中国银河证券
CHINA GALAXY SECURITIES

國際金融論壇
INTERNATIONAL FINANCE FORUM

Global Sustainable Investment Index Report

July, 2025

2025

國際金融論壇
INTERNATIONAL FINANCE FORUM
Since 2003

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1. International Financial Strategic Dialogue Platform
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Strategic Objectives

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A Time for reflection, a call to action

As we commemorate the 10th anniversary of the United Nations Sustainable Development Goals it is an opportune moment to reflect on the significant strides humanity has made—and the challenges that persist. The goals, adopted in 2015, were a bold vision to end poverty, protect the planet, and ensure prosperity for all by 2030. While the journey has been far from smooth, the global community has demonstrated remarkable resilience and innovation.

A key factor in this progress has been the rise of green finance, a transformative force that is reshaping economies and driving sustainable development worldwide. In 2024, aligned Green Social Sustainable+ issuance increased to over a trillion dollars, reflecting the growing demand for investments that align with environmental objectives. Financial institutions, corporations, and governments are increasingly recognizing that sustainability is not just a moral imperative but also a sound business strategy. Companies that prioritize Environmental, Social and Governance principles has demonstrated superior performance, proving that environmental responsibility and financial success are not mutually exclusive. There is not a choice between ecology and economy. We can improve both.

As we look into the future, it is clear that the world is at a crossroads, and the choices we make today will determine the future of our planet. Green finance must play an even greater role in driving the transition to a sustainable economy. Governments need to create enabling environments through policies and regulations that incentivize green investment. Financial institutions must integrate green and social principles into their core operations, and businesses must embrace sustainability as a strategic priority.

China has been a leader in this transformation. It is now the world's largest issuer of green bonds, with its financial markets playing a pivotal role in funding renewable energy projects, green infrastructure, and sustainable urban development. China has also increasingly incorporated green principles into its Belt and Road projects, ensuring that infrastructure development in Asia, Africa, and beyond is both sustainable and inclusive. Belt and Road has been turned into the world's largest green investment initiative. China's experience investing in electric cars and batteries, in solar and other renewable technologies has demonstrated that sustainable development is not a zero-sum game. By investing in green technologies and infrastructure, we can create new industries, generate employment, and improve quality of life while protecting the environment. The challenge lies in expanding these efforts and replicating them on a global scale.

The 10th anniversary of the Sustainable Development Goals is not just a time for reflection; it is a call to action. We have the tools, the knowledge, and the resources to achieve our ambitions but we need the political will and collective effort to make it happen. Green finance is a powerful tool in this endeavor. The topic cannot be overstated, it requires sustained attention, persistent tracking, and ongoing evaluation and reflection. These imperatives drive the creation of this report.

The report is made possible by the joint effort of the International Finance Forum and the China Galaxy Securities. By reviewing the global and Chinese efforts and achievements during the past decade, it has introduced an original evaluation framework comprising 28 indicators to systematically assess the progress of green finance development across nations. It has provided a comparative ranking of countries' green finance performance and has identified key trends, gaps, and success stories. Building on these insights, the report has also concluded with actionable policy recommendations to accelerate sustainable development and enhance global cooperation for a greener, more resilient future. It has also demonstrated that China's leadership in green finance and sustainable development offers a model for the global community, and by collaborating, it is possible that we can create a prosperous, equitable, and sustainable future.

The time to act is now. Let us seize this opportunity and transform the next decade into one of hope. The future is not something we adopt, but something we create.

Let us create a future we can be proud of.

Erik Solheim
IFF Vice Chairman
Former Under-Secretary-General of the United Nations
Former Executive Director of the UN Environment Programme

Future Forged Now

In the face of unprecedented economic, political, and climate complexities reshaping the global landscape, we have reached a pivotal moment: sustainable development is no longer an idealistic notion but an urgent necessity. With just 17% of UN Sustainable Development Goals on target and a $9 trillion climate financing shortfall, we must cut through illusions with solid data, chart true global contours, and delineate progress and deficiencies across nations.

Responding to this imperative, the International Finance Forum (IFF) and China Galaxy Securities (CGS) have formed the Global Sustainable Development Research Project task force. This joint initiative culminates in this Global Sustainable Investment Index Report—a comprehensive analysis offering critical insights and actionable pathways for policymakers, financial institutions, and enterprises worldwide.

The Report consists of three chapters.

Chapter One tracks the global and Chinese sustainability journey over the past decade and the compounding challenges confronting it: fragmenting economic systems, intensifying geopolitical friction, and a widening climate financing gap. Crucially, it positions sustainability as the essential strategic anchor in this era of transformation.

Chapter Two identifies four major trends via our proprietary Global Sustainable Investment Index. This innovative framework—evaluating 33 economies across Sustainability Capacity, Quality, and Transitional Support—reveals structural shifts often overlooked by traditional metrics while highlighting emerging opportunities. Our research reveals accelerating global sustainable investment, particularly in Asia-Pacific markets, where clean energy transitions and technological innovation counterbalance environmental challenges. Stronger policy commitments and expanding green finance ecosystems further drive this momentum.

Chapter Three proposes four integrated pathways to advance sustainable investment globally: optimizing policy-market alignment, strengthening regional experimentation through international cooperation, catalyzing green technology advancement, and mobilizing long-term capital for transformation—each supported by specific measures and recommendations.

As a lifelong practitioner in global economic governance, I appreciate how this report transcends static rankings to reveal the drivers advancing sustainability. The green transition is not a "tournament" but a shared "commitment" to humanity's future. May it inspire bolder policy innovation, capital mobilization, and technological collaboration—for our true legacy lies not in rankings, but in learning from and strengthening the global ecosystem.

At this critical juncture, I would like to commend this report to global leaders and researchers. Beyond identifying challenges, it offers actionable policy solutions—from benchmarking and regional pilots to technological innovation. Breakthroughs for deadlocked negotiations, like Azerbaijan's COP29 emissions stalemate, may well lie within initiatives showcased in this report.

The future hinges on the choices we make today. Sustainable development is not a cost, it is humanity's most vital investment. With every step forward, we shape the legacy of this shared planet.

Lin Jianhai
Executive Vice Chairman, IFF
Former Secretary of the IMF

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Chapter 1

A Certain Choice in an Era of Uncertainty: Global Sustainable Development

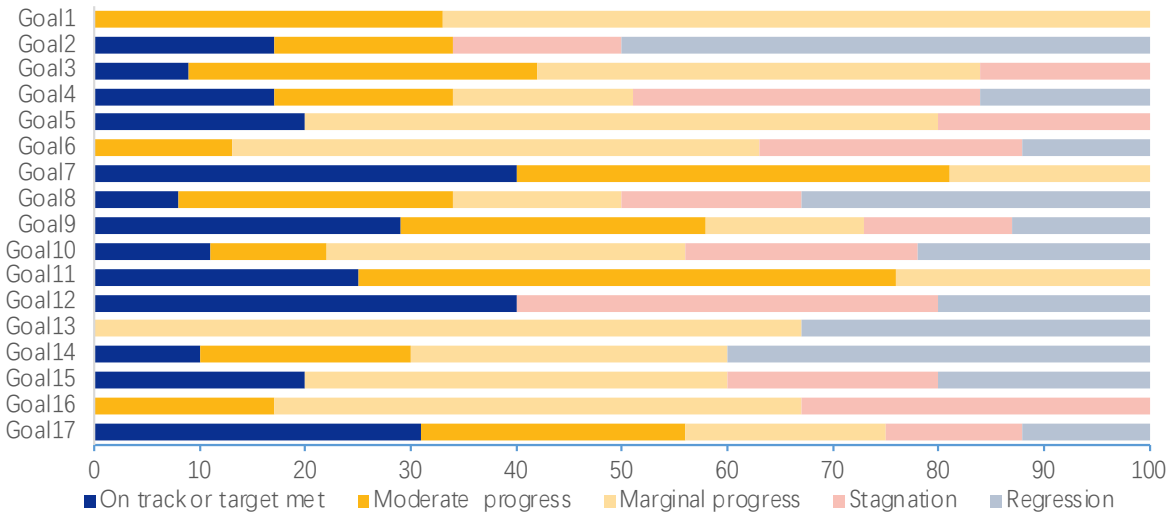
The world now stands at a pivotal moment of the "transition decade", and the global economies, politics and climate all face complex environments and new challenges. Against this backdrop, countries urgently need to work together to make fundamental shifts to accelerate progress toward the SDGs and ensure a just, equitable and sustainable future for all amid uncertainty.

1.1 A decade development of the SDGs

Since the adoption of the 2030 Agenda for Sustainable Development ("2023 Agenda") by the United Nations in 2015, global efforts around 17 Sustainable Development Goals (SDGs) have unfolded across multiple levels. Over this decade, countries have made breakthroughs in policy frameworks, technological innovation, energy structure transformation, and green products. Yet the progress is still slow and lags behind the 2030 Agenda's timeline, with actions still falling short of the SDGs' ambition. The accelerated process will continue to face challenges in the future, and international cooperation must be strengthened to forge a future for sustainable development.

1.1.1 Global progress to the SDGs

While the SDGs advancement continues, urgent acceleration is needed. According to the UN's The Global Sustainable Development Goals Report 2024,



Source: Sustainable Development Report 2024

Figure 1.1: Progress assessment for the 17 Goals based on assessed targets, by Goal (percentage)

the world is "severely off track" to realize the 2030 Agenda. Of the 135 targets with available trend data and custodian agency analyses, only 17% display "progress sufficient" for achievement by 2030. Nearly half (48%) of targets exhibit "moderate to severe deviations" from the desired trajectory. This underscores urgent need for intensified efforts to put the SDGs on curse. In addition, over one third of the targets indicate "stagnation and even regression".

Countries have made breakthroughs in policy frameworks, technological innovation, energy structure transformation, and green products

At the policy level, the UN launched the "Decade of Action" in 2019, overwhelmingly adopted the Pact for the Future in the "Summit of the Future 2024", which outlined 56 commitments to reform the global financial architecture and accelerate the implementation of the SDGs, and slated for execution during the 2025 High-Level Political Forum (HLPF). Internationally, sustainable standard-setting has achieved steady progress, with EU nations leading policy development and the Asia-Pacific region rapidly advancing the formulation of green-related polices. Overall, major economies have largely established robust sustainability legal frameworks, the focus now shifts to enforcement and funding mobilization as critical success factors.

At the technological innovation and energy structure transition level, rapid technological innovation worldwide and the emergence of new industries are reshaping the global industrial chain. Technological changes in artificial intelligence (AI), biotechnology, and new energy have driven the high-quality development of the global economy and continuous improvement in economic resilience. In terms of green transition, the dual engines of green and digital technologies have accelerated global sustainability transitions. Over the past decade, the global energy structure has undergone tremendous changes, with clean energy's share consistently rising.

At the green finance level, sustainable financial products are scaling rapidly, with global sustainable investment assets growing annually and carbon markets gaining momentum. Diverse sustainability-linked products are being rolled out worldwide. In general, capital markets are structurally tilting to sustainability agendas, particularly in Asia, where green finance is booming.

1.1.2 China's progress to the SDGs

China has made critical progress in sustainable development

Despite numerous difficulties and challenges, China has actively responded to the UN's call since the UNDP's 17 Sustainable Development Goals (SDGs). Although the overall SDGs process has faced setbacks, China has made significant strikes in the evaluation of Global Sustainable Development Report 2023, scoring 70.85 points (out of 100) on the SDG composite index. Notably, China has achieved expected outcomes in ensuring No Poverty (Goal 1) and Quality Education (Goal 4), while also making breakthroughs in Industry, Innovation and Infrastructure (Goal 9) and public health services.

In terms of policies, China has elevated carbon emission reduction and pollution control to a national strategic level. In 2020, China pledged to peak carbon emissions by 2030 and reach carbon neutrality by 2060 (the "Dual Carbon" goals). In March 2021, the central government issued the 14th Five-Year Plan (2021-2025) for National Economic and Social Development and the Long-Range Objectives Through the Year 2035, establishing a consistent policy framework from the central to local levels and forming a societal consensus. In 2024, China had achieved significant progress in the development of domestic ESG policies, establishing a multi-tiered framework involving "central government - central ministries - financial regulatory agencies - local governments" in terms of policy issuers. In terms of environmental improvement and energy restructuring, from 2013 to 2023, the central government's cumulative investment in ecological and environmental protection exceeded RMB1 trillion. China's renewable energy capacity is growing rapidly, with the proportion of non-fossil energy in primary energy consumption rising from about 12% (2015) to 17.9% (2023). In terms of green finance, in recent

years, the China has positioned green finance as a core strategic tool for high-quality economic development and low-carbon transition. The green finance market represented by green bonds, loans, insurance and other innovative financial instruments is flourishing, leading the structural transformation of China's capital market.

China's practices in Green & Growth

Since the adoption of the SDGs a decade ago, China's efforts and achievements in sustainable development have demonstrated that Green & Growth can advance hand-in-hand. Since its reform and opening-up, China's economy first underwent decades of rapid growth under an investment- and export-driven growth model. This phase significantly enhanced the comprehensive national strength, greatly improved the living standards of hundreds of millions of people, improved infrastructure, accelerated industrialization and lifted millions out of poverty. Objectively, this "growth first" model is the inevitable choice for a particular stage of development to a large extent. However, with China's rise to the forefront of the global economy and its profound changes in development foundation and environmental conditions, the environmental carrying capacity neared its limits, the marginal benefit diminished under traditional development model, and its adverse effects continued to intensify. Therefore, the core objective of the current development stage has shifted from pursuing speed to prioritizing high-quality and sustainable growth. Economic policies must undergo profound realignment, resolutely transitioning toward a high-quality, sustainable development path characterized by innovation-driven growth, green and low-carbon practices, structural optimization, and inclusive shared benefits.

China's pioneering efforts in sustainable development deserve full recognition, as they have not only provided valuable experience for less developed regions worldwide, but also accumulated critical technologies and resources for future development. The "grow first, clean up later" development model represents a path with prohibitively high environment costs, but it is by no means an inevitable route that other underdeveloped regions must follow. The funds, experience, technologies and more economical and clean energy accumulated through China's four decades of reform and opening-up have provided more sustainable development options available to underdeveloped regions such as Africa. China's sustainable development experience provides a broad possibility for relatively backward regions to reach the SDGs at lower environmental costs.

