

Emerging Market Sustainable Bonds

*IFC-Amundi Joint
Report*

JUNE 2026

About IFC

IFC—a member of the World Bank Group—is the largest global development institution focused on the private sector in emerging markets. We work in more than 100 countries, using our capital, expertise, and influence to create markets and opportunities in developing countries. In fiscal year 2025, IFC committed a record \$71.7 billion to private companies and financial institutions in developing countries, leveraging private sector solutions and mobilizing private capital to create a world free of poverty on a livable planet. For more information, visit www.ifc.org.

About Amundi

Amundi, the leading European asset manager, ranking among the top 10 global players, offers its 100 million clients—retail, institutional and corporate—a complete range of savings and investment solutions in active and passive management, in traditional or real assets. This offering is enhanced with IT tools and services to cover the entire savings value chain. A subsidiary of the Crédit Agricole group and listed on the stock exchange, Amundi currently manages more than €1.9 trillion of assets. With its six international investment hubs, financial and extra-financial research capabilities and long-standing commitment to responsible investment, Amundi is a key player in the asset management landscape. Amundi clients benefit from the expertise and advice of 5,400 employees in 35 countries.



Emerging Market Sustainable Bonds

IFC-Amundi Joint Report

Acknowledgments

This report has adopted a new title, replacing Emerging Market Green Bonds Report to reflect the full spectrum of labeled sustainable instruments: green, social, sustainability, sustainability-linked and, for the first time, transition bonds. It was prepared under the guidance of Paolo Mauro, Cesaire Assah Meh, and Dilek Aykut, who are, respectively, Acting Director, Manager, and Principal Economist of the Private Markets Department within the Development Economics Vice Presidency at the World Bank Group.

José Abad, also at the World Bank Group, was the lead author. Working team members included Angge Roncal Bazan, Stephen Garrett, Timothée Jaulin, Esther Law, Clara Menet, and Mohamed Ben Slimane from Amundi, and Peter Jakub Tojzl from the World Bank Group.

The update of the GSSS bond database was led by the World Bank Group's Peter Jakub Tojzl, while the bond issuance forecasts were run by Mohamed Ben Slimane from Amundi.

We thank peer reviewers Barriatou'lah Achimi, Delgermaa Begz, Nicolo Ceruti, Taeko Hagihara, Kaikham Onedamdy, James Seward, Nam Thanh Tran, and Nina Zegger, from the Climate Department at the World Bank Group, as well as Selin Gonca Ozyurt, from the Private Markets Department within the Development Economics Vice Presidency at the World Bank Group.

Chris Vellacott edited the report while Irina Sarchenko was responsible for graphics and design.

Contents

Executive Summary	5
PART 1: Introduction	9
PART 2: Performance and the Greenium (2018–2025)	13
PART 3: The Maturing of Labeled Markets in Developed Economies	16
PART 4: Sustainable Bond Issuance (2012–2025)	25
PART 5: Special Theme: Women’s Economy Bonds in Emerging Markets	44
PART 6: The Investment Gap	50
PART 7: Regulatory Developments	53
PART 8: Outlook 2026–2027	58
PART 9: Conclusion	63
Methodology and Data	66

Key Messages

Clean-energy investment continues to expand. Global clean-energy capital expenditure reached a record \$2.2 trillion in 2025, 10 percent higher than a year earlier and equivalent to 65 percent of total energy capex.

Modest headline growth masks a stark divergence. Emerging market green, social, sustainability and sustainability-linked (GSSS) bond issuance rose 2.2 percent to \$186.8 billion in 2025. China surged 51 percent to a record \$111.1 billion, becoming the world's largest issuer. Outside China, however, emerging market issuance contracted 31 percent, with the steepest declines in Latin America (-56 percent) and South Asia (-68 percent).

Sustainable bonds in emerging markets outside China lead in fixed-income share. Excluding China, GSSS bonds reached 2.6 percent of total emerging market fixed-income issuance in 2025, above developed markets at 2.5 percent. China's share stood at 1.6 percent.

The labeled bond market in developed markets is maturing. The decline in labeled issuance does not signal a retreat from sustainable investment. Developed-market clean energy capex rose to \$1.1 trillion, yet the share financed through labeled bonds fell from 48 percent to 35 percent. Issuers are not cutting on green investment. They are choosing not to label it as tighter disclosure requirements, political headwinds, and rising compliance costs have made labeling costlier without delivering commensurate benefits.

Suprationals provide a structural anchor. Multilateral development

banks contributed \$151.1 billion of GSSS bond issuance in 2025, around 17 percent of global supply and 3.2 percent higher than a year earlier. The supranational segment has remained largely insulated from the policy dynamics driving developed-market retrenchment, and its institutional mandates underpin a steady issuance pipeline.

The greenium has effectively vanished. The pricing advantage for issuers on green bonds fell below one basis point globally in 2025, down from an average of approximately 2.4 basis points over 2019–2024. In emerging markets, the greenium can no longer be distinguished from zero with statistical confidence. The economic case for labeling now rests entirely on non-pricing factors.

Policy architecture determines where labels survive. China's central bank lending facilities, broadened taxonomy, and macro-prudential integration sustain labeling independently of market pricing dynamics. Southeast Asian authorities subsidize verification and documentation costs. In the Middle East, sovereign strategies tied to long-term economic transformation programs anchor issuance pipelines. Where these policy structures exist, labeled issuance grew. Where they do not, it contracted.

Strong financial performance, with caveats. Emerging market GSSS corporate bonds returned 10.4 percent in 2025, outperforming the broader index by two percentage points. However, the GSSS market is tilted toward higher credit quality and

longer duration, and any performance differential likely reflects index composition rather than a pricing effect specific to the label.

Women's Economy Bonds reach scale. Cumulative issuance of Women's Economy Bonds has reached \$57 billion across more than 40 countries and over 100 issuers. Latin America and the Caribbean lead with 40 percent of volumes. Scaling the market further will require standardized bond principles, wider adoption of sex-disaggregated data, and deeper market infrastructure in regions where issuance remains nascent.

A maturity wall threatens the outstanding stock. Approximately \$371 billion in emerging market GSSS bonds will mature between 2026 and 2028, or 45 percent of the outstanding stock. Net issuance has already fallen from its 2023 peak of \$187 billion to \$91 billion. If maturing issuers choose not to re-label their refinancing, the total stock of emerging market sustainable bonds could contract for the first time.

Transition bonds and taxonomy interoperability are the key catalysts. The ICMA Climate Transition Bond Guidelines, published in November 2025, create a credible pathway sector that green bonds were not designed to serve. Progress on taxonomy interoperability and the European Union's (EU) flexibilization of its sustainable finance framework could lower cross-border issuance frictions. Whether these developments will be sufficient to offset the maturity wall and restore net issuance growth remains the defining question ahead.

Executive Summary

Sustainable bonds—instruments that raise funds for environmental or social projects, or with terms imposing sustainability targets on the borrower—emerged as one of the fastest-growing segments of the global fixed-income market over the past decade. This eighth edition of the IFC-Amundi Emerging Market Sustainable Bonds Report examines how the market performed in 2025 and where it is heading. The picture that emerges is one of paradox. On the one hand, investor demand has proved resilient despite political and regulatory headwinds (including the withdrawal of major asset managers from net-zero alliances in the United States), amid solid financial returns and a growing need for the capital raised by these instruments. But this is set against sharp contractions in issuance of bonds carrying sustainable labels, driven by tighter disclosure requirements, the near-disappearance of the “greenium” pricing advantage for issuers associated with sustainable debt, and the rising cost of maintaining a credible label.

The headline for 2025 sits in the underlying activity. Clean-energy investment expanded to a record \$2.2

trillion globally, equivalent to 65 percent of total energy capex with developed-market clean-energy capital expenditure reaching \$1.1 trillion. Capital allocation toward the energy transition continued to grow even as labeled-bond volumes adjusted. Five points frame this edition. First, the labeled-bond market in developed markets is maturing. Sustainability considerations are being internalized into mainstream financing channels even as a smaller share is now raised under explicit labels. Second, emerging markets excluding China saw sustainable bond sales reach 2.6 percent of total fixed-income issuance in 2025, above both developed markets at 2.5 percent and China itself at 1.6 percent. Third, supranationals contributed \$151.1 billion of GSSS bond issuance in 2025, around 17 percent of global supply and 3.2 percent higher than a year earlier, a structural anchor of the labeled-bond ecosystem that has remained largely insulated from the policy dynamics driving the developed-market retrenchment. Fourth, the policy infrastructure for sustainable finance in emerging markets is broadening: 60 sustainable-finance taxonomies are now in place or under development globally, of which 40 are in emerging markets under the umbrella of the Taxonomy Roadmap Initiative. Fifth,

the November 2025 ICMA Climate Transition Bond Guidelines bring transition bonds inside the sustainable-bond market and provide a labeled pathway for hard-to-abate sectors.

The lack of a harmonized international framework for sustainable finance has fragmented the market and raised compliance costs. Work to align frameworks is advancing: the Principles for Taxonomy Interoperability published in November 2025 under the Taxonomy Roadmap Initiative establish a common reference for mapping and aligning national taxonomies, complementing the EU–China Common Ground Taxonomy and the ASEAN Taxonomy. **Part 7** of this report examines the interoperability agenda in detail.

For the investors that held them, emerging market sustainable bonds delivered strong returns in 2025 with those securities issued by corporations returning 10.4 percent, two percentage points ahead of their conventional counterparts. But while secondary market performance was strong during the year, global issuance of bonds carrying the sustainable label contracted by 15 percent in 2025. The decline was led by developed markets, where issuance fell 23 percent. The United States lost its status as the world’s biggest issuer with sales dropping 37 percent to leave it in fourth place. Emerging markets edged up 2.2 percent to \$186.8 billion, but this headline figure masks a stark divergence. China surged 51 percent to a record \$111.1 billion, driven by central bank lending incentives and an expanded green taxonomy. Outside China, however, emerging market issuance contracted 31 percent. The only non-China growth regions were the Middle East and North Africa and East Asia and the Pacific (excluding China), where issuance rose 21 percent and 11 percent, respectively. Green bonds now account for 72 percent of emerging

market sustainable bond issuance, while social bonds fell 56 percent.

The decline in labeled issuance does not signal a slowdown in sustainable investment. Developed-market clean-energy capital expenditure expanded to \$1.1 trillion in 2025, while the share financed through labeled instruments fell from 48 percent to 35 percent. The pattern is consistent with a maturing labeled-bond market in advanced economies in which sustainability considerations have been increasingly internalized into mainstream financing channels. Tighter disclosure and labeling requirements raised compliance costs, alongside policy developments, most notably in the United States where the withdrawal of major asset managers from net-zero alliances and shifting government policy had a dampening effect on sustainability branding. At the same time, the disappearance of the greenium and the absence of harmonized labeling standards have increased compliance costs for issuers operating across jurisdictions. For many developed-market issuers in 2025, compliance costs rose while the pricing benefit compressed, shifting the cost–benefit calculus of a credible label. The balance remains issuer-, product-, and market-specific, with defensive-asset and reputational considerations continuing to support labeling for higher-quality issuers.

