Emissions reduction actions are gradually expanding to more emission sources along the value chain: 14.4% of companies are working with their upstream high-emitting raw material suppliers to implement emissions reduction projects such as energy efficiency improvements and low-carbon technology innovations in 2023, and 21.7% of companies are working with their logistics suppliers to reduce emissions from the transportation and distribution of their products;
- Lenovo, Dell, Apple, Adidas, PUMA, Microsoft, Luxshare Precision, LONGi Green Energy, and 50 other companies from 14 industries, including IT/ICT, textile and leather, and photovoltaic equipment, measured and disclosed the carbon footprints of their key products.

Over the past six years, more than 3,500 supplier companies have disclosed more than 8,000 sets of carbon data through the Blue Map, from the initial estimation of GHG emissions using only energy consumption data, to the identification of carbon emission sources, to carbon accounting based on mainstream GHG accounting standards using digital tools. The dimensions of corporate disclosure have also gradually expanded from total GHG emissions to include Scope 1, 2, and 3 data, methodology, third-party verification, carbon intensity, energy use, and climate targets, etc. (see Figure 4-18).

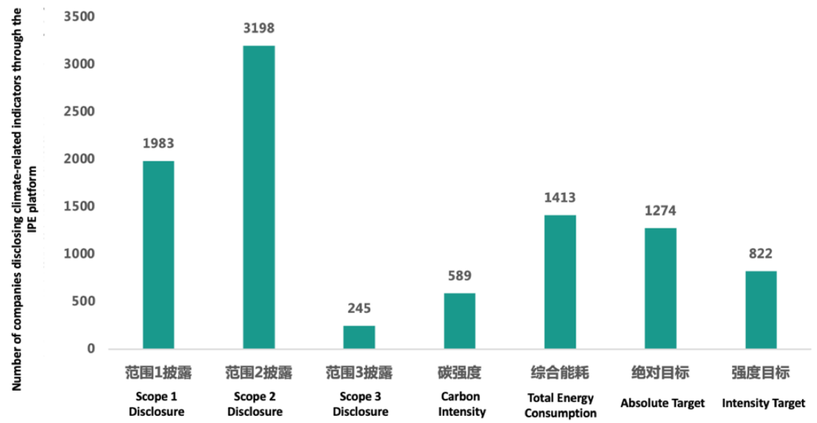


Figure 4-18 Number of supplier companies disclosing core climate indicators through carbon data disclosure form over the past six years

As more and more companies recognize the importance of collecting actual supplier data and continue to promote carbon data disclosure by their direct and indirect suppliers, 2,225 suppliers have disclosed their carbon emissions data through the Blue Map website during this evaluation period, an increase of 15.5% compared to the 2022 evaluation period, motivated by IPE and 33 global and Chinese companies. These suppliers' Scope 1 & 2 carbon emissions in the most recent year surpassed 56.18 million tonnes of CO_2e[17].

Among them:

- Approximately 2/3 of suppliers have annual carbon emissions between 100 tonnes and 10,000 tonnes, and 107 suppliers have annual emissions of more than 100,000 tonnes (Figure 4-19);

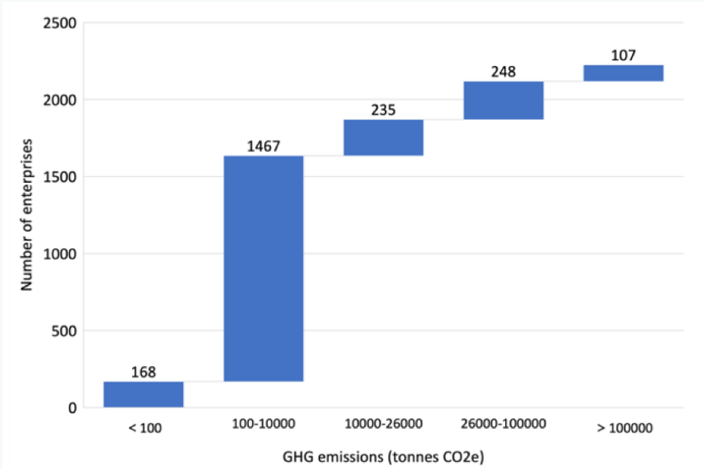


Figure 4-19 Magnitude distribution of annual carbon emissions disclosed through the Blue Map in this evaluation period

- 1,919 supplier companies used the Enterprise GHG Emissions Accounting Platform to account for their GHG emissions; 261 supplier companies conducted third-party verification based on carbon accounting and uploaded the verification reports, of which more than 50% (141 supplier companies) were from the computer, communication and other electronic equipment manufacturing industry, while the others were from textile-related industries, electrical machinery and equipment manufacturing industry, metal products industry, rubber and plastic products industry, and others;

17. Note: This data may involve double counting because of possible inclusion or supply relationships between supplier enterprises.

- In addition to calculating and disclosing Scope 1 & 2 emissions, 175 suppliers calculated and disclosed Scope 3 emissions;
- 947 supplier companies began setting carbon reduction targets. Of these, 652 suppliers have set absolute emission reduction targets, an increase of 99.4% compared to the 2022 evaluation period, with committed emission reductions totaling 2,720,700 tonnes of CO_2e; 313 suppliers have set intensity reduction targets. Although more suppliers have started to set emission reduction targets compared to the 2022 evaluation period, the amount of committed emission reductions is still low, reflecting the fact that suppliers still need to increase their ambition to reduce emissions;
- In terms of industry distribution, supplier companies disclosing carbon emissions data came from 39 industries[18], mainly including textile related industries, the computer, communication and other electronic equipment manufacturing industry, and the leather, fur, feather, and footwear industries. Among them, 887 suppliers from the textile and apparel industry emitted a total of 16,206,900 tonnes of CO_2e; and 337 suppliers from the computer, communication and other electronic equipment manufacturing industry emitted a total of 21,294,800 tonnes of CO_2e.

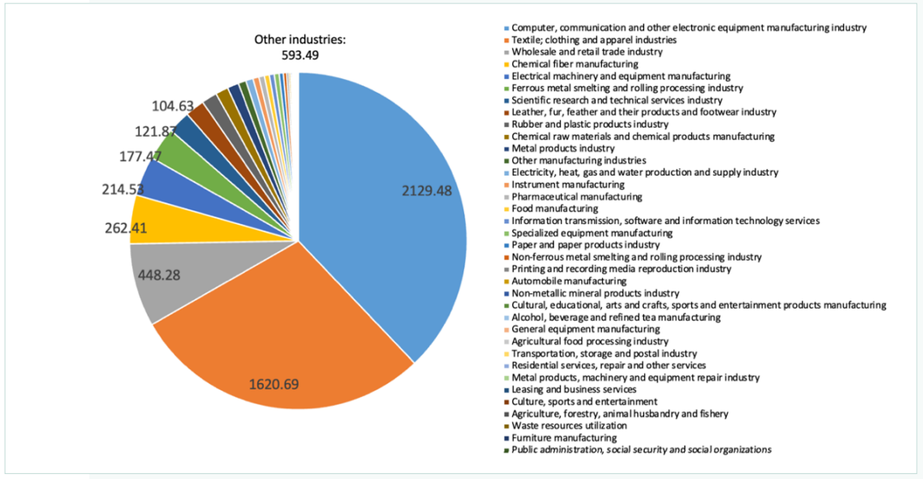


Figure 4-20 Distribution of industries' carbon emissions disclosed through the Blue Map website in this evaluation period (Unit: 10,000 tonnes of CO_2e)

18. Note: The industry classification standard for enterprises disclosing carbon data on the Blue Map website adopts the National Economic Industry Classification (GB/T 4754-2017), and the missing industry information of some enterprises is delineated by IPE with reference to the main products of the enterprises, for reference only.

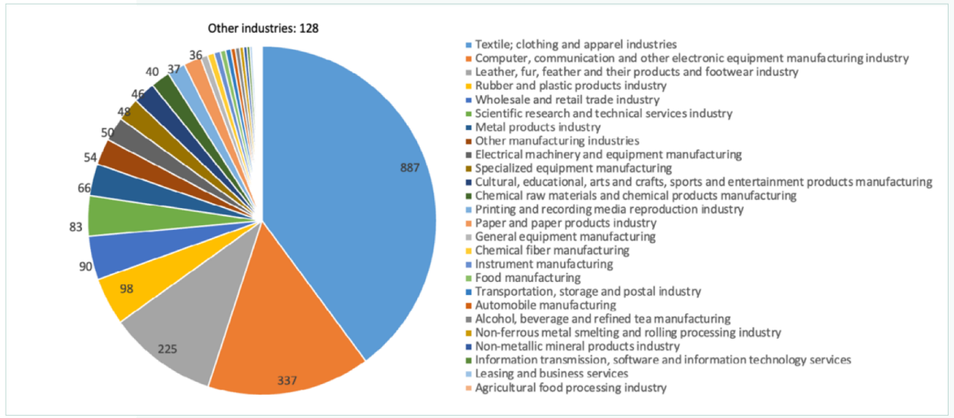
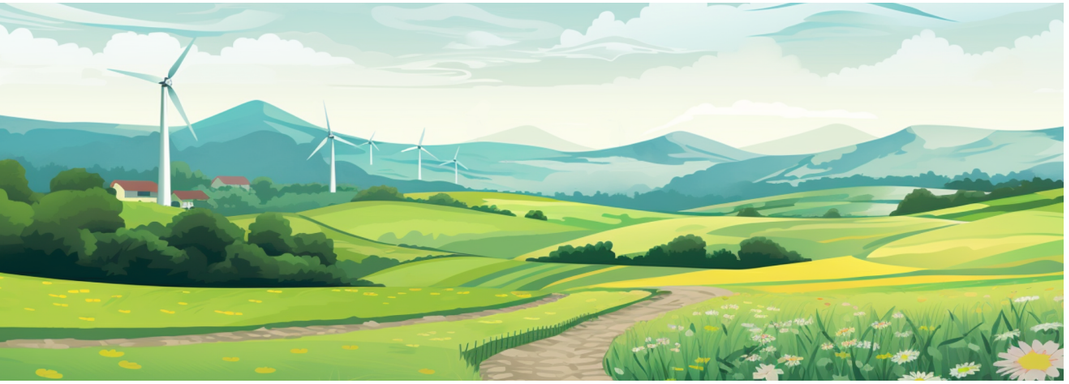


Figure 4-21 Number of supplier companies in each industry that disclosed their carbon emissions through the Blue Map website in this evaluation period



5 Green Supply Chain Management Good Practices and Solutions

5.1 Leading Companies Use Environmental Disclosure to Drive Improvement Among Large Number of Suppliers

5.2 Leading Companies Explore New Models for Collaborative Management of the Upstream and Downstream Industrial Chain

5.3 PRTR and Carbon Data Disclosure Demonstrate Supply Chain Progress in Reducing Pollution and Carbon Emissions

5.1 Leading Companies Use Environmental Disclosure to Drive Improvement Among Large Number of Suppliers

To promote the construction of green supply chain, it is necessary to play the leading role of market mechanism as well as the guiding role of industry leading enterprises, to form self-restraint based on enterprise or industry green procurement standards, and to ensure credibility through public supervision and third-party verification system.

Over the years of green supply chain evaluation, we have observed a group of leading companies and industry associations, leveraging environmental big data to carry out supply chain environmental compliance management and form innovative solutions to drive suppliers to improve their environmental performance. Many good cases have emerged from this process, which are published on the Blue Map website and documented in the ten years of evaluation reports.

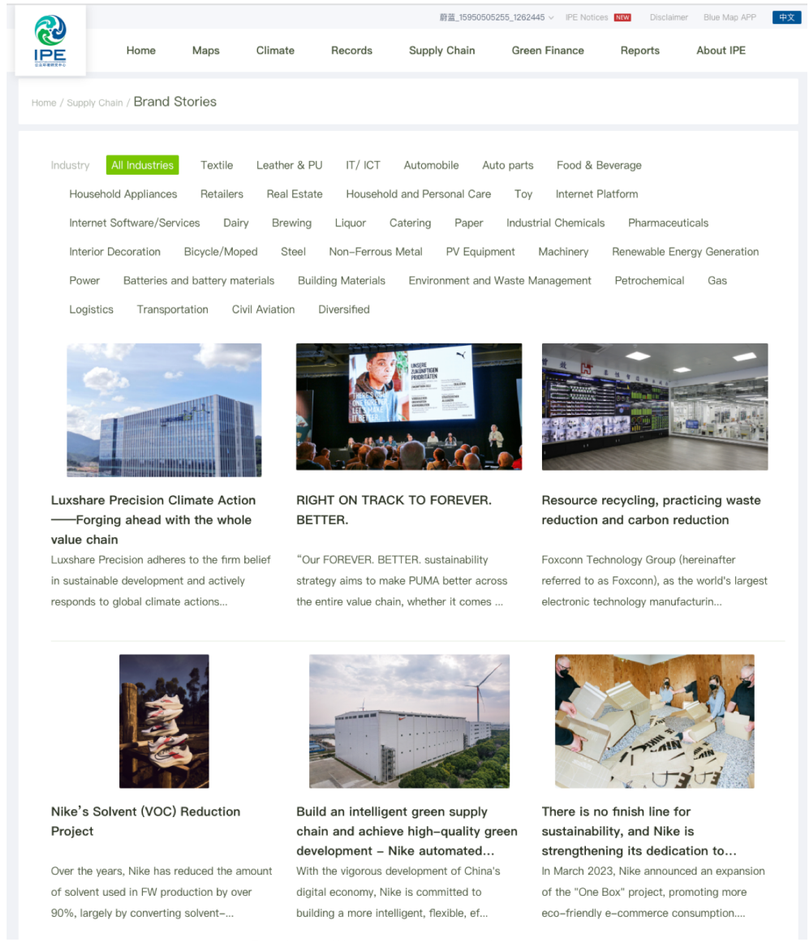
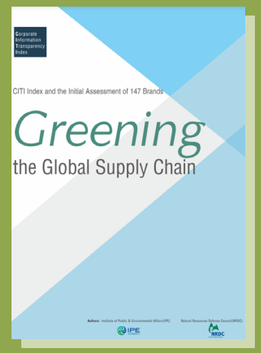


Figure 5-1 Brand Story section of the Blue Map website

2014-2022 Green Supply Chain CITI Index Evaluation Reports



2014

2015

2016

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2018

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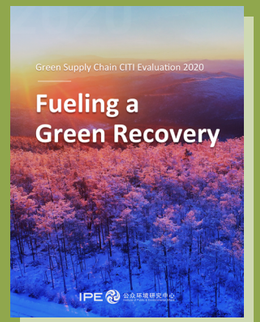
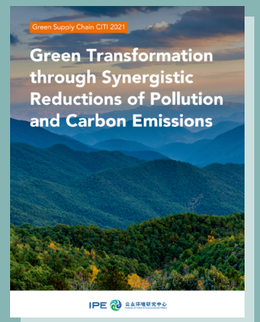
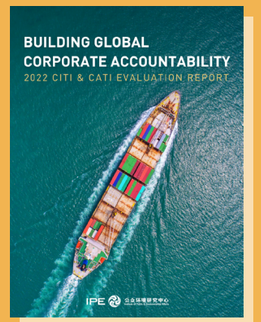


2020



2021



2022

2018-2022 Corporate Climate Action CATI Index Evaluation Reports

Case 1

Huawei drives green supply chain development through digital solutions, building a green supply ecosystem

In 2006, Huawei participated in the "Green Procurement" program initiated by the Shenzhen Environmental Protection Bureau, and began to use the environmental performance data provided by the government for supplier management.

In 2011, Huawei took the lead in joining the "Green Choice" initiative launched by IPE and its partners, incorporating the environmental supervision records collected by the Blue Map into supplier self-inspection forms and audit lists, promoting supplier self-management, and requiring suppliers with violations to take corrective actions within a certain period of time to ensure environmental compliance, and publicly disclosing evidence of rectification and accepting public supervision of its suppliers' environmental improvement.

In 2014, Huawei entered the TOP 50 in the first Green Supply Chain CITI evaluation, ranking seventh in the IT industry, and continued to expand the scale of supplier environmental risk management, regularly communicating with IPE on the results of the screening and the progress of rectification.

As of 2022, Huawei regularly screens the environmental performance of more than 900 key suppliers[19] and promotes suppliers to independently carry out supply chain environmental risk control, utilizing the Blue EcoChain to gradually expand green supply chain requirements to upstream segments of the industry chain with high environmental impact, and has been ranked in the CITI Top 50 for ten consecutive years.