A clear understanding of development stages is paramount. China's practical experience profoundly illustrates that development priorities must align with socioeconomic stages. During periods of extreme poverty and initial industrialization, the focus on economic growth and foundational development possesses undeniable rationale. However, as development enters new phases with substantially enhanced material foundations and elevated public demands, timely transition toward more balanced, inclusive and sustainable development models becomes imperative. This transition does not negate past approaches, but rather follows the spiral ascent of development principles. China's current developmental achievements stand as compelling evidence for both the validity and feasibility of the UN's SDGs.

1.2 A sustainable future: the imperative choice amid global complexities

At the convergence of technological singularity and institutional transformation, globalization is undergoing a dual test of structural fragmentation and paradigm reconstructing. Currently, the widening global wealth gap, surging anti-globalization sentiments, the COVID-19 pandemic aftershocks and intensified geopolitical conflicts collectively pose three major challenges to economic sustainable development worldwide: 1) global economic fragmentation; 2) the normalization of geopolitical conflicts; and 3) a vicious cycle of debt and climate rises. Against this backdrop, advancing sustainable development has become the definitive choice for addressing uncertainties, offering a pragmatic pathway to revitalize the world economy.

1.2.1 Three significant challenges to global economic sustainability

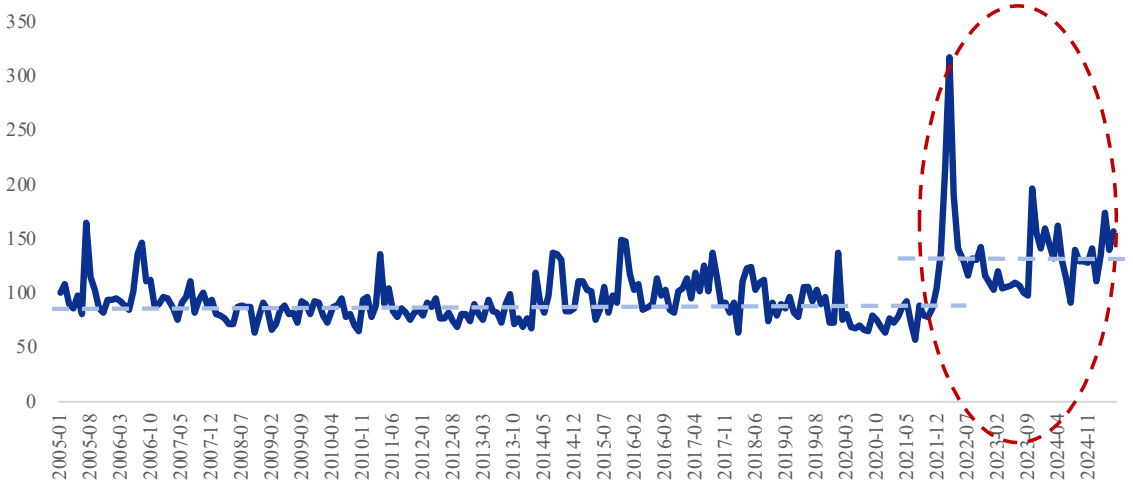
The global economy is experiencing sluggish growth with fragmentation

Persistent geopolitical turbulence continues to weigh on global economic growth and trade activities. According to the latest UN estimates, global economic growth is projected to decelerate from 2.9% in 2024 to 2.4% in 2025, with countries facing multiple challenges such as export declines, falling commodity prices, tightening financial conditions and mounting debt burdens. Financial market volatility, exchange rate fluctuations, capital flight and other problems are frequent, while risks in international trade and investment continue to escalate. The UN forecasts international trade growth will sharply slow from 3.3% in 2024 to 1.6% in 2025, with global investment growth remaining sluggish.

Concurrently, regional restructuring and fragmentation of global value chains have become pronounced. Trade conflicts between major economies have prompted many widespread reassessments of supply chain security, driving more countries and corporates to reduce their dependence on a single market and to strengthen autonomy and industrial security. Global supply chains may be divided into multiple parallel trading systems to form regionalized trading architectures. The "decentralization" trend in the global industrial chain will accelerate, particularly for smaller economies that reliant on a single market to realign their economic strategies and industrial chain planning according to great-power dynamics.

The world simultaneously confronts intensifying geopolitical risks and political landscape transformation

On the one hand, escalating regional conflicts and tensions including the Russia-Ukraine war, the Israel-Palestine conflict, and the Red Sea crisis has generated widespread disruptions to global energy and trade security, supply chains and financial system stability. The Global Geopolitical Risk Index has risen significantly since 2022. The Russia-Ukraine conflict triggered explosive price surges for related metal raw materials, which had led to a realignment of critical mineral supply chain and industrial chain towards geographically or ideologically aligned regions/blocs, intensifying the trend of bloc-based competition. The Israel-Palestine conflict has affected the oil supply and price, further increasing production costs globally, and leading to rising inflationary pressures in several economies. The Red Sea crisis has elevated trade costs, and poor shipping lanes have jeopardized corporate supply chains, resulting in losses to many businesses. It also distorted global grain trade flows, particularly affecting EU and Black Sea grain exports to Asia and East Africa via the



Source: Wind

Figure 1.2: Global Geopolitical Risk Index

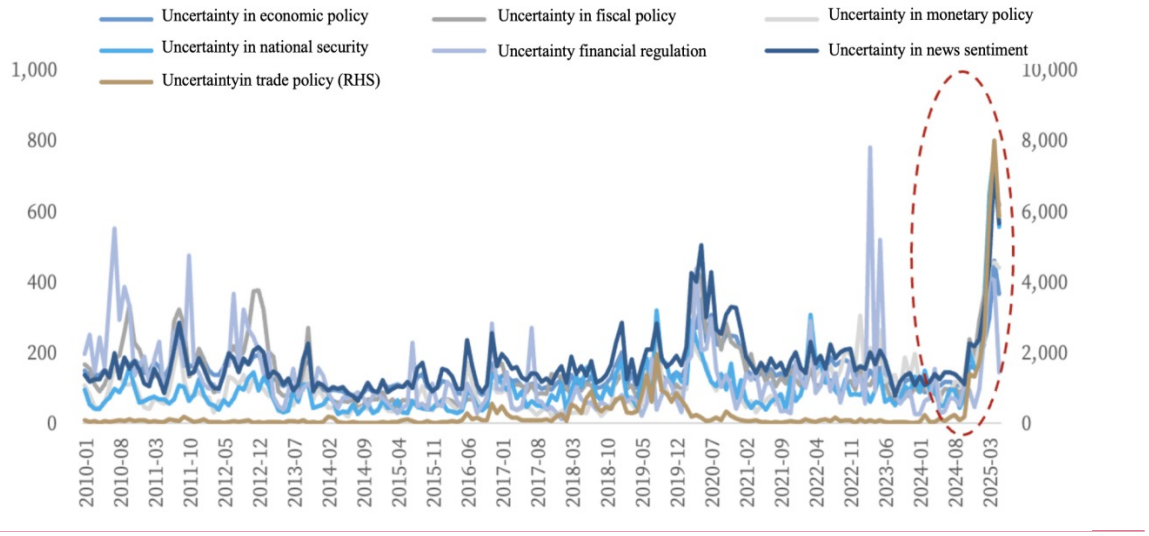
Red Sea route, and heightening global food security concerns.

On the other hand, America's political shift toward unilateralism and isolationism - particularly under the Trump administration - is dramatically reshaping global political-economy architecture. Trump's trade protectionism policies and techo-nationalism have significantly impeded globalization, with escalating policy uncertainty and its spillover effects becoming major risk amplifiers. The US Trade Policy Uncertainty Index has soared since 2025. Moreover, US's persistent obstruction of international cooperation mechanisms - having withdrawn from over 10 international organizations and agreements since 2017, including the Paris Agreement, the United Nations Educational, Scientific and Cultural Organization (UNESCO), the Iran Nuclear Agreement, and the World Health Organization (WHO) - epitomized its unilateral foreign policy approach. As US politics turns downward, multi-polarization lacks a consensual governance framework, and geo-economic confrontation could raise the risk of a global recession.

ESG backlash coupled with sovereign debt pressure may widen green financing gap, exacerbating climate risks

The long-term climate goals of the Paris Agreement call for holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C. The Agreement also necessitates a 45% reduction in emissions by 2030 and achieving net-zero by 2050. According to the World Economic Forum, to achieve these goals, global annual financing (including climate mitigation and adaptation, and industry decarbonization) for net-zero transition needs to increase sevenfold, with the annual global climate financing needs expecting to increase to USD9 trillion by 2030 [1]. Constrained by political and regulatory uncertainties, insufficient public funding, limited private sector engagement and fragmented financial services, the widening climate financing gap has become a key bottleneck in global climate governance.

The international anti-ESG campaign has picked up in recent years, with notable cases including the UK government's announcement in 2023 to delay the implementation of several net-zero emissions policies, the US's withdrawal from the Paris Agreement, etc. The primary reason for this trend is the growing anxiety among stakeholders at all level over short-term financial returns in the context of the rise of political polarization and conservatism, and economic growth slowdown, the main actors at all levels of anxiety about short-term financial returns. It is worth noting that this anti-ESG wave has materially hindered the global green transition process, delayed the achievement of



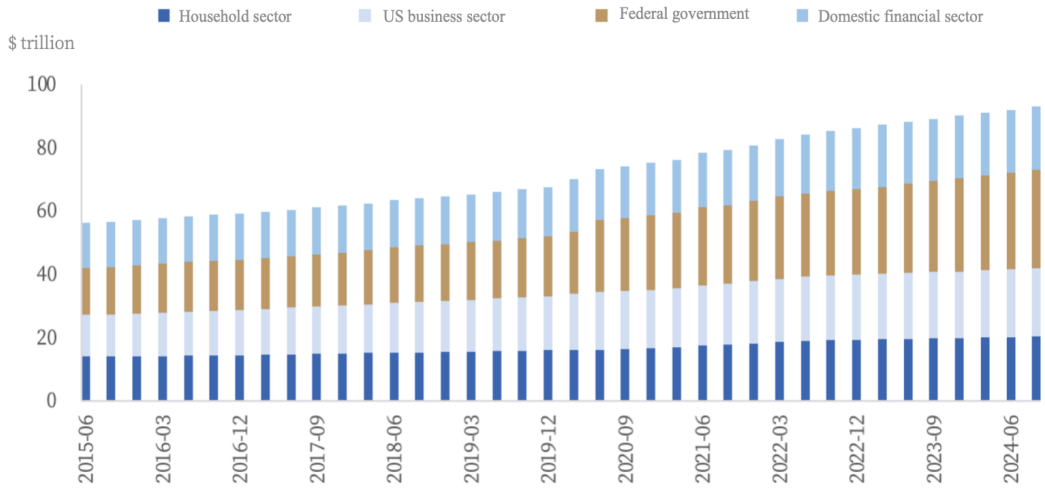
Source: Wind

Figure 1.3: Economic Policy Uncertainty Index for United States

1 Bridging the Gap: How to Finance Net-Zero Transition, World Economic Forum, January 2025.

worldwide emission reduction targets, undermined the trust foundation for multilateral cooperation, affected capital markets' broad consensus on ESG, and formed a key constraint to green finance.

Meanwhile, sovereign debt pressure has also become a driver for squeezing public spending on climate governance and widening the green funding gap. The COVID-19 outbreak in 2019 hit fiscal spending in most global economies, compounding the prolonged high-interest-rate environment led by the U.S. since 2020 and the relatively sluggish global economic recovery, macro leverage ratios across economies may have reached a very highly challenging level, for example, by the end of 2024, the outstanding debt balance of U.S. non-financial sector reached USD76.7 trillion, with federal government debt expanding rapidly after the pandemic in 2019 to a record high of USD31.6 trillion, reaching a record high of USD31.6 trillion. As debt level rise, interest payments grow increasingly burdensome, and the cost of debt servicing may reduce the space of climate-related public spending through fiscal squeeze-out effect, exacerbating climate risks and ultimately creating a dual crisis of debt and climate.



Source: Wind, CGS RESEARCH

Figure 1.4: The outstanding debt balance in the U.S. credit market

1.2.2 Sustainable development is a certain path in uncertain times

The urgency to address major global risks has further intensified. The World Economic Forum's Global Risk Report 2025 reveals that interstate armed conflicts rank first, which have held the position of the global long-term risk for four consecutive years, followed by extreme weather events, and geo-economic confrontations rank third. These three core risks collectively account for 45% of global risk perceptions. Among the top ten risks, environmental risks occupy five spots, including extreme weather events, biodiversity loss, significant changes to Earth systems, natural resource shortages, and pollution.

However, current progress toward global SDGs has significantly lagged behind targets. As the aforesaid, the UN's The Sustainable Development Goals Report 2024 indicates slow progress toward achieving the SDGs. The main reason is that nations only agree on certain issues, and resource allocation and critical commitments to support developing countries remain insufficient. This underscores a striking feature of current multilateral governance: "rule-making preceding enforcement mechanisms", which will serve as a critical window to test whether countries can transform their governance commitments into substantive actions in the next two years.

On the positive side, global sustainability-related investments have demonstrated remarkable resilient. Despite the Federal Reserve's persistently high-interest rate policy, frequent regional conflicts and volatile

energy prices, capital markets have ratcheted up their recognition of green value against the odds. Over 45% of new funds in Europe and Canada are sustainability-themed, while ESG investment products in Asia experienced explosive growth. Green bonds and transition financial instruments expanded in China, Japan and Singapore, underscoring that capital now views sustainability as a core strategy for hedging structural risks and securing long-term stable returns.

The current landscape of multiple disruptions has fundamentally reshaped the strategic positioning of sustainable development. Although the environmental crisis data reveal that the ecological red line is approached and governance gaps highlight delayed action, the capital allocation against the trend confirms that sustainable development has become the core strategic pivot for building national economic resilience, ensuring energy security, and maintaining supply chain controllability. The pressing global challenges today are further elevating the priority of the sustainability agenda.