Government policy has become the decisive factor in determining where sustainable bond labels grow and where they fade. China’s central bank lending facilities, which offer discounted financing for green projects, directly incentivize issuers to label their bonds. Malaysia’s Sustainable and Responsible Investment (SRI) Sukuk and Bond Grant Scheme and similar programs elsewhere in emerging Asia subsidize external review and verification costs, lowering the compliance burden.⁷ In the Middle

⁷ Sukuks are bond-like instruments that adhere to Islamic laws

East, sovereign policy programs anchored around long-term economic transformation strategies have created issuer pipelines that do not depend on market-based pricing incentives. A widening regulatory asymmetry has emerged. Developed markets have tightened disclosure requirements (raising the cost of labeling) while, in contrast, several emerging Asian economies have focused on reducing labeling costs. It is in these latter markets that issuance has held up.

The decline in emerging market issuance outside China is best understood as a consequence of several country-specific disruptions rather than a systemic rejection of sustainable finance. Chile shifted toward local-currency bonds, which carry a sustainable label less frequently. Mexico front-loaded conventional debt issuance amid uncertainty over trade tariffs. Brazil's benchmark interest rate of 15 percent made all bond issuance expensive, crowding out the additional costs associated with labeling. India's sovereign green bond auctions were undersubscribed in a market where the government accounts for 94 percent of issuance. In each case, the lack of dedicated policy support meant that labeling could not be sustained through the disruption. Across emerging markets excluding China, the share of total bond issuance carrying a sustainability label fell from 3 percent in 2024 to 2.6 percent in 2025.

These market dynamics are unfolding against a backdrop of rapidly growing investment needs. Emerging markets excluding China need to roughly triple their annual clean energy spending to approximately \$950 billion per year to meet internationally agreed targets. Adaptation to more extreme weather events with flood defenses, drought-resistant agriculture, or resilient infrastructure, remains severely underfunded, accounting for just 0.9 percent of green bond proceeds globally. At the same time, official development assistance fell 18 percent in 2025, and about half of low-income countries are at high

risk of debt distress, limiting their ability to borrow for investment in adaptation.

One area that has seen growth is sustainable finance for women's economic growth and participation. Over 100 issuers across more than 40 countries have channeled capital toward women's entrepreneurship, employment, and leadership through labeled bonds, which this report classifies as Women's Economy Bonds. Cumulative issuance has reached \$57 billion. Latin America and the Caribbean lead the segment with 40 percent of volumes. Growth in this market demonstrates that capital allocation for women's inclusion is both commercially viable and scalable, though further progress requires improved sex-disaggregated data standards, market standardization, and demonstrable additionality in the use of proceeds.

Looking ahead, the most critical challenge facing the market is an impending spike in debt maturities. Approximately \$371 billion in emerging market sustainable bonds are scheduled to mature between 2026 and 2028, equivalent to 45 percent of the \$784.4 billion in outstanding stock. Net issuance has already fallen from its 2023 peak of \$187 billion to \$91 billion in 2025 as maturities accelerate. Simply keeping net supply flat in 2026 would require gross issuance growth of 11 percent, far above the 2.2 percent recorded in 2025. If a significant share of maturing issuers chooses not to re-label their refinancing, the total stock of emerging market sustainable bonds could contract for the first time in the asset class's history.

Whether the market can avoid this contraction depends on three developments: the adoption of transition bonds, which for the first time offer a dedicated framework for hard-to-abate sectors such as steel and cement; progress on taxonomy interoperability, which would allow issuers to satisfy multiple regulatory frameworks with a single

bond label; and the continued increase of the Asian policy model of reducing labeling costs. The sustainable bond market is not contracting because investors have lost interest or because the underlying investment needs have diminished. Global capex in areas denominated “clean” was higher, up almost 6 percent to a record \$2.2 trillion. It therefore follows that the sustainable bond market is contracting because the institutional architecture (i.e., the incentive structure) has not fully kept pace with the scale of the challenge.

Part 1

Introduction

Global sustainable bond issuance fell 15 percent in 2025, with developed economies leading the decline as tighter regulatory scrutiny and shifting political signals made the securities less attractive to issuers, even amid a broader trend toward investment in clean energy.² At \$891.2 billion, worldwide sales volumes were 19 percent below their 2021 peak.³ The United States, until recently the world's largest issuer, saw a 37 percent contraction to \$71.2 billion, falling from first to fourth place globally. European issuance declined, albeit less dramatically, and the developed-market aggregate dropped by 23.2 percent. Taken at face value, these figures suggest an asset class in retreat.

Emerging markets tell a different story. Green, Social, Sustainability, and Sustainability-Linked (GSSS) issuance in developing economies rose by 2.2 percent to \$186.8 billion over the year. This was largely fueled by China, where issuance of the securities surged over 50 percent to \$111.1 billion, making it the world's largest sustainable bond market for the first time. The Middle East and North Africa saw sales rise by more than a fifth, led by a near doubling of issuance in Saudi Arabia. Excluding China, the East Asia and Pacific region also recorded robust growth (11 percent). Nevertheless, not all emerging markets saw such strong momentum and some experienced sharp falls in sales. Outside China, emerging market issuance fell by 31 percent, with the steepest declines concentrated

² For sustainable bond definitions, see Box 1.

³ Global GSSS issuance: \$891.2 billion, down 15 percent year-on-year and 19 percent from the 2021 peak of \$1.1 trillion. Developed market issuance: \$553.3 billion (-23 percent). Multilateral development bank issuance: \$151.1 billion (+3.2 percent). Emerging market issuance: \$186.8 billion (+2.2 percent). China issuance: \$111.1 billion (+51 percent).

in Latin America (-56 percent) and South Asia (-68 percent).⁴

This tension—declining issuance despite resilient demand—is the central puzzle of the 2025 market, and the organizing question of this report. The answer, we argue, lies in a structural shift in the economics of applying a GSSS label to securities rather than a generalized loss of appetite for sustainable finance.

The more consequential development of 2025 is the change in the relationship between climate-related investment and labeled issuance, a dynamic that reflects the maturing of labeled markets in advanced economies, with sustainability considerations increasingly pursued through other, more established financing channels. As GSSS bond issuance expanded between 2019 and 2022, the market's principal credibility problem was greenwashing, where issuers overstated the environmental credentials of the bonds. As regulation tightened in response and scrutiny intensified, particularly in Europe and the United States, this challenge to credibility inverted. Issuers turned their focus to making direct investments in sustainable assets and activities and made less use of labeled financing instruments like GSSS bonds. Capital expenditure in clean energy in developed markets rose from \$829 billion in 2022 to \$1.1 trillion in 2025 while the share channeled through labeled bonds fell from 48 percent to 35 percent over the same period. The investment continued as the label retreated.

The evaporation of the so-called greenium, the pricing advantage to issuers of sustainable bonds in comparison with yields on conventional bonds, reinforces this dynamic. The greenium on green bond yields fell below one basis point in 2025, down from a 2019–2024 average of approximately 2.4 basis points. In emerging markets, the greenium effectively vanished and can no longer be distinguished from zero with statistical confidence. If labeled bonds offer no measurable financial advantage, the economic case for labeling rests entirely on factors unrelated to the cost of issuance such as diversification of the investor base and regulatory alignment. However, some of these are themselves under pressure amid closer scrutiny and shifting political priorities in some countries.

Policy architecture has emerged as the defining characteristic of whether a region saw issuance of GSSS bonds expand or contract over the period. In China, central bank lending facilities, macro-prudential integration, and broadened taxonomy eligibility make labeling economically advantageous for financial institutions regardless of whether a secondary market greenium exists. Elsewhere in east Asia, direct cost subsidies offset verification and documentation expenses. In the Middle East, sovereign policy programs anchored around long-term economic transformation strategies have created issuer pipelines that do not depend on market-based pricing incentives. Where these policy structures exist, labeled issuance grew. Where they do not, it contracted, even where underlying investment in sustainability rose.

⁴ Emerging markets excluding China: \$75.6 billion (-31 percent). Latin America and the Caribbean: \$19.7 billion (-56 percent). East Asia excluding China: \$18.1 billion (+11 percent). Europe and Central Asia: \$18 billion (-27 percent). Middle East and North Africa: \$15.4 billion (+21 percent). South Asia: \$2.7 billion (-68 percent). Sub-Saharan Africa: \$1.7 billion (-35 percent).

BOX 1

Sustainable (or GSSS) Bond Definitions

This report uses the umbrella term GSSS (Green, Social, Sustainability, and Sustainability-Linked) to refer to the five categories of labeled bonds aligned with the International Capital Market Association (ICMA) principles and guidelines.

Green bonds are use-of-proceeds instruments whereby the money they raise is exclusively used for financing or refinancing eligible projects related to sustainability in areas such as renewable energy, energy efficiency, clean transportation, or adaptation to extreme weather. Aligned with

the ICMA Green Bond Principles (GBP, 2021).

Social bonds are use-of-proceeds instruments used to fund eligible social projects, such as affordable housing, access to essential services, food security, or socioeconomic advancement. Aligned with the ICMA Social Bond Principles (SBP, 2023).

Sustainability bonds are use-of-proceeds instruments where funds are applied to finance or refinance a combination of green and social projects. Aligned with the ICMA Sustainability Bond Guidelines (SBG, 2021).

Sustainability-linked bonds (SLBs) are structurally distinct. Proceeds are not earmarked for specific projects but may be used for general corporate purposes. Instead, the bond's financial or structural characteristics (typically the coupon) are linked to the issuer's achievement of predefined sustainability performance targets. Aligned with the ICMA Sustainability-Linked Bond Principles (SLBP, 2023).

Transition bonds are use-of-proceeds instruments that finance decarbonization activities in hard-to-abate sectors (such

as steel, cement, chemicals, and heavy transport) where low-carbon alternatives are not yet technically or economically feasible. Unlike green bonds, transition bonds may finance projects that reduce but do not eliminate greenhouse gas emissions. The ICMA Climate Transition Bond Guidelines (November 2025) provide the first dedicated framework, requiring an issuer-level transition strategy, a technical feasibility analysis, taxonomy alignment, quantifiable emissions reduction beyond business-as-usual, and disclosure of carbon lock-in risks (see **Part 7.2**).

The weakness in Latin America and South Asia is best understood through this lens. In each case, the decline in labeled issuance reflects country-specific factors interacting with the absence of a compensating policy architecture. Mexico's economic uncertainty given a shifting U.S. tariff policy, Brazil's 15 percent policy rate, Chile's pivot to local-currency issuance, and failed sovereign green bond auctions in India all put the brakes on issuance. These are not symptoms of a generalized emerging market retreat from sustainable finance. They are idiosyncratic shocks in markets where the greenium was already too thin to buffer macro volatility and where no policy mechanism existed to sustain labeling through the disruption.

The macro and policy backdrop frames these dynamics. The COP30 summit held in Belém, Brazil in November 2025 reaffirmed the existing climate finance architecture and articulated a path forward. Parties agreed to triple adaptation finance to \$120 billion by 2035 within the \$300 billion New Collective Quantified Goal envelope agreed at COP29, and endorsed the Baku to Belém Roadmap to mobilize \$1.3 trillion per year by 2035 from a broad set of public and private sources.⁵ Discussions on a binding fossil-fuel phase-out timetable did not converge among Parties.⁶ Official Development Assistance is declining (by an estimated 18 percent in 2025 alone) and about half of low-income countries are considered at high risk of debt distress. The fiscal space for discretionary green expenditure is narrowing precisely as the investment gap is widening. Emerging markets outside China need to roughly triple clean energy capital expenditure from \$310 billion to \$950 billion per year to align with net-zero pathways.