(The above supplier data was obtained from the public disclosure of Huawei Investment Holdings Limited's sustainability reports in previous years)

Supplier Risk Rating and Auditing

Huawei's approach to supply chain management is defined by risk-based due diligence. We work with suppliers to identify and clarify CSR opportunities, and take actions to prevent and mitigate CSR risks. Every year, we assess all major suppliers, which represent 90% or more of our procurement spending. We assign each supplier one of three risk ratings (high, medium, or low) after a comprehensive assessment of indicators such as procurement amount, material category, supplier location, CSR performance score, and previous audit records. We develop an annual sustainability audit plan to deal with suppliers that are assessed as posing medium or high risk. In addition, we perform onsite assessments on all potential suppliers to examine their sustainability systems. No company that fails the assessment is eligible for consideration to become a Huawei supplier.

In 2022, we updated our Supplier CSR Audit Checklist in accordance with industry best practices to better meet customer requirements. This updated checklist raises the bar for energy conservation and emissions reduction, and includes requirements for a Cobalt Reporting Template (CRT) and annual sustainability reports. In 2022, we conducted supplier CSR audits using internationally recognized methods such as onsite inspections, employee interviews, management interviews, documentation reviews, and online searches. We also used the Blue Map database developed by the Institute of Public and Environmental Affairs (IPE) to assess supplier compliance with environmental requirements, and urged five suppliers to resolve the identified issues within a specified timeframe.

In 2022, we assigned CSR risk ratings to more than 1,600 major suppliers and conducted 305 onsite CSR audits on new suppliers, medium- and high-risk suppliers, and suppliers with EHS risks.

Figure 5-2 Huawei Investment & Holding Co., Ltd. 2022 Sustainability Report

19. Huawei Investment & Holding Co., Ltd. 2022 Sustainability Report [R/OL].2022. https://www-file.huawei.com/-/media/corp2020/pdf/sustainability/sustainability-report-2022-cn. pdf

Case 2

Anta Group launches green supply chain management in 2023, greatly improving transparency

Since 2023, Anta has been using the Blue Map database and the Blue EcoChain automated tool to conduct large-scale green supply chain management, including: requiring its own production units and nearly 200 suppliers of apparel and footwear product lines to pay attention to their own environmental performance through the Blue Map website, and publicly disclosing evidence of remediation of past environmental violations to accept public supervision.

On the basis of compliance, Anta also encourages its own factories and strategic core suppliers to independently disclose pollutant emission transfer and greenhouse gas emission data at the factory level. Anta also disclosed information on the environmental performance, pollutants and carbon emissions of 31 key suppliers through IPE's Green Supply Chain Map, which includes not only direct suppliers such as shoe factories, but also upstream suppliers such as dyeing and finishing and materials, making it the first Chinese textile company to publicly disclose the environmental performance of its suppliers through the Blue Map.

Compared with European and American companies, Anta's green supply chain management work started late, but in less than a year, it has significantly improved the transparency of its green supply chain management, from encouraging suppliers to publicly provide explanations on non-compliance, to going beyond compliance to disclose pollutant emission data, to disclosing a transparent supply chain, significantly improving the transparency of its green supply chain management.

Scan the QR code to read the brand story of ANTA Sports

Case 3

Real estate industry joins forces to expand green procurement influence

On June 5, 2016, China Urban Realty Association (CURA), SEE Conservation Ecological Association and China Real Estate Chamber of Commerce (CRECC), together with Landsea and Vanke, launched the "Green Supply Chain Action in China's Real Estate Industry" (hereinafter referred to as the "Real Estate Green Supply Chain Action"), which aims to promote the environmental management of multi-category suppliers through the development of industry-wide green procurement standards.

The innovative Real Estate Green Supply Chain Action initiative not only solves the challenges of insufficient leverage by individual companies and lack of effective communication on common industry issues, but also expands the impact of green procurement by requiring real estate companies participating in the Real Estate Green Supply Chain Action to make the suppliers on the "whitelist" the subject of preferential purchasing to form the synergistic force of the industry.

Figure 5-3 Green Supply Chain Action in China's Real Estate Industry - Environmental Compliance Whitelist Search Platform

Over the past 7 years, the Real Estate Green Supply Chain Action initiative has attracted more than 100 real estate companies to join, published a total of 19 categories of "whitelist" evaluation rules, and launched the Green Supply Chain Action in China's Real Estate Industry - Environmental Compliance Whitelist Search Platform (hereinafter referred

Case 3

to as the "Search Platform"). In 2022, based on IPE's Blue Map database, the search platform dynamically presents the environmental compliance performance of upstream and downstream suppliers in the real estate industry, making it more convenient for real estate enterprises to track the environmental risks of their suppliers, and motivating and guiding their suppliers to pay attention to their own environmental performance, take corrective measures and make public explanations in a timely manner. By the end of September 2023, the search platform included more than 1.34 million enterprises in 38 subcategories of the National Economic Industry Classification, significantly expanding the number of suppliers in the environmental compliance "whitelist".

In addition to the Real Estate Green Supply Chain Action initiative, as a co-sponsor, CURA Joint Purchasing has made environmental compliance the entry standard for suppliers' bidding from 2022. During the review process of bidding enterprises, the search platform is used to retrieve the environmental compliance status of bidding enterprises, ensuring 100% environmental compliance of bid-winning enterprises. In 2023, the categories included in the joint purchasing have been further expanded to the upstream segment of the industrial chain with high environmental impact, with the addition of six new types, such as ready-mixed mortar, insulating glass, modified asphalt waterproofing roll roofing material, sealant, gypsum board, and architectural ceramics. By the end of September 2023, CURA Joint Purchasing has cumulatively promoted more than 200 supplier enterprises in the real estate and construction industry to pay attention to their own environmental performance through the Blue EcoChain, and has promoted more than 50 enterprises to make public explanations regarding their past environmental problems and corrective measures.

In addition, AUPUP e-commerce platform, a B2B building material procurement trading platform, has also started to retrieve and track the environmental violations of building material suppliers on a large scale through the Blue EcoChain since 2023, to promote suppliers to pay attention to their own environmental performance; and to use the CITI evaluation index as a roadmap for implementing green procurement, benchmarking against the good practices of the Internet platform industry and improving its own green procurement strategy.

As a downstream customer of the iron and steel, building materials (cement, glass, ceramics) and non-ferrous metals industries, the real estate industry’s green procurement practices will strongly promote the management of local pollutants. We look forward to seeing the real estate industry's joint efforts to further promote suppliers to synergistically reduce pollution and carbon emissions, and to promote the green and low-carbon transformation of key industries.

5.2 Leading Companies Explore New Models for Collaborative Management of the Upstream and Downstream Industrial Chain

To realize the green and low-carbon transformation of the industrial sector, it is necessary to bring into play the advantages of industrial synergy and linkage, and build a green and low-carbon industrial system. This requires not only leading enterprises to push forward, but also manufacturing enterprises to take the initiative to carry out green supply chain management and accelerate the pace of green and low-carbon transformation of the industrial chain through vertical expansion and synergistic promotion.

In order to guide companies to promote the green supply chain management model to the industrial chain, the CITI Index has added the indicator of "promoting suppliers to control environmental risks along their own supply chains" since 2019. With the introduction of the "dual carbon" target and strategies for synergistic reduction of pollution and carbon emissions, etc., by the evaluation period of 2023, 28 evaluated companies have provided capacity building and technical support for suppliers to independently implement green and low-carbon procurement, and nearly 500 suppliers have been promoted to track the environmental compliance performance of their supply chains with the help of Blue EcoChain; on the basis of compliance, some suppliers have started to further promote their supply chain enterprises to measure and disclose carbon and PRTR data.

Case 1

Upstream and downstream IT/ICT industries jointly expand the scale of green procurement

The IT/ICT industry was the first to take action to empower suppliers to implement supply chain environmental management on their own. At an industry roundtable organized by IPE in April 2015, representatives from Apple, Microsoft, Huawei, Panasonic, Hitachi, Samsung, Canon and other companies shared their management experiences and discussed green supply chain solutions in the industry.

In 2016, Apple took the lead in pushing Foxconn to establish an environmental performance screening mechanism. In 2018, Dell encouraged suppliers to use the IPE database and green supply chain management tools to track their own suppliers' environmental performance.[20] Microsoft provides training and self-assessment forms for suppliers to support them in various aspects of management based on the IPE database.[21]

These end customers have taken the lead in encouraging and guiding suppliers to independently manage the environmental impacts of their supply chains, and have pushed Intel, Foxconn, Avary Holding, Luxshare Precision, and Kersen Technology to join green and low-carbon procurement, and these companies have successively joined the CITI Top 50. Among them, Foxconn, Luxshsare Precision, and Avary Holding have further expanded their green and low-carbon procurement practices upstream of the industrial chain, and have promoted 10 major suppliers to track the environmental performance of their own supply chains in the 2023 evaluation period.

20. DELL. Supply Chain Sustainability Progress 2018 Annual Report[R/OL].2018:[2023-10-09].https://www.dell.com/zh-cn/dt/corporate/social- impact/advancing-sustainability/sustainable-supply-chain/supply-chain-reports.htm#pdf-overlay=//www.dell.com/content/dam/ delltechnologies/assets/corporate/pdf/progress-made-real-reports/scs-report-2018.pdf.

21. Microsoft .Microsoft Devices Responsible Sourcing Report FY22 [R/OL].2022:[2023-10-09].https://query.prod.cms.rt.microsoft.com/cms/api/am /binary/RE5aBW3.

Case 2

Upstream and downstream automotive companies initiate green supply chain management

Since the start of mass production, Polestar has included environmental compliance in its procurement standards, and in 2022, it began to fully promote suppliers to disclose public explanations and corrective actions regarding past environmental violations. In 2023, a total of seven suppliers have taken corrective actions and made public explanations. While managing the environmental performance of its own supply chain, Polestar also requires suppliers to track and manage the environmental performance of their upstream supply chains.

Schaeffler, an auto parts company, has incorporated environmental compliance into its Supplier Code of Conduct, promoting steel companies to publicly disclose information demonstrating remediation of past environmental problems, and committing to pay attention to their own environmental performance and accept public supervision. Schaeffler also discloses the environmental performance of its steel suppliers through the Green Supply Chain Map, which promotes its suppliers to fulfill their primary responsibility for environmental protection. In 2023, Schaeffler and Baosteel signed a strategic agreement on the sustainable development of green steel, in which the two companies will strengthen cooperation in the field of steel decarbonization based on the common concept of sustainable development, and work together to build a green steel supply chain by leveraging the synergistic reduction of pollution and carbon emissions.[22]

Promoted by Schaeffler, since 2022, Baosteel has established a communication mechanism with IPE, utilizing IPE's database to sort out the past environmental performance of its subsidiaries and affiliates, and continuously tracking the current environmental compliance status of its affiliates; and has successively pushed nine affiliates to make public explanations on past environmental violations, accepting public supervision. Baosteel has also set up a supply chain ESG risk management mechanism[23] to incorporate environment-related auditing requirements into the supplier admission and assessment process, and to continuously improve suppliers' environmental management awareness and capability through regular training.

22. Schaeffler Schaeffler. Schaeffler Group and Baosteel Sign Strategic Agreement on Green Steel Sustainability [EB/OL].2023:[2023-10-09]. https://mp.weixin.qq.com/s/kZDg2i8Mr3-rw-GCDTSJvQ.

23. Baoshan Iron & Steel Company Limited. 2022 Sustainability Report [R/OL].2023:[2023-10-09].http://static.sse.com.cn/disclosure/listedinfo/announcement/c/new/2023-04-28/600019 _20230428_FG11.pdf.

5.3 PRTR and Carbon Data Disclosure Demonstrate Supply Chain Progress in Reducing Pollution and Carbon Emissions

Reducing pollutant and greenhouse gas emissions in the supply chain requires not only the example and guidance of industry-leading enterprises, but also the promotion of downstream end-users and close cooperation among stakeholders to jointly promote the low-carbon transformation of the industrial chain. Promoting the measurement and disclosure of pollutant and carbon data in the supply chain not only helps enterprises understand the bottom line, identify emission reduction opportunities, and promote emission reduction actions, but also helps stakeholders fully understand the progress of enterprise emission reduction and enhance stakeholder trust.

Case 1

Procurement companies promote PRTR data disclosure in response to international requirements and certifications

■ Corporate Sustainability Reporting Directive (CSRD)

In January 2023, the European Commission's Corporate Sustainability Reporting Directive (CSRD) came into force. On July 31, the adoption of the European Sustainability Reporting Standard (ESRS) marked a further step forward in the implementation process of the CSRD.

According to the ESRS, the sustainability statement disclosed by a reporting company should include information on the material impacts, risks and opportunities arising from its direct and indirect operations in the upstream and/or downstream value chain. This means that reporting companies need to consider how the sustainability issues raised by the ESRS relate to their upstream and downstream operations in the value chain when making a materiality assessment. If the issues are assessed as having a material impact, the reporting company will need to disclose policies, actions, targets and data related to upstream and downstream supply chain participants.

Case 1

In view of the difficulty in collecting value chain data, the ESRS proposes that reporting companies may follow the "comply or explain" principle for the first three years of disclosure under the ESRS; however, from the fourth year, reporting companies are required to disclose information covering both upstream and downstream of the value chain. If it is not possible to obtain data from value chain participants, the ESRS allows reporting companies to make estimates based on industry averages, etc., but they are required to disclose the accuracy of the data and disclose measures to improve the accuracy of the data in the future.

In preparation for responding to the new CSRD requirements, the headquarters of a well-known global IT/ICT company learned through its supply chain management team in China that its key suppliers in China had been continuously working on carbon and PRTR data disclosure through the IPE digital platform for several years and would be able to effectively respond to the CSRD disclosure requirements on sustainable development of the value chain.

■ B Corp Certification

B Corp certification requires companies applying for certification to provide information on how they will reduce the environmental footprint of their supply chain, including tracking and managing climate, water, chemicals, waste, and biodiversity. In preparation for B Corp certification, a France-based food and beverage company required all of its suppliers in China to complete IPE's PRTR and carbon data sheets and publicly disclose the data to accept stakeholder oversight. The company collected and organized the publicly disclosed data from its suppliers and successfully passed the certification.

■ Electronic Product Environmental Assessment Tool (EPEAT)®

The EPEAT Server Criteria proposed by EPEAT® for the ecolabeling of electronic products are based on the NSF/ANSI 426-2019 Environmental Leadership and Corporate Social Responsibility Assessment of Servers (hereinafter referred to as "NSF/ANSI 426-2019"). With respect to corporate responsibility, specifically supply chain data disclosure, the standard proposes that companies may choose to publicly disclose data related to toxic and hazardous substances emitted by their global supply chains and receive additional points for doing so.

Case 1

The specific requirements of NSF/ANSI 426-2019 are as follows:

-Frequency of disclosure: Annual;

-Scope of suppliers: Three types of components for servers (principal storage device[s]; processor[s] [CPU]; and printed circuit board[s]) from facilities owned or operated by three of the manufacturer's top six suppliers (by annual spend, fiscal or calendar) for each component;

-Toxics release inventory: US EPA Toxics Release Inventory, United Nations Protocol on Pollutant Release and Transfer Registry, or toxics and Hazardous substances inventory applicable in the suppliers' country/region;

-Disclosure indicators: Name of the emitting enterprise, name of each toxic and hazardous substances emitted, amount of emissions and location of emission;

-Verification requirements: The URL for the manufacturer's public website disclosing this information shall be provided and made publicly available.

In order to meet EPEAT® requirements, a well-known global IT/ICT company required its suppliers in China to publicly disclose relevant data using the PRTR data sheet developed by IPE, and integrated the measurement and disclosure of PRTR data into the environmental management requirements of its suppliers in China.

Case 2

Textile industry leader pushes suppliers to improve processes to reduce water use

In 2021, in order to promote the recycling of industrial wastewater, enhance the utilization of industrial water resources, and promote the comprehensive green transformation of the economy and society, the Ministry of Industry and Information Technology and other six ministries and commissions jointly issued the *Implementation Plan on Recycling of Industrial Wastewater*[24], which put forward the proposal to strive for

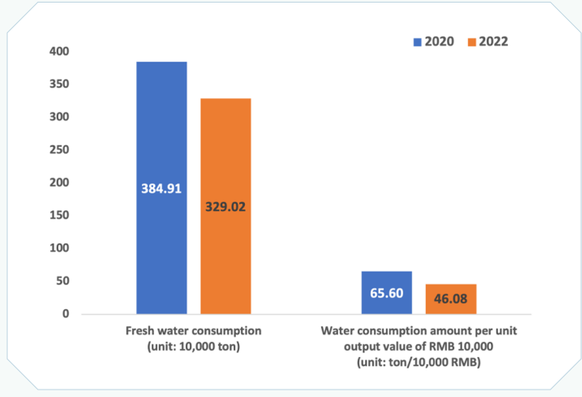
24. Ministry of Industry and Information Technology. Notice on the Issuance of Implementation Plan on Recycling of Industrial Wastewater [EB/OL].2021-12-29:[2023-10-09].https://www.miit.gov.cn/jgsj/jns/wjfb/art/2021/art_ 61767aabd6b-f4b648c6bafdf60ab8c1b.html.