1.3 The need to improve sustainable investment framework

Against the backdrop where sustainable development has become a global consensus and a core strategy for countries, the scientific assessment of their sustainability performance and precise identification of development trajectories constitute a critical operational link in effectively advancing the SDGs worldwide. In this context, systematically evaluating the different priorities of existing evaluation frameworks across key dimension settings and optimizing sustainable investment decisions based on existing frameworks hold significant implications for constructing a market-credible national sustainable development index, which can be used to optimize global sustainable capital flows, improve resource allocation efficiency, and accelerate the transformation process of sustainable development.

Divergence and commonalities in domestic and international sustainable development indicator system

Globally, the indicator systems for evaluating the sustainable development of countries and regions exhibit considerable diversity, with distinct focuses on core dimensions. International ESG evaluation systems, such as MSCI's ESG Ratings for governments and Robeco's Country Sustainability Ranking, emphasize detailed assessments of traditional non-financial risks, namely environmental, social, and governance (ESG), and incorporate up to 40 indicators to evaluate national ESG performance.

Beyond traditional ESG evaluation that focus on non-financial risks, numerous international investment institutions and research organizations have developed evaluation frameworks emphasizing sustainability alignment. For instance, Morningstar's Sustainability Rating evaluates not only corporates' ESG risks but also measures alignment with the SDGs through indicators like carbon footprint intensity and labor rights and benefits safeguards. China's Green Development Indicator System, developed by authoritative bodies including the National Development and Reform Commission (NDRC), Beijing Normal University, and Renmin University of China, focuses on region-specific green development outcomes. Its core indicators are used to quantify resource utilization efficiency, environmental protection performance, and ecological infrastructure development. These objective-oriented evaluation systems transcend risk warnings to emphasize proactive contributions of enterprises and countries in promoting green transition and social equity, offering a multi-perspective approach for global sustainability evaluation.

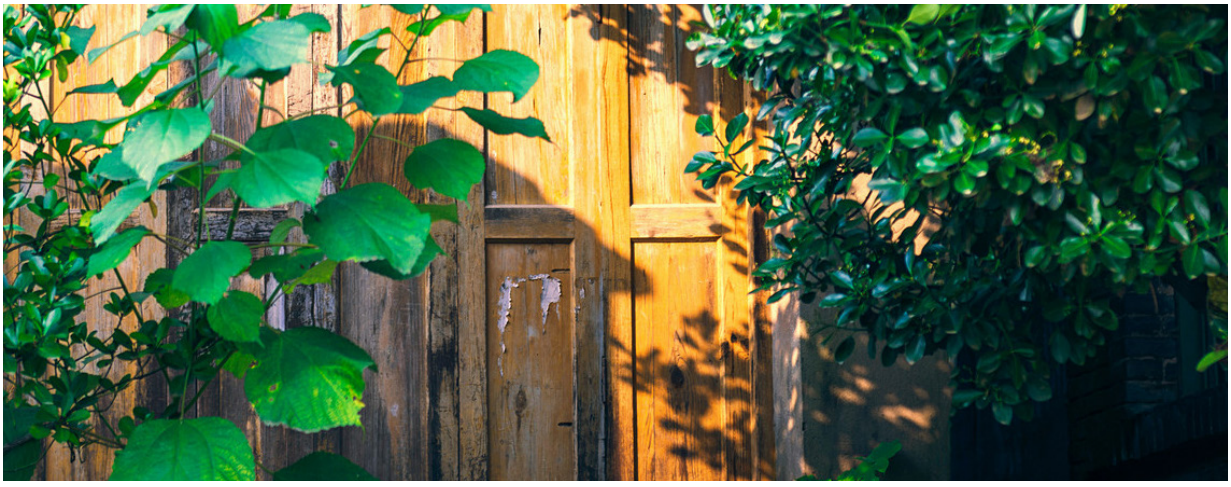
Differing priorities in key dimension coverage across existing systems

A notable divergence among assessing methodologies lies in their inclusion of specific driving factors. Most international mainstream assessment systems, including comprehensive ESG frameworks, provide relatively limited coverage of green financial system development and its dynamic potential. While they may include some financial policy indicators related to environmental governance, there is room for coverage of such dimensions as green capital market liquidity, the depth of green financial instrument adoption and

the acceleration effects from technological disruption. Additionally, existing systems rely more on static indicators measuring stock conditions, making it challenging to identify regions excelling in achieving sustainable development through technological innovation and rapid industrialization. For instance, Asian countries' outstanding performance in renewable energy capacity expansion and new energy vehicle industry chain often remains underrepresented in conventional assessments.

Innovative indicators integrating green finance with dynamic developments

On the basis of the different priorities of existing systems, this study will introduce a structural innovation to sustainability indicator systems. With the core objectives of improving capital efficiency and enhancing global policy implementation, we have developed a new framework integrating institutional support and transformation momentum in the following chapter. The institutional support focuses on assessing green finance depth and policy responsiveness, while the transformation momentum focuses on assessing innovation iteration and development resilience. The indicator system aims to establish a national sustainable development assessment tool with international comparability and investment decision support, offering new analytical perspective and practical reference for global long-term capital.



Chapter 2

Four Major Trends in Global Sustainable Investments

As discussed in the previous chapter, a sustainable future is an inevitable choice amid global complexities. Against this backdrop, the global sustainable investment is currently experiencing vigorous growth, reflected across dimensions including resource utilization efficiency, economic transition, policy support, financial market shift and international cooperation. To better assess global and regional sustainability carrying capacities, economic sustainability quality and green transition support level, this chapter introduces the Global Sustainable Investment Index from sustainability, investment and development perspectives. The index builds upon internationally recognized authoritative indicator systems, encompassing national-level environmental, social, and governance (ESG) performance while introducing additional indicators such as economic quality and sustainable products. This design ensures the overall indicator framework aligns more closely with real-world investment practices. At the same time, our results are presented through time-series investment trends and cross-country rankings at specific timepoints to explore global sustainability trajectories and countries' sustainability performance and to provide insights and supports for policymaking and portfolio selection.

2.1 Global Sustainable Investment Index (GSII)

This chapter introduces the compilation method for Global Sustainable Investment Index (GSII), jointly developed by the International Finance Forum (IFF) and China Galaxy Securities Research Institute. The GSII is a quantitative indicator designed to measure country-level sustainable development and investment performance through systematic research and data collection. It aims to provide policymakers, financial practitioners, businesses, academics and other stakeholders with relevant information on global sustainable development to support policy making and business decisions.

2.1.1 GSII methodologies, principles and coverage

Innovative points

The GSII established in this chapter is based on extensive prior research and data accumulation. By integrating internationally authoritative indicator frameworks, it constructs a scientifically indicator system to reflect global sustainable investment performance. Compared to existing frameworks, the indicator system focuses on sustainability, development and investment. In addition to covering environmental, social and governance dimensions, it further highlights development progress

and brings relevant indicators such as economic quality and sustainable products, making the indicator more aligned with real-world investment practices. The results are presented through time-series investment trends and cross-sectional country rankings with both vertical and horizontal perspectives, offering a scientific, reasonable and more feasible assessment system for systematic evaluation and advancing sustainable investment.

Indicator principles

The compilation of the GSII adheres to the principles of transparency, completeness, comparability and objectivity. The underlying data are sourced from all official published data by international organizations, policy documents, official agency reports and widely recognized global databases. The indicator design holistically considers the absolute performance level and dynamic changes across countries, as well as multi-dimensional sustainable investment performance, showing its completeness. Most country-level data incorporated in the indicators have better quality and availability, ensuring comparability between countries and time series with unified indicator definitions. Meanwhile, the index strictly follows the data information, conducts objective evaluation of all indicators, and minimizes regional bias to maintain objectivity.

Coverage: countries and timeframe

This indicator system samples include all G20 member countries and 13 non-G20 countries (such as Switzerland, Sweden, Norway, etc.) with exemplary green finance practices and strong data availability. This 33-country cohort enhances the measurement breadth and policy adaptability of the sustainable development. The sampling timeframe is from 2010 to 2024, which can dynamically track the trends in global sustainable development.

2.1.2 GSII construction process

Indicator structure

The GSII is designed with a multi-level structure and consists of four levels of indicators. The level 1 indicators reflect three core aspects of sustainable investment performance, namely sustainability carrying capacity, economic sustainability quality and green transition support level. The global sustainability carrying capacity, as a core dimension in the indicators for measuring the long-term resilience of regional sustainability, comprehensively reflects the resource utilization efficiency, the level of environmental quality, and the robustness of social and governance systems globally and regionally. The economic sustainability quality indicator primarily measures the region's capacity for economic sustainable growth and innovation transition, reflecting the resilience of economic development globally and regionally. The global green transition support level reflects the systematic support for sustainability in terms of policy, market, and international cooperation globally and regionally, demonstrating the efforts and achievements in green transition. The level 2 indicators delve the sustainable investment evaluation into eight core sectors, including resource utilization efficiency, environmental quality, social and governance performance, economic sustainability quality, economic transition, green products, policy & strategy, international role, and so on. The level 3 and level 4 indicators further refine the upper-level indicators respectively, totaling 15 level-3 indicators and 28 level-4 indicators, which are the important components of each dimension.

Data processing

The raw data processing mainly includes missing value imputation, convergence treatment, and fixed-base index construction. For incomplete country/year data, this study mainly adopts mean predication and CAGR-based projection for missing values. Data convergence treatment will be conducted after the missing value imputation is completed. The original indicators cover both positive and negative indicators. Higher values of positive indicators mean better performance and scores, while the opposite is true for negative indicators. Therefore, all negative indicators are directionally adjusted to align with positive indicators. Subsequent standardization is performed using year 2010 as the base year (base value = 100), followed by indicator aggregation.

Value assignment and weight allocation

The indicator system sets up differentiated and targeted value assignment methods based on different indicator types. For quantitative indicators (e.g., carbon dioxide emissions, coal consumption, renewable energy generation, etc.), this study adopts flexible value assignment methods. Some indicators are valued by directly calculating the change rate. For another indicators, firstly convert the quantity into the proportion, then calculate the proportion's change rate, and finally calculate the index. For qualitative indicators (e.g., the system integrity of responsible investment and green financial policy), the study assigns values through selecting key assessment elements and standardized scoring methods, so that they can be quantified and integrated into the evaluation system with quantitative indicators. This paper adopts innovative weighting method to ensure the comparability and uniformity between qualitative and quantitative indicators, which is convenient for comprehensive analysis of sustainable investment status of various countries or regions.

The indicator weight allocation initially adopts equal-weight method. Subsequently, a secondary weight fine-tuning in a scientific and reasonable manner is conducted in combination with each indicator data and their relative importance in achieving the SDGs. The relative contribution and representativeness of each indicator are fully considered to ensure that the weight allocation is scientific and reflects the balance between indicators, so as to avoid the excessive influence of a single indicator on the overall evaluation results.

Indicator aggregation

The ranking of countries above level 4 is weighted sum by the index of sub-indicators. The global index above level 4 is firstly aggregated the correcting country's indicator index according to GDP or population weights, and then weighted sum. The specific indicator aggregation method is as follows:

$$Y_1^{ij} = \sum_{i=1} X_1^{ij} \cdot \beta_j \quad Y_2^{ij} = \sum_{i=1} X_2^{ij} \cdot \beta_j$$

X_1^{ij}、X_2^{ij} represent the aggregated values of the indicator of j for the country of i, which are then aggregated upward by levels.

Moreover, to eliminate dimensional differences, reduce the sensitivity of data indicators to outliers, and better reflect data distribution characteristics, this study applies Z-Score standardized scoring to each level of indicators when aggregating and ranking indicators at level 2 and above.

2.1.3 GSII limitations

The current global sustainable investment system faces several limitations, including insufficient information and relatively subjective qualitative items from some developing economies, varying definitions of green finance across countries, overly macro-level cooperation dimensions, and unified scores that fails to reflect differences in development stages. Moving forward, we will also expand data coverage, refine the measurement of relevant indicators, and continuously optimize the indicator system by incorporating feedback from all sectors.

Table 2.1: Global "Sustainable Investment" Indicator System

Indicators			
Level 1 indicators	**Level 2 indicators**	**Level 3 indicators**	**Level 4 indicators**
Sustainability Carrying Capacity (SCC)	Resource utilization efficiency	Carbon dioxide emissions	Reduction rate of CO_2 emission per GDP
			Reduction rate of CO_2 emissions from fossil fuels
		Energy consumption	Reduction rate of energy consumption per GDP
			Reduction rate of total coal and oil consumption - Index (Coal, oil: combined share of 73%)
			The logarithm of renewable energy power generation
	Environmental quality	Environment and air	Growth rate of forest coverage
			Growth rate of air quality
		Biodiversity	Whether has natural resource protection legislation?
			Whether to sign the Kunming Declaration?
	Society and governance	Society	INFORM Risk Index Forecast-Index
		Governance	Global Rights Index
			Global Freedom Score
Economic Sustainability Quality (ESQ)	Economic growth	Economic growth	GDP growth
			Human Development Index
		Income and population	Gini index
			Life expectancy
			Ageing ratio
	Economic transition	Innovation-driven transition	Growth rate of research and experimental development expenditure
			Growth rate of PCT application per capita
Green Transition Support Level (GTSL)	Green products	Green bond	Growth rate of green bonds issued
			Ratio of green bonds issued to treasury bonds issued
			Growth rate of green bond transaction volume
		Green fund	Whether has green funds issued?
		Carbon finance	Whether has a carbon market?
	Policy and strategy	Green policy	Responsible Investment (4 Parts: the Paris Agreement, the Kyoto Protocol, Equator Principles, Responsible Investment Agency)
			Integrity of green finance policy system
	International role	NGFS	Central Banks and Supervisors Network for Greening the Financial System
		IDFC	International Development Finance Club IDFC Are development banks involved?