This report examines these dynamics in sequence.

Part 2 analyses sustainable bond performance and the collapse of the greenium. **Part 3** documents the maturing of labeled markets in advanced economies and its geographic pattern. **Part 4** presents issuance data by region, with particular attention to the divergence between China and other emerging markets, and the country-specific factors behind the contractions in issuance from Latin America and South Asia. **Part 5** focuses on Women's Economy Bonds as a special theme. **Part 6** quantifies the investment gap and the fiscal constraints on closing it. **Part 7** examines the regulatory developments reshaping the labeling architecture, including the divergence between developed markets and eastern Asia, the International Capital Market Association (ICMA) Climate Transition Bond Guidelines, and taxonomy interoperability. **Part 8** presents issuance projections for 2026–2027, against the backdrop of a maturity wall that will determine whether the outstanding stock of emerging market sustainable bonds contracts for the first time in the asset class's history.

⁵ UNEP, Adaptation Gap Report 2025

⁶ COP30 endorsed a call to triple adaptation finance by 2035, but within the unchanged \$300 billion New Collective Quantified Goal on Climate Finance envelope agreed at COP29, implying a reallocation from mitigation rather than additional resources. More than 80 countries pushed for a fossil-fuel transition roadmap, but major producers blocked binding measures.

Part 2

Performance and the Greenium (2018–2025)

2.1. Sustainable Bond Performance

Emerging market debt delivered strong positive returns to investors in the secondary market during 2025. In dollar terms, emerging market sovereign debt (as measured by the JPM EMBI Global Diversified Index) returned 13.5 percent, while emerging market corporate debt (tracked by the JPM CEMBI Broad Diversified Core Index) advanced 8.4 percent. This followed positive, but more moderate, returns in 2024 of 6.5 percent for emerging market sovereigns and 7 percent for corporates (see **Table 1**).

It was also a strong year for emerging market GSSS bonds. Emerging market corporate bonds returned 10.4 percent in 2025 on the EM Credit Green, Social and Sustainability Bond Diversified Index (GESSIE), outperforming the broader emerging market corporate debt index by 2 percentage points. This contrasts with

2024, when the same index returned 3.5 percent and underperformed broad emerging market corporates by 3.6 percentage points.

As in previous editions, performance comparisons should be interpreted with caution. The emerging market GSSS bond universe is tilted toward higher credit quality and longer duration issuance, and these structural features, rather than the sustainability label itself, are likely to account for much of the variation in returns relative to broader indexes. **Table 1** reports the data for reference but the near-zero greenium documented in **Part 2.2** (and **Annex C**) suggests that any performance differential reflects index composition rather than a pricing effect specific to GSSS bonds. Still, sustainable bonds can make sense from a financial perspective for issuers and investors alike. The higher-quality profile of many GSSS

issuers and a longer-term investor base may make them attractive as defensive assets in times of volatility.

A complementary Sharpe ratio analysis can be found in **Annex A**.

2.2 The Greenium: From Pricing Advantage to Near-Zero

The greenium has compressed significantly as the labeled bond market has matured. Growing liquidity, reduced scarcity, and the normalization of investor appetite for sustainable assets have narrowed the yield differential between labeled and conventional debt. Although empirical evidence continues to support the existence of a greenium, it is falling. Panizza et al. (2025) estimate an average of about 2 basis points in advanced economies and around 13 basis points in emerging markets, but stress that signaling, reputational benefits, and market-development effects may far outweigh direct funding cost savings.⁷ Our own estimates, presented in **Annex C**, confirm this compression across markets and currencies. The greenium is unlikely to recover to previous levels, meaning the case for GSSS bond issuance will increasingly rest on non-pricing motivations. These can include a push for investor diversification, eligibility for policy incentives and taxonomy access, governance and reputational signaling, and market-development effects, making the policy interventions documented in **Parts 7.3–7.5** critical to keeping the labeling infrastructure intact.

⁷ Panizza, U., Shi, S., Weder di Mauro, B., and Gulati, M. (2025). "The Sovereign Greenium: Big Promise but Small Price Effect." CEPR Discussion Paper No. 20817.

TABLE 1

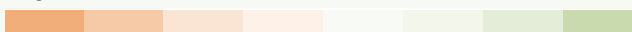
GSS Bonds Outperform in Risk-Off Years but Lag in Buoyant Markets

Annual Total Returns by Bond Category, 2018–2025 (Sovereign and Corporate)

	Index name	2018	2019	2020	2021	2022	2023	2024	2025
Green Bonds	GENIE	-3.5	7.5	12.7	-7.9	-23.3	11.3	-2.1	12.4
GSS Bonds	GSS	-3.4	7.0	11.1	-7.3	-21.2	10.3	-1.5	12.0
EM GSS Bonds Corporates	EM Credit GSS Bond Diversified Index (GESSIE)	-1.8	10.7	8.3	-2.4	-14.7	8.6	3.5	10.4
EM Bonds - Sovereigns	EMBI Global Diversified Index	-4.3	15.0	5.3	-1.8	-17.8	11.1	6.5	13.5
EM Bonds - Corporates	CEMBI Broad Diversified Core Index	-2.1	13.9	7.6	0.3	-13.1	8.6	7.0	8.4
EM Corporate Bonds: GSS vs Total		0.2	-3.3	0.7	-2.7	-1.6	0.0	-3.6	2.0
US Bonds : IG	GCI US Domestic IG	-2.3	14.0	9.9	-1.1	-15.3	8.4	2.4	7.7
US Bonds : HY	GCI US Domestic HY	-2.1	14.0	6.3	5.5	-11.0	13.3	8.3	7.9
US Bonds : IG vs HY		-0.2	0.0	3.6	-6.6	-4.3	-4.9	-5.9	-0.2
European Bonds : IG	GCI EUR Western Europe IG	-1.3	6.2	2.7	-0.9	-12.4	7.9	4.6	3.4
European Bonds : HY	GCI EUR Western Europe HY	-4.3	10.8	2.1	3.4	-9.7	11.7	7.8	4.7
European Bonds : IG vs HY		3.0	-4.6	0.6	-4.3	-2.7	-3.8	-3.1	-1.4

Negative returns

Positive returns



Source: Amundi, Bloomberg, and J.P. Morgan.

Note 1: (Row 1) JPM Green Bond Index; (2) JPM Green, Social and Sustainability Bond Index (GESSIE, the global aggregate benchmark); (3) GESSIE's hard currency only emerging markets benchmark (GESSIE EM Credit DIV); (4) JPM EMBI Global Diversified Index; (5) JPM CEMBI Broad Diversified Core Index. (6) to (9) are carve-outs from the JPM Global Corporate Index (GCI), a suite of fixed-income benchmarks. The GCI series tracks global corporate debt issuances in dollars, euros, and sterling, covering both investment-grade and high-yield bonds across developed and emerging markets. (6) and (7) correspond, respectively, to the investment-grade and high-yield categories of the GCI U.S. Domestic, specifically for dollar issuances with the country of risk identified as the United States. (8) and (9) pertain, respectively, to investment-grade and high yield issuances denominated in euros from Western Europe. **Note 2:** This Table shows absolute returns on an annual basis, from 2018 to 2025, for each bond category. Data is unadjusted for duration. The sixth row shows the relative performance of GSS vs. total corporate bonds, calculated as the difference between (5) and (3). The ninth row shows the relative performance of investment-grade vs. high yield bonds in the United States, calculated as the difference between (6) and (7). Finally, the last row shows the relative performance of investment-grade vs. high-yield bonds in Western Europe, calculated as the difference between (8) and (9).

Part 3

The Maturing of Labeled Markets in Developed Economies

The decline in sustainable bond issuance across advanced economies in 2025 reflects a confluence of factors. Tighter disclosure requirements raised the cost of issuing debt with GSSS labels. But this was compounded by political developments, most notably in the United States where the withdrawal of major asset managers from net-zero alliances dampened sustainability branding. At the same time, the absence of internationally harmonized taxonomies and labeling standards has fragmented the market, increasing compliance costs for issuers operating across jurisdictions. Market maturity has also played a role. As the stock of labeled bonds has grown, the scarcity premium that once rewarded early issuers has compressed. The sections that follow examine each of these dynamics in turn.

3.1 The Paradox: Resilient Demand, Falling Supply

Global GSSS bond issuance declined in 2025, and the headline numbers might suggest a retreat from sustainable finance. Yet the available evidence on investor and corporate demand points in the opposite direction. This disconnect is the central puzzle that this section addresses.

Amid polarization of debates around investment centered on environmental, social and governance priorities (ESG) in parts of the developed world, which has contributed to significant outflows from ESG-labeled funds in the United States, evidence suggests that demand for sustainable products remains resilient. According to the Morgan Stanley Institute for Sustainable Investing, sustainable

assets under management (AUM) increased marginally as a share of global AUM, from 6.6 percent in December 2024 to 6.7 percent by December 2025 (**Exhibit 1**).⁸ This marginal incline is nonetheless consistent with broadly stable demand, suggesting that recent ESG headwinds are more about relabeling and repricing of strategies than a wholesale retreat in capital allocation.

That said, emerging markets still play a limited role in sustainable investment. Only 3.1 percent of domiciled sustainable funds are based in developing economies, almost all in Asia, and just 4 percent of sustainable funds have an explicit Asia-Pacific investment focus. Global sustainable fund flows turned negative in 2025, with net outflows of \$62.8 billion for the full year. Asia was the only region to record net inflows, albeit modest, reinforcing the pattern of marginal demand growth shifting toward the regions where future emissions trajectories and physical climate risks are most acute.

From an asset-class perspective, within global asset allocation fixed income remains relatively under-represented. Sustainable fixed-income funds account for roughly 23 percent of total sustainable AUM, compared with 26 percent for their traditional counterparts,

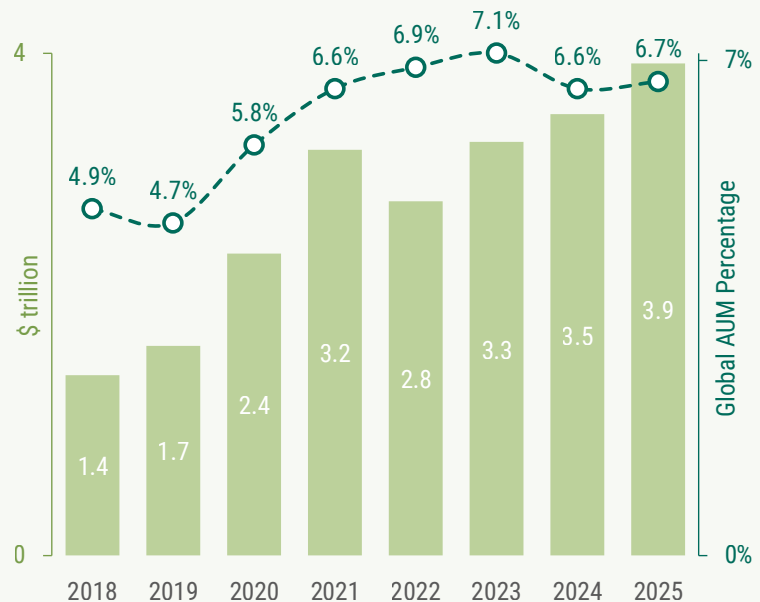
pointing to further room for growth. This is particularly relevant given the capital-intensive nature of the energy transition and the need for long-dated debt instruments.