Case 2

the reuse rate of industrial water about 94% by 2025, of which the textile industry's reuse rate of water for industries more than 5 percentage points compared to 2020.

In recent years, several Chinese and global textile companies have set freshwater reduction targets for their supply chains and pushed their suppliers to increase water reuse rates and reduce water consumption. Driven by these customers:

- Zhejiang Wondray Textile Printing and Dyeing Co., Ltd. carries out equipment renovation and management system upgrading, introduces low-bath ratio high-temperature and high-pressure dyeing machine, high-efficiency continuous dyeing and washing machine, steam condensate recycling equipment, constructs rainwater collection and reuse system and water reuse equipment, water consumption energy platform management system, carries out real-time monitoring and control on the water consumption data of each workshop, and set alarm when water quantity exceeding the standard. By the above means, from 2020 to 2022, the enterprise's water reuse rate has increased from 40% to 43%. The PRTR data disclosed by the enterprise shows that freshwater consumption and water consumption per 10,000 RMB output value have been gradually reduced.



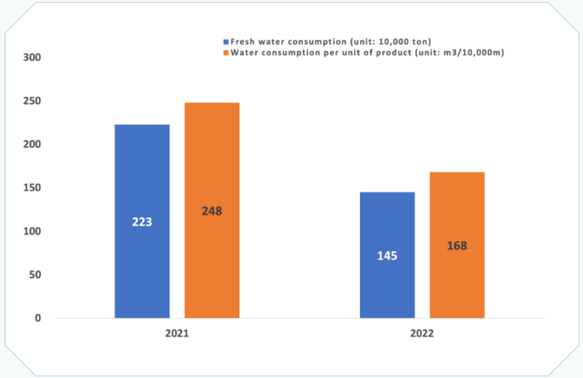
Scan the QR code to learn more

Figure 5-4 Changes in water consumption of Zhejiang Wondray Textile Printing and Dyeing Co., Ltd., 2020 - 2022

- Yixing Lucky Textiles Group Co., Ltd. starts from process water reuse, through condensate recovery, cooling water recovery, combined with water production and production load changes in the specific circumstances, the installation of various types of temperature, level, flow sensors, through software programming to realize the three types of water automatic switching and regulation, to achieve the "water balance", The company has achieved the goal of "water balance" and "energy

Case 2

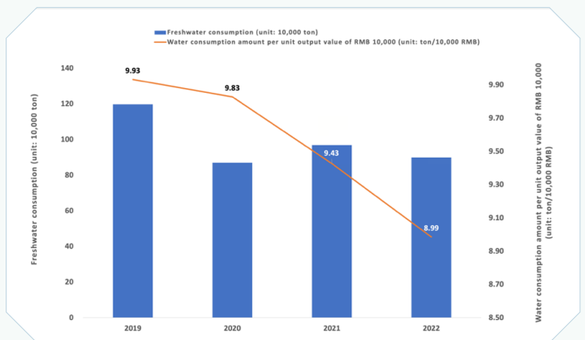
balance", and recovered 270,000 tons/year of condensate cooling water throughout the year. The PRTR data disclosed by the enterprise shows that the freshwater consumption in 2022 has been significantly reduced compared to that in 2021.



Scan the QR code to learn more

Figure 5-5 Changes in water consumption of Yixing Lucky Textiles Group Co., Ltd. in 2020 and 2022

- Zhongshan Yida Apparel Ltd. mainly adopts chemical substitution, supplemented by the development of anhydrous enzyme process, reduction of spraying links and other production improvement measures, to reduce pollutant emissions while reducing water consumption. The PRTR data disclosed by the enterprise shows that the water consumption per 10,000 RMB output value has been continuously reduced over the years.



Scan the QR code to learn more

Figure 5-6 Changes in water consumption of Zhongshan Yida Apparel Ltd. from 2019 to 2022

Case 3

Levi Strauss & Co. empowers suppliers to develop carbon reduction plans and leads them to publicly disclose their annual progress in reducing emissions

Levi Strauss & Co.[25] empowers its key global apparel and fabric suppliers (covering more than 140 mills from more than 70 suppliers worldwide and more than 80% of its global sourcing) to use its self-developed Climate Tracker tool to develop clear, actionable plans to reduce emissions and track each supplier's progress towards carbon targets.

Scan the QR code to read the brand story of Levi Strauss & Co.

The 50 Chinese suppliers using the tool have publicly disclosed their GHG reduction targets in 2022 through IPE's carbon data disclosure platform; 17 factories from 12 suppliers have identified roadmaps and action plans to work with Levi Strauss & Co. to drive the green transformation of supply chain.

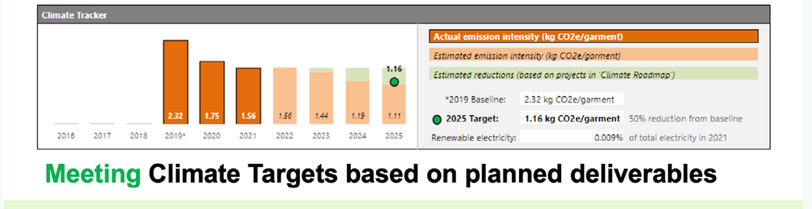


Figure 5-7 Levi Strauss & Co. Climate Tracker Tool

25. Levi Strauss & Co. Ten Years Together, Looking Ahead: 2023 Levi Strauss & Co. Sustainability Efforts Reviewed and Shared [EB/OL].2023:[2023- 10-09].https://www.ipe.org.cn/GreenSupplyChain/BrandStoryDetail.aspx?id=92

Case 4

LONGi Green Energy sets science-based targets, empowers suppliers to reduce Scope 3 emissions

LONGi Green Energy is committed to reducing Scope 1&2 GHG emissions by 60% and carbon intensity per tonne of purchased raw materials by 52% by 2030 from a 2020 base year. LONGi Green Energy has also joined the RE10040[26], EP10041[27] and EV10042[28] initiatives, committing to increase the use of renewable energy, improve energy efficiency and disclose the progress of emission reduction through annual reports.

To address the issue of reducing carbon emissions embedded in key purchased raw materials in Scope 3, LONGi Green Energy launched the "Supply Chain Green Partner Empowerment Programme" in 2022 to help supply chain companies establish corporate carbon management systems, empower suppliers to establish carbon inventories, formulate carbon emission reduction targets and pathways, implement energy saving and emission reduction measures, and increase the proportion of renewable energy inputs.

LONGi Green Energy Technology Co., Ltd.
China, Asia

NEAR TERM	LONG TERM	NET-ZERO
1.5°C	-	-

Date published/updated
2023

Sector
Semiconductors and Semiconductors Equipment

Target summary
Near term: 1.5°C by 2030

Target
LONGi commits to reduce absolute scope 1 and 2 GHG emissions 60% by 2030 from a 2020 base year. LONGi also commits to increase active annual sourcing of renewable electricity from 15% in 2019 to 100% by 2028 through 2030. LONGi further commits to reduce scope 3 emissions from purchased goods and services 52% per tonne of purchased materials by 2030 from a 2020 base year.

Figure 5-8 LONGi Green Energy's science-based targets

Case 4

Initiative	Initiative	Initiative
RE100 CLIMATE GROUP | CDP	CLIMATE GROUP EP100	CLIMATE GROUP EV100
Commitment to Target	**Commitment to Target**	**Commitment to Target**
Achieve 70% renewable electricity consumption by 2027, and 100% by 2028.	Install Energy Management System for all operational sites by 2025 and improve power utilisation efficiency by 35% compared to that in 2015.	Install vehicle charging facilities in 100% operational sites by 2030.
Progress in 2022	**Progress in 2022**	**Progress in 2022**
In 2022, green power usage accounted for 47.18% of LONGi's total power usage, achieving a 38. 21% increase compared to that in 2021.	By 2022, a total of eight manufacturing bases had completed the construction of the energy management information system, and another manufacturing base completed the construction of the system in 2022; the overall energy use efficiency of the whole group in 2022 was 66. 64% higher than that in 2015.	The Group organised a group-wide centralised procurement of charging piles, involving 7 provinces, 13 cities, and 23 business sites. The first batch of charging piles for "EV 100" is expected to be put into use in 2023.

Figure 5-9 LONGi Green Energy's three "100" initiatives

26. Climate Group RE100.RE100 [EB/OL]. [2023-10-09]. https://www.there100.org/.
27. Climate Group EP100.EP100 [EB/OL]. [2023-10-09]. https://www.theclimategroup.org/about-ep100.
28. Climate Group EV100.EV100[EB/OL]. [2023-10-09]. https://www.theclimategroup.org/about-ev100.

6 Challenges and Outlook

6.1 Gap between Green Supply Chain Ideal and Reality Remains Wide

6.2 Looking Ahead: Green Supply Chain a Matter of Global Environmental and Climate Security

Looking back over the past decade, we have seen positive progress in supply chain environmental management. However, we must also recognize that there is still a long way to go in building green supply chains. There are still many leading supply chain companies in many industries that have failed to effectively implement supply chain environmental management; green supply chain management still needs to be further extended to the upstream of the industry chain that has a high environmental impact and is resource and energy intensive; many companies that have publicly made environmental and climate commitments have not yet implemented them in the supply chain links that have the largest environmental and climate footprints; and there are even some companies that have stopped requesting carbon data disclosure from suppliers while at the same time publicizing their carbon neutral products.

6.1 Gap between Green Supply Chain Ideal and Reality Remains Wide

Challenge 1: Green supply chain management remains weak in many companies

Although the average score of the TOP 50 has continued to rise over the past decade, the gap between the overall average score and the average score of the TOP 50 has more than doubled over the same period, indicating that the green supply chain management of a large number of companies is still very weak. There are still many leading supply chain enterprises in many industries that fail to effectively implement supply chain environmental management, and the gap between the management performance of industries is gradually widening.

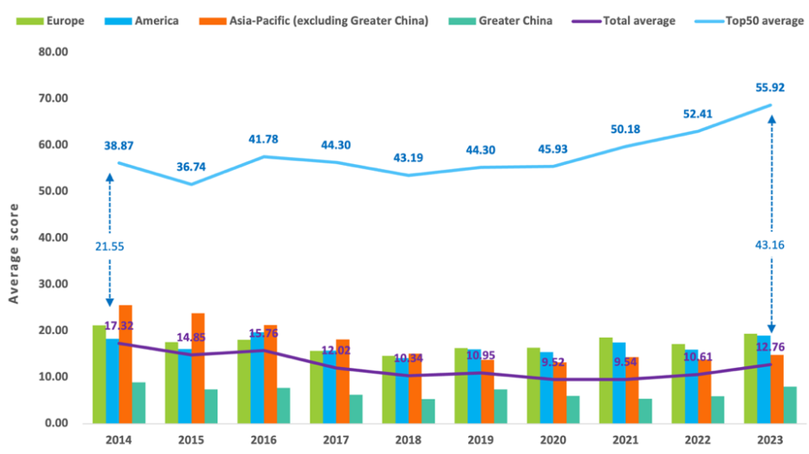


Figure 6-1 2014-2023 Average CITI scores

In terms of corporate climate action, 11% of evaluated companies have not yet disclosed their green supply chain commitments during the 2023 evaluation period, and about 13% have not yet made any climate commitments.

Of the companies that have publicly stated that they are concerned about green supply chain management, 19% remain at the commitment stage, pending the inclusion of environmental compliance in their supplier code of conduct, 67% have not yet disclosed their green supply chain management approach and progress, and less than 6% have begun to promote the disclosure of PRTR data by their suppliers. Among companies that have made public climate commitments: 50% have not yet disclosed Scope 3 GHG emissions, more than 80% have not yet incorporated supplier GHG accounting and reporting into their supplier code of conduct and other policy requirements, and only 29% have begun to promote public disclosure of suppliers' annual carbon emissions data and/or climate targets. Less than 20% of the evaluated companies disclosed empowering suppliers to carry out green supply chain management or climate actions on their own, and most of the promoted suppliers are from the textile and leather, IT/ICT related industries, with enterprises “above designated size” dominating, including 25 A-share/H-share listed companies, and small and medium-sized enterprises (SMEs) accounting for only about 30%.

The above results show that there is still a significant gap between building a green supply chain and promoting a green and low-carbon transformation of the economy as a whole, and that the overall performance of supply chain environmental and carbon management still needs to be improved. A group of companies with high supply chain environmental impacts, high resource and energy consumption, and a high proportion of Scope 3 emissions have yet to fulfill their environmental and climate commitments, engage suppliers to improve their environmental performance, and measure and publicly disclose data on pollutant and greenhouse gas emissions, leaving stakeholders unable to understand the progress of their efforts to reduce the supply chain environmental impacts and greenhouse gas emissions.

Challenge 2: Companies with high supply chain environmental impact and carbon emissions need to take urgent actions

Although the proportion of companies that publicly require environmental compliance from suppliers through written documents such as supplier code of conduct and the establishment of regular screening mechanisms has increased significantly over the decade, the proportion of companies that are actually pushing suppliers to rectify non-compliance issues and disclose explanations has declined over the decade as the number of companies evaluated has increased (Figure 6.2). This indicates that most companies' green supply chain management has not improved in tandem with improvements in management awareness and mechanisms.

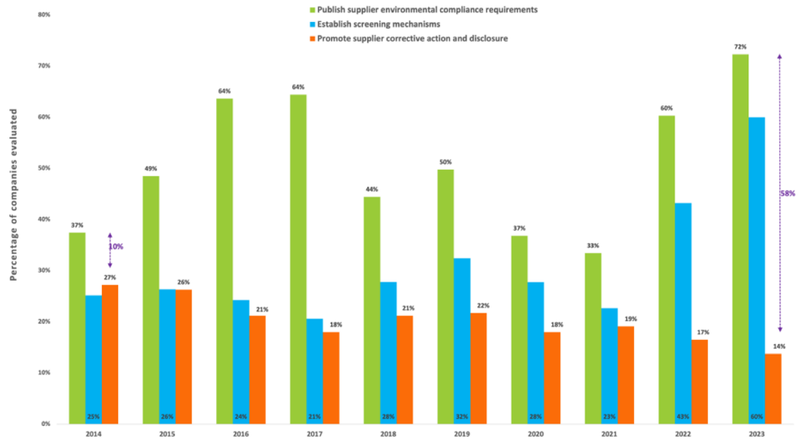


Figure 6-2 Percentage of companies requesting supplier environmental compliance and promoting corrective action and disclosure, 2014-2023

The lack of transparency in their supply chain environmental and carbon management processes not only makes it impossible for them to demonstrate to stakeholders their commitment to driving green and low-carbon transformation of their supply chains, but also prevents stakeholders from effectively monitoring the implementation of their green and low-carbon procurement commitments. We call for those companies that have not yet taken action to use the CITI Index as a roadmap for green supply chain management, benchmark the management style of leading companies, use automated management tools, and start by promoting supplier environmental compliance to gradually build a green supply chain.

Challenge 3: Environmental and carbon management not yet extended to value chain hotspots

Among the companies that have taken action, most are still at a low level of green supply chain management and have yet to extend their environmental and climate management to upstream hotspots in the supply chain. By 2023, only about 40% of the evaluated companies have publicly disclosed that they have extended their green supply chain management requirements to chemical suppliers, wastewater and solid waste treatment facilities, and upstream and downstream logistics in the value chain; and only 10% have disclosed that they have pushed the abovementioned suppliers or service providers to disclose information on environmental compliance and rectification, or cases of energy saving and emission reduction.