2.2 Four major trends in global sustainable investments

In recent years, global sustainable development has demonstrated consistent and rapid advancement. Comprehensive improvements across multiple dimensions, including resource utilization, economic transition, policy support, financial market shift, and international cooperation, have collectively established a positive framework for sustainable development. Global sustainable investment has formed four distinct investment trends: 1) Asia-Pacific region outperforming amid accelerated global sustainable development; 2) Environmental quality dragging down the global SCC annually while energy structural transition standing out, and technology empowering productivity and innovative transition driving high-quality economic development; 3) the GTSL continuing to strengthen, and policies, international cooperation and green markets forming a strong sustainable support.

2.2.1 Asia-Pacific region outperforming amid accelerated global sustainable development

evolved beyond conceptual discussions into extensive and concrete actions. Governments, financial institutions and enterprises worldwide have consistently intensified their efforts to advance sustainability, as reflected in resource utilization, economic transition, policy support, financial market shift and international cooperation.

Global sustainable development is accelerating, the improvement in the GTSL and the ESQ has become the two major pillars of current global sustainability, while the decline in the SCC has become the main drag on the sustainability progress. Figure 2.1 shows changes in the sustainable investment index for 33 representative countries globally as of December 31, 2024. The data reveals that the GSII has maintained a steady and continuous upward trend in recent years, reflecting the deepening of international commitments and actions in sustainable investment. The core driver of this positive trend lies in the GTSL's substantial elevation. Countries have significantly strengthened their support for clean energy, low-carbon technologies, and green products through policy formulation, capital investment and international collaboration, laying the

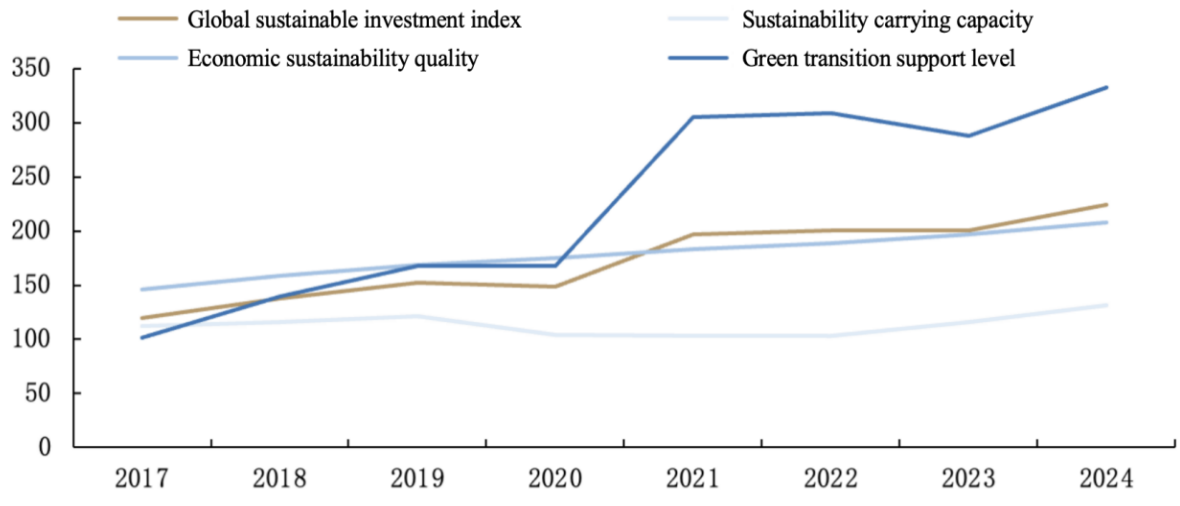


Figure 2.1: Changes in trends of the GSII and level 1 indicators

Global sustainable development continues to accelerate, and improvements in two dimensions form a positive framework for sustainable development.

In recent years, global sustainable development has

foundation for overall green transition. Concurrently, the ESQ has demonstrated year-on-year improvement, primarily manifested through sustainable economic growth and the transition toward low carbon and innovation, indicating that global economic development model is shifting to a more resilient and high-quality direction. However, at the same time, the global SCC,

particularly the decline in its environmental quality dimension, is dragging down the global sustainability process. Against the backdrop of steady global economic growth brining continuous energy consumption and a significant climate funding gap, the overall natural system is still under considerable pressure.

Global consensus on sustainable development is strengthened, with distinct characteristics emerging in sustainable investment evolution.

The global consensus on sustainable development has gradually strengthened, and the concept of sustainability has gradually transitioned from a pioneering idea to a mainstream demand. According to data compiled by Morgan Stanley, as of March 25, 2025, 83% of U.S. respondents and 87% of European respondents expressed their interests in sustainable investments. In terms of growing attention, nearly two-thirds of global investors (~ 65%) have increased their focuses on sustainable investment over the past year. The upward trend in interest is widespread across regions, with over 60% of investors in major markets such as North America, Europe and Asia Pacific reporting a "significant" or "moderate" increase in interest in sustainable investments.

Delving deeper into the motivations behind sustainable investment, we observe two distinct evolutionary pathways, each marked by clear regional characteristics. North American and Asia-Pacific investors are mainly driven by "real-world impact", viewing sustainable investment as a tool to advance energy transition, community development, and other tangible

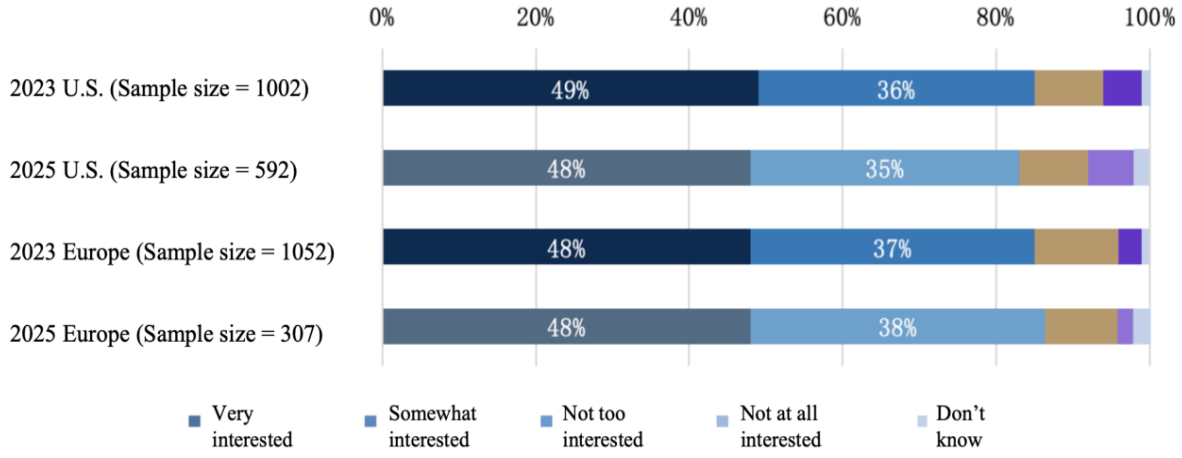


Figure 2.2: Respondents' interest in sustainable development

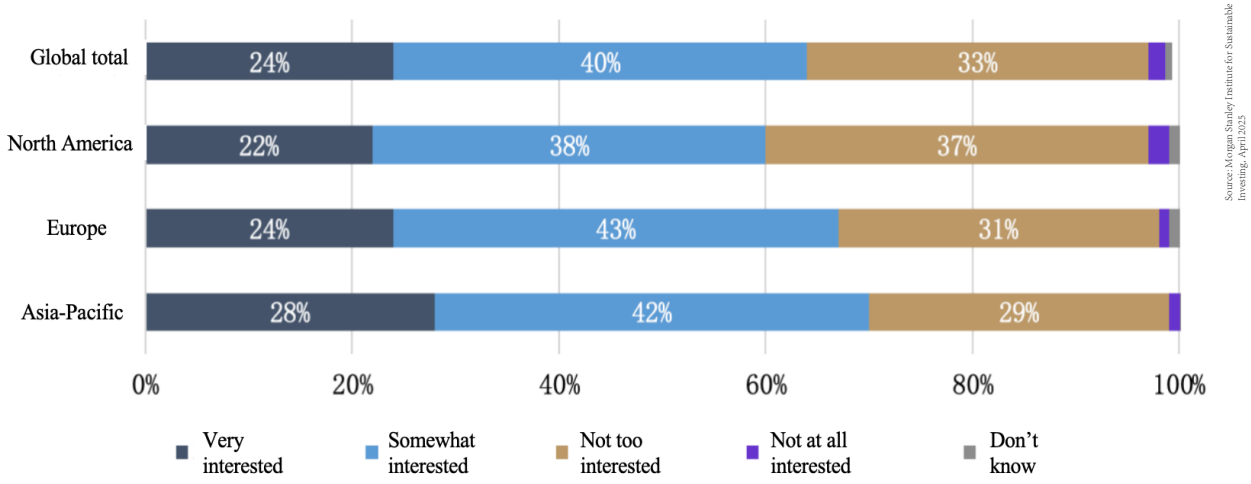


Figure 2.3: Changes in respondents' interest in sustainable development

transformations, that is, participation in public governance through investment behavior, especially in Asia-Pacific region, which has a strong preference for green bonds, impact funds and other tools. European investors, in contrast, are more focused on financial rationality. A striking 40% of respondents explicitly cited "achieving alpha returns" as a core driver, reflecting local mature markets have turned ESG risks into explicit costs, and prompting investors to consider sustainability as necessary to avoid regulatory penalties and capture premium opportunities. ESG factors now fully have been integrated into investment valuation criteria. At the regional level, 88% of global individual investors expressed their interest in sustainable investment, with interest remaining consistently across regions. Asia-Pacific led with 92% ("very" or "somewhat interested"), followed by Europe (88%) and North America (84%).

Sustainable development in the Asia-Pacific region and some emerging economies has been advanced widely.

The global sustainable development process exhibits significant regional divergence, with the Asia-Pacific region and some emerging economies becoming the focus of global sustainable investment due to their strong momentum. According to the 2024 rankings of sustainable investment across 33 countries, China secured the top position, leveraging its comprehensive advantages in green product scale expansion, systematic policy frameworks and economic transition efficiency. Some Asia-Pacific countries, such as South Korea, Thailand and Japan, also ranked among the top ten. While traditional sustainability powers in Europe, such as the UK, Germany, Switzerland etc., maintained strong positions due to their early-mover advantages in environmental carrying capacity and social governance, the overall ranking pattern highlights the rising sustainability momentum in the Asia-Pacific region.

The GSII focuses more on measuring the incremental progress in sustainable transition and economic transition speed across nations for recent years. The Asia-Pacific region's leading performance stems from its explosive "green speed": On the one hand, governments have intensively rolled out industrial support policies to promote large-scale green capacity leaps and exponential growth in green products. On the other hand, the improvement in economic quality brought about by low-carbon manufacturing retrofits, the circular economy adoption, and digital economy integration has significantly improved the growth indicator of "economic sustainability quality". In contrast, Europe maintains its advantages in environmental carrying capacity, social governance, green policy and other existing dimensions, but shows moderated incremental contribution due to steadier transition pacing. The ranking also reveals divergent transition pathways by development stages, with Asia-Pacific realizing outperforming through policy-driven scale expansion, and Europe consolidating sustainable foundations by institutional resilience.

Table 2.2: Global sustainable investment rankings (by country)

Country	Total ranking	Ranking by SCC	Ranking by ESQ	Ranking by GTSL
China	1	23	1	1
UK	2	1	15	18
Thailand	3	22	2	11
South Korea	4	17	10	2
Germany	5	2	27	6
Switzerland	6	5	19	4
Japan	7	15	28	3
Netherlands	8	4	17	12
Turkey	9	26	5	9
Peru	10	13	11	25
Sweden	11	3	23	15
New Zealand	12	9	12	24
Norway	13	12	32	5
Vietnam	14	33	3	30
Indonesia	15	31	4	7
Australia	16	7	22	13
Hungary	17	6	18	28
Chile	18	16	13	21
Saudi Arabia	19	21	8	26
Italy	20	8	30	16
Canada	21	10	24	23
France	22	11	26	19
India	23	30	7	10
Singapore	24	29	9	8
US	25	19	14	20
South Africa	26	14	33	17
Brazil	27	18	20	14
Egypt	28	32	6	29
Argentina	29	20	25	33
Malaysia	30	27	16	31
Mexico	31	24	31	22
Russia	32	25	29	32
Nigeria	33	28	21	27

2.2.2 Environmental quality dragging down the global SCC while energy structural transition standing out

The global SCC continues to decline, showing clear divergence in three indicators.

As a core dimension measuring long-term regional resilience within the indicator system, the SCC reflects resource utilization efficiency, the level of environmental quality and the robustness of social and governance systems. As shown in Figure 2.4, the indicators have shown a downward trend since 2020, with a faster decline in 2020 and 2021 and a stable trend from 2022 to 2024. However, three level-2 indicators exhibit divergence trends. The resource utilization level has entered a rapid upward trajectory since 2022, mainly benefiting from the breakthroughs in energy efficiency from green technology upgrades circular economy commercialization and digital management, which has led to the reduction of global carbon dioxide emissions and the shift from fossil energy to new energy. Conversely, the global environmental quality indicator has shown a downward trend, dragging global sustainability, which mainly due to increased ecological degradation from frequent extreme climate events and reduced global collaboration on biodiversity conservation. The social and governance dimension has maintained a steady and modest rise.