Survey evidence reinforces this picture. In a study published in 2025 covering over 55 global institutional investors, Royal Bank of Canada found that more than 60 percent of respondents experienced stable or increasing demand for sustainable funds. Investors with euro-denominated mandates stood out with

EXHIBIT 1

Sustainable Fund Assets Surpass \$3.5 Trillion Despite ESG Backlash

Sustainable Funds' Assets Under Management, 2018–25



Source: Morgan Stanley's Institute for Sustainable Investing

Note: This Exhibit shows the evolution of global sustainable fund assets under management (AUM) in 2018–25, both in absolute terms (trillions of dollars) and as a percentage of total global assets under management. Sustainable funds are those classified as such by Morningstar.

⁸ Morgan Stanley Institute for Sustainable Investing (2026). "Sustainable Reality," March 2026.

half reporting rising demand, well ahead of other currencies.⁹ Conversely, perceived demand weakness was most pronounced among investors with mandates denominated in sterling and Australian dollars, and the survey explicitly noted that the bulk of the reported decline was attributable to U.S.-domiciled investors. This geographic pattern emphasizes how recent ESG retrenchment is concentrated rather than global.

Among investors already committed to sustainability, expectations remain upbeat. In another survey run by the Morgan Stanley Institute for Sustainable Investing, 86 percent of asset owners expect the share of assets allocated to sustainable strategies to increase over the next two years, up from 80 percent in 2024.¹⁰ Asset managers echo this view, with 79 percent expecting to raise the share of sustainable AUM, driven primarily by client demand rather than regulatory compliance. Critically, strong performance, rather than values-based considerations, was cited as the top driver, reinforcing the view that sustainability is increasingly treated as an asset class offering investment growth.¹¹

3.2 The Mechanism: How the Incentive to Label Eroded

The retreat of sustainable labeling reflects multiple forces, not only regulatory tightening but also political headwinds in the United States, the absence of harmonized international standards, and natural market maturity,¹² that together made sustainability labeling less appealing.

During the expansionary phase of the GSSS bond market, issuers had strong incentives to overstate the sustainability content of their activities. Use-of-proceeds frameworks, combined with weak ex-post enforcement and broad investor acceptance of labels, allowed GSSS bonds to scale rapidly. At the level of individual transactions, proceeds were typically directed to eligible projects. At the aggregate level, however, the fungibility of capital meant that labeling did not necessarily translate into additional sustainable investment. Issuers could finance projects they would have undertaken regardless, while accessing the reputational and pricing benefits associated with a sustainability label. In this context, labeling (rather than real capital reallocation) became the dominant margin. Issuers could access the benefits associated with sustainable finance without materially altering investment plans, and investors largely accepted the signal embedded in the label.

⁹ Royal Bank of Canada (2025). "2025 Global ESG Fixed Income Investor Survey," February 2025.

¹⁰ Morgan Stanley Institute for Sustainable Investing (2025). "Sustainable Signals: Institutional Investors 2025," November 2025.

¹¹ According to Morgan Stanley's calculations, sustainable equity funds, a proxy for sustainable investments, offer stronger long-term performance (+62 percent vs. traditional funds at +52 percent, cumulatively between December 2018 and December 2025). See Morgan Stanley Institute for Sustainable Investing's (2026) "Sustainable Reality," March 2026.

¹² By 'market maturity' we refer to the fact that the GSSS bond asset class is now old enough for early vintages to reach final maturity in meaningful volumes. Until recently, the market was young enough that gross and net issuance moved in tandem; the maturity wall documented in Part 4.8 means this is no longer the case, and net issuance, rather than gross volumes alone, has become the relevant metric for tracking market growth.

A growing empirical literature has documented the limits of environmental additionality during this period. Lam and Wurgler (2024) show that only a very small share of green bond proceeds financed genuinely new green projects, with a large fraction used for refinancing or for expansions of projects that were already underway.¹³ Crucially, markets did not price these differences. Offering yields, announcement effects, index inclusion, and green-bond fund holdings were statistically unrelated to project novelty, indicating that labels were rewarded largely irrespective of actual impact.

Firm-level evidence reinforces this conclusion. Shi et al. (2023) find that green bond issuance is associated with a surge in green patent filings, but a deterioration in quality (more non-invention patents, lower grant rates, and no improvement in citation intensity) suggests that issuers responded to visibility incentives without upgrading their underlying innovation capacity.¹⁴ At the outcome level, Shimauchi et al. (2025) show that while green bonds are associated with reduced CO₂ emissions, sustainability bonds and sustainability-linked bonds have no statistically significant link to emissions or water usage.¹⁵ Finally, Ul-Haq and Doumbia (2022) document design features in sustainability-linked bonds (late targets, weak penalties, and back-loaded enforcement) that dilute incentives *ex ante*.¹⁶

Taken together, this evidence points to a common mechanism across GSSS bonds. Labels proliferated,

markets largely accepted them at face value, issuers responded strategically, and environmental impact was often limited. As this concern became increasingly visible to regulators, investors, and issuers, the incentive structure began to shift. Over the same period, the greenium compressed sharply and in many cases disappeared altogether.¹⁷ Importantly, empirical evidence shows that investors do not price differences in additionality within labeled bonds (Lam and Wurgler, 2024), implying that once confidence in a label weakens, its pricing power erodes. At the same time, scrutiny intensified. Tighter disclosure requirements, more explicit anti-greenwashing frameworks, and shifts in the policy environment for sustainability-related disclosure raised the expected cost of labeling, further reducing its attractiveness to issuers.

In this new environment, labeling ceased to be a low-cost signal and increasingly became a potential liability. Issuers responded rationally. Rather than cutting back on climate-related investment, many chose to stop advertising it through labels. This is the essence of the labeled market's maturity in advanced economies—the withdrawal of labels from otherwise green investment—and it is among the core forces shaping the 2026–2027 issuance outlook.

This interpretation helps resolve the paradox documented in **Part 3.1**. The demand evidence consistently points to stable investor appetite for sustainable assets, yet GSSS

¹³ Lam and Wurgler (2024). "Green Bonds: New Label, Same Projects," NBER Working Paper 32960, September 2024.

¹⁴ Shi et al. (2023), "Green bonds: Green investments or greenwashing?," *International Review of Financial Analysis*, Volume 90, November 2023.

¹⁵ Shimauchi et al. (2025), "Sustainability bond, sustainability-linked bond, and firms' environmental performance," *International Review of Financial Analysis*, Volume 102, June 2025.

¹⁶ Ul-Haq and Doumbia (2022), "Structural Loopholes in Sustainability-Linked Bonds," World Bank Group Policy Research Working Paper 10200, October 2022.

¹⁷ See Part 2.2 for the greenium analysis.

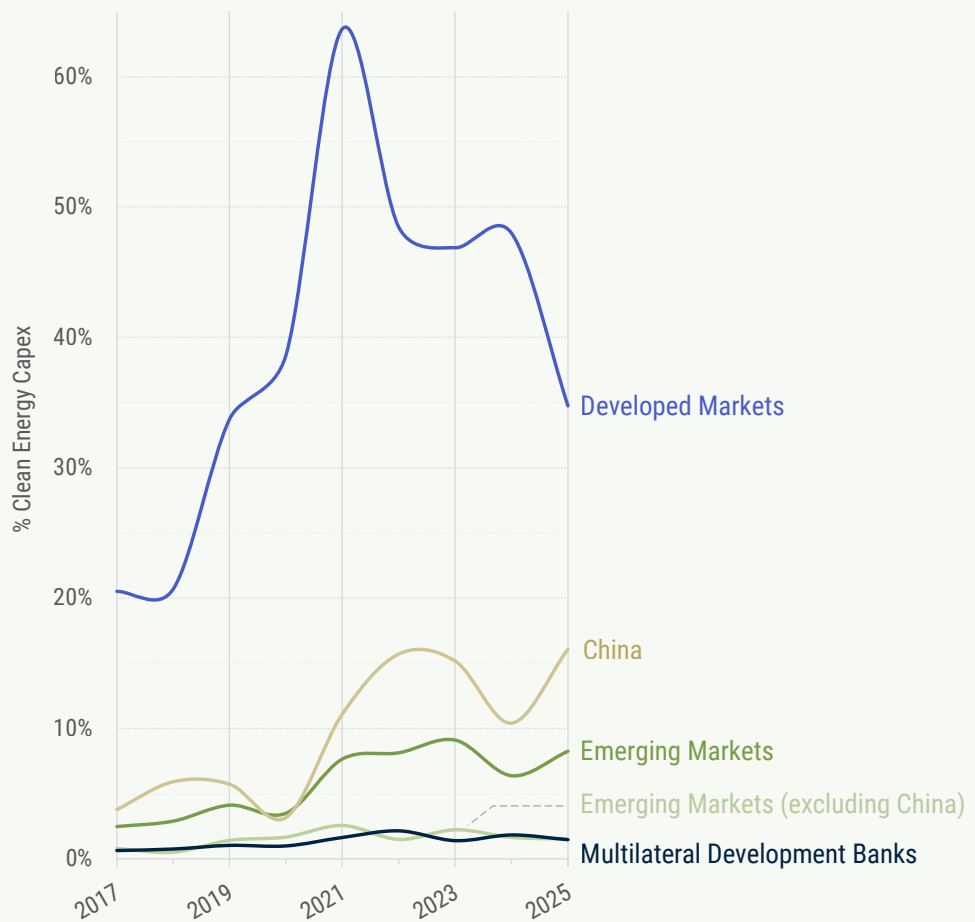
bond issuance contracted sharply across developed markets, particularly in the United States. The maturity of the labeled market explains this disconnect. Issuers are not responding to lower demand but to higher costs of labeling relative to its benefits. The supply of labeled instruments is declining because the incentive to label has eroded, even as underlying investment continues.

Data on total clean energy capital expenditure corroborate this reading. Cross-referencing labeled bond issuance against clean energy capex (from the International Energy Agency's World Energy Investment 2025) shows a "labeling rate" that tracks how much clean investment is channeled through labeled instruments¹⁸ (see **Exhibit 2**).

EXHIBIT 2

Green Bond Labeling Rates Drop Sharply in Developed Markets, Hold Steady in Emerging Markets

Green Bond Issuance as a Share of Clean Energy Capital Expenditure, 2017–2025



Source: Morgan Stanley's Institute for Sustainable Investing

¹⁸ International Energy Agency (2025). "World Energy Investment 2025," June 2025.

In developed markets, this ratio rose steadily from approximately 21 percent in 2017 to 48 percent in 2024, before dropping sharply to 35 percent in 2025, a 13-percentage-point decline relative to the 2022–2024 average. Clean energy investment in advanced economies continued to grow over this period, rising from \$829 billion in 2022 to \$1.1 trillion in 2025. Furthermore, even in 2025, clean energy investment increased by over 7 percent, well above emerging markets (under 3 percent) and faster than in 2024 (under 7 percent). The retreat is therefore not in underlying investment but in the decision to label it.