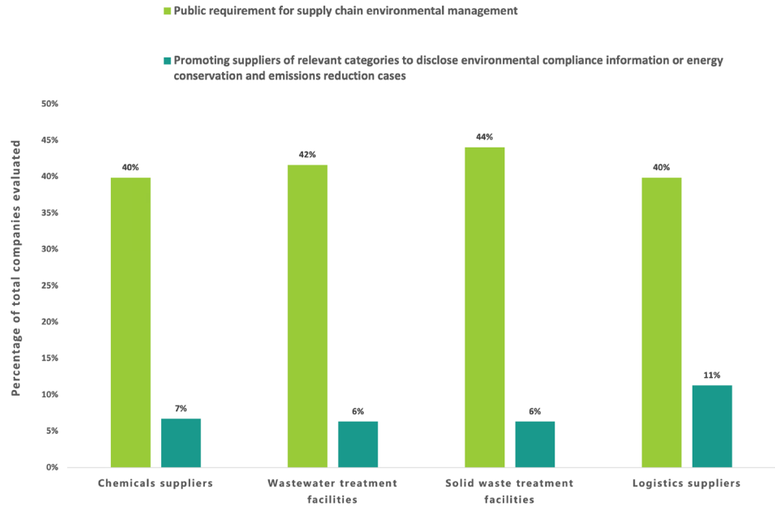


Figure 6-3 Percentage of companies extending green supply chain management in the 2023 evaluation period

In our discussions with some of the companies that have begun to take action, we learned that implementation of green supply chain management requirements is often slow because chemical suppliers, wastewater and waste treatment facilities, and logistics providers are often located further upstream or downstream in the supply chain, and companies must rely on multiple tiers of suppliers to sort through and identify their supply relationships.

On the other hand, we see that chemical companies, represented by Archroma and Dystar, have initiated green and low-carbon procurement, starting from focusing on the environmental compliance of subsidiaries and gradually expanding to the environmental performance of the supply chain, and have started to promote the disclosure of PRTR and carbon data by suppliers. Grandblue, a listed company in the environmental protection industry, has been paying attention to the environmental performance of its subsidiaries engaged in waste incineration power generation and wastewater treatment for many years, and has explicitly incorporated green supply chain requirements into the construction of its supply chain management system, which has been launched in 2023.[29] Maersk, a leading global logistics company, has established a relationship with IPE through the promotion of its textile customers, and has promoted its subsidiaries in China to make public explanations and disclose corrective measures regarding past environmental problems in 2023.

29. Grandblue. Grandblue started the construction of supply chain management system | Innovating management, improving competitiveness [EB/OL].2023-02-07:[2023-10-09].https://mp.weixin.qq.com/s/ZWH8d29ylRmrlV0OK3VNeQ.

Realizing the comprehensive greening and upgrading of the industrial chain requires not only the guidance of leading companies, but also the joint efforts of the entire industry to promote the green and low-carbon transformation of suppliers at all levels of the value chain in a concerted manner. We call on procurement companies that have not yet extended their environmental management to the above links to take active measures to encourage chemical suppliers, wastewater and waste treatment facilities, and logistics service providers to participate in green procurement through supplier empowerment and joint industry actions, so as to continuously expand the influence of the green supply chain; benchmark the management methods of leading companies and disclose the progress of environmental management to the public through adequate information disclosure, so as to eliminate "greenwashing" and "climatewashing" and effectively promote the joint efforts of all parties to strengthen the green and low-carbon transformation of the supply chain.

Challenge 4: Supplier empowerment and training still needs to be strengthening

The 2023 CITI evaluation results show that less than 20% of the evaluated companies indicated that they have empowered suppliers to implement green supply chain management or climate actions on their own, and that the empowered suppliers are mainly companies above designated size, with SMEs accounting for only about 30%.

According to a questionnaire survey conducted by IPE in 2023 among corporate users of the Blue Map website, 78.8% of supplier companies have started to pay attention to the environmental compliance of their own supply chains, and 41.8% have started to collect GHG emissions data from their suppliers. As shown in Figure 6-4 and Figure 6-5, the main motivations for these suppliers to independently implement environmental and carbon management in their supply chains come from their end customers' green and low-carbon procurement requirements, their own environmental risk management and GHG emission reduction needs in the supply chain, as well as China's "dual carbon" target and the synergistic strategy of reducing pollution and carbon emissions.

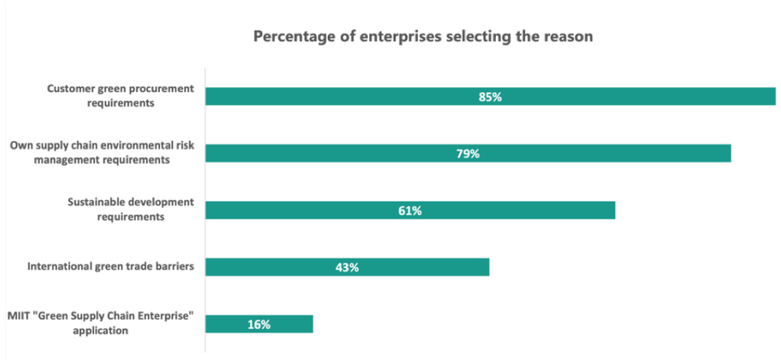


Figure 6-4 Main reasons for enterprises to undertake supply chain environmental compliance management

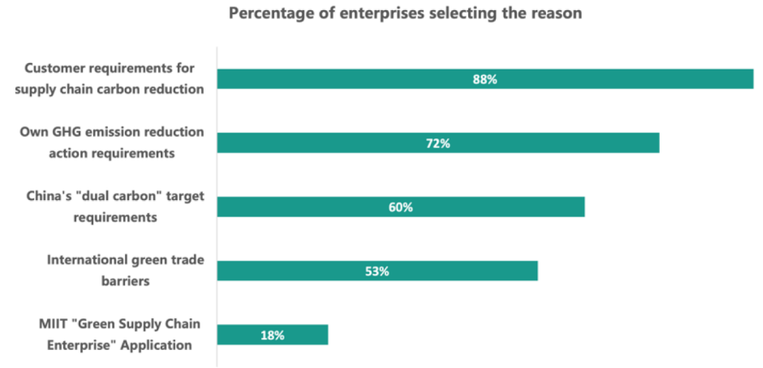


Figure 6-5 Main reasons for enterprises to undertake supply chain climate risk management

On the other hand, insufficient professional staff, lack of funds, and low input and output are the main challenges and concerns of these supplier companies in implementing green supply chain management or GHG emission reduction measures on their own. Some SMEs indicated that the lack of management awareness and willingness affects the internal support; the large investment and long payback of supply chain management, and the lack of policy support and market recognition also lead to the input-output ratio being lower than expected.

In this regard, we call on purchasing companies to provide more technical and capacity building support to suppliers, to raise suppliers' awareness and capacity in green supply chain management, and to make suppliers equal partners in green supply chain management. We also call on government agencies and financial institutions to provide more policy and financial support for SMEs to implement green supply chain management and climate action.

To empower suppliers to improve their green supply chain management and climate action capabilities, IPE launched the Supplier Online Training Program in 2022, which regularly invites IPE's internal and external experts to conduct thematic trainings on key supply chain management issues for various industries, with the aim of improving the professional knowledge and management skills of responsible personnel. As of September 2023, IPE has conducted 11 public online trainings with a total of more than 13,000 participants.

Scan the QR code to view video replays of previous online training sessions

6.2 Looking Ahead: Green Supply Chain a Matter of Global Environmental and Climate Security

Three years after the COVID-19 pandemic, energy markets are in turmoil, geopolitical tensions are high, supply chain security and stability are challenged, and the green, low-carbon transition faces new uncertainties. At the same time, the world is facing a triple planetary crisis of climate change, biodiversity loss and pollution. The combined impact of these global challenges on industrial production, supply chains and the global economy continues to emerge.

Looking ahead to the next decade, we see supply chain environmental and climate standards becoming more stringent in the EU and other regions, and supply chain environmental and climate risk management becoming an indicator of supply chain sustainability under some mainstream ESG standards.

Looking ahead to the next decade, we expect China to continue to play a critical role in global supply chains. Against the backdrop of unprecedented emphasis on supply chain security, green supply chains will receive more attention as they are related to supply chain resilience. China is expected to continue to strengthen the construction of green supply chains in order to achieve the policy goals of promoting concerted efforts to cut carbon emissions, reduce pollution, expand green development, and pursue economic growth.

At the same time, a new round of changes in the global supply chain is taking place, with some labor-intensive industries shifting to Southeast Asia and South Asia, and raw material extraction related to the new energy industry expanding to Africa and South America, posing serious challenges to local environmental regulation and infrastructure. The green and low-carbon transformation of the global supply chain should draw on China's experience in environmental governance, anchor on the solid foundation of global environmental information disclosure, promote the synergistic reduction of pollution and carbon emissions through corporate environmental information disclosure, mobilize market forces through broader public participation, and form a multistakeholder synergy, so as to jointly promote the construction of the supply chain from light green to deep green, until the realization of the true zero-carbon supply chain.

Triple Planetary Crisis Calls for Strengthening Green Supply Chains

At present, the world is facing a triple planetary crisis of climate change, biodiversity loss and environmental pollution, which seriously threatens human health and well-being and the security of ecosystems, with the climate change crisis being particularly prominent. In recent years, extreme weather events such as typhoons, rainstorms, high temperatures, droughts and hailstorms have become more frequent, and the temperature in July 2023 even broke the record and became the highest average global temperature since meteorological records began.[30] Businesses must play a leading role in responding to the climate crisis.

As extreme weather events become more frequent, high temperatures, extreme cold, typhoons, and other extreme weather conditions are becoming new hazards that affect the normal operation of environmental protection facilities (see Table 6-1 for details); carbon emissions impact assessment is being incorporated into environmental impact assessment (EIA); and the Supreme People's Court and the Supreme People's Procuratorate in China have included falsifying carbon emissions data in the scope of criminal regulation.[31] All of this suggests that issues related to corporate carbon emissions will become a focal point of environmental enforcement, and that pressure on both brand companies and their suppliers will increase.

Table 6-1 Examples of environmental violations due to extreme weather conditions

Type of Violation	Common Violations by Enterprises	Environmental Management Considerations
Exhaust gas emission exceeding standards	Due to continuous high summer temperatures, high water temperatures during spraying in the scrubber tower of the company's air pollution control equipment, and a decrease in the scrubber tower's adsorption capacity for pollutants, resulting in exhaust gas emissions exceeding national or local pollutant emission standards.	Enterprises should pay attention to the effects of high temperatures on air pollution control facilities, such as: reduced adsorption capacity, overheating operation, deformation and cracking of materials and equipment exposed to high temperatures. If necessary, install cooling towers and other facilities to control the temperature of air pollution control equipment in a timely manner.

30. United Nations. WMO officially declares July 2023 the hottest month on record [EB/OL].2023-08-08:[2023-10-16]. https://news.un.org/zh/story/2023/08/1120502.

31. China Environment News. The Supreme People's Court and the Supreme People's Procuratorate have issued judicial interpretations on environmental pollution crimes, using judicial weapons to severely punish environmental data falsification.[EB/OL].2023-08-16:[2023-10-09].https://www.mee.gov.cn/home/ztbd/2022/sthjpf/fgbzjd/202308/t20230818_1038876.shtml.

Type of Violation	Common Violations by Enterprises	Environmental Management Considerations
Wastewater discharge exceeding standards	Extremely cold weather affects the activity of microbial flora in the biochemical system of water treatment facilities, resulting in poor wastewater treatment and discharges exceeding national or local pollutant discharge standards.	Enterprises should pay attention to the effects of the low-temperature environment on water treatment facilities, such as: inactivation of bacterial flora, icing of water pipes, etc., and take measures for heat preservation of the outer wall, water inlet heating, increasing the low-temperature resistant microbial flora, and other measures.
Malfunction of pollution control facilities	In southern Chinese cities, the motors or switches of the pollution control equipment are located outdoors, which can lead to water ingress and power failure of the control equipment during extreme weather conditions such as typhoons, resulting in malfunctioning of the pollution control equipment.	Enterprises located in typhoon-prone areas should consider installing rain shelters or additional non-functioning warning lights, alarms, etc.

Since the beginning of the 14th Five-Year Plan, China's ecological civilization construction has entered a critical period in which carbon reduction has become the key strategic direction, promoting the synergistic reduction of pollution and carbon emission reduction, and realizing quantitative to qualitative changes in ecological environmental quality improvement. Taking carbon reduction as the general guide to promote the concerted efforts of pollution reduction, greening and growth has become the key to managing the complex interaction among the four aspects and integrating development and emission reduction.[32]

Air pollutants and greenhouse gases share a common root. The combustion of fossil fuels used in supply chain production processes, such as coal, emits air pollutants such as particulate matter, SO_2 and NO_X, as well as CO_2 and black carbon, accelerating climate warming. At the same time, processes in industries such as cement and petrochemicals also emit local pollutants and greenhouse gases.

32. Chinese Academy of Social Sciences. Synergizing Carbon Reduction, Pollution Reduction, Green Expansion and Growth [EB/OL].2023-02-10 :[2023-10-09].http://www.cass.cn/xueshuchengguo/jingjixuebu/202302/t20230210_5587213.shtml.

Unlike the United States, Europe and Japan, which rely heavily on the relocation of high-emission industries to achieve pollution control and environmental improvement, China plans to maintain a high proportion of secondary industries and a relatively complete industrial system for the foreseeable future. Under these conditions, China's supply chain can only achieve quality improvement and efficiency enhancement through the deep coupling and resonance of pollution reduction and carbon reduction, and effectively promote the green and low-carbon transformation.[33]

As part of the strategy to synergistically reduce pollution and carbon emissions, China is also further promoting the classification of household waste. *The Notice on Comprehensively Carrying out Domestic Waste Classification in Cities at the Prefectural Level and Above* proposes that, by 2025, cities at the prefectural level and above will have basically established a domestic waste classification and treatment system. As an important step in realizing the goal of "building a multi-level system of efficient resource recycling" proposed in the 14th Five-Year Plan, the promotion of domestic waste classification has also been included in the State Council's *Action Plan for Carbon Dioxide Peaking before 2030*. Against this backdrop, IPE and Vanke Foundation, under the guidance of the China Forum of Environmental Journalists, jointly launched the "Take a Picture to Figure out Garbage Sorting in Your Neighborhood" campaign in 2020. With the participation of technical support organizations such as Green Jiangnan, civil society groups and volunteers in many places, as of September 2023, more than 170,000 garbage sorting photos have been taken and submitted, and IPE has also evaluated the garbage sorting performance of 100 cities through the Garbage Sorting Index, identifying excellent cities such as Suzhou and Shanghai.

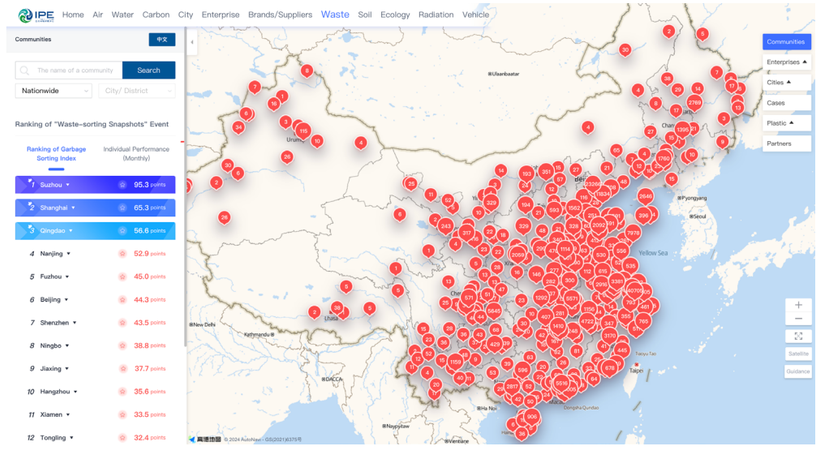


Figure 6-6 Blue Map website – Garbage Sorting Map

33. Ministry of Ecology and Environment. Expert Interpretation | Synergistic reduction of pollution and carbon emissions to help realise the construction of a beautiful China and the "dual carbon" target [EB/OL].2022-06-20:[2023-10-09]. https://www.mee.gov.cn/zcwj/zcjd/202206/ t20220620_986122.shtml.

In the current global trend of net-zero greenhouse gas emissions and comprehensive reduction and recycling of plastic waste, we suggest that major Chinese and global brands, e-commerce platforms and logistics companies that produce and discard large quantities of plastic packaging materials should pay attention to the progress of China's waste classification system, select advanced waste classification cities to conduct pilot projects, and combine the front-end municipal waste classification with the back-end enterprise's efficient recycling and reuse, so as to effectively solve the bottlenecks in the recycling of plastic packaging, especially low-value plastic packaging, and get twice the result with half the effort in reducing plastic.