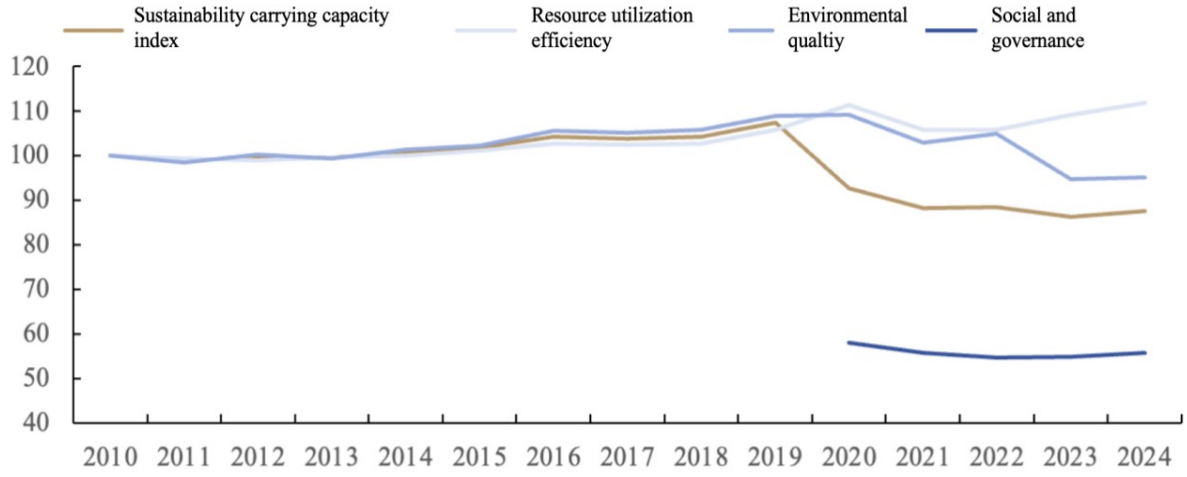


Figure 2.4: Changes in trends of the SCC and its level 2 indicators

The decline in environmental quality is eroding the ecological carrying threshold, and the protection of biodiversity is urgently needed.

Environmental quality, as an important component of ecosystems, determines the stability of ecosystems and the carrying threshold for sustainability. Currently, global environmental quality has shown a significant decline since 2021. Deteriorations in air quality, loss of biodiversity, and soil degradation are further endangering the delicate balance of ecosystems and are collectively dragging down the global sustainable carrying capacity. According to the progress update from UN's The Sustainable Development Goals Report 2024, the global coverage of protected and conserved areas in key biodiversity areas, including oceans, terrestrial freshwater, and mountain regions, has stagnated over the past 20 years. The risk of species extinction continues to worsen, with the overall Red List Index deteriorating by 12% from 1993 to 2024. Against the backdrop of rising global climate risks, the protection of biodiversity is urgently needed.

The decoupling of carbon emission growth and economic expansion deepens, and the efficiency of clean technology emission reduction enters a new stage

In 2024, global fossil energy consumption continued to increase, but the growth rate of emissions lagged significantly behind consumption expansion, high-

lighting intensified "quality-quantity" decoupling. According to IEA data, global coal emissions increased by 0.9% in 2024 (135 metric tons of CO2). Among them, China, India and Southeast Asia saw coal-driven emission rising due to surging power demand and delayed renewable grid integration. Developed economies such as the US and EU achieved demand reduction through accelerated coal-fired plant retirements. For oil, global oil consumption grew 0.8% in 2024, and emissions rose merely 0.3%, demonstrating slower emission growth than consumption expansion.

Energy-related CO2 emissions growth continues to decouple from global economic growth. According to the IEA's Global Energy Review 2025, global energy-related CO2 emissions in 2024 increased marginally by 0.8% (about 300 million tons), far below the economic growth rate of over 3%, marking a deepening decoupling process between carbon emission growth and economic expansion. This trend stems primarily from scaled clean energy substitution, since 2019, accelerated deployment of solar photovoltaics, wind, nuclear, EVs and heat pumps has established annual CO2 reduction capacity of 2.6 billion tons (7% of total global emissions). At present, global emissions reduction has gradually entered the "dual-track development" stage. Developed economies should maintain a deep decoupling rhythm to allow emissions space, and emerging markets need breakthroughs in technology-capital-policy bottlenecks. However, existing clean technologies successfully provide replicable pathways for global carbon peaking. Future priorities should focus on embedding climate resilience into energy system design and addressing development equity conflicts in emerging economies via just transition mechanisms.

Rapid improvement in resource utilization: clean energy accounted for over 80% of the total power generation growth in 2024

Global resource utilization has increased rapidly, with a pronounced structural shift in power generation. According to IEA data, global power generation grew at an unexpectedly high rate of 4% in 2024, exceeding 1200 TWh, and significant outpacing the 2010-2023 average annual growth rate (2.6%), reflecting accelerated electrification worldwide. This growth demonstrated strong sustainability characteristics, as renewables and nuclear power generation dominated with over 80% contribution, up from two-thirds of total growth in 2023. Among them, renewable energy accounted for nearly three-quarters of total generation growth. Solar photovoltaics led the expansion, adding approximately 480TWh in 2024, far surpassing the previous year. The exponential growth rate of "doubling every three years" shows that the current positive cycle of technology iteration and scale effect has gradually formed. In contrast to clean energy outbreak, fossil fuel power generation increased only slightly by 1%, contributing less than 20% to global power generation growth. The output of coal-fired power plants grew by less than 1%, half the growth rate of the previous year, underscoring the structural shifts.

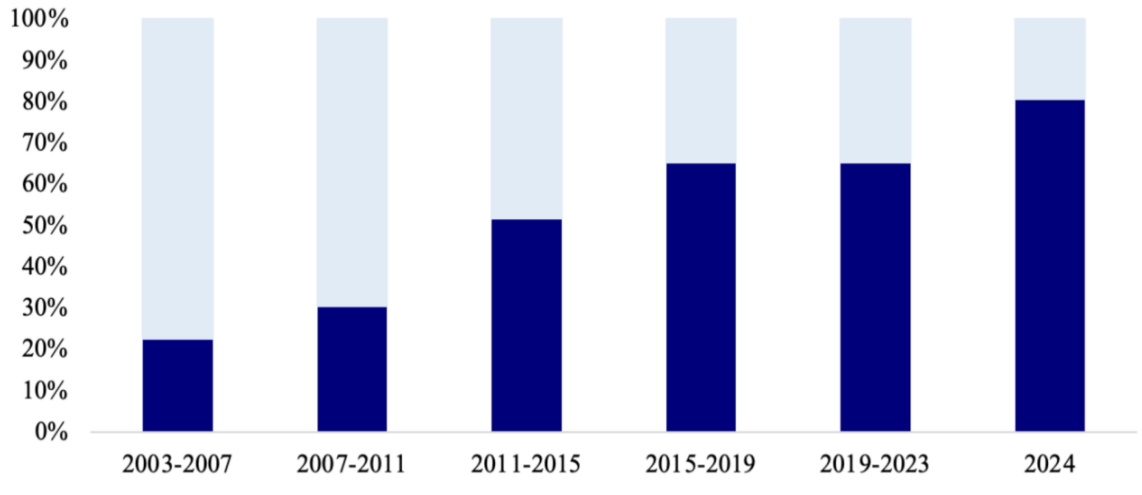


Figure 2.5: Share of increase in global electricity generation (2003-2024)

Case study: Kweichow Moutai achieves 100% green electricity coverage with outstanding low-carbon emission results

Kweichow Moutai has consistently committed to optimizing its energy structure, gradually achieving 100% green electricity coverage in recent years. The company actively develops energy-saving and environmental technologies, formulates carbon emission management plans, and establishes and improves a new power system dominated by renewable energy. In December 2022, Kweichow Moutai completed 30 million kWh of green electricity procurement through China green energy platform and was certified by the National Renewable Energy Information Management Center. A total of 44 million kWh of green electricity was purchased in the year, reducing carbon emissions by 32,930.60 tons. Since then, Kweichow Moutai had improved and established an internal energy management system, accelerated technology research and development to establish an intelligent energy measurement platform, and replaced energy-saving equipment (e.g., 84.8-kVA pilot PV system) to rebuild the enterprise's power system and effectively control the total electricity demand. In 2023, the company achieved full green power coverage in its Moutai and Yixing production bases, cutting 52,297.65 tons of CO2. In 2024, the company launched distillation waste heat recovery technology on the basis of an automated and information-based energy monitoring system, persistently achieving 100% green electricity application. A total of 100 million kWh green power framework agreement was signed within one year, cumulatively reducing 65,231.24 tons of CO2 emissions annually.

Moutai's "coal-to-gas" project achieved an annual carbon dioxide emission reduction of 1.024 million tons. From 2011 to 2014, the company invested RMB190 million to complete the 'coal-to-gas' transformation of its boiler system, fully adopting high-efficiency natural gas condensing boilers. To date, 48 boilers have been installed, annually reducing SO2 emissions of 9,546 tons, NOx emissions of 3,345 tons, while simultaneously eliminating solid waste residue of 28,800 tons. In 2022, the company advanced the application of ultra-low nitrogen technology in gas boilers, further reducing nitrogen oxide emissions. In 2024, the company started the research on CO2 heat pump distillation technology, which recovers waste heat to generate steam. This technology has been included in China's Fifth Batch of Key Low-Carbon Promotion Directories.

2.2.3 Technology empowering productivity and innovation-driven transition driving sustainability

Steady improvement in the ESQ

The ESQ indicators mainly measure the regional economic sustainable growth and innovation-driven transition capabilities. As shown in Figure 2.6, this indicator has demonstrated a steady upward trend over the past ten years, with its core momentum stemming

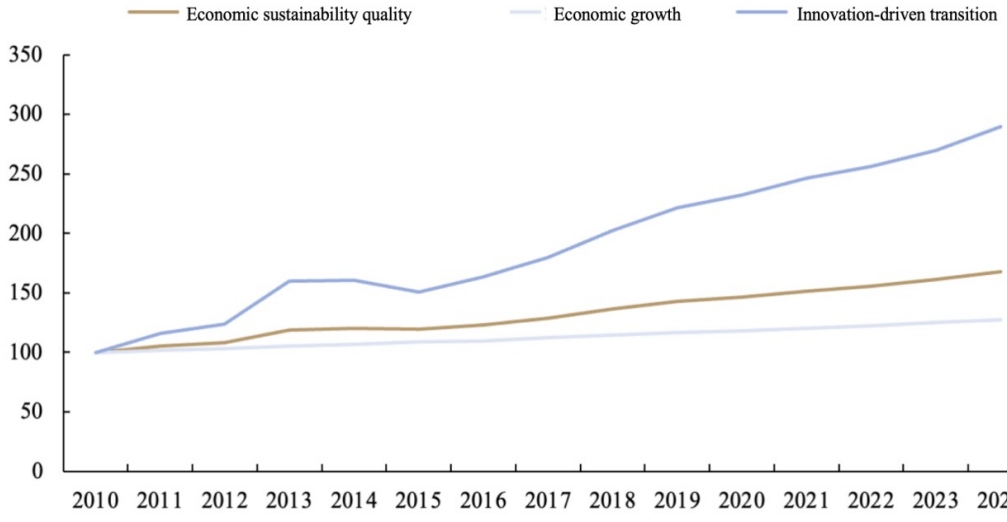


Figure 2.6: Changes in trends of the ESQ and its level 2 indicators

from deep innovation-driven transition under the background of global value chain reconstruction. In particular, since 2015, the innovation transition dimension within this indicator has entered a rapid growth path, facilitating the global shift to high-quality economic development. In addition, the global economy has shown steady growth, with its resilience progressively strengthening.

Emerging industries such as the digital economy and artificial intelligence have gradually become engines of economic growth, reshaping the global industrial landscape.

Artificial Intelligence (AI), as a core enabler of the digital economy, is driving global economic sustainable transition with dual acceleration. On the one hand, AI infrastructure investment has expanded significantly, forecasts indicate that global AI-related investment scale will increase rapidly from USD232 billion (2023) to over USD500 billion (2027). On the other hand, AI application also expands rapidly to various industries, thereby affecting more non-technology investment

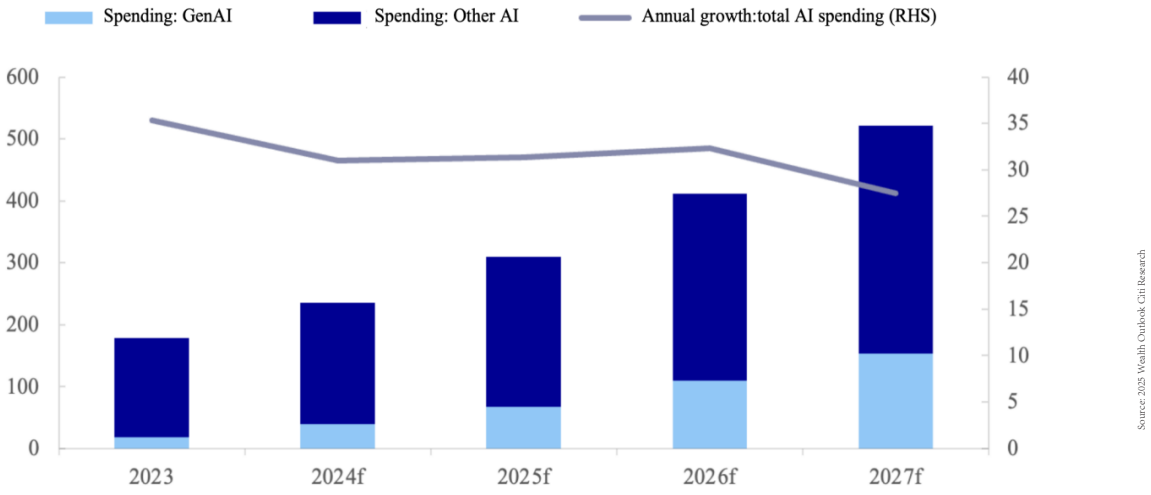


Figure 2.7: Company's heavy AI investment

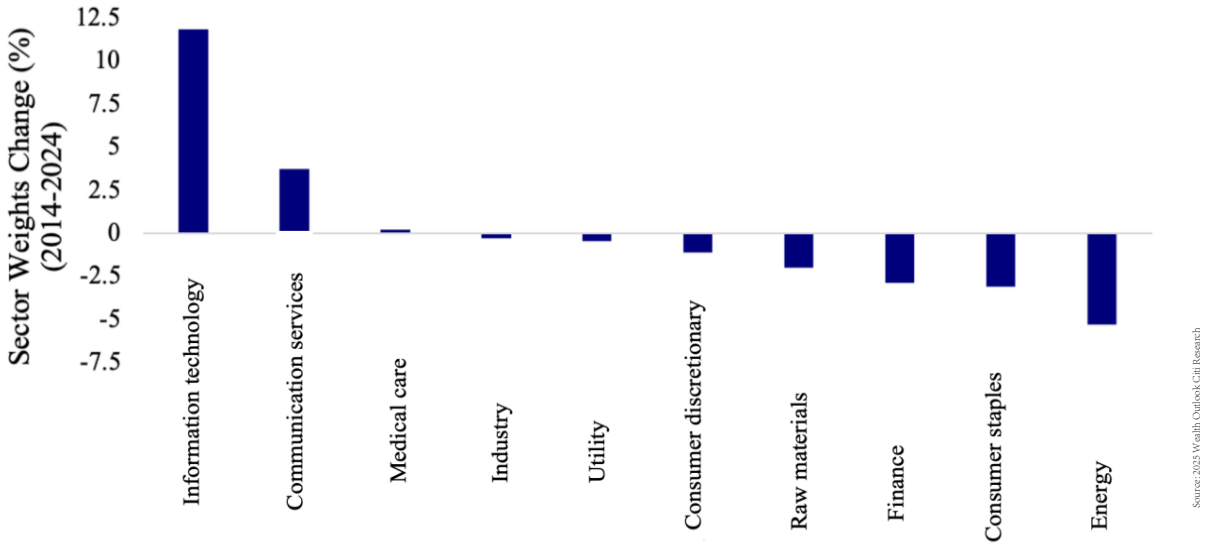


Figure 2.8: Changes in sector weights of MSCI ACWI index

and bringing more profound and extensive industrial structure changes. For manufacturing, energy and other fields, AI also acts as a catalyst for traditional industry transition and innovation. This momentum has also been mapped in capital markets. IT and Communication Services sectors both grew significantly in terms of the number of companies and market capitalization, according to MSCI. By mid-2024, the IT sector became the largest component of the MSCI ACWI index. The voting mechanism of capital is further accelerating global economic innovation.