In emerging markets, by contrast, the labeling rate has remained broadly stable. The ratio of green bond issuance to clean energy capex stood at 8.2 percent in 2025, essentially unchanged from the 2022–2024 average. Within this aggregate, China’s labeling rate rose from a 2022–2024 average of 13.8 percent to 16.1 percent in 2025, reflecting policy incentives described below. Emerging markets excluding China saw a modest decline to 1.5 percent from a 2022–2024 average of 1.8 percent, though this remains within the narrow range observed over the entire 2017–2025 period. The data therefore suggest that the maturation pattern, with sustainability investment continuing while explicit labeling recedes, is primarily a developed-market phenomenon. In emerging markets, the labeling rate has consistently been low. The challenge is less a retreat from labeling than a structural under-penetration (i.e., the gap between the potential and actual share of labeled issuance) of labeled instruments relative to actual clean capital expenditure.

3.3 The Geographic Pattern: Why the Shift is Uneven

The maturing of labeled markets has not played out uniformly across regions. In Europe and other developed markets, the contraction in labeled issuance reflects a combination of diminished financial rewards and rising regulatory and reputational risk. New anti-greenwashing frameworks (while improving credibility) have raised the hurdle for labeling in a context where the greenium no longer compensates for costs associated with compliance, documentation, and litigation risk. Refinancing continues but increasingly without re-labeling, as issuers judge that the expected costs of attaching a GSSS label exceed the benefits.

Importantly, this does not contradict the conclusions of the last IFC–Amundi report published in June 2025, which argued that the European Union’s evolving labeling framework—including ESMA’s clarifications on fund naming and disclosure—would raise compliance costs for smaller issuers but was unlikely to materially shrink the investable GSSS bond universe.¹⁹ That assessment remains valid from a legal standpoint. What has changed is the margin of adjustment. Rather than being forced out of labeled markets, issuers are opting out voluntarily in a low-greenium world. Regulation has improved credibility, but it has also reduced the tolerance for deals when labeling ceases to deliver a pricing advantage.

The United States illustrates a distinct variant of the labeled-market dynamic, driven less by regulatory tightening than by shifts in the policy environment for

¹⁹ IFC & Amundi (2025). “Emerging Market Green Bonds Report,” June 2025.

climate-related disclosure.²⁰ The current government has proved less supportive of climate programs than its predecessor and reallocated public funding accordingly. In this context, attaching a green label to a bond carries far less appeal and brings limited marketing advantage. Yet the underlying investment continues to grow. U.S. utilities generated a record 1,162 terawatt-hours of electricity from renewable sources in 2025, a 10 percent increase over the prior year, with renewables accounting for 26 percent of all U.S. electricity.²¹ Nearly 80 percent of planned generation capacity additions over the coming decade is tied to renewable sources, and 93 percent of new capacity expected to come online in 2026 will be wind, solar, or battery storage. The divergence between surging clean-energy deployment and retreating green bond issuance in the United States illustrates the labeled-market maturation pattern.

Asia, by contrast, reflects a different equilibrium, one in which labels continue to work because policy, regulation, and market structure remain aligned. This relative resilience reflects a more interventionist (and often more issuer-friendly) policy stance across both emerging and developed Asia. In China, green and transition finance is embedded directly in the policy toolkit. Banks' green performance is incorporated into the central bank's macro-prudential framework. Green assets feature prominently in liquidity and credit channels, including

eligibility within central-bank facilities and access to targeted low-cost lending programs extended through 2027. These mechanisms make demand for labeled and transition instruments anchored in policy.

Elsewhere in emerging Asia, a distinctive "subsidize the label" model has taken hold, with no parallel in other emerging market regions. Malaysia's SRI Sukuk and Bond Grant Scheme explicitly offsets a large share of external review and verification costs. Thailand's financial regulator waived application and filing fees for ESG bonds through mid-2025, while the Thai Bond Market Association waived registration fees. Indonesia's OJK offers a 75 percent discount on green bond registration fees and Bank Indonesia complements this with macro-prudential incentives, namely reduced reserve requirements (up to 30 basis points) for banks holding green assets and relaxed inclusive financing ratios for institutions that purchase sustainable bonds. At the regional level, the Asian Development Bank's Credit Guarantee and Investment Facility provides irrevocable credit guarantees for sustainable bonds, effectively lowering borrowing costs. Meanwhile, the facility guaranteed its first sustainability-linked bonds in both Indonesia and Thailand. These measures collectively lower the fixed costs of issuing labeled debt in a low-greenium environment. No comparable architecture exists in Latin America, Africa, or the Middle East, where

20 In 2023–2025, opposition to ESG investing in the United States moved from rhetoric to concrete action. Several states divested public funds from asset managers deemed ESG-aligned; most notably, the Texas Board of Education withdrew \$8.5 billion from BlackRock. In late 2024, Texas led an 11-state antitrust suit against BlackRock, Vanguard, and State Street, alleging coordinated use of ESG commitments to suppress coal output. A coalition of 21 state treasurers issued formal warnings to major asset managers that incorporating sustainability factors could violate state and federal law, and over 20 states enacted or advanced statutes restricting the use of sustainability criteria in public pension management. At the federal level, the SEC in early 2025 required asset managers advocating ESG-related changes to file under the more onerous 13D disclosure regime. The incoming administration froze Inflation Reduction Act (IRA) disbursements for clean energy on its first day in office, subsequently terminated wind and solar tax credits, paused all wind energy permitting, and withdrew the United States from the Paris Agreement (January 2025) and the UN Framework Convention on Climate Change (January 2026). Concurrently, approximately \$40 billion in new subsidies and tax credits for the fossil fuel industry through 2035 were enacted, a policy mix that simultaneously penalized sustainable labeling and subsidized conventional energy.

21 Sullivan and Rosenthal, "Renewable Energy Defies Trump's Attacks, Reaching a New Record," Bloomberg Green, 25 February 2026.

governments have relied on sovereign signaling, tax incentives, or multilateral credit enhancement rather than direct issuer-facing subsidies. This asymmetry is central to understanding why labeling rates in eastern Asia have held up while other emerging market regions have contracted.

In developed Asia, policy support operates through a complementary channel. Japan's GX framework links sovereign transition bond issuance to a large, multi-year public-private investment program, creating a credible sovereign-backed benchmark that anchors the domestic transition bond curve and reduces the labeling burden

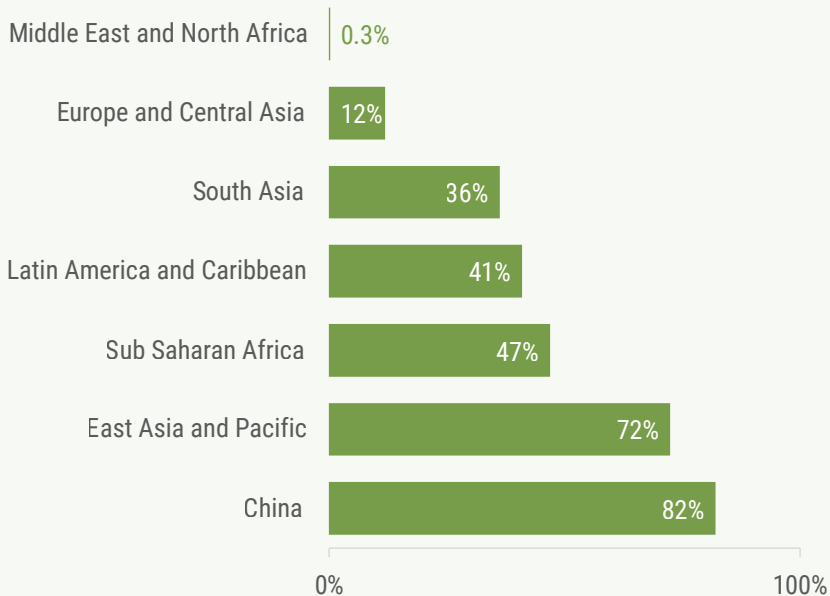
for private issuers. Singapore and Hong Kong further reinforce the regional architecture by directly subsidizing issuance-related costs through grant programs that have been extended into the second half of the decade.

Taken together, these measures support issuance not by relying on a greenium, but by improving the viability of issuing and providing policy certainty. This helps explain why Asian issuance (particularly in emerging markets) has held up better than in developed Western markets in a low-greenium, high-scrutiny environment.

EXHIBIT 3

Asian GSSS Markets Are Overwhelmingly Local-Currency, Insulating Them from Global Headwinds

Share of issuance in local currency by region, 2012–2025



Source: Bloomberg, Climate Bonds Initiative, Environmental Finance, IFC

Market structure reinforces this effect. Asian sustainable bond markets are more dominated by local-currency issues (**Exhibit 3**), are concentrated onshore, and are more bank-focused, and therefore less exposed to global ESG sentiment swings. Financing coal-heavy grids, industrial retrofits, or fuel switching is treated as a necessary transition step rather than as evidence of greenwashing. In this context, issuance has held up against a global backdrop of softening volumes.

This geographic divergence has important implications for the composition of future issuance. As developed-market issuers increasingly refinance without re-labeling, the share of global GSSS bond supply originating in Asia (and in emerging markets more broadly) is set to rise further. The moderate headline growth projected for 2026–2027 (**Part 8**) therefore conceals meaningful compositional shifts, with the balance of labeled issuance tilting toward markets where policy support and pragmatic standards continue to underpin the economics of labeling.

Part 4

Sustainable Bond Issuance (2012–2025)

4.1 Total Issuance and Its Composition

Global GSSS bond issuance totaled \$891.2 billion in 2025 (**Exhibit 4**), a decline of 15 percent year-on-year and 19 percent below the 2021 peak of \$1.1 trillion.²² Read in isolation, this suggests a broad retreat from sustainable finance. Scrutiny of the data, however, reveals that the contraction is predominantly a developed-market phenomenon.

Developed-market issuance fell 23 percent from a year earlier to \$553.3 billion. The United States registered the sharpest contraction, with issuance dropping 37 percent to \$71.2 billion. The U.S. share of global GSSS supply fell from an average of 16 percent

over 2017–2024 to just above 8 percent in 2025, and the country slipped from its position as the world’s largest GSSS bond issuer to fourth. The decline reflects the policy environment that followed the country’s withdrawal from the Paris Agreement and the rollback of clean energy subsidies. Among European issuers Germany saw a 20 percent drop from a year earlier to \$72.4 billion but maintained its 8.1 percent share of the global total, while France declined 4 percent to \$82.8 billion, a 9.3 percent global share. The United Kingdom fell 6 percent to \$45 billion.

Multilateral development banks contributed \$151.1 billion of global GSSS bond issuance, 3.2 percent higher than a year earlier. International institutions accounted for 17 percent of total global issuance of the

²² Global figures include developed markets, emerging markets, and multilateral development banks.

asset class in 2025, and their relative stability reflects institutional mandates that have so far been largely shielded from the policy dynamics driving developed market retrenchment.