In order to address biodiversity loss, since 2020, IPE has started to include information on licenses issued by the Ministry of Forestry and Grassland Administration related to enterprises legally involved in the operation and use of wildlife, as well as penalty records related to acts of biodiversity destruction, such as illegal wildlife trade and illegal occupation of forest land, etc. IPE has also developed a biodiversity map (Figures 6-7) to help companies use the maps to compare the biodiversity and ecological sensitivity of different regions and reduce the risk of project site selection or production processes violating ecological spatial control requirements.

Given that the relevant data have already been applied in the green credit work of financial institutions, we suggest that enterprises engaged in production and procurement in China actively use the publicly available information on ecological zoning control and biodiversity data to understand the ecological red line where the project is located in their own planning, operation and supply chain management, and the requirements of spatial layout constraints, pollutant emission control, environmental risk prevention and control, resource utilization efficiency, etc., to formulate and implement biodiversity conservation targets, and contribute to sustainable economic and social development.

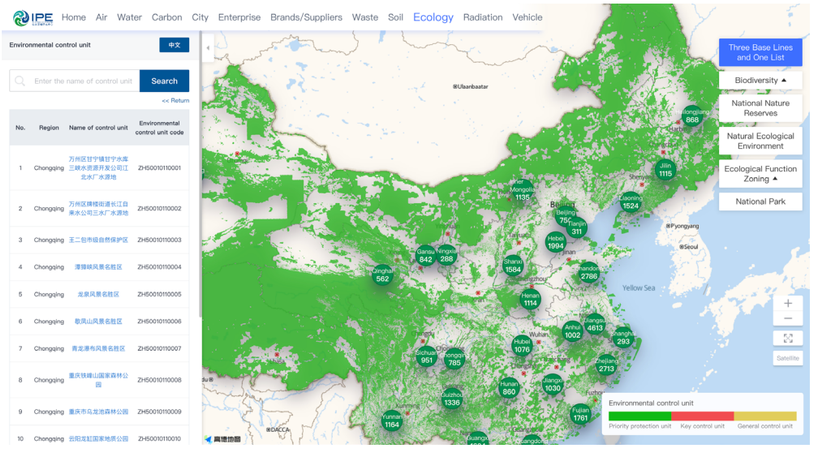


Figure 6-7 Blue Map website – Biodiversity Map

Green Supply Chain Requirements in Global Trade Tending Toward Stringency

Since 2022, regions such as the EU have introduced a number of policy requirements for sustainable supply chains, which aim to promote more proactive management of environmental and climate risks in companies' supply chains:

- In 2022, the European Commission adopted the *Proposal for a Directive on Corporate Sustainability Due Diligence*[34], requiring EU companies and third country companies operating in the EU market to conduct environmental due diligence on their direct and high-risk indirect suppliers;
- The *Act on Corporate Due Diligence Obligations in Supply Chains*[35], which came into force in Germany on January 1, 2023, requires companies to introduce an environmental due diligence process in supply chain management to identify the negative environmental impacts of their direct suppliers and to take preventive and countermeasures.
- The European Union's *Corporate Sustainability Reporting Directive* (CSRD)[36], which came into force on January 5, 2023, and the *European Sustainability Reporting Standards* (ESRS)[37], adopted by the European Commission on July 31, 2023, clearly state that due diligence in corporate sustainability reporting should include identifying the adverse impacts of the corporate value chain on the environment and climate change, and disclosing any actions and results taken to prevent and mitigate adverse impacts, such as pollutant release and transfer from the value chain and Scope 3 greenhouse gas emissions, etc.;
- The EU *Regulation on Batteries and Waste Batteries*[38], which came into force on August 17, 2023, requires battery operators in the EU market to conduct supply chain environmental due diligence, collect and calculate carbon emissions data from upstream minerals, and conduct full lifecycle management of batteries, including carbon footprint accounting.

34. European Commission.Corporate sustainability due diligence Fostering sustainability in corporate governance and management systems.[EB/OL].2022:[2023-10-09].https://commission.europa.eu/business-economy-euro/doing-business-eu/corporate-sustainability-due-diligence_en.
35. BMAS. Act on Corporate Due Diligence Obligations in Supply Chains[EB/OL].2021:[2023-10-14].https://www.bmas.de/SharedDocs/Downloads/DE/Internationales/act-corporate-due-diligence-obligations-supply-chains.html.
36. THE EUROPEAN PARLIAMENT AND THE COUNCIL. Corporate Sustainability Reporting Directive [EB/OL].2022:[2023-10-09]. https://www.consilium.europa.eu/en/press/press-releases/2022/11/28/council-gives-final-green-light-to-corporate-sustainability-reporting-directive/.
37. European Commission.Implementing and delegated acts - CSRD[EB/OL].2023-07-31:[2023-10-14].https://finance.ec.europa.eu/regulation-and-supervision/financial-services-legislation/implementing-and-delegated-acts/corporate-sustainability-reporting-directive_en.
38. THE EUROPEAN PARLIAMENT AND THE COUNCIL. Regulation on batteries and waste batteries[EB/OL].2023:[2023-10-09].https://data.consilium.europa. eu/doc/document/PE-2-2023-INIT/en/pdf.

Table 6-2 Relevant policy requirements for sustainable supply chains in selected countries and regions

Name	Constraint objects	Implementation time
CSRD, ESRS	Companies that meet at least two of the following three criteria: more than 250 employees, turnover of more than €40 million, total assets of more than €20 million	FY 2024
	Companies listed on EU regulated markets	
	Non-EU companies with a turnover in the EU of more than €150 million and at least one subsidiary or branch in the EU	
German Act on Corporate Due Diligence Obligations in Supply Chains	From 2023: companies with more than 3,000 employees headquartered in Germany or German-registered branches of foreign companies with more than 3,000 employees	FY 2024
	From 2024: companies with more than 1,000 employees headquartered in Germany, or German-registered branches of foreign companies with more than 1,000 employees	
EU Proposal for a Directive on Corporate Sustainability Due Diligence	Companies with more than 500 employees in the EU and a global net turnover of more than 150 million euros	Unspecified
	Third country companies with a turnover of more than € 150 million in the EU	
	Companies with more than 250 employees in the EU and a global net turnover of more than €40 million, of which more than half is in high-impact sectors such as textiles, leather, food production, extractive industries, etc.	
	Third country companies with a turnover of more than €40 million in the EU, of which more than half in high impact industries such as textiles, leather, food production, extractive industries, etc.	
EU Regulation on Batteries and Waste Batteries	Battery carbon footprint: battery manufacturers	February 18, 2025
	Supply chain due diligence: market players that have placed batteries on the market or put them into service and have a net turnover of at least €40 million in the last financial year	August 18, 2025
	Battery passport: Battery manufacturer	February 18, 2027

With the introduction and implementation of these documents, the relevant requirements of the green supply chain are becoming more refined, especially the supply chain related requirements related to the European Union tend to become more stringent, and have become the standards and technical bases that companies and their suppliers must pay attention to and implement. It also means that supply chain due diligence is changing from a social responsibility that companies choose to fulfill to a mandatory obligation that must be fulfilled.

ESG Investment Begins to Focus on Environmental and Climate Risks in the Supply Chain

As the capital markets pay increasing attention to environmental, social and governance (ESG) issues, the size of global ESG investments is growing rapidly. According to Bloomberg, global ESG assets are expected to exceed $53 trillion by 2025, accounting for one-third of total global assets under management.[39] The management of environmental and climate risks in supply chains has become one of the key indicators of supply chain sustainability as measured by some mainstream ESG standards.

The International Sustainability Standards Board (ISSB) issued *International Financial Reporting Standards (IFRS) S2 Climate-related Disclosures* in June 2023, which requires reporting entities to disclose Scope 1, 2, and 3 GHG emissions data, action plans and targets for reducing value chain emissions, and potential supply chain climate risks and responses to increase the transparency of supply chain climate information.[40]

The *Consultation Paper on Enhancement of Climate-related Disclosures under the Environmental, Social and Governance Framework,*[41] released by the HKEx in April has proposed to introduce new requirements for climate-related disclosures based on the ISSB's climate-related disclosure guidelines, and proposed to upgrade the climate-related disclosures from "comply or explain" to mandatory disclosure.

Although the China Securities Regulatory Commission has not yet imposed requirements for supply chain ESG disclosure, the introduction of the ISSB standards is expected to push A-shares to benchmark with international capital markets, which are incorporating mandatory supply chain environmental and climate disclosure into disclosure guidelines for listed companies.

39. Bloomberg. ESG assets may hit $53 trillion by 2025, a third of global AUM [EB/OL].2021-02-23:[2023-10-09].https://www.bloomberg.com/professional /blog/esg-assets-may-hit-53-trillion-by-2025-a-third-of-global-aum/.
40. ISSB.IFRS S2 Climate-related Disclosures[S/OL].2023:[2023-10-09].https://www.ifrs.org/projects/completed-projects/2023/climate- related-disclosures/.
41. HKEx. SEHK Publishes Consultation Paper on Enhancement of Climate-related Disclosures under the Environmental, Social and Governance Framework [EB/OL].2023-04-14:[2023-10-09].https://sc.hkex.com.hk/TuniS/www.hkex.com.hk/News/Regulatory- Announcements/2023/230414news?sc_lang=zh-CN.

Digital Solutions Facilitate the Construction of Global Corporate Accountability

A new round of shifts in the global supply chain is taking place, with some labor-intensive industries moving to Southeast and South Asia. According to a report by the Institute for New Structural Economics at Peking University, about 25 to 35 percent (in terms of export value) of the garment manufacturing industry has shifted from China to Southeast Asian countries, especially Vietnam, Cambodia, and Myanmar.[42] The extraction of raw materials associated with the new energy industry is also expanding in Africa and South America, posing serious challenges to local environmental governance and infrastructure. According to the International Energy Agency (IEA), meeting the goals of the Paris Agreement would require a quadrupling of mineral demand for clean energy technologies by 2040,[43] and more than 40% of these critical reserves are located in Africa.[44] In our research, we have found that most developing and emerging economies have relatively weak environmental oversight and monitoring capacity, as well as human and financial constraints. It is therefore necessary for these countries to consider a leap to Environmental Disclosure 2.0, i.e. building a regulatory mechanism centered on corporate disclosure, ensuring that corporate investments, financing, and supply chain shifts meet local environmental and social standards wherever they occur, and that they can be effectively monitored, requires not only global accountability mechanisms, but also the empowerment of digital technology.

To help promote environmental governance and climate action in a practical way and to curb "greenwashing," IPE developed the Global Business Accountability Map in 2022 to showcase the environmental and climate commitments that companies have publicly made, while tracking progress in implementing their emission reduction commitments based on GHG emissions data disclosed by companies, and providing statistics and documentation on their actions to promote supply chain emission reductions.

Drawing on the PRTR system that originated in Europe and the United States, IPE has adapted the PRTR data sheet to the needs of developing countries, covering toxic and hazardous chemicals as well as general major pollutants, making it more suitable for use in developing countries and emerging economies. We are glad to see that companies like Levi Strauss & Co. are beginning to explore ways to encourage suppliers outside of China to disclose PRTR data and track progress in reducing pollutant emissions. Governments and social organizations in the Global South are also working with IPE to develop corporate disclosure mechanisms.

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42. Institute for New Structural Economics, Peking University. Estimating the Scale of Relocation of Labor-Intensive Manufacturing from China: Facts and Potentials[EB/OL].2019-12:[2023-10-17]. . https://www.nse.pku.edu.cn/docs/20210804152158674852.pdf.
43. IEA. In the transition to clean energy, critical minerals bring new challenges to energy security[EB/OL].2022-03:[2023-10-6].https://www.iea.org /reports/the-role-of-critical-minerals-in-clean-energy-transitions/executive-summary.
44. IEA. Africa Energy Outlook 2022[EB/OL].2023-03:[2023-10-17].https://www.iea.org/reports/africa-energy-outlook-2022/key-findings.

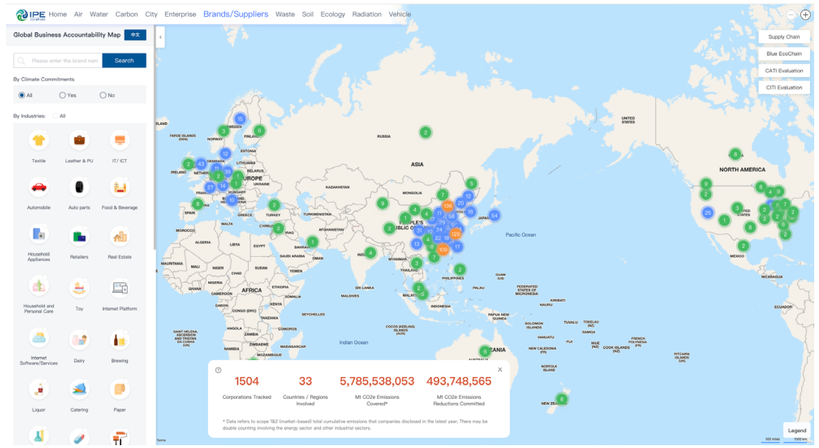


Figure 6-8 Global Business Accountability Map on the Blue Map website

To address the lack of accounting capacity and high cost of outsourcing for SMEs, IPE developed the Chinese Enterprise GHG Emissions Accounting Platform (Figure 6-9) with its partner organization in 2020 and has been continuously upgrading the platform. Developed in accordance with the *Corporate GHG Accounting Methodology and Reporting Guide (Trial)* for 24 Industries issued by China's NDRC, the platform incorporates different types of fossil fuel, electricity and heat emission factors applicable to Chinese enterprises into the automatic parameters of the calculator, and guides suppliers to identify their emission sources through the settings of the calculation process to improve the completeness and accuracy of the accounting data.

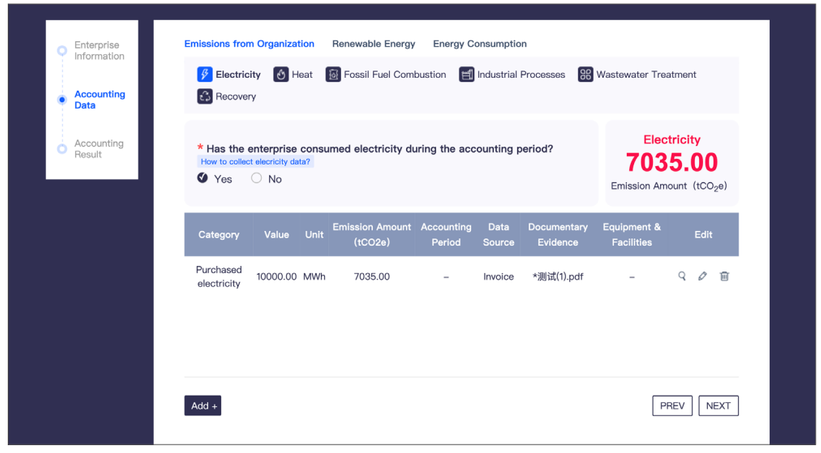


Figure 6-9 Chinese Enterprise GHG Emissions Accounting Platform

IPE has also continued to upgrade its carbon disclosure platform to automate the process of data accounting, reporting and disclosure. Most suppliers have been able to carry out data accounting and reporting on their own and have been measuring and disclosing their data through the IPE website for many years to track progress in reducing GHG emissions. However, suppliers need to further improve their carbon and energy data management capabilities to ensure that the quality of the data reported meets their own statistical analysis needs and the requirements of their stakeholders.

To assist companies in setting climate targets based on science and benchmarking against international mainstream mechanisms such as the Science Based Targets Initiative (SBTi), IPE has developed and launched the Corporate Carbon Target Setting Tool in 2023. It generates emission reduction target options for companies based on the methodology of the Science Based Targets initiative. The tool enables SMEs to set appropriate science-based emission reduction targets (aligned with the 1.5 ℃, well below 2 ℃, and 2 ℃ temperature control pathways). By simply entering base year emissions data, combined with industry, region, policy requirements, etc., the tool helps companies to easily simulate their Scope 1 & 2, and Scope 3 emission reduction targets.