Asia-Pacific's "Dual-driver" accelerates economic sustainability

The countries' rankings in economic sustainability worldwide reveals that the Asia-Pacific region and selected emerging economies have led in both economic growth and innovation-driven transition over the past 15 years. Asia-Pacific countries such as China, India and Vietnam have maintained high economic growth and achieved robust industrial development. While maintaining their role as global economic growth anchors, these countries have also pioneered the transition of economic growth momentum.

Table 2.3: Global sustainable investment rankings (by country)

Country	Ranking by ESQ	Ranking by economic growth	Ranking by innovation-driven transition
China	1	1	3
Thailand	2	11	1
Vietnam	3	3	2
Indonesia	4	8	4
Turkey	5	5	5
Egypt	6	7	6
India	7	2	9
Saudi Arabia	8	12	7
Singapore	9	4	11
South Korea	10	9	8
Peru	11	10	10
New Zealand	12	17	12
Chile	13	13	14
United States (USA)	14	20	13
United Kingdom (UK)	15	29	15
Malaysia	16	6	31
Netherlands	17	23	16
Hungary	18	25	18
Switzerland	19	27	17
Brazil	20	15	25
Nigeria	21	14	28
Australia	22	18	26
Sweden	23	22	23
Canada	24	16	27
Argentina	25	30	21
France	26	28	24
Germany	27	32	19
Japan	28	31	22
Russia	29	26	29
Italy	30	33	20
Mexico	31	19	32
Norway	32	24	30
South Africa	33	21	33

2.2.4 Policy orientation supporting global green transition, deepening international sustainable cooperation, and expanding the scale of green products

Significant rise in global GTSL

The GTSL has risen significantly as a whole, with policy, market and international collaboration forming a tripartite systemic framework, especially in the stages of carbon neutrality commitment in 2021 and policy-intensive implementation in Asia and Europe in 2024. Specifically, the systematic formulation of sustainable policies and strategies has built a solid institutional environment for sustainable development. The continuous expansion of green products strongly supports the global sustainable investment process from the financial side; meanwhile, sustainable cooperation among countries has maintained at a relatively high level, jointly promoting green transition to in-depth development.

Accelerating development of sustainable policy coexists with deepening regional divergence

At the international level, the formulation of sustainability-related standards continues to make steady breakthroughs. The International Sustainability Standards Board (ISSB) released the General Requirements for Disclosure of Sustainability-related Financial Information, which provided operational guidance at the operational level for enterprises to identify sustainable risk opportunities and assess financial materiality. COP29 advanced the establishment of a global carbon credit mechanism platform, urging developed countries to provide climate finance to developing countries to mitigate climate vulnerability; During the conference, ISO issued the global ESG standards, laying an important foundation for standardized and globalized ESG development.

At the regional level, the sustainable policy development across countries shows diversified trends. EU

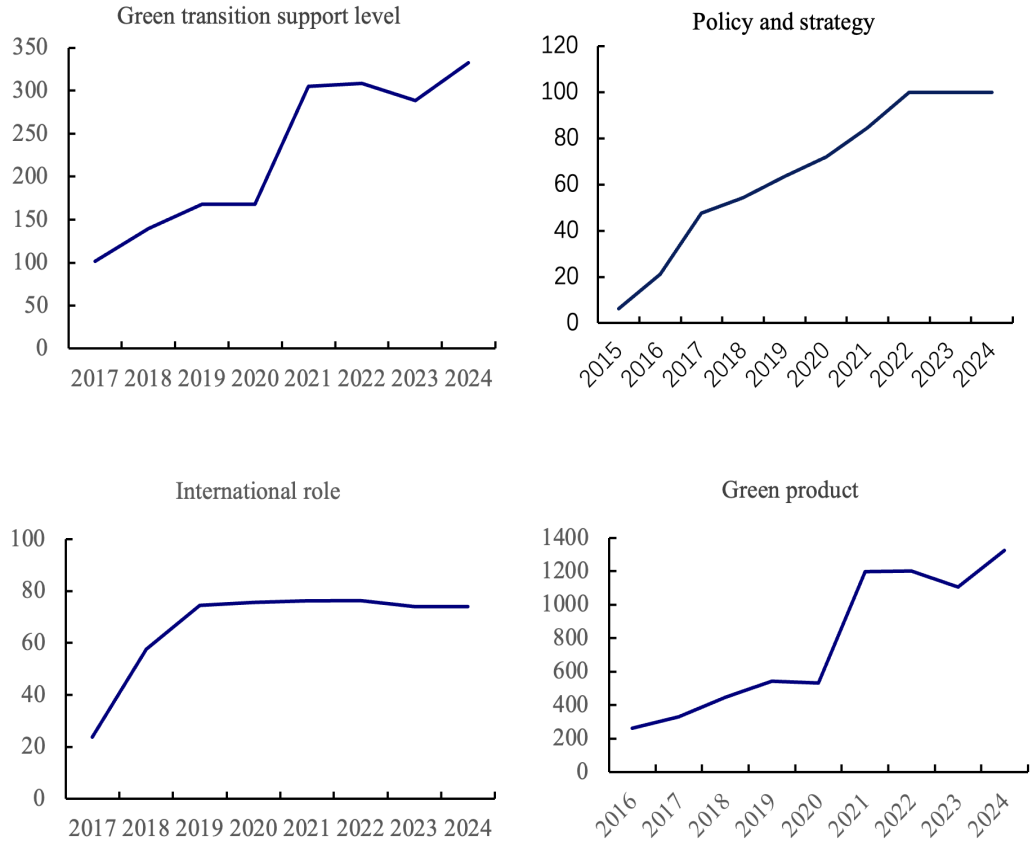


Figure 2.9: Changes in trends of the GTSL and level 2 indicators

countries maintain leadership in sustainable development, emerging markets are gradually shifting from passive adopters to active shapers, and US faces instability in sustainable policy development. The EU has been a leader in global sustainable development since the issuance of the Sustainable Investment Action Plan in 2018. In 2024, the EU adopted the "Corporate Sustainability Due Diligence Directive (CSDDD)", which mandated companies to undertake supply chain sustainability investigation to enhance ESG oversight and combat greenwashing. Emerging markets has accelerated the implementation of sustainable-related policies. In recent years, China has refined its policy framework, forming a multi-tiered system (central government - central ministries - financial regulators - local governments) to drive top-down sustainability governance. However, the US's sustainable story is more tortuous. Its climate disclosure rules face opposition due to partisan divides at federal/state levels. The US withdrawal from the Paris Agreement under the Trump administration disrupts global sustainability progress.

At the corporate level, under the background of mandatory sustainable policies and strengthened operability trends, more companies have incorporated sustainability concepts into corporate governance and disclosure processes, and the proportion of companies appointing sustainability leaders has increased significantly. According to KPMG, 56% of G250 companies had a dedicated sustainability leader within their boards or senior management teams in 2024, an increase of 11 percentage points from 45% in 2022. Among N100 companies, the ratio climbed from 34% to 46% over the same period, an increase of 12 percentage points. Notably, the share of G250 companies reporting biodiversity decline as a business risk in 2024 had doubled compared to 2022, reflecting more companies had considered sustainable development governance and climate risk in their operations and disclosures under policy driving.

Region	Issuing agency	Policy document and main content
International	IFRS Foundation	*Disclosure of Sustainability-Related Risks and Opportunities and Important Information,* December 2024: To guide companies to identify important information about sustainable risks and opportunities that affect financial disclosure.
EU	European Council, Parliament and Committees	*Corporate Sustainability Due Diligence Directive*, July 2024: Require large businesses to undertake sustainability due diligence.
	European Securities and Markets Authority	*Guidelines on Sustainability Information Enforcement & European Sustainability Reporting Standards,* July 2024: Provide specific guidance on the preparation of sustainability reporting.
UK	UK Financial Conduct Authority	*Sustainability Disclosure Requirements (SDR) and Investment Labels,* May 2024: Enacted anti-greenwashing rules and investment labeling system take effect, including pre-contract disclosure requirements.
Germany	German Federal Parliament	*German Supply Chain Due Diligence Act*, January 2024: The scope of application was expanded to companies with more than 1000 employees.
France	French Ministry of Economy and Finance	Revised Investissement Socialement Responsible (ISR) took effect, March 2024: Regulatory tightening of ISR investment label screening criteria.
US	U.S. Securities and Exchange Commission	*Rules to Enhance and Standardize Climate-Related Disclosures for Investors*, August 2024: Holistically plan green transition, and require industries represented by energy and transportation to be low-carbon transition.
Singapore	Singapore Ministry of Finance	Announced the phased implementation of mandatory climate disclosure requirements for large corporations, February 2024

Source: IFRS Foundation, EU Official Gazette, UK Financial Conduct Authority website, German Federal Law Gazette, Sina Finance, SEC website, The Paper, etc.

Table 2.4: International important sustainability-related policies (2024)

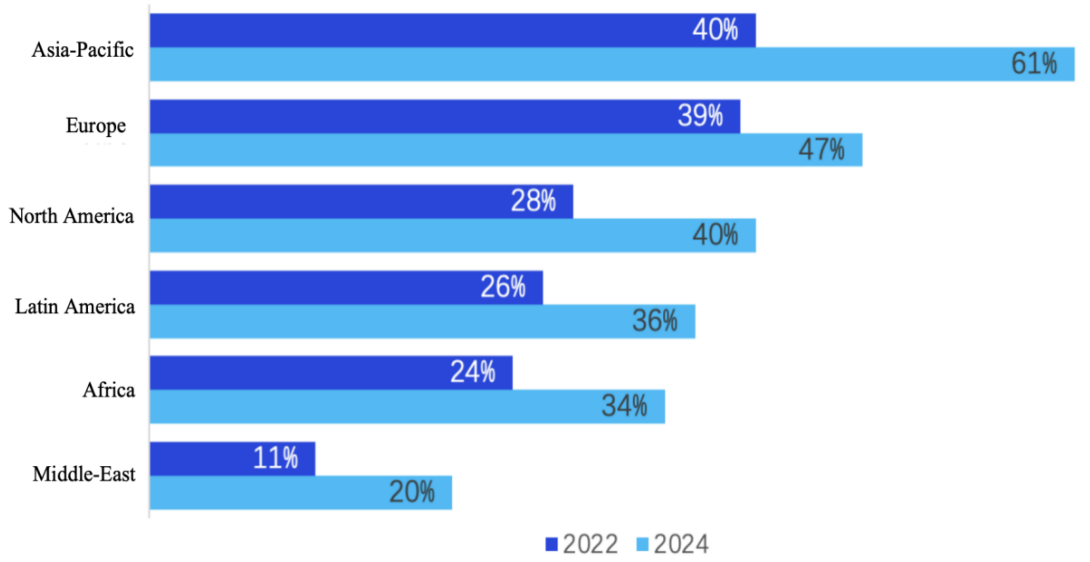


Figure 2.10: Companies with sustainability leaders by region

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International cooperation in climate investment and financing maintains high level, but faces new global order adjustments in the future

Global sustainable cooperation mechanisms have been deepened and improved. China and EU have established a high-level dialogue mechanism on environment, forging a China-EU green partnership, while China and the U.S. launched the "Task Force on Strengthening Climate Action in the 2020s" to engage in dialogue and cooperation. Additionally, the G20 has established the G20 Sustainable Finance Working Group to jointly address financial risks stemming from climate change. These mechanisms provide a stable framework and platform for countries to cooperate in the field of climate investment and financing. Meanwhile, countries have actively signed the Paris

Agreement and the Kyoto Protocol, and played active roles in organizations like the Network for Greening Finance System (NGFS) and the International Development Finance Club (IDFC) organized by between central banks and financial regulators, so as to deepen global sustainable cooperation.

With the international order restructuring in the future, all countries need to strengthen dialogue and cooperation. As discussed in Chapter I, the complex global landscape created by global economic, political and climate risks, along with deepening sustainability divergence and trade realignments, is restructuring the international order. 65% of GRPS respondents anticipate a multipolar or fragmented order, according to world economic forum's Global Risk Report 2025. Affected by geopolitics, economic development and sustainability imbalance, and socio-technological challenges are driving many nations to shift their policy focus to domestics. Nevertheless, sustainable multilateral cooperation remains the most certain solution to uncertainty, and countries should seek more ways of dialogue and cooperation amid this global realignment.