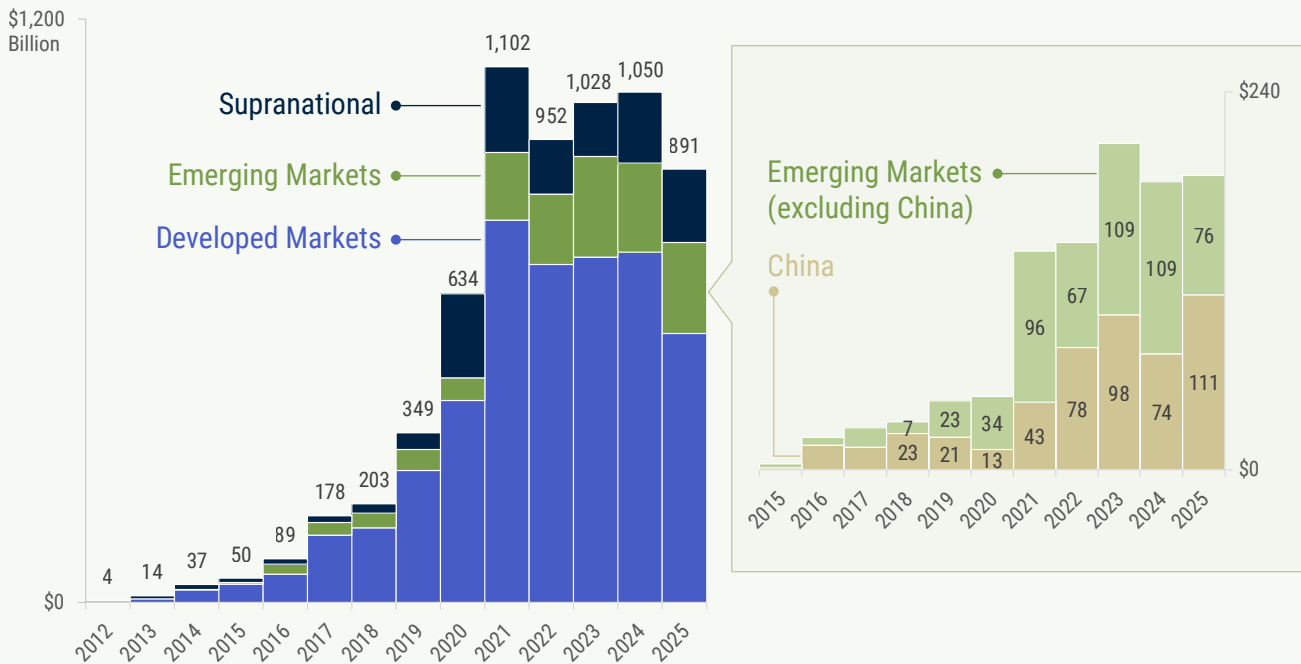
Emerging-market issuance, by contrast, rose 2.2 percent year-on-year to \$186.8 billion, partly

offsetting the broader developed-market contraction. The aggregate, however, masks a stark divergence. China’s GSSS bond issuance surged 51 percent to \$111.1 billion, an all-time high that made it the world’s largest GSSS issuer in 2025, from fourth in 2024 (**Exhibit 6**). China now accounts for 12.5 percent of global supply and 60 percent of all emerging market issuance,

EXHIBIT 4

Global GSSS Issuance Fell 15 Percent in 2025, Led by a Developed-Market Pullback

Global GSSS Bond Issuance by Region, 2012–2025



Source: Bloomberg, Climate Bonds Initiative, Environmental Finance, IFC

Note: This Exhibit shows total GSSS bonds issued per annum (billions of dollars). The left panel shows global issuance, broken down into developed markets, emerging markets, and multilateral development banks. The right panel shows GSSS bond issuance in emerging markets split between China and the rest. See Annex D for details on the underlying data.

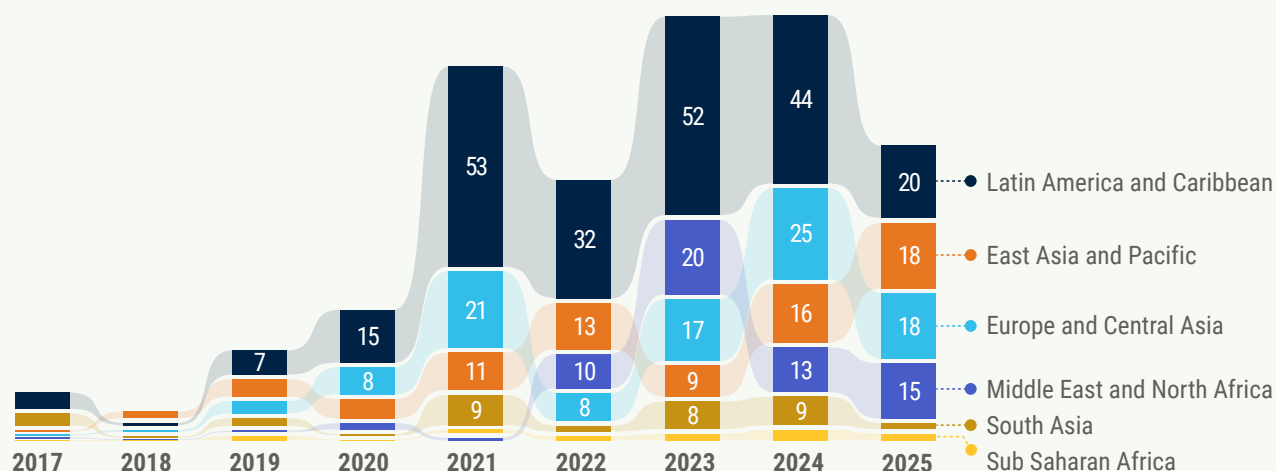
up from roughly 40 percent in 2024.²³ Emerging markets excluding China, meanwhile, contracted 31 percent to \$75.6 billion. But this too, requires disaggregation (**Exhibit 5**). The decline is concentrated in two regions (Latin America and South Asia) while other regions grew or tracked their broader fixed-income markets. The remainder of this section unpacks these dynamics.

At the country level, the 2025 ranking shifted markedly (**Exhibit 6**). China rose to first place with \$111.1 billion of GSSS bond issuance (a 51 percent year-on-year increase), ahead of France (\$82.8 billion, –4 percent), Germany (\$72.4 billion, –20 percent), and the United States (\$71.8 billion, –37 percent). The United States, the largest single-

country issuer in every prior edition of this report, fell to fourth. Among the other top-10 issuers, the United Kingdom (\$45.0 billion, –6 percent), Korea (\$43.3 billion, –19 percent), Japan (\$41.8 billion, –35 percent), Italy (\$30.7 billion, –24 percent), the Netherlands (\$27.3 billion, –21 percent), and Sweden (\$23.1 billion, –19 percent) all contracted. Outside the top 10, the largest proportional 2025 increases came from Saudi Arabia (+93 percent to \$9.4 billion), Norway (+12 percent to \$16.2 billion), Austria (+32 percent to \$8.5 billion), the Philippines (+21 percent to \$5.9 billion), and Argentina (more than tripling from a low base to \$0.9 billion). The steepest non-U.S. contractions among emerging markets were India (–70 percent to \$2.5 billion), Mexico (–64 percent to \$5.9

EXHIBIT 5

Emerging Markets (Excluding China) GSSS Bond Issuance by Region, 2017–2025



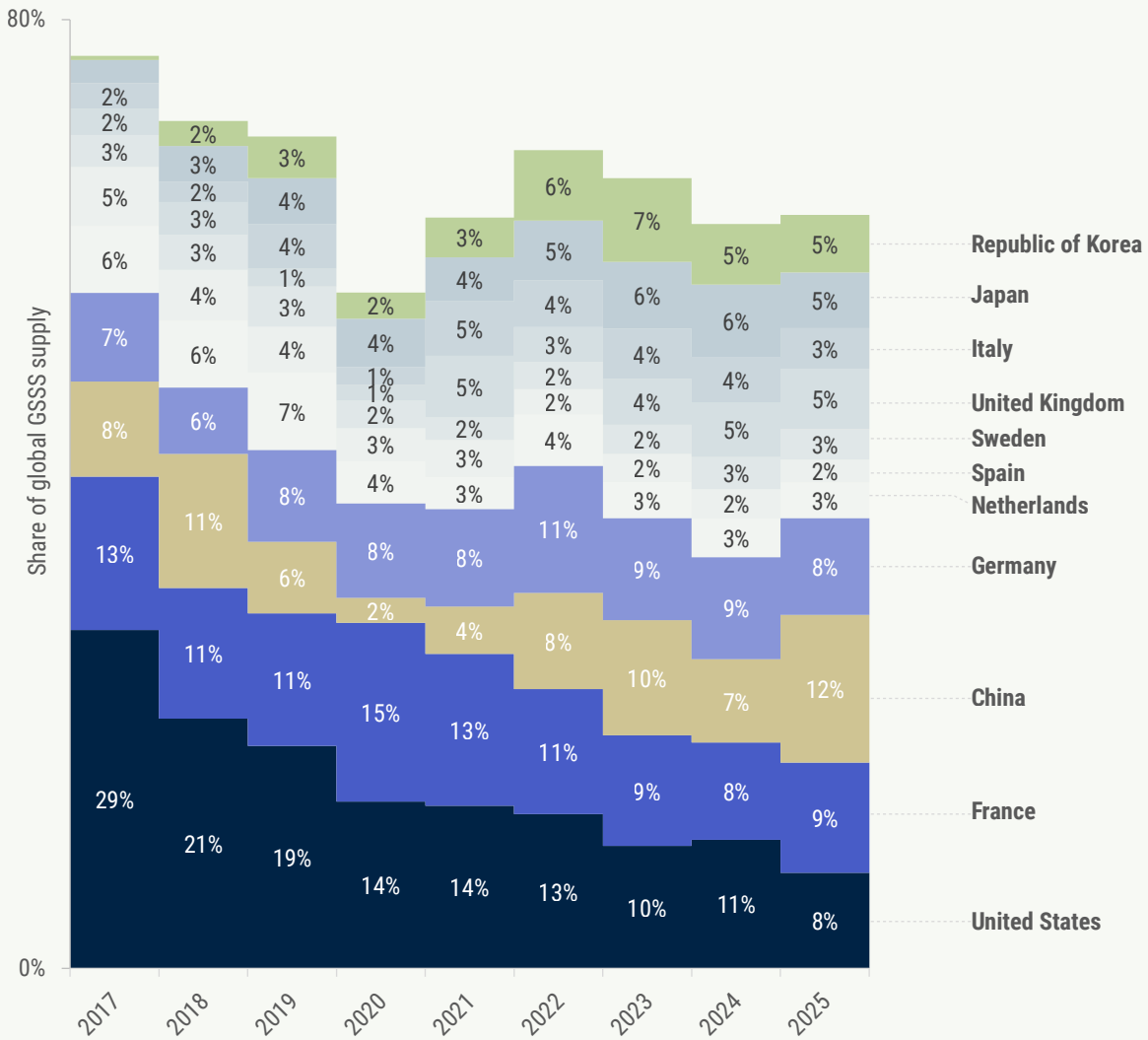
Source: Bloomberg, Climate Bonds Initiative, Environmental Finance, IFC. **Note:** This Exhibit shows annual GSSS bond issuance in emerging markets excluding China, broken down by World Bank regional grouping. See Annex D for details on the underlying data.

²³ Excluding China, global GSSS issuance fell by 15% year-on-year, exceeding the 14% decline recorded in 2022.

EXHIBIT 6

China Overtakes the United States as the Largest Single-Country GSSS Issuer in 2025

Country-level GSSS bond issuance, 2017–2025



Source: Bloomberg, Climate Bonds Initiative, Environmental Finance, IFC

Note: The chart only displays the top-country issuers of GSSS bonds. The remaining share (gap to 100%) is made up of other countries and supnationals not shown here

billion), and Brazil (–39 percent to \$7.7 billion). Reported separately, supranationals issued \$151.1 billion (3.2 percent above 2024), outpacing every individual country.