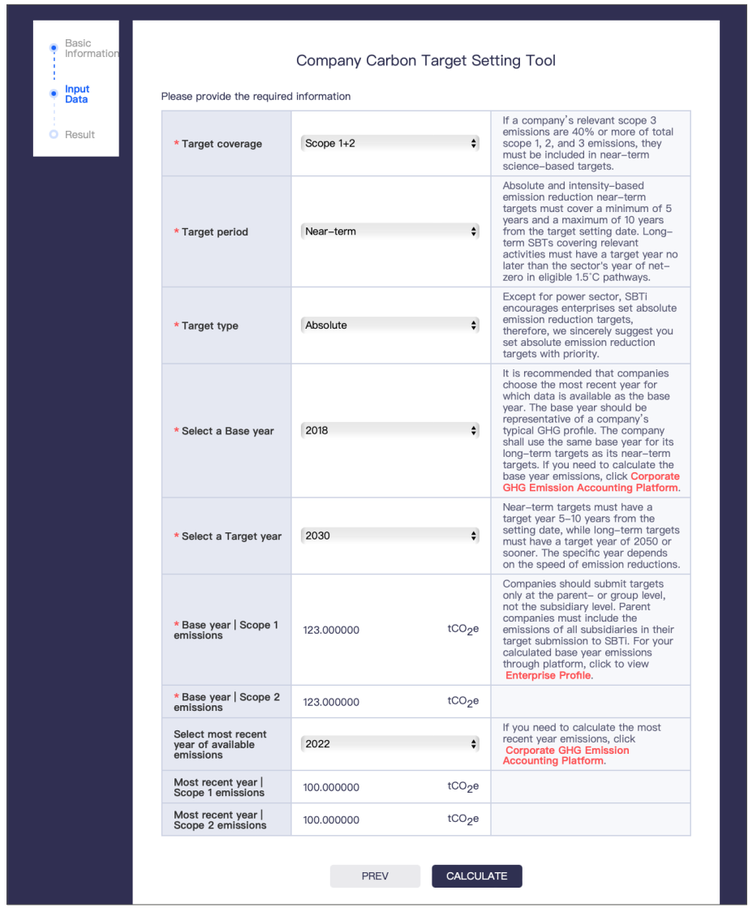


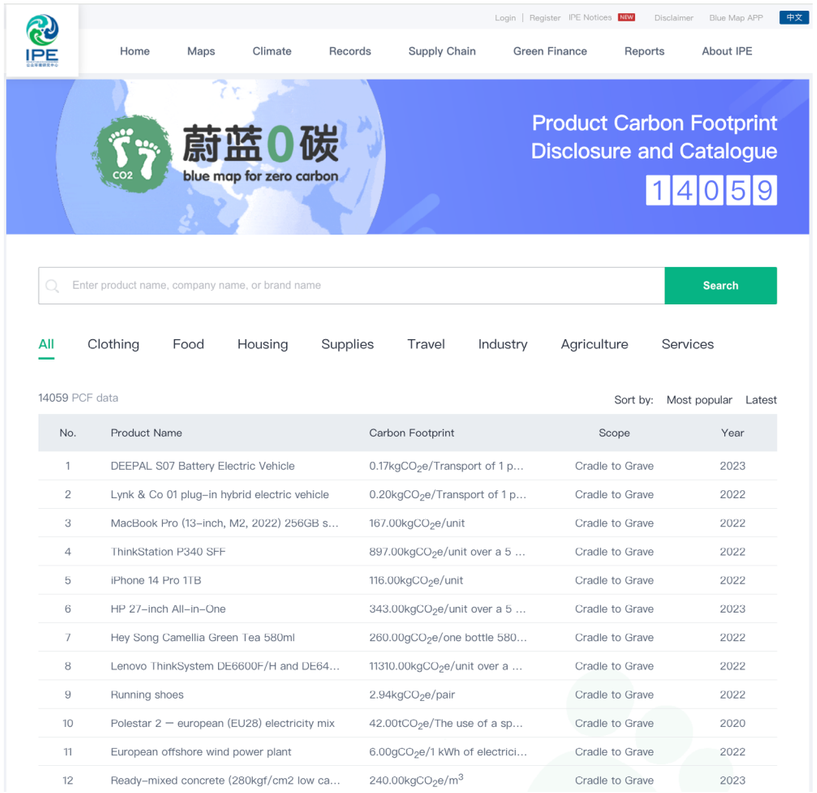
Figure 6-10 Corporate Carbon Target Setting Tool

Figure 6-11 Example of target setting

As part of the Global Business Accountability mechanism, IPE and the China City Greenhouse Gas Working Group also jointly developed and launched the China Products Carbon Footprint Factors Database (CPCD) in 2023, which aims to help Chinese companies analyze the carbon footprint of their products, calculate scope 3 categories such as purchased goods and services, improve the accuracy of supply chain carbon emissions data, and implement supply chain carbon management.

Figure 6-12 China Products Carbon Footprint Factors Database (CPCD)

IPE has also developed and launched the Product Carbon Footprint Disclosure and Catalogue (PCFD) Platform in 2023, which continuously collects more than 10,000 product carbon footprint data disclosed by companies in China and overseas, and cooperated with the International EPD System and the China Automotive Industry Chain Carbon Public Disclosure Platform (CPP), etc. for data collaboration, so that stakeholders can conveniently retrieve product carbon footprint information on the PCFD platform, and jointly promote the public disclosure of product carbon footprint information and the convergence of standards.



No.	Product Name	Carbon Footprint	Scope	Year
1	DEEPAL S07 Battery Electric Vehicle	0.17kgCO_2e/Transport of 1 p...	Cradle to Grave	2023
2	Lynk & Co 01 plug-in hybrid electric vehicle	0.20kgCO_2e/Transport of 1 p...	Cradle to Grave	2022
3	MacBook Pro (13-inch, M2, 2022) 256GB s...	167.00kgCO_2e/unit	Cradle to Grave	2022
4	ThinkStation P340 SFF	897.00kgCO_2e/unit over a 5 ...	Cradle to Grave	2022
5	iPhone 14 Pro 1TB	116.00kgCO_2e/unit	Cradle to Grave	2022
6	HP 27-inch All-in-One	343.00kgCO_2e/unit over a 5 ...	Cradle to Grave	2023
7	Hey Song Camellia Green Tea 580ml	260.00gCO_2e/one bottle 580...	Cradle to Grave	2022
8	Lenovo ThinkSystem DE6600F/H and DE64...	11310.00kgCO_2e/unit over a ...	Cradle to Grave	2022
9	Running shoes	2.94kgCO_2e/pair	Cradle to Grave	2022
10	Polestar 2 — european (EU28) electricity mix	42.00tCO_2e/The use of a sp...	Cradle to Grave	2020
11	European offshore wind power plant	6.00gCO_2e/1 kWh of electrici...	Cradle to Grave	2022
12	Ready-mixed concrete (280kgf/cm2 low ca...	240.00kgCO_2e/m^3	Cradle to Grave	2023

Figure 6-13 Product Carbon Footprint Disclosure and Catalogue (PCFD) Platform

We hope that these data and technology-enabled tools, mechanisms and solutions can help companies and industries measure, disclose and benchmark factory carbon emissions and product carbon footprints; help companies compete in the international marketplace with greener and lower-carbon quality products; help downstream customers conduct lifecycle carbon accounting of end products based on measured data; and at the same time serve more stakeholders to conduct public oversight and jointly promote the implementation of corporate environmental and climate commitments and accelerate the global green and low-carbon transformation.

Zero Carbon Supply Chain Initiative

The practice of the green development concept is a profound revolution in the concept of development, which requires the whole society to reach consensus and promote the formation of a new way of social production and living, so as to ultimately achieve the goal of environmentally friendly and resource-saving social development and realize sustainable development. It is an important issue for China and the world.

To further accelerate the supply chain decarbonization process and achieve global climate goals, IPE has launched the Zero Carbon Supply Chain Initiative in 2023. As of the end of September 2023, Lenovo, LONGi Green Energy, Luxshare Precision and Foxconn have joined the Initiative, committing to promote supplier carbon data measurement and disclosure, set emission reduction and carbon neutrality targets, and track and disclose emission reduction progress. We call on leading companies, industry associations and key institutions with supply chain influence and climate ambitions to take the lead in joining the initiative to encourage key companies in the supply chain to join the Global Race to Zero, encourage more SMEs to participate in the global climate process and work together to protect our only planet home.

Best practice in recent years indicates that brands have a unique and critical leveraging opportunity for improving supply chain performance by introducing carbon sensitive sourcing criteria. This will motivate key suppliers to join in the Race to Zero and help bring small and medium-sized suppliers into the global climate governance loop, while also contributing to low-carbon transition in developing and emerging markets, where the majority of the global supply chains reside.

We recognize that decarbonizing the supply chain is challenging. The supplier base is often large and dispersed, while the “hotspots” are often located with suppliers further up the supply chain, making it difficult to reach and obtain reliable data. Moreover, some decarbonization technologies are still being developed or optimized.

Motivating the entire supply chain to decarbonize relies on the collaborative efforts across the industry and multiple value chains, as well as support from financial institutions, governments, research institutions, and public awareness.

To accelerate the pace of supply chain decarbonization, we have committed to work with major stakeholders to jointly launch the Zero Carbon Supply Chain Initiative.

AS PART OF CORPORATE AND INDUSTRY COALITIONS, WE ARE PLEDGED TO UNDERTAKE AND SUPPORT THE FOLLOWING ACTIONS FOR EFFECTIVELY BUILDING ZERO CARBON SUPPLY CHAINS THAT PROVIDE ZERO CARBON PRODUCTS AND SERVICES:

- Recognize the importance of carbon emission reduction in supply chains, and integrate it into corporate governance and supplier management mechanisms;
- Calculate and disclose corporate-level carbon data, and gradually integrate supplier-specific activity data into the calculation of Scope 3 purchased goods and services. Embark on the measurement and disclosure of product-level carbon data;
- Set corporate carbon neutrality targets in line with the Paris Agreement and Nationally Determined Contributions (NDCs), and publicly disclose progress annually;
- Incorporate supplier climate actions into procurement considerations, require suppliers to measure carbon emissions, set science-based emission reduction targets and disclose progress;
- Promote research on industry-specific decarbonization pathways and technologies, so as to empower suppliers to take effective carbon reduction actions;
- Support the exploration of nature-based solutions to reduce supply chain footprint, and promote synergized efforts on biodiversity conservation and climate action.

AS FINANCIAL INSTITUTIONS, WE COMMIT TO SUPPORTING BUSINESS AND INDUSTRY EFFORTS TOWARD A ZERO CARBON SUPPLY CHAIN WITH THE FOLLOWING ACTIONS:

- Set science-based carbon neutrality targets for investments, and measure and disclose progress annually;
- Strengthen the climate information disclosure requirements for investees and guide them in building zero carbon supply chains;
- Support the development and application of key technologies for supply chain carbon neutrality;
- Provide sufficient financing for large-scale projects with long borrowing horizon.

AS FOUNDATIONS, RESEARCH INSTITUTES AND ENVIRONMENTAL NGOS, WE COMMIT TO CREATING AN ENABLING ENVIRONMENT FOR ZERO CARBON SUPPLY CHAINS WITH THE FOLLOWING ACTIONS:

- Promote the construction of climate data infrastructure and quantitative evaluation of supply chain climate actions;
- Motivate incorporation of supply chains in carbon neutrality commitments and effectively curb climate “greenwashing”;
- Promote the full consideration of supply chain climate performance in ESG evaluation;
- Identify, disseminate and promote zero carbon supply chain best practices;
- Support the development of innovative solutions to empower supply chain decarbonization;
- Track the construction of zero carbon supply chains and promote the development of policies and regulations that facilitate decarbonization.

We call on leading companies, industry coalitions and key institutions that influence supply chain and climate ambition to lead in joining the Initiative. We also look forward to attention and support from all sectors of society to jointly advance the decarbonization of supply chains, accelerate the global Race to Zero, and protect our planet Earth.

零碳供应链
Zero Carbon Supply Chain

Appendix I Companies Disclose China Supply Chain Environmental and Carbon Management Efforts

Lenovo

Since 2021, the Company has been using IPE's Blue EcoChain tool to track the environmental performance of its suppliers and encouraging the disclosure of carbon data and GHG reduction targets.

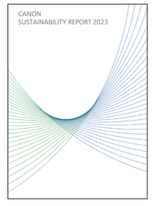
—— Lenovo Group Limited 2022/23 Environmental, Social and Governance Report

TCL

We have developed the Supplier Social Responsibility Investigation Form, covering 111 review items under 13 dimensions, including business ethics, labor rights and interests, chemical safety, environmental protection, fire safety, and occupational health. We use this form to investigate the social responsibility performance of suppliers, and require them to describe how to implement each item and provide relevant evidence accordingly. Then, we would command CSR personnel review such items and inform suppliers of the reason for non-compliance and effective rectifications for non-compliant items...TCL Industries focuses on the greenhouse gas management and IPE record management of suppliers while reviewing, and supervises and urges suppliers to establish greenhouse gas management organizations, mechanisms and personnel capabilities and eliminate IPE records as soon as possible.

—— 2022 TCL Industries Holdings Co.,Ltd. Corporate Social Responsibility Report

Canon



Based on supply chain information published by the Institute of Public & Environmental Affairs (IPE), a Chinese environmental NGO, we help secondary and tertiary suppliers and other Chinese businesses located in the upstream of the supply chain to reduce environmental risk by making recommendations and carrying out improvements. By sharing information regularly and communicating with the IPE on best practice, we contribute to reducing environmental risk throughout the supply chain.

—— Canon Sustainability Report 2023

臻鼎科技集團 Zhen Ding Tech. Group

Together with our strategic partners in the green supply chain, we promote the five major systems of IPE legal compli- ance, energy-saving technology exchange, eco-friendly material innovation, management system, and the selection of low-carbon raw materials.

—— 2022 Zhen Ding Technology Holding Limited Sustainability Report

万科
让建筑赞美生命

In 2020, in cooperation with the Institute of Public and Environmental Affairs in Chaoyang District, Beijing, we established a "green list" online application platform, which has been officially launched, to include supply chain enterprises with outstanding performance in energy conservation and emission reduction in the "green list" and make priority purchases from them. In 2021, there were already 22 "green list" enterprises. At present, the green list standards for rock wool, heat pump, and stone have been formulated, and it is planned to continue to empower real estate enterprises and suppliers in the future to promote actual procurement.

—— 2022 Sustainability Report of Vanke

INDITEX

Inditex works with the Chinese Institute of Public and Environmental Affairs (IPE) on the continuous improvement of environmental management in our supply chain in this market. This entity provides information through its environmental platform, both from governmental sources and from the factories themselves and the brands that work with them. In addition to the environmental performance of the textile factories, IPE monitors upstream suppliers (raw materials and chemicals) as well as the wastewater treatment plants and the results of the wastewater analysis.

—— Inditex Annual Report 2022

HUAWEI

Since 2011, Huawei has participated in the Green Choice initiative, which was launched by the Institute of Public and Environmental Affairs (IPE). We continue to use the IPE's Blue Map environmental data search during supplier audits and supplier self-checks, encourage suppliers to better manage themselves, and require suppliers to rectify all discovered problems within a required period, so as to ensure that suppliers maintain environmental compliance... In 2022, we conducted supplier CSR audits using internationally recognized methods... We also used the Blue Map database developed by the Institute of Public and Environmental Affairs (IPE) to assess supplier compliance with environmental requirements, and urged five suppliers to resolve the identified issues within a specified timeframe.

—— Huawei Investment & Holding Co., Ltd. 2022 Sustainability Report

领取新未来
OJI

Starting in 2015, OJI China established a supply chain screening system using the Blue Map developed by the NGO Institute of Public and Environmental Affairs (IPE) to inspect OJI's key suppliers and invested enterprises in China. Since 2017, OJI has been sending letters of inquiry to enterprises with violation records asking them to publicly explain the outcomes of their corrective action to contribute to a more environmentally-friendly society.

——《王子 (OJI) 中国 可持续发展报告 2022》

Microsoft

The Responsible Sourcing team uses this information to monitor our China-based suppliers. Since partnering with IPE, we have resolved 122 violations with corrective action, including two cases in FY22. We have extended the IPE program to our suppliers' sub-tier and vendor management, providing them with guidance and training. We have also given them a self-assessment tracking checklist, which includes 11 key checkpoints to enable suppliers' to build their own IPE program.

—— Microsoft Devices Responsible Sourcing Report FY22

DELL Technologies

Climate Action Transparency Index (CATI): Ranked No.2 out of 825 companies across all industries and 87 information technology companies. Developed by IPE in 2021, this assessment focuses on brands' performance on corporate and value chain-level climate action.

—— DELL TECHNOLOGIES FY23 ESG REPORT - SUPPLY CHAIN SUSTAINABILITY

LUXSHARE ICT 立讯精密

In 2022, we cooperated with IPE to provide regular special training for subsidiaries and suppliers, answering questions on a one-to-one basis and assisting subsidiaries and suppliers insolving issues such as GCA (Green Choice) audit on removal of environmental violation information submitted and refined the PRTR (Pollutant Release and Transfer Register) information disclosure.