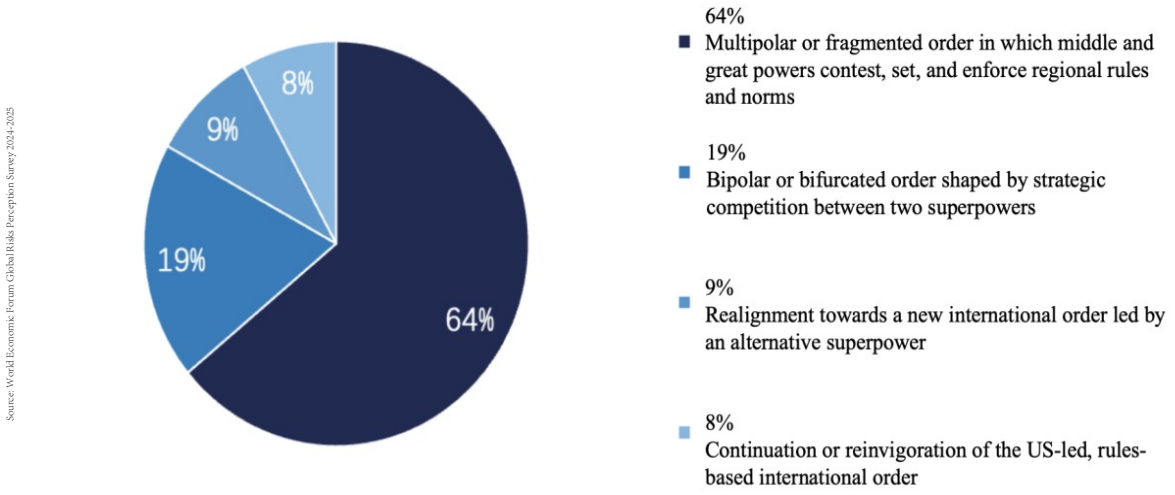

Figure 2.11: Global political outlook survey

Integration of sustainability factors in investments: scaling of green financial instruments

The sustainable bond market continues to expand and has become the most resilient asset class in the global sustainable financial system. According to CBI data, the cumulative issuance volume of green, social responsibility, sustainability and sustainability- linked bonds (collectively referred to as "GSS+ Bonds") reached USD6.9 trillion as of December 31, 2024. In 2024 alone, total bond issuance hit a record high of USD1.05 trillion (10,331 transactions), up 31% from USD946.9 billion in 2023. Regionally, Europe ranked first in sustainable bond issuance volume, and the Asia-Pacific market also performed well, especially in China, with its sustainable bond issuance accounting for 43% of the region. The expansion of the sustainable bond market is driven by in-depth implementation of national sustainable strategies, continuous improvement of green financial system, and rising demand from institutional investors for ESG allocations. The sustainable bond market is now transitioning from a policy-driven phase to a new stage of institutionalized and standardized and high-quality development.

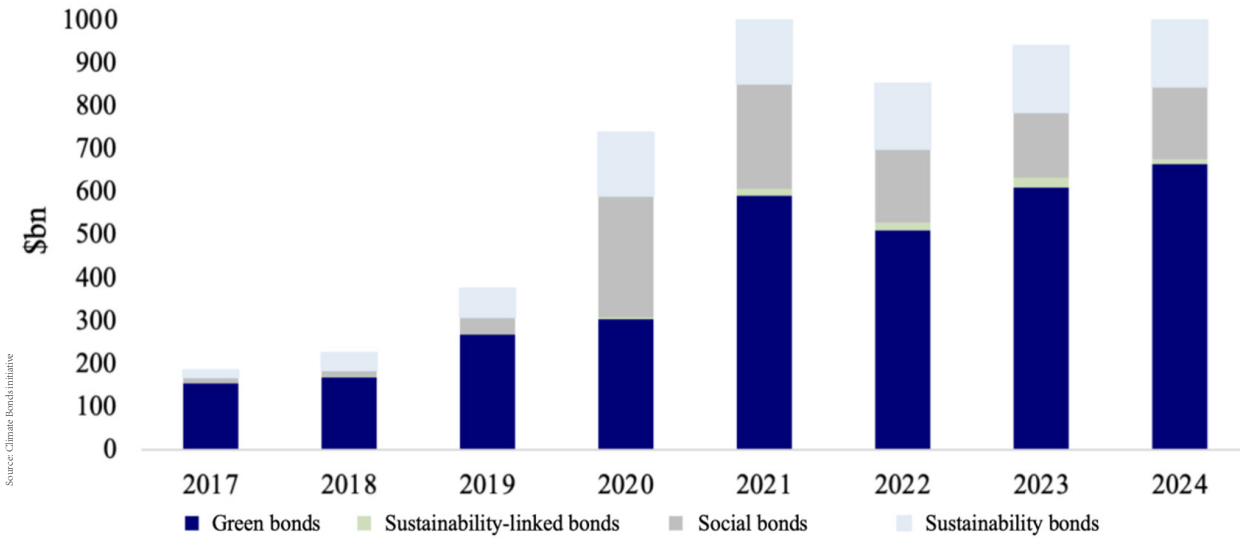

Figure 2.12: Total global sustainable bond issuance

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In global efforts to address climate change, the carbon market, as a tool to measure the performance of companies or countries in terms of carbon emissions and carbon management, has become an important reference for investors and policymakers. Countries such as China, the United States, Japan, the European Union and the United Kingdom have established relatively mature carbon trading system. Carbon trading is widely used globally with good policy compatibility, regional and industry scalability and financial derivative potential. Therefore, carbon market development serves as a viable comparative indicator of regional climate action. The EU Emissions Trading System (EU-ETS) is the first cross-border mandatory carbon market and the largest carbon market with the most countries, industries and transactions globally. Although the UK and US carbon markets started later than the EU's, they have demonstrated their unique characteristics and practices in terms of operating mechanism, coverage and development path, and have become an important part of global carbon markets. The UK officially launched its own emissions trading scheme (UK ETS) in 2021 after Brexit. The US's carbon market lacks a unified federal framework but has active regional markets. China's carbon trading system mainly includes the national carbon emissions market with regional pilot markets. Driven by policies, the closing price of China's carbon market has grown steadily.

Case study: China positions green finance as a strategic tool for economic development and Low-carbon transition

In recent years, the Chinese government has established green finance as a core strategy for high-quality economic development and low-carbon transition.

By continuously expanding green finance reform and innovation pilot zones and enhancing financing incentives for clean and low-carbon industries, China has demonstrated its transition commitment. This process relies on long-term institutional development, and gradually seeks a dynamic balance between policies and markets, risks and benefits, and aligns with global standards.

At present, the green financial market, represented by green bonds, green loans, green insurance and other innovative green financial instruments, is guiding the structural transformation of China's capital market. Since 2017, China has launched green finance pilot programs in 8 cities and 5 provinces to build a differentiated system, pioneered environmental equity pledge financing (e.g., carbon emission pledge) with a scale of over RMB80 billion, established local green industry catalogues (e.g., Huzhou's 12-category standards), and implemented mandatory environmental disclosure (e.g., the quarterly carbon footprint disclosure requirement in Shenzhen). By 2023, the average annual growth in green loans reached 35% in pilot zones, with the non-performing loan ratio of 1.8 percentage points lowering than that of ordinary loans. These practices have been codified into national green credit rules and stress-testing standards. In 2024, China's ESG products shown an explosive growth, the total number of ESG mutual funds products increased over 28% compared with last year, and the total size exceeded RMB1 trillion. The environmental protection-themed and social-themed wealth management products reached about 600 in 2024 .By improving regulatory frameworks and incentive mechanism, the government also attracts social and international capital investment to green projects, curbs investment in polluting industries, and promotes financial institutions to innovate products and services and standardize market operations. Its significant externalities require deep government involvement in rulemaking and implementation to enhance market transparency and credibility and ultimately provide systemic support for addressing climate change and sustainable growth.

国際金融论坛
INTERNATIONAL FINANCE FORUM

Global Sustainable Investment Index Report

中国银河证券
CHINA GALAXY SECURITIES
2000-2025
25th ANNIVERSARY

Chapter 3

New Pathways of Sustainable Investment

The previous chapter systematically outlined the four major trends in global sustainable development based on the Global Sustainable Investment Index. In the context of an accelerating global green transition, this chapter focuses on innovative practices in sustainable investments, and explores several actionable new pathways for sustainable investment. Aligning with sustainable development trends and leveraging policy synergy, market mechanism optimization, international cooperation, and innovation-driven reforms to address the structural challenges and opportunities in sustainable development.

3.1 Policy synergy and market mechanism optimization

In the current wave of global economic integration, sustainable investment has become a key force to promote the synergistic advancement of high-quality economic development and environmental protection. However, factors such as fragmented rules and cross-border policies, imbalanced risk-return for green projects and policy instability have seriously restricted the effective fund flows and deep participation in the field of sustainable investment. To break this deadlock, it is imperative to construct an efficient, synergistic and attractive sustainable investment ecosystem.

3.1.1 Establishing a policy mechanism of "rule alignment, regional synergy and policy resilience"

Aligning standards across nations on green taxonomies, ESG disclosures, and carbon pricing. Rule alignment is the basis and prerequisite for all subsequent work in global sustainability investment. Multilateral platforms like G20 should lead comparative studies of international standards and rules in the field of sustainable investment, sort out existing mainstream international standard and rule systems, and mark commonalities and differences, so as to help countries benchmark their existing standards and future plans. This initiative will reduce transaction costs, improve the comparability of investment decisions, and attract more funds to allocate global green assets.

Actively participating in multi-level regional coordination and cooperation mechanisms, and gaining a sustainable voice internationally. With the growing anti-ESG sentiment in developed western economies in recent years, the Asian region should seize the opportunity to strengthen their influences in sustainability. It is suggested that leverage the Belt and Road Initiative (BRI) as an anchor to drive regional sustainable investment synergy and strengthen cooperation among participating countries: 1) establish a sustainable investment alliance with relevant institutions along the BRI route to refine and improve relevant standards, and form a unified understanding of sustainable investment criteria and operational practices. 2) bridge communication channels between governments and

enterprises across BRI nations, build cross-border green data sharing platforms, and establish sustainable investment information exchange mechanisms to improve cooperation and synergy efficiency. For example, an open-access green data hub will be constructed, and the key data from countries' sustainable finance and carbon markets will be shared on this hub, which will reduce the threshold for international market investors to interpret global sustainable development data, enable investors to obtain accurate and timely data more easily, and provide strong support for investment decision-making.

Building resilience in sustainability policy to avoid industrial shocks caused by the policy swings. This requires not only the domestic policy coherence and stability but also alignment and consistency among regional partners' policies. By the impact of U.S. sustainability policy fluctuations on green industry progress, for domestic policy resilience, it is suggested that countries integrate sustainability policies into national strategies, improve relevant policies and legislation, and strengthen legal effectiveness to avoid policy volatility. At the same time, it is suggested to establish a cross-departmental permanent liaison group to jointly oversee policy implementation, and prevent policy disconnections or deformations. For cross-border policy synergy and stability, it is recommended to establish a regular communication mechanism at the multilateral ministerial level or above, facilitating communication on the design, formulation, and execution of sustainability policies to strengthen coordination.

3.1.2 Constructing multi-tier green capital market and project pipeline

Strengthening the role of multi-level capital markets in supporting green financing through following measures: 1) reform capital market mechanisms, attract more green enterprises to be listed and raise funds, including simplifying approval procedures for green companies' IPOs and refinancing, and giving priority support to qualified green enterprises; and 3) promote regional equity trading markets to facilitate early-stage funding for local SMEs' green projects.

Enriching and innovating green financial products and expanding green financing channels. By issuing green bonds, establishing green funds, and providing green credit - coupled with innovative green financial products, it can meet diversified green finance needs, expand financing channels, and attract greater capital participation in green investment. Specific actions include: 1) enrich green credit products: financial institutions can develop diversified green credit products tailored to project characteristics and optimize credit approval processes to improve the efficiency of loan issuance; 2) advance the green bond market: encourage financial institutions and enterprises to issue green bonds to support the financing of green projects, and improve the system for green bonds' issuance, trading, and information disclosure to enhance market liquidity; and 3) expand green investment channels: support financial institutions in establishing green funds and green insurance products, and provide investors with more investment opportunities. Additionally, explore innovative services like carbon finance and ecological compensation finance to widen financing channels for green projects.

Strengthening green project screening, reserving and post-investment management. In terms of green project screening: formulate and improve evaluation standards and methods for green projects, comprehensively evaluate projects from environmental, economic, social benefits and other dimensions to ensure that projects included in the project pipeline have significant green attributes and sustainability value. In terms of project serving: relevant government departments and financial institutions can establish a green project reserve pool, timely incorporate qualified projects into the pool, and conduct dynamic management and update. In terms of investment and post-investment management: guide rating agencies to introduce unified "green project risk ratings", incorporate emission reduction performance, governance performance and cash flow stability into the rating system, and enable investors to quickly and accurately assess risks and bolster investment confidence. Green benefit assessments should be incorporated into the post-investment management of green projects and establish multi-tiered objectives for green investments, rather than focusing solely on financial targets.

3.1.3 Strengthening infrastructure construction for sustainability disclosure

Establishing a unified framework for sustainability disclosure systems. First, countries can align with international benchmarks while developing localized standards to ensure compatibility with core global frameworks. Specifically, they can formulate disclosure standards tailored to national conditions with clear elements, reduce compliance costs for multinational corporations, and enhance data comparability by using the International Financial Reporting Standards (IFRS) S1 - General Requirements for Disclosure of Sustainability - related Financial Information and IFRS S2 - Climate-related Disclosures, issued by the International Sustainability Standards Board (ISSB), as key references. Developing countries adopt a phased approach based on their industrial structures, for instance, prioritizing climate disclosures before gradually expanding to biodiversity and other topics.

Enhancing technical support and data interoperability. Countries should strengthen their sustainable data infrastructure, while the UN lead the development of a global platform to connect and share sustainability data across nations. This platform can standardize data collection formats and quality validation rules, and deploy intelligent data collection and processing technologies, so as to provide basic supports for integrating public data resources, such as environmental monitoring and carbon footprint data from countries, and promoting cross-border recognition and circulation. Additionally, technical assistance will be provided to developing countries to ensure seamless platform integration and effective participation in global sustainability initiatives.