4.2 Penetration Rates: the Denominator Story

GSSS bond issuance cannot be assessed in isolation from total fixed-income supply. A decline in labeled bond volumes could reflect either a genuine pullback in sustainable borrowing or a shift in labeling behavior against a stable or expanding conventional debt market. Penetration rates—GSSS issuance as a share of total fixed-income issuance—distinguish between these two possibilities (**Exhibit 7**).²⁴

In emerging markets excluding China, the GSSS penetration rate fell from 3 percent in 2022–2024 to 2.6 percent in 2025. Over that period, conventional bond issuance in these markets held broadly steady or expanded. The contraction was therefore in the labeling, not in the underlying borrowing. The immediate drivers vary by region and are documented in **Parts 4.5** and **4.6**, but they played out against a shared global backdrop: the near disappearance of the greenium documented in **Part 2**. Without a meaningful pricing reward, there was no financial buffer to offset the costs and frictions of labeling, and each local shock became a reason to drop the label rather than to persist with it.

The exceptions are telling. China's penetration was broadly stable: 1.6 percent in 2025 compared with 1.5 percent in 2022–2024. The Middle East's penetration rate rose from 4.4 percent to 5.2 percent, an increase of 0.8

percentage points, driven by acceleration in Saudi Arabia. These are the only two emerging market regions where sustainable bonds are gaining share relative to total debt markets, and they are precisely the regions where policy continues to support the net incentive to label.

4.3 Where Labels Advanced: China

China's record issuance year was the product of a deliberate, multi-layered policy architecture that has made labeling economically rational even in a zero-greenium environment.²⁵

Most individual elements of this architecture have parallels elsewhere in emerging markets. Taxonomy expansion is broadening across developing economies (**Part 7.2**: 40 emerging market taxonomies). Sovereign green-bond frameworks now span Saudi Arabia, Indonesia, Egypt, Brazil, and Chile, among others. Grants and subsidy programs for verification costs operate in Malaysia and Singapore (**Part 3.3**). Central-bank green-refinancing facilities exist in Bangladesh (since 2009) and Hungary (since 2021). What distinguishes the Chinese case is less the choice of instruments than the combined scale and the integration of green-credit performance with macro-prudential assessment—that is, the link between bank capital and liquidity treatment to green performance—within a bank-dominated financial system that transmits policy signals quickly to issuance pipelines. China, therefore offers a menu of policy instruments visible in many emerging markets, namely the scale and depth of integration domestically reflect features of Chinese policy and financial architecture.

The catalysts arrived in sequence. In February 2025, the

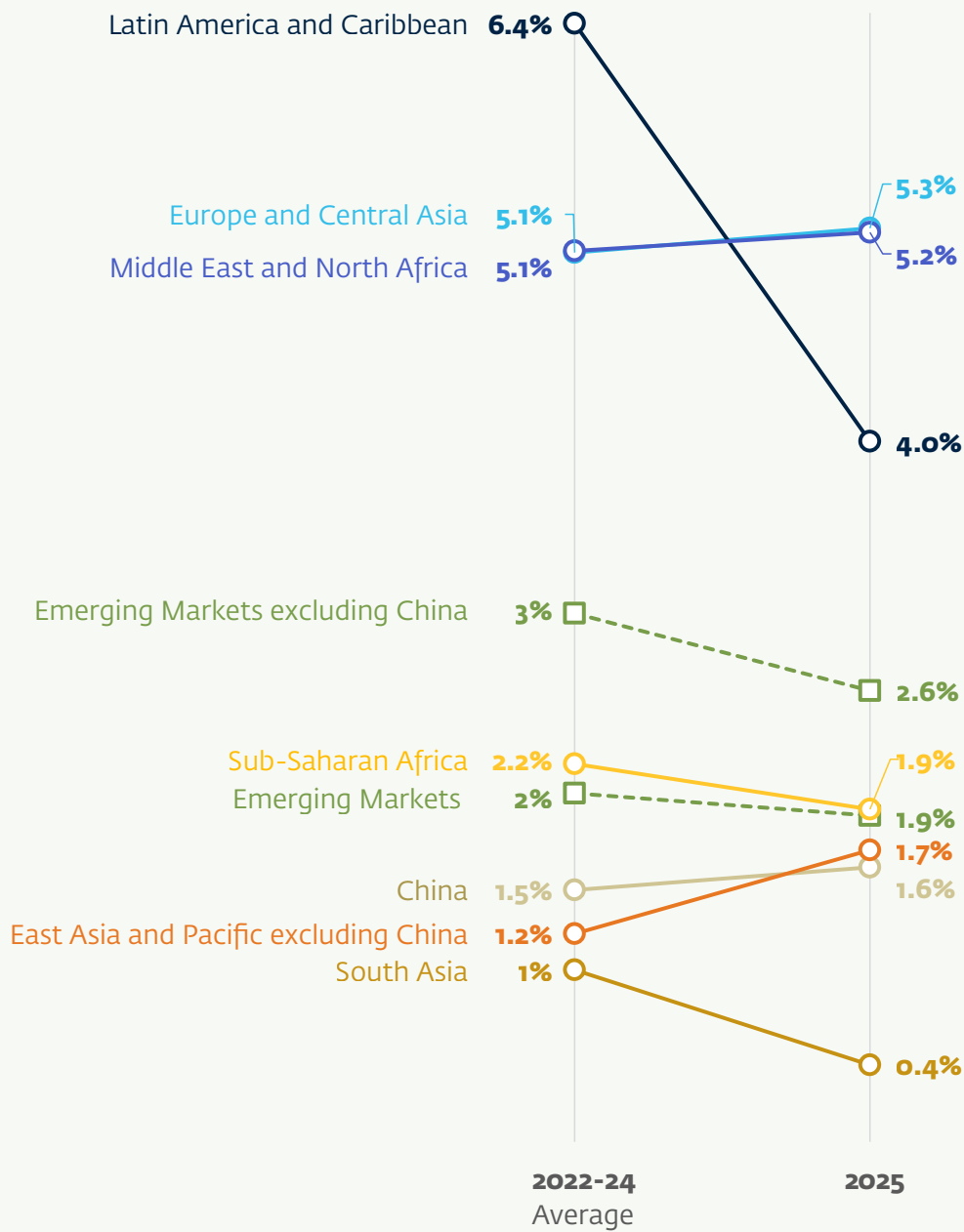
²⁴ See Part 3.2 for the labelling-rate analysis showing DM rates fell from 48% to 35% while EM rates remained stable at approximately 8%.

²⁵ See Part 3.3 on the Asian policy architecture supporting labelled issuance.

EXHIBIT 7

GSSS Penetration Slips in Most Regions but Rises in the Middle East

GSSS bond issuance as a share of total fixed income by region, 2022–2025



Source: Bloomberg, Climate Bonds Initiative, Environmental Finance, IFC

country's Ministry of Finance published a sovereign green bond framework stipulating that at least 50 percent of proceeds be earmarked for green expenditures, with clear governance standards.²⁶ In April, China listed its inaugural renminbi-denominated sovereign green bond on the London Stock Exchange (6 billion yuan, approximately \$824 million), signaling a commitment to international engagement alongside domestic capital channeling. In July, the People's Bank of China updated its Green Finance Catalogue, broadening the eligible project taxonomy, expanding climate mitigation categories, and introducing wholesale lending-window measures that provide cheaper capital to institutions holding green bonds.²⁷ These measures sit atop the so called "Beautiful China" policy directives issued by China's Central Committee and State Council, which embed green transformation objectives across the policy apparatus.

The composition of Chinese GSSS bond issuance reflects this policy alignment. Green bonds accounted for \$100.9 billion, or approximately 91 percent of the total, with year-on-year growth of 55 percent. Sustainability bonds reached \$7.7 billion, up 87 percent from \$4.1 billion in 2024. Sustainability-linked bonds rose sharply to \$2.1 billion from \$300 million.

The issuer mix shifted toward financial institutions which sold 82 percent more of the debt than a year earlier (**Exhibits 8 and 9**), accounting for 57 percent of the total (from 47 percent in 2024), driven principally by the green lending incentives from the central bank. Corporate issuance grew 24 percent, and together financial institutions and companies accounted for around 90

percent of Chinese GSSS bond supply. Sovereign issuance rose 23 percent, while municipal government issuance more than doubled from a base below 2 percent of the total. Government agency issuance was the sole decliner, falling 17 percent.

The step-change in scale is best illustrated by the Agricultural Bank of China (ABC), which in February 2025 issued 60 billion yuan (\$8.2 billion) in green bonds. This included a record 50 billion yuan (\$6.8 billion) three-year tranche, the largest green bond tranche ever issued by a non-sovereign entity globally. In a single three-month period, ABC's issuance exceeded its cumulative green bond volume over 10 years to 2025. The transaction encapsulated the broader shift from incremental to institutional-scale participation in the Chinese green bond market.

The implication is that China's green bond expansion is structurally embedded. Unlike in markets where the incentive to label depended on a pricing premium, Chinese issuance is sustained by regulatory incentives, taxonomy breadth, and central bank liquidity channels. This distinction matters for the outlook. Even if global greenium conditions remain compressed, Chinese volumes are unlikely to reverse as long as the policy apparatus remains in place.

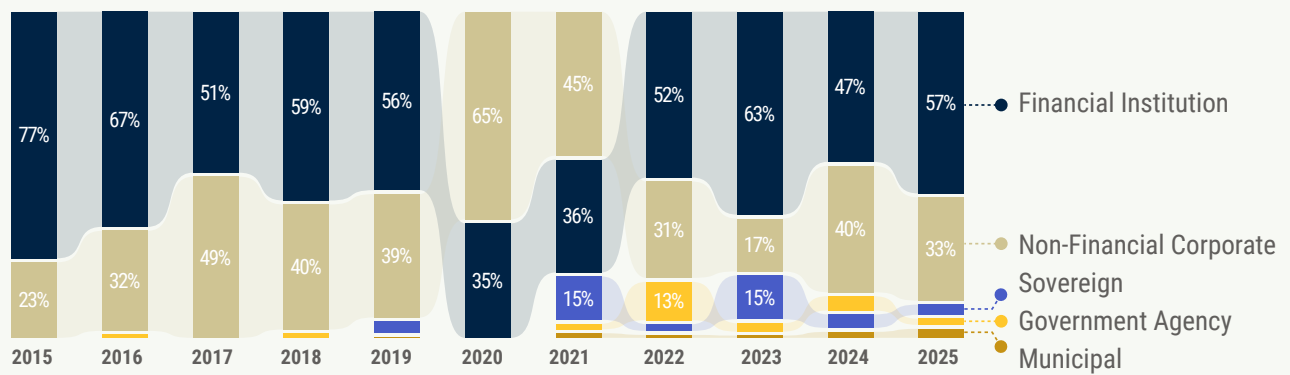
²⁶ Ministry of Finance of the People's Republic of China, Sovereign Green Bond Framework, February 2025. Available at: https://www.mof.gov.cn/en/news/mn/202502/t20250220_3958750.htm

²⁷ People's Bank of China, Green Finance Endorsed Project Catalogue, July 2025. Available at: <https://www.pbc.gov.cn/en/3688006/3995557/2025112114583967269/index.html>

EXHIBIT 8

Financial Institutions Drive China’s Green Bond Surge, Reaching 57 Percent of Issuance...