—— Luxshare ICT 2022 Sustainability Report

Fii 工业富联

The company continues to promote multi-level and multi-dimensional responsibility audits... promote 9 suppliers to register IPE platform accounts, and a total of 166 suppliers have IPE platform accounts. A total of 37 suppliers have violation records on the IPE website, promoting 33 suppliers to conduct a GCA audit.

—— 2022 Fii CORPORATE SOCIAL RESPONSIBILITY REPORT

CISCO

To supplement our core environmental work, Cisco engages with the Institute of Public and Environmental Affairs (IPE) to screen supplier sites based in mainland China for environmental violations or risks. We work with our suppliers to correct any environmental issues identified. Our areas of focus include wastewater, exhaust gas, and waste management and pollution mitigation, as well as tracking and addressing corrective action reports of illegal pollution.

—— 2023 Cisco Supplier Guide: Sustainability, Risk, and Security

PRIMARK®

We have worked with the Institute of Public and Environmental Affairs (IPE) in China since 2016 to improve the environmental performance of tier one and tier two factories in our Chinese supply chain. This non-profit environmental research organisation has developed an online database and tool called Blue EcoChain, which offers instant updates on suppliers' environmental performance. We're also using Blue EcoChain to encourage our suppliers to manage their environmental impact in key areas such as water use.

—— Primark Environmental Insights 2021/22

LINDEX

Lindex works with IPE to monitor environmental performance of direct suppliers and significant upstream suppliers in China through the PRTR (Pollutant Release and Transfer Registry) system. Lindex is one of the few brands in China that incorporates PRTR into our supply chain management requirements. In 2022, we deepened the partnership to also address sustainable development issues in China, and we are listed on the IPE Green supply chain map.

—— Sustainability Report 2022 Lindex

朗诗绿色管理

The Green Chain Index for real estate enterprises is published by the Green Chain Action Committee, evaluated by the Institute of Public and Environmental Affairs (IPE), and supported by the CURA, China Real Estate Chamber of Commerce, Society of Entrepreneurs and Ecology (SSE), and China Association of Building Energy Efficiency. According to the newly released rankings of the "Green Supply Chain CITI Index", Landsea Green Management has once again taken the top spot, maintaining its leading position in China's green real estate industry for six consecutive years.

—— Landsea Green Management 2022 Environmental, Social and Governance (ESG) Report

Carrefour

The Clean Water Project is a programme primarily aimed at water-consuming textile industries that use water and chemicals in their production processes... The Project includes a training and audit programme in chemical management, an environmental programme in China in collaboration with the Institute of Public & Environmental Affairs (IPE).

—— CARREFOUR UNIVERSAL REGISTRATION DOCUMENT 2022 ANNUAL FINANCIAL REPORT

We screen China-based suppliers for environmental violations—including wastewater violations—using the Institute of Public & Environmental Affairs (IPE) Blue Map Database. IPE collects publicly accessible data issued by governments and other testing agencies into its Blue Map database, increasing environmental information transparency and furthering our visibility into conditions at our factories in China. Through Blue Map, we identified 11 violations and then helped the suppliers identify the cause, remediate, and achieve compliance.

—— New Balance Sustainability and Impact Report 2022

To achieve our carbon reduction goals, we study all aspects of our supply chain, identify problems, and implement a variety of measures to effectively reduce carbon emissions. In November 2022, the 2022 Green Supply Chain CITI evaluation released by the Institute of Public and Environmental Affairs (IPE) showed that among 650 Chinese and international brands in 20 industries, Adidas ranked third with a score of 76.86. Adidas also ranked fourth in the Corporate Climate Action Transparency Index among all textile and leather industry with a score of 71.8, ranking seventh overall.

—— 2022 Adidas China CSR Report

To supplement our responsible sourcing strategy, we leverage the Institute of Public and Environmental Affairs (IPE) to screen our suppliers in China for environmental compliance... On a regular basis, we screen our suppliers within IPE's Blue Map website to identify violations and, if found, create a corrective action plan for the respective vendor and facility to remediate within an assigned timeframe. In 2022, we screened more than 80% of our China facilities and over 50% have rectified their violations. We plan to continue expanding the scope of our supplier screening and push our suppliers to remediate outstanding environmental noncompliance.

—— KOHL'S 2022 ESG REPORT

Suppliers and sub-tier suppliers (e.g., chemical, sewage and solid waste treatment, logistics and raw materials suppliers) are required to register as corporate users on the IPE website, track environmental performance, and promptly rectify and issue public explanation regarding environmental violations records; Mainland China suppliers and their sub-tier suppliers, which account for more than 80% of Avary Holding's procurement, are required to publicly disclose annual PRTR data on IPE website, measure greenhouse gas emissions, set emission reduction targets and regularly update progress.

——《鹏鼎控股（深圳）股份有限公司 2022 年度可持续发展报告》

We are pleased to have been recognised for our leadership in environmental supply chain management by China's most influential environmental NGO, the Institute of Public and Environmental Affairs (IPE). In the 2022 Corporate Information Transparency Index (CITI), C&A ranked sixth out of over 120 apparel and textile brands and fourth overall among 611 companies across all industries. The annual index ranks the supply chain practices of brands in the areas of transparency, responsiveness, compliance and corrective action, energy conservation, emissions reduction, as well as performance disclosure.

—— C&A Sustainability Report 2021

DWC has established a partnership with the Institute of Public & Environmental Affairs (IPE). As supported by the IPE, DWC has driven suppliers to improve their compliance and encouraged suppliers to join the Pollutant Release and Transfer Register (PRTR) project, in a bid to realize more transparent environmental performance of suppliers.

—— 2022 Danone Waters China OPOH Progress Report

Hang Lung and LVMH will work with the Institute of Public and Environmental Affairs (IPE), an environmental NGO based in Beijing, to strengthen our environmental governance, including use of IPE's database and capabilities for enhanced supply chain due diligence and supplier engagement.

—— Our Common Charter: JOINING FORCES TO ACCELERATE CHANGE

In order to assess the environmental performance of its key suppliers and to be aware of any environmental violations by those suppliers, DyStar has been using a tool created by the Institute of Public and Environmental Affairs (IPE) since FY2019. The tool allows DyStar to monitor its core suppliers' environmental performance and cases of non-compliance by creating a "Blue Map" of the shortlisted providers. DyStar will prompt suppliers to resolve any identified issues and take the necessary corrective action if they have been detected for any kind of non-compliance.

—— INTEGRATED SUSTAINABILITY REPORT 2022-2023

During 2022, we continued encouraging our suppliers to submit inventories of substances released through IPE's public pollutant release and transfer register system, and cross-checked supplier sites representing 95% of our spend against IPE's public database of environmental violations. First-tier manufacturing suppliers in China also provide information about sub-tier supplier compliance with local environmental laws. This review of 1,237 sub-tier suppliers against IPE's public database of environmental violations identified 135 issues in 2022. Of these, 41 had been corrected as of December 2022, and we continue working with the relevant first-tier suppliers and IPE to assess, address, and resolve the remaining issues.

—— 2022 HP Sustainable Impact Report

GAC TOYOTA has constructed a comprehensive supplier environmental risk monitoring system by incorporating suppliers' emissions data, environmental supervision records and ratings from IPE's Blue Map database. Both GAC TOYOTA and suppliers would be notified for potential risks, and GAC TOYOTA will follow up on suppliers' corrective actions following a "early detection and early resolution" principle.

—— GAC TOYOTA CORPORATE SOCIAL RESPONSIBILITY REPORT

If any zero tolerance issues are found during the onboarding of new suppliers, Li Ning will terminate the onboarding process. If the following major risks occur during the onboarding of new suppliers, (e.g., there are still unresolved supervision record(s) on the IPE website...), the potential suppliers must complete the rectification before resuming the onboarding process.

—— Li Ning Co., Ltd. Supplier CSR Management Manual

The Group fully understands the importance of public monitoring for environmental compliance relating to supply chains. Therefore, we actively collaborate with external parties such as the Institute of Public Environmental Affairs (IPE). We use the IPE Blue Map application to monitor supplier environmental compliance performance and provide improvement counseling for suppliers that incur environmental violations. Violation records are removed from the Blue Map website for suppliers following environmental reviews and verification of rectification effectiveness. In 2022, we assisted 32 suppliers with environmental violations in removing their records. We also extended environmental management to our upstream suppliers. To protect the public's right to know about their surrounding environments, the Group guided 148 suppliers in filling out PRTR (Pollutant Release and Transfer Register) data for public disclosure on the IPE website in 2021.

—— 2022 Hon Hai Sustainability Report

Based on laws and regulations, the company takes customer standards as the guide, starts from the chapter of "solid waste", formulates and strictly implements the "Lens Group EHS Standardization Management Manual", integrates the regulatory requirements and daily EHS management process... The third-party solid waste treatment units must have adequate qualification and capacity, and have no violation record(s) on the IPE Blue Map website.

—— Lens Technology Co., Ltd. CSR Report 2022

We explicitly state in our Vendor Compliance and Operating Standards that all suppliers are required to adhere to all applicable laws and regulations of the regions where they operate, including, but not limited to, the local environmental standards. We have the right to terminate our business relationship should the supplier fail to comply with the applicable laws and regulations. In addition to that, we are screening our supply base for any potential significant environmental impacts through the Higg Index Facility Environmental Module and IPE Supervision platform (the latter is specific to China-based facilities). If an issue is found, we require the supplier to take corrective action and put in place preventive measures to avoid recurrence. Specifically, on any violation record found on the IPE platform, we also require the facilities—at a minimum—to publish enterprise feedback onto the platform, which details the corrective and preventive measures taken.

—— 2023 Global Citizenship & Sustainability Report

Panasonic

Collaborating with the Institute of Public & Environmental Affairs (IPE), a China's environmental NGO, we have been working on to improve suppliers CSR environment, through sharing information on latest laws and regulations in a periodical working group meeting, and requesting for suppliers whose regulatory violation is recorded on a monthly base to improve it.

—— Environment: Collaboration Across the Supply Chain

維他奶 Vitasoy

We partnered with the Institute of Public and Environmental Affairs (IPE) to conduct quarterly environmental risk screening of our direct suppliers in mainland China, including their compliance with environmental laws and regulations. Of the 123 direct suppliers screened, we identified 19 records of non-compliance for the period 2019-2022 and followed up on these records to ensure that corrective measures were implemented. All corrective actions are now in place.

—— Sustainability Report 2022/23

Gap Inc.

We use the IPE's platform and tools to ensure environmental compliance and monitor pollution data from our Tier 1 and Tier 2 suppliers in China. This platform also provides a mechanism for us to work with suppliers on corrective action if any environmental violations are found. As of the end of 2022, 128 Tier 1 and 41 Tier 2 suppliers registered to the IPE platform for monitoring.

—— Gap Inc. 2022 ESG Report

TESCO

We have shared our list of suppliers located in China through the Institute of Public Environmental Affairs (IPE) Green Supply Chain Brand Blue Map and encourage them to disclose environmental data to the Pollutant Release and Transfer Registers (PRTR) on this platform..

—— Chemical Management at Tesco F&F clothing - our Detox progress

大悦城控股 GRANDJOY

GrandJoy joined the twelfth batch of CURA Joint Purchasing, participated in the Green Supply Chain Action in China's Real Estate Industry Initiative... and the results have been applied to CURA's joint procurement work: 1. All companies participating in the updated categories of procurement bidding are required to meet the green standard, i.e. the pollutants emitted by companies in the process of project construction and production should comply with relevant laws and regulations on national environmental protection and industry emission standards, using the "Blue Map" website as a tool to carry out monitoring...

—— GRANDJOY 2022 Social Responsibility Report

SAMSUNG

Regarding supply chain environmental information disclosure, for suppliers who have not yet published environmental reports or other forms of environmental information disclosure, Samsung China invites them to publish annual pollutant release and transfer registry (PRTR) data through IPE's PRTR system, and provides specialized personnel to assist suppliers with data reporting.

Regarding environmental compliance in the supply chain, Samsung China regularly checks the compliance status of suppliers in China through the Blue Map database. For suppliers with environmental violations, suppliers are required to provide documentation of corrective actions and disclose them on the IPE website...

—— Green Samsung Website

Appendix II 2023 CITI Scores

Brand	Score	Brand	Score	Brand	Score	Brand	Score
Levi Strauss & Co.	88.6	Carrefour	47.32	Burberry	28.5	BOSIDENG	18.5
Adidas	84.54	Polestar	47.2	Vanke	27.94	MENGNIU DAIRY	18.4
Inditex	83.78	LENOVO GROUP	46.44	LENS	27.9	Church & Dwight	18.4
Cisco	78.62	Uniqlo	45.34	HMD	27.4	Kohl's	18.38
Puma	77.76	Esprit	44.46	GOERTEK	26.2	Sainsbury's	18.38
Nike	77.06	Archroma	41.56	TCL	26	Reckitt Benckiser	18.32
VF	76.32	AEO	41.38	ZTE	25.44	Ajinomoto	18.1
Foxconn	75.1	LI NING	39.46	Lego	25.32	Deckers Brands	18.04
Primark	74.88	Canon	39.18	L'Oréal	24.52	AMOREPACIFIC CORPORATION	17.88
New Balance	74.76	Nestlé	38.86	MANGO	23.12	Lojas Renner	17.78
LUXSHARE-ICT	72.4	The Very Group	38.1	Toshiba	22.64	Starbucks	17.66
M&S	71.32	Vitasoy	37.96	Mars	21.68	Zalando	17.64
C&A	70.48	Panasonic	37.8	BASF	20.98	Volvo	17.58
Bestseller	68.06	Oji Paper	37.68	Walmart	20.88	Spalding	17.5
Microsoft	67.78	HP	35.08	HUGO BOSS	20.66	TCL TECH.	17.36
AVARY HOLDING	67.4	IKEA	34.66	HANG LUNG PROPERTIES	20.3	Keurig Dr Pepper	17.36
Lindex	64.86	KERSEN	34.6	Hasbro	20.24	Xiaomi	17.28
Kontoor	64.16	Royal Philips	33.54	HAIER	19.72	Mercedes-Benz	17.22
Tesco	63.28	Suitsupply	33.3	Kraft Heinz	19.44	Ericsson	17.2
GAP	62.9	Toyota Motor	32.96	GEELY AUTO	19.36	LINGYI iTECH	17.1
Target	61.78	Honor	32.2	ASICS	19.32	Bayer	17
Huawei	57.82	Coca Cola	31.46	Guess	19.06	Meiji	17
Danone	54.46	Amazon	31.28	PVH	19.02	OMRON	16.86
Schaeffler	53.62	LANDSEA MGMT	30.9	Tendam	19	Arçelik	16.76
Kao	53.56	Honda Motor	30.14	CENTRAL CHINA	18.88	Henkel	16.68
ANTA	53.22	LONGI	30.08	Seagate	18.84	BYD	16.66
Intel	50.04	Columbia Sportswear	29.82	Prada	18.82	Under Armour	16.64
H&M	49.22	OPPO	29.76	Unicharm	18.68	Stora Enso	16.5
Decathlon	49.22	Ralph Lauren	29.08	Colgate-Palmolive	18.62	Hormel	16.46
Samsung	48.68	Lululemon	29.06	Abercrombie & Fitch	18.6	NIO	16.46
P&G	47.66	Dystar	28.9	Unilever	18.5	Merck Group	16.42