3.2 Strengthening regional pilots and international participation

Given significant disparities in culture, development stages and industrial structure across countries, sustainability levels vary across regions. Therefore, it is advisable for countries to implement sustainability initiatives in a manner that is tailored to local conditions and to actively engage in international participation to establish an image of sustainability nation.

3.2.1 Advancing the "regional pilot" model to integrate sustainable investment policies into local industries and regulatory ecosystems

It is recommended that the international organizations take the lead, collaborating with international financial institutions such as Multilateral Development Banks (MDBs) and Regional Development Banks (RDBs), to launch sustainability pilot programs within the regions like the EU, ASEAN, AU. Leveraging existing cooperation frameworks and mechanisms, these pilots would enhance policy coordination and resource integration, fully integrate local industrial challenges and carbon reduction opportunities, and conduct differentiated incentives for pilots, improving their success rate and influence.

1) Establishing high-level coordination mechanism within pilot zones to improve top-level design of the pilot program. This includes identifying regional strengths and weaknesses in sustainable development pathways, clarifying intergovernmental responsibilities and cross-border coordination mechanisms, forming working groups on standards and rules alignment within the regions to explore international benchmarking and internal harmonization of sustainable investment rules among participating countries.

2) Reviewing and optimizing policies for sustainable development in pilot areas. A comprehensive review of existing investment, industrial and environmental policies in pilot countries should be conducted to identify areas that conflict with or are inconsistent with sustainable investment policies, revise and improve them. At the same time, targeted sustainable investment policies should be formulated, including guidelines on investment areas, preferential tax policies, and green financial support policies, to channel capital flows toward sustainability projects.

3) Establishing cross-departmental regulatory coordination mechanisms within the regions to ensure effective policy implementation and regulatory consistency. For example, unified standards and processes for green bond certification and ESG disclosures in sustainability financial fields should be jointly developed by finan-

cial regulators, environmental agencies, and market supervision departments.

4) Strengthening guidance and support for key green industries and projects. On the one hand, it is essential to identify key industries for sustainable investment, such as renewable energy, energy conservation and environmental protection, eco-friendly agriculture, and green transportation, and to focus efforts on supporting and nurturing them to foster industrial clusters and create a demonstration effect. On the other hand, it is crucial to establish a systematic mechanism for screening, evaluating, and promoting green projects. Based on unified criteria, projects should be selected for their sustainability and social benefits, with a focus on innovation, replicability, and exemplary impact. A sector-specific green project catalog should be developed, with priority support provided. Projects must undergo a full lifecycle assessment to identify best practices, analyze challenges and shortcomings, and develop replicable, scalable models. These successful cases should then be promoted and shared with other regions to drive broader adoption.

3.2.2 Fostering global participation to drive global sustainable development

Given the different in national development levels, different countries assume their diversified roles in promoting global sustainable development and investment. For countries with strong economic capabilities and international influence, they should actively establish a responsible major-county image by serving as architects of the global sustainable development and investment ecosystem, leading in the process of rule-making and promotion, and provision of capital and technology. Countries with relatively weak economic power should be actively integrated into the ecosystem built by the leading countries. Specifically:

For developed countries, at the experience level, leveraging their advantages in sustainable investment (e.g., being the first-mover, mature expertise and rich case studies), they should provide models and best practices for less advanced countries, promoting initiatives like France's "Plan d'Epargne Avenir Climat" (where funds are locked until adulthood to channel long-term capital into green industries) or the issuance of sovereign green bonds by the UK, France, and Germany to steer funding toward sustainability projects. At the fund and technology level, relying on relatively abundant capital reserves and advanced technologies, they should actively provide more financial support for sustainable development projects through international financial institutions, multilateral development banks and other channels. Simultaneously, they should facilitate the transfer and adoption of advanced technologies to developing countries in clean energy, environmental protection technologies, resource recycling and other fields to enhance their sustainable development capabilities. At the industry level, given their domestic consumers' strong demand for sustainable products and services, they should drive the transition of global industrial chain toward sustainability.

For emerging economies, first, facing the dual challenges of economic growth and environmental protection during economic developments, they need to actively implement sustainable development principles while providing valuable lessons for other developing countries. Second, leveraging their growing discourse power and influence in international economic and financial affairs, they need to play a leading role in shaping sustainable investment rules and standards, advance the establishment of globally unified ESG evaluation criteria, and standardize sustainable investment practices and procedures. Third, their economic expansion and capital market development have positioned them as emerging forces in global sustainable investment. Therefore, they should encourage domestic enterprises and financial institutions to actively participate in domestic sustainable investment projects, promote the green transition and upgrading of domestic industries, and gradually expand sustainable investments in overseas to participate in global sustainability initiatives. Fourth, their unique development stage enables them to maintain close ties with both developed and developing countries. They should serve as bridges, sharing sustainable development experiences with other developing countries while engaging in dialogue and cooperation with developed nations to deepen North-South and South-South collaboration on sustainability.

For developing countries, given their substantial needs in infrastructure construction, education, medical care, and resource development, they should leverage their abundant natural resources, labor resources and huge market potential to actively integrate to the sustainability ecosystem established by other nations, and facilitate increased domestic and foreign investment in local sustainability sectors. Additionally, successful experiences and best practice cases should be learned from other countries through international cooperation and exchange.

3.3 Promoting technological upgrade and innovation reform

At the current stage, global sustainable development is in the process of deep transformation, with technological upgrade and innovation reform emerging as core forces to drive sustainability to a new height. Promoting economic sustainable development through reform and innovation, and advancing energy sector transition through green technology breakthroughs, are essential pathways to build a more resilient sustainable development system. Meanwhile, the application of green sustainable technologies can continuously enhance enterprises' core competitiveness through reducing energy consumption and increasing brand premium, thereby achieving a value closed-loop of "technology R&D - application implementation - returns realization".

3.3.1 Reforms and innovations to enhance economic sustainability quality

Promoting emerging technologies such as digital economy and artificial intelligence (AI) to empower economic sustainability transition and reshape global industrial landscape. In recent years, innovations and applications in emerging technologies such as big data, cloud computing, Internet of Things and AI have accelerated the digital and intelligent transition of traditional industries, leading to a restructuring of global industrial chains. In this process, to address the challenges from data security, ethical governance, etc., countries need to strengthen technical collaboration and standard alignment to achieve high-quality sustainable development. Specifically: 1) reduce cross-board data flow barriers through digital trade agreements; 2) expand diversified AI and digital technology application scenarios to foster new business models and industries; and 3) establish a cross-border technology cooperation mechanism. Given that emerging technologies such as AI are mainly mastered in a few economies, building an open-source architecture for global cooperation is an important option for accelerating technology iterations and fostering a shared technology ecosystem.

Accelerating the development of new digital infrastructure to ensure large-scale adoption of advanced information technology. New digital infrastructure not only includes hardware systems such as sensor terminals, 5G networks, big data centers, and industrial networks but also involves the application of cutting-edge technologies such as IoT, edge computing, and AI to implement comprehensive digital transformation, networked collaboration, and intelligent upgrading of traditional infrastructure such as transportation, energy, ecology, and industry. As the foundation of the digital economy development, the new digital infrastructure not only provides the necessary platform for scaling new technologies but also builds a solid technical base for industrial transformation and upgrading and smart society development.

3.3.2 Green technology upgrades to accelerate energy sector transition

Accelerating energy structure evolution through green technological innovation to promote the energy sector transition and upgrading. In the context of addressing climate change and meeting emissions reduction targets, green tech innovation is a critical pathway for sustainable development. This requires not only the large-scale adoption of clean energy, but also systematic smart upgrades across the entire chain of energy production, transmission and consumption, to achieve an efficient, low-carbon and secure energy transition and upgrading. On the supply side, leveraging large-scale deployment of renewable energy technologies such as photovoltaics and wind power, in combination with new power system technologies such as UHV power transmission and smart grids, the efficient consumption of clean energy will be

achieved. On the consumption side, the terminal energy consumption efficiency will be improved by means of electrification, building energy-saving technology, and NEV adoption in the transportation field.

Strengthening multilateral cooperation on sustainable development to help upgrade and transition in global green industry chains and create a global ecosystem for green development. At this pivotal stage of global green transition, it has become an international consensus to build a new pattern of coordinated development of the entire industry chain by deepening cross-border technical cooperation. Countries should leverage existing free trade agreements and regional cooperation mechanisms to establish a full-chain green technology sharing platform covering raw material mining, manufacturing, logistics and transportation to end consumption, with a focus on promoting cross-border transfer and application of key technologies in clean energy, carbon capture and utilization, and circular economy. This cooperation not only needs to break through the boundaries of traditional industries, realize the deep connection between upstream and downstream enterprises in terms of low-carbon processes, green standards, and carbon accounting methods, but also builds a dynamic and adaptive technology iteration mechanism, so that green innovation achievements can spread rapidly in transnational supply chain networks. Through the establishment of international green patent pools, joint R&D centers and demonstration projects, a positive interaction between technology, industry and finance has been formed. Ultimately, this will create an open, inclusive, and mutually beneficial global green development ecosystem, providing solid support for addressing climate change and achieving sustainable development goals.

The application of green and sustainable technologies enhancing enterprises' core competitiveness through reducing energy consumption and increasing brand premium. At the operational level, intelligent management and sustainable technology adoption reduce energy consumption, directly translating into cost advantages. At the market value level, the brand premium from ESG practices increase enterprises' share. Through these mechanisms, a value closed-loop of "technology R&D - application implementation - returns realization" can be achieved, driving the entire industrial ecosystem toward sustainable transition. Ultimately, this fosters synergistic growth between economic performance and environmental benefits.

3.4 Guiding patient capital and long-term capital participation

The unique value of patient capital in sustainable investment lies in its ability to generate environmental positive externalities that transcend traditional financial returns. Therefore, investment evaluations should holistically account for both external sustainability and green benefits, appropriately extend assessment time horizons, and examine projects' sustainable benefits through a broader lens. To effectively channel patient capital and long-term funding into sustainability industries, it should improve disclosure standards, deepen investor education, and guide capital market focusing on sustainability performance metrics. This will drive capital to aggregate in high-quality sustainable fields, provide continuous and stable financial support for high-quality sustainable technology research and development, and ultimately form a virtuous cycle between global capital and technological innovation.

3.4.1 Guiding patient capital and long-term capital investors toward sustainability indicators

Optimizing the investment decision-making mechanism of sovereign states to unlock long-term investment capability of patient capital such as insurance funds and Sovereign Wealth Funds (SWF).

1) Establish a diversified decision-making evaluation system. Sovereign funds and long-term capital allocators should integrate economic, social, environmental factors into decision-making, construct scientific assessment frameworks, and ensure that investment decision-making is in line with national long-term strategies and global sustainability trends. 2) Strengthen regulatory coordination and transparency, establish cross-departmental oversight coordination mechanisms, strengthen the oversight of patient capitals (e.g., insurance funds and SWF), improve the transparency of investment decision-making, and regular-

ly disclose investment strategies, project progress, and performance evaluation results to the public. 3) Incentive policies should be introduced. Governments should encourage patient capital to increase long-term investment in strategic emerging industries and environmentally friendly projects through tax incentives, financial subsidies, risk compensation and other means, so as to increase investment enthusiasm.

Standardizing ESG disclosures and strengthening investor education and mutual recognition mechanisms. Promoting the standardization of information disclosure is an important cornerstone for the high-quality development of the capital market. 1) Build unified information disclosure frameworks and indicator assessment system to enhance the transparency of corporate environmental, social and governance performance, providing investors with comparable and reliable decision-making basis. 2) Conduct multi-level investor education activities to help market participants understand ESG investment concepts and valuation methodologies. 3) Establish cross-border ESG data recognition mechanisms, promote collaboration among international rating agencies, exchanges and regulatory authorities, and achieve cross-border flow and mutual recognition of ESG data through bilateral or multilateral agreements, so as to form a unified global ESG investment ecosystem and guide capital allocation to areas with more sustainability potential.

Guiding investors to focus on enterprises' long-term sustainability capabilities. Traditional investment decisions mainly focus on operating indicators such as corporate profits and risks. However, with the growing emphasis on sustainable developments, it is urgent to guide investors to pay attention to corporate sustainability capabilities. Specifically: 1) encourage and enhance enterprises' sustainability awareness, incorporate sustainability into their strategies, establish a sound ESG management system, and ensure that ESG factors are fully considered in the production and operation process; 2) strengthen investor relation management and release sustainability-related information in a timely manner to enhance communication and trust with investors; and 3) promote sustainable investment concepts. Stock exchanges and international financial institutions can organize lectures, seminars, online courses and other initiatives to educate investors on the principles and methods of sustainable investment.

3.4.2 Embedding sustainability factors into investment strategy framework to reshape market valuation logic

Developing innovative valuation methods to quantitatively measure enterprises' sustainability capabilities. First, enterprises should translate ESG performance (e.g., carbon emission reduction performance, supply chain responsibility management, board diversity) into quantifiable financial impact indicators. This ensures that their sustainability efforts and outcomes are accurately reflected in market valuations. Second, financial regulators are encouraged to issue policies to provide preferential tax or operational policies for enterprises' performances in green patent density and R&D investment, so as to increase valuation premiums for high-quality innovation projects in capital markets. Third, innovating and optimizing existing existing ESG indicators system will help enterprises better identify and manage sustainable development risks and opportunities, provide investors with more accurate and valuable information, and steer capital flow to more sustainable enterprises.

Encouraging more asset management institutions to adopt ESG investment strategies and to launch diversified investment plans and products. The accelerated deployment of ESG-themed products by international asset managers can help guide international capital flows. Specifically: 1) improve ESG-themed investment strategies. Investment institutions can construct differentiated ESG investment plans and realize diversified investment products based on enterprises' sustainability performance; and 2) strengthen risk monitoring, effectively manage and mitigate portfolio risks, and control investment risks on the basis of realized returns.

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