Brand	Score	Brand	Score	Brand	Score	Brand	Score
Kosé	16.4	Heineken	15.2	Solvay	14.06	Mondelēz International	13.36
Yihai Kerry Arawana	16.4	APP	15.16	Merck & Co.	14.02	Oatly	13.36
REI	16.38	Natura & Co	15.14	Land Rover	13.96	Santen	13.32
NONGFU SPRING	16.36	CIFI HOLD GP	15.08	J.C. Penney	13.94	BLUE MOON GROUP	13.3
Moncler	16.3	Dow	15.02	Costco	13.92	Continental	13.24
The Kroger Co.	16.26	Fonterra	15	YILI	13.9	De'Longhi	13.22
Asahi	16.1	SUNKWAN PPT	15	Facebook	13.9	IBM	13.18
ZF Friedrichshafen	16.02	Woolworths	15	Singtel	13.88	Hershey	13.18
ASUS	15.96	Alibaba	14.96	na-kd	13.82	VAUDE	13.18
General Mills	15.92	JA SOLAR	14.86	JD Sports Fashion	13.82	Li Auto	13.16
Whirlpool	15.88	Cargill	14.84	BROOKS	13.82	Pentland	13.1
Syngenta	15.78	ABOUT YOU	14.82	Bentley	13.74	Western Digital	13.06
L'Occitane	15.78	Carlsberg	14.8	Takeda	13.72	KFC	13.02
AkzoNobel	15.72	Hyundai	14.8	GM	13.7	Eastman	13.02
Armani	15.7	VELUX	14.76	ABInBev	13.7	TENTIMES	13
DuPont	15.7	Delta Galil	14.74	Logitech	13.66	Hisense	13
Macy's	15.66	DAFA PPT	14.68	Next	13.64	Kingdom Group	13
GLP	15.66	UPM	14.66	Roche	13.64	DaHan	13
TONGWEI	15.6	camper	14.66	Metro	13.6	ZhongFang	13
Bunge	15.6	Baxter	14.62	Salomon	13.6	ROFFAR	13
River Island	15.58	AMD	14.58	G-Star RAW	13.58	AUX	13
Bang & Olufsen	15.54	LG Electronics	14.54	GSK	13.56	Huajian Real Estate	13
Nissan	15.44	Valentino	14.54	GILEAD	13.56	Sincere	13
PepsiCo	15.42	asos	14.44	Tesla	13.52	Joru Group	13
ABBOTT	15.42	Tiffany	14.42	Electrolux	13.5	yahe	13
Clariant	15.4	3M	14.34	COACH	13.48	TIANI Group	13
Deutsche Telekom	15.38	AUPUP	14.3	SHANYING INTERNATIONAL	13.48	EAST SEA	13
Mammut	15.34	Disney	14.28	7-Eleven	13.46	AIJIA	13
Kellogg's	15.28	CHIXIA DEVELOPMENT	14.2	Seasalt	13.44	LINGPAI GROUP	13
Ford	15.26	Bosch	14.1	Hyundai Mobis	13.42	AOHAI	13
Ted Baker	15.22	The Children's Place	14.08	desigual	13.42	SCEGC REAL ESTATE GROUP	13

Appendix II 2023 CITI Scores

Brand	Score	Brand	Score	Brand	Score	Brand	Score
EASTIDE GROUP	13	Olympus	12.32	Wilmar	11.62	Home Depot	11.12
Kate Spade	12.98	Google	12.3	Hankook Tire	11.6	GROHE	11.1
FILA	12.96	Arla	12.3	BOE	11.6	SCSF	11.1
XPENG	12.96	UCB	12.3	Morrisons	11.52	SWIRE PROPERTIES	11.04
Swire Foods	12.94	Zebra	12.3	SUNGROW POWER SUPPLY	11.48	Sony	11.02
Adient	12.92	Seiko Epson	12.18	new look	11.48	boohoo	11.02
BMW	12.9	Magna	12.18	Novartis	11.46	DSM	10.98
CANADIANSOLAR	12.86	AstraZeneca	12.18	Kimberly-Clark	11.46	BT	10.96
Chery	12.82	VTECH HOLDINGS	12.16	Razer	11.44	WENS	10.96
JINKOSOLAR	12.78	Pfizer	12.14	CJ	11.44	fenix outdoor	10.92
Vodafone	12.76	Teva Pharmaceutical	12.14	FUYAO GLASS	11.38	SAIC MOTOR	10.9
Biogen	12.68	RICOH	12.06	carter's	11.38	Orion	10.9
TRINA SOLAR	12.66	Huntsman	12.06	Sartorius	11.38	Aisin	10.78
Clorox	12.66	Ella's Kitchen	12.06	SINO-OCEAN GP	11.38	Allbirds	10.76
Johnson & Johnson	12.64	TOTO	12	McDonald's	11.36	Pirelli	10.74
Peak Performance	12.64	SK HYNIX	11.96	XINYI SOLAR	11.36	WULING MOTORS	10.72
CHINA RES BEER	12.6	Burger King	11.92	HAI TIAN	11.34	TSINGTAO	10.7
MUJI	12.58	Plastic Omnium	11.92	WEICHAI POWER	11.34	Orion	10.66
Ferragamo	12.58	GAC GROUP	11.88	Lonza	11.32	XTEP INT''L	10.66
Bridgestone	12.56	Fujitsu	11.88	AbbVie	11.26	novo nordisk	10.64
Crocs	12.56	BIMBO	11.84	HanesBrands	11.24	Tata Motors	10.62
Arkema	12.54	Sharp	11.82	Lee & Man Paper	11.22	Sanofi	10.56
Faurecia	12.52	TZE	11.82	PROYA	11.2	NetEase	10.56
PPG	12.52	Viessmann	11.82	LocknLock	11.2	Mazda	10.54
KIA	12.5	Bristol Myers Squibb	11.8	Nippon Paint	11.18	HISENSE H.A.	10.5
McCormick	12.5	kathmandu	11.78	Acer	11.18	SEMIR	10.46
Hewlett Packard Enterprise	12.46	Victoria's Secret	11.74	Gymshark	11.18	TONGLI CEMENT	10.44
LG Chem	12.4	SHISEIDO	11.68	Nongshim	11.16	KUMHO TIRE	10.42
Mizuno	12.34	Goodyear	11.68	Midea Group	11.14	SKSHU	10.36
Volkswagen	12.34	CHANEL	11.66	BAIC MOTOR	11.14	SHANGHAI PHARMA	10.34
HENGAN INT''L	12.32	Siemens	11.62	NEXEN TIRE	11.12	SERVIER	10.32

Brand	Score	Brand	Score	Brand	Score	Brand	Score
iRobot	10.3	SHEIN	9.56	MATTEL	8.86	DAWNRAYS PHARMA	8.02
Renault	10.26	SMCP	9.54	DEXIN CHINA	8.84	Canada Goose	8
GH	10.22	watsons	9.52	SHANGHAI XINMEI	8.82	patagonia	7.98
New Hope Dairy	10.2	Lear	9.48	ND PAPER	8.78	VINDA INT''L	7.94
Denso	10.2	Long Chen	9.46	LUZHOU LAO JIAO	8.7	Meituan Bike	7.94
Tyson Foods	10.2	KOHLER	9.46	AGILE GROUP	8.64	MILLION CITIES	7.86
MEC	10.18	AVON	9.44	Lilly	8.6	GOLDEN EAGLE	7.84
SUNING COMMERCE	10.12	M&G	9.44	Skechers	8.58	TRAD CHI MED	7.84
MICHELIN	10.08	Domino's	9.4	vivo	8.56	CHINA OVERSEAS	7.8
SHANGHAI JAHWA	10.04	Hylo	9.4	MINTH GROUP	8.54	CHINA MEHECO	7.78
Samsonite	10.04	HIKVISION	9.38	C.BANNER	8.5	GIORDANO INT''L	7.7
GRANDJOY	10.04	CMSK	9.38	361 DEGREES	8.44	Yuen Foong Yu	7.7
Etam	9.98	UNITED LAB	9.3	Changhong	8.44	BAIYUNSHAN PH	7.66
Conagra	9.94	Kagome	9.28	JD.com	8.44	RS MACALLINE	7.64
MING FAI INT''L	9.94	CHINT	9.24	SUZUKI	8.28	YUZHOU GROUP	7.64
YUEXIU PROPERTY	9.9	XIANHE	9.22	FAW Group	8.28	CHINA JINMAO	7.64
CHINAHUAJUNGP	9.88	ZHEJIANG SHIBAO	9.22	PRE	8.28	AEON	7.58
Centrient	9.86	CR Land	9.22	AUSNUTRIA	8.28	Benetton	7.56
TINGYI	9.82	Costa	9.2	SHUANGHUI	8.24	WANT WANT CHINA	7.56
TAI HING GROUP	9.82	BANDAI	9.16	hellyhansen	8.24	COUNTRY GARDEN	7.56
KWEICHOW MOUTAI	9.8	SHENZHEN INVEST	9.12	LVGEM CHINA	8.22	POLY PROPERTY	7.56
INSPUR	9.8	PERFECT	9.1	KING''S LUCK	8.2	NIVEA	7.54
MARUBI	9.8	Subaru	9.08	CHINA MOBILE	8.2	LEAPMOTOR	7.54
Fortune Brands	9.76	DAQO	9.02	Toyoda Gosei	8.18	ZHOU HEI YA	7.54
HTC	9.72	TRANSSION	9	XINHUA PHARM	8.18	YANJING BREWERY	7.5
CH MODERN D	9.7	Nokia	8.98	LONGFOR GROUP	8.14	JIUJIUWANG	7.5
CapitaLand	9.68	Infinitus	8.98	SHUI ON LAND	8.12	YURUN FOOD	7.5
Quiksilver	9.66	Hush Puppies	8.96	XINTE ENERGY	8.1	Tokai Rika	7.48
YANGHE	9.6	Arc’teryx	8.94	GREENTOWN CHINA	8.08	ALDI	7.46
Sherwin-Williams	9.58	JIASHILI GP	8.92	Lion	8.06	Hello Bike	7.38
Catalent	9.58	DALI	8.88	CHANGAN AUTOMOBILE	8.02	Boehringer-Ingelheim	7.3

Appendix II 2023 CITI Scores

Brand	Score	Brand	Score	Brand	Score	Brand	Score
SINYI	7.28	DATANG GROUP	6.52	GLORY HEALTH	5.56	GUJING DISTILLERY	3.9
Mulberry	7.28	Thai Union	6.44	JOTUN	5.52	HAIMA AUTOMOBILE	3.86
Stellantis	7.26	Suntory	6.42	PEARL RIVER	5.5	SFY	3.84
QUZHOU WUZHOU SPECIAL PAPER	7.24	YOUNGOR	6.4	Niulanshan	5.5	Barry Callebaut	3.76
COFCO TUNHE	7.22	LACOSTE	6.4	China Lesso	5.5	C&S	3.7
ZHONGLIANG HLDG	7.22	Charles & Keith	6.4	Meituan	5.44	YUNNAN BAIYAO	3.66
SKYWORTH	7.2	ELLASSAY	6.4	ANGEL	5.38	DMEGC	3.62
HONGDOU INDUSTRIAL	7.2	Feihe Milk	6.38	CENTRAL NEW EGY	5.3	CABBEEN	3.6
R&F PROPERTIES	7.2	RSUN PPT	6.36	GIANT BICYCLES	5.2	UNI-BIO GROUP	3.56
SUPOR	7.18	LVMH	6.28	OCT HOLDING	5.2	XIABUXIABU	3.56
MICHAEL KORS	7.16	HEPALINK	6.26	YOTRIO	5.14	SLH	3.52
TASLY	7.12	Sephora	6.2	RISEN ENERGY	5.14	CHINA UNICOM	3.5
POP MART	7.06	MITSUBISHI MOTORS	6.12	HOSHINE SILICON INDUSTRY	5.14	JIUSHENG	3.4
MINMETALS LAND	7.04	WULIANGYE	6.1	Shede Spirits	5.1	Jollibee Foods	3.34
SHOUCHENG	7	Ann Taylor	6.06	CR SANJIU	5.06	ERDOS	3.3
OPPEIN	6.9	Clarks	6.06	GCL TECH	5.06	SPEG	3.28
ecco	6.88	MONALISA	6.02	PORSCHE	5.04	WEICHUAN	3.14
Paulmann	6.86	BRIGHT DAIRY	6	A.O.Smith	5.02	HLA	3.12
NVC	6.84	CSPC PHARMA	6	COOPERTIRES	5	FUJIYA	3.1
TBEA	6.84	Dyson	6	JML	4.68	MFSP	3.1
JEANSWEST	6.8	CHENMING PAPER	5.98	JMC	4.64	EASYHOME	3.04
HAIDILAO	6.8	YYFP	5.98	MIDEA REAL EST	4.52	HISUN	3
Vip.com	6.76	SUN PAPER	5.94	Rivian	4.5	VANTONE REAL ESTATE	3
Lafuma	6.7	HUAZHONG IN-V	5.94	Perfetti	4.44	Hodo	3
XINYI GLASS	6.7	CHINA AOYUAN	5.92	Papa John's	4.12	BSD	3
CHINA TELECOM	6.62	SANYUAN	5.9	TAIJI GROUP	4.06	TENHONG LAND	3
Dachan	6.6	MERCURY	5.9	TOPRAYSOLAR	4.02	SunnyWorld	3
WINNER	6.6	Uni-president	5.82	HY PROPERTY	4	Sunriver	3
SC Johnson	6.58	MERIDA	5.82	Dongdu International	4	Liby	2.92
DAPHNE INT''L	6.56	ANTAI GROUP	5.8	Peacebird	4	DFAC	2.92
OPPLE	6.54	YADEA	5.8	Joyi	3.96	MARY KAY	2.9

Brand	Score	Brand	Score	Brand	Score	Brand	Score
JOYOUNG	2.8	Mothercare	1.8	CP	0.4	BEAR	0
KONKA GROUP	2.76	Pacific Coffee	1.8	Junlebao	0	Jimei	0
FIRST	2.76	HENGLIN	1.7	MEIZU	0	Feidiao	0
WXTJ	2.7	THREE SQUIRRELS	1.64	Dicos	0	Macro	0
LONKEY	2.68	METERSBONWE	1.56	FJMOTOR	0	DIDI BIKE	0
AIMA	2.58	Nature Home	1.52	SENLI BEER	0	DAJA	0
Aimer	2.5	ZHONGLI SCI-TECH	1.5	QINGYUAN	0	YURUN	0
TRT	2.46	GOLDEN THROAT	1.24	wondersun	0	HONGBAOLAI	0
Wahaha	2.44	Royalstar	1.16	Huishan	0	SHUITA	0
GREE	2.38	K-BOXING	1.12	Pechoin	0	Synear	0
YIBIN PAPER	2.3	Nice	1.04	Chando	0	Micoe	0
ACHT	2.3	Xifeng	1	Hanhoo	0	BATTLE	0
CNSIC	2.28	CST Tires	1	Unifon	0	LUYUAN	0
GITI TIRE	2.26	Greenland Holdings	1	TIANYOU	0	TAILG	0
CR Vanguard	2.24	TALESUN	0.96	Tranlin	0	SLANE	0
TIANDA PHARMA	2.24	AOKANG	0.9	XINYA PAPER	0	BYVIN	0
SUNNER	2.2	Baojun	0.8	HONGAN	0	Boloni	0
EGING PV	2.18	Kaimi	0.8	SHUANGDENG	0	Lanju	0
JAC	2.14	YINGE	0.8	HPEACE DAIRY	0	Hozonauto	0
BAOXINIAO	2.14	VEKEN	0.8	GAEA GEM	0	WM Motor	0
AUX	2.1	Orchard Farmer	0.72	Oishi	0	Luckin Coffee	0
GOLD MANTIS	2.06	CLENERGY	0.68	Kingstar Beer	0	Gloria Jean's Coffees	0
SEPTWOLVES	2.06	SUNRAIN	0.64	EuroGroup	0	HAOYUE	0
JINKO POWER	2.06	BEINGMATE	0.6	lepur	0	JINQIAO GROUP	0
LMZ	2.02	AKCOME	0.56	ZC Rubber	0	JIAWEI ENERGY	0
ASD	2.02	HOYUAN	0.56	Coconut Palm Group	0	JSQJ	0
TOREAD	2	Whitecat	0.52	Panpan Foods	0	JINCHEN	0
XINRI E-VEHICLE	2	Huiyuan Juice	0.52	Be & Cheery	0		
PAK	1.96	Galanz	0.52	Ruchen	0		
SHANSHAN	1.92	AUPU	0.52	DaAi City	0		
DARE POWER DEKOR	1.9	BESTORE	0.44	LAO GAN MA	0		

About IPE

The Institute of Public & Environmental Affairs (IPE) is a non-profit environmental organization based in Beijing, China. Since its establishment in 2006, IPE has developed and operated the Blue Map Database (wwwen.ipe.org.cn), and launched the Blue Map app in 2014, promoting environmental information disclosure, facilitating green supply chain and green finance, empowering the green transition and low carbon development of enterprises, and boosting multi-stakeholder participation in environmental governance.

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Disclaimer

Note

1. This round of evaluation was performed from October 1, 2022, to September 30, 2023;
2. The information used for evaluation was obtained from official websites of corporations; annual reports, corporate social responsibility (CSR) reports, environmental, social, and governance (ESG) reports, and other regular reports; information published through public channels such as official websites; data published by credible sources and collected by the Blue Map database; and responses to CDP climate change questionnaires, which are publicly disclosed by companies.
3. Quotes from some brands have been translated by IPE for reference purposes only. If any questions arise related to the accuracy of the information contained in the translation, please refer to the original documents published by the brands.
4. If there are any discrepancies between the English and Chinese versions of this report, please refer to the Chinese version, which is the official version of the report.

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