China issuer-mix share of GSSS bond issuance, 2015–2025

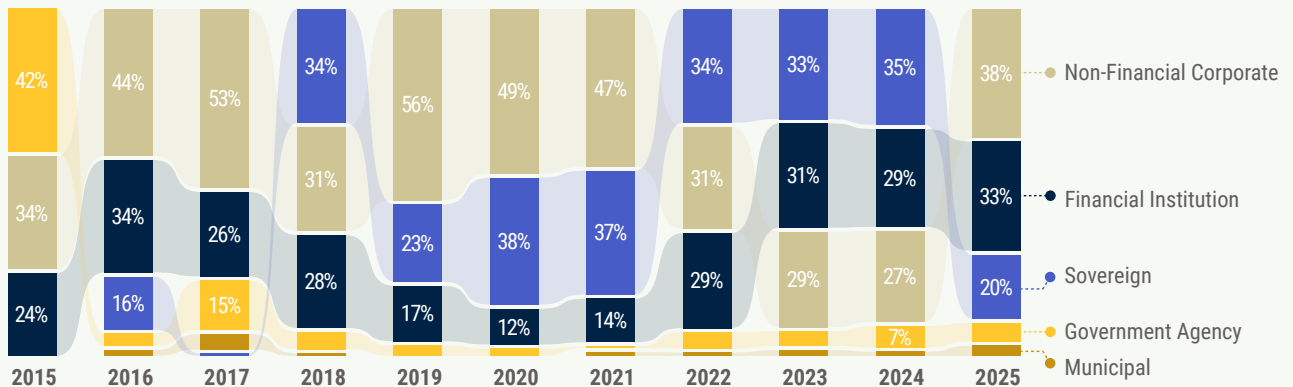


Source: Bloomberg, Climate Bonds Initiative, Environmental Finance, IFC

EXHIBIT 9

...While Sovereign Issuance Retreats Sharply Outside China

Emerging markets (excluding China) issuer-mix share of GSSS bond issuance, 2015–2025



Source: Bloomberg, Climate Bonds Initiative, Environmental Finance, IFC

Note: These Exhibits show the contribution of each issuer type to overall GSSS bond issuance (percent of total), per annum, in emerging markets—China and the rest. See Annex D for details on the underlying data

4.4 Where Labels Advanced: the Middle East and North Africa

GSSS bond issuance also advanced materially in the Middle East and North Africa, where total volumes reached \$15.4 billion, an increase of 21 percent. The region's share of emerging markets outside China rose to 20 percent from approximately 12 percent in 2024.

Saudi Arabia was the primary driver, with issuance reaching \$9.4 billion, roughly double the 2024 level. The expansion is linked to infrastructure programs and a growing sustainable market in sukuk. The green bond sub-segment was particularly strong across the region. The region's share of emerging market green bond issuance outside China surged from below 10 percent in 2024 to approximately 30 percent in 2025. The United Arab Emirates and other Gulf states also contributed, though at smaller scale as energy-transition commitments and sovereign wealth fund mandates increasingly channeled capital through labeled instruments.

The most significant structural development was Saudi Arabia's debut as a sovereign green bond issuer. In February 2025, the Kingdom issued a 1.5 billion euro green tranche alongside a 750 million euro conventional tranche, the largest euro-denominated green bond from a Middle Eastern sovereign. The order book exceeded 7 billion euros, reflecting strong demand from ESG-mandated investors. The transaction carries broader strategic significance. As a major oil producer, Saudi Arabia's decision to enter the labeled sovereign market signals a diversification of its investor base and a commitment to channeling transition finance through recognized instruments.

Like China, the Middle East's GSSS bond market growth is more shaped by policy than the direction of pricing

trends. Sovereign strategic incentives and the structural alignment of sustainability labels with national economic transformation programs have kept the cost-benefit calculus of labeling firmly positive.

4.5 Where Labels Tracked Fixed Income: East Asia and the Pacific, Sub-Saharan Africa, and Emerging Europe

Between the growth stories of China and the Middle East (**Parts 4.3–4.5**) and the sharp contractions in Latin America and South Asia (**Part 4.6**), three emerging market regions saw GSSS bond issuance broadly track their wider fixed-income markets. In these, GSSS penetration rates remained roughly flat even as absolute volumes moved. In East Asia and the Pacific, labeled issuance grew in absolute terms at a similar rate to overall fixed-income supply, leaving sustainable bonds' share of the market little changed. Sub-Saharan Africa and Emerging Europe saw issuance decline, but again in line with overall regional bond issuance.

East Asia and the Pacific outside China recorded absolute growth in labeled volumes, driven by the same policy dynamics documented in **Part 3.3** but playing out at the issuance level. Indonesia rose 49 percent to \$3.4 billion, Malaysia more than doubled to \$4.7 billion, and the Philippines grew 21 percent to \$5.9 billion. However, total fixed-income issuance in the region expanded at a broadly comparable pace, leaving GSSS penetration rates roughly unchanged year-on-year (1.7 percent in 2025 vs. 1.5 percent in 2024). Labeling kept up with, but did not outpace, the underlying market.

The contrast with developed markets is instructive. Although developed market regulators have focused

on tightening disclosure, taxonomies, and anti-greenwashing enforcement that raises the compliance cost of labeling, Asian authorities have moved in the opposite direction by actively reducing the frictions and costs of issuing labeled debt. Malaysia's SRI Sukuk and Bond Grant Scheme offsets a large share of external review and verification expenses. Indonesia's green bond framework, backed by OJK regulation, provides a streamlined issuance pathway with lower documentation burdens than international equivalents. The Philippines' Securities and Exchange Commission has adopted ASEAN Green Bond Standards that offer a light-touch, principles-based approach in contrast to the more prescriptive framework pursued by the European Union. In each case, the regulatory stance lowers the net cost of labeling. Combined with expanding national taxonomies and onshore investor bases that are less exposed to global ESG sentiment swings, this regulatory orientation helps explain why Asian issuance grew even as developed market and other emerging regions contracted. **Part 7** discusses these regulatory divergences in more detail.

Sub-Saharan Africa issued \$1.7 billion of GSSS bonds, a decline of 35 percent. The region accounted for just 2.3 percent of emerging market GSSS supply outside China in 2025, broadly flat compared with 2024, while a low number of transactions means volume totals are subject to large swings. South Africa was the bright spot, with issuance of \$1.3 billion representing a 64 percent year-on-year increase, underpinned by Eskom's ongoing energy transition financing needs and accelerating issuance from the financial sector. Outside South Africa, frontier African markets continue to face structural barriers to labeled issuance such as limited market depth, high borrowing costs, a small universe of issuers capable of meeting the documentation and reporting requirements of GSSS frameworks, and a near-total absence of the greenium that might offset these costs. The broader

decline in sub-Saharan Africa, therefore, reflects capital-market constraints rather than a change in attitudes toward sustainable finance. Penetration rates in the region, which fell year-on-year due to a base effect (2024 was abnormally high due to Côte d'Ivoire's \$1.1 billion inaugural sustainability bond in January 2024), remained in 2025 at levels comparable to those recorded in 2021–2023.

Emerging Europe and Central Asia declined 27 percent to \$18 billion. The contraction was broad-based, with Türkiye (historically the region's largest emerging market GSSS bond issuer) retreating 18 percent year-on-year in 2025 amid tighter domestic financial conditions as the central bank maintained elevated policy rates to stifle inflation. On the positive side, Poland saw GSSS bond volumes surge 64 percent, partly offsetting weakness elsewhere. Across the region, the decline is broadly consistent with conventional fixed-income trends and does not appear to reflect a green-specific pullback. Consistent with this, penetration rates in the region in 2025 were broadly in line with the 2021–2024 average.

The common thread across all three regions is that GSSS bond dynamics tracked the underlying fixed-income cycle. Penetration rates were flat when compared to recent years, implying the label's share of total sales did not move significantly.

4.6 Where Labels Retreated: Latin America and South Asia

Latin America and South Asia are the two emerging market regions where GSSS bond transactions fell significantly faster than total fixed-income issuance. In both cases, however, the drivers were country-specific (a strategic currency shift, trade-war disruption, extremely high domestic rates, and a structural market

failure) rather than symptoms of a systemic retreat from sustainable finance.

Latin America and the Caribbean

GSSS bond sales in Latin America and the Caribbean fell 56 percent to \$19.7 billion, the steepest contraction of any emerging market region, second only to South Asia which is much smaller and overwhelmingly dominated by India. Latin America's share of emerging market issuance outside China dropped from 41 percent in 2024, to 26 percent, well below the 2018–2024 average of approximately 42 percent. The region's three largest issuers—Chile, Mexico, and Brazil—each responded to distinct pressures.

Chile (-53 percent, \$4.3 billion). Chile's decline reflects a deliberate strategic shift rather than a loss of commitment to green finance. The sovereign has been pivoting from foreign- to local-currency issuance, targeting approximately 70 percent of new supply in Chilean pesos. This shift naturally reduces the rationale for green labeling as Chile's GSSS bonds were historically hard-currency instruments placed with ESG-mandated foreign investors, and domestic investors (pension funds and insurers). Importantly, Chile already accounts for the largest cumulative stock of sovereign GSSS bond issuance outside China (\$90 billion in 2017–2025), which reduces marginal issuance pressure relative to newer entrants. The decline in labeled volumes is therefore consistent with a currency mix decision and does not in itself signal a diminished sustainability ambition.

Mexico (-64 percent, \$5.9 billion). Mexico's contraction was driven by trade-war disruption and macroeconomic

uncertainty. The April 2025 U.S. tariff announcements created acute policy uncertainty for an economy where GSSS bonds are almost entirely sovereign and quasi-sovereign dollar instruments dependent on stable U.S.-facing demand.²⁸ The government's response was to front-load conventional issuance: in January 2025, Mexico executed its largest-ever bond placement (\$7.5 billion), locking in funding before any tariff shock materialized, as it eventually did. The subsequent pullback on green labeling reflects a rational triage where securing market access took priority over the incremental benefits of a sustainability label.

Brazil (-39 percent, \$7.7 billion). Brazil's decline is a function of extremely high domestic interest rates rather than a retreat from green finance. With the Selic rate at 15 percent (far above rates elsewhere in Latin America) corporations had strong incentives to delay international issuance, and the cost of hedging external debt back to Brazilian reals made cross-border transactions unattractive. Brazil's GSSS bond market is almost entirely corporate driven and at prevailing rates, the green label added cost to an already expensive transaction. The global fall from favor of sustainability-linked bonds compounded the problem. With sustainability-linked bond issuance down 49 percent globally in 2024 amid investor concerns over weak target setting and enforcement, Brazil's reliance on the instruments left it disproportionately exposed.²⁹ These pressures intensified into 2025.

Argentina (quadrupled, \$900 million) was the exception within the region. The rebound, albeit from a very low base (below 5 percent of the regional total),

²⁸ S&P Global Ratings, "Sustainability Insights: Emerging Market Sustainable Bond Issuance Constrained By Uncertainty," July 2025.

²⁹ Global SLB issuance declined 43% in 2024, reflecting investor concerns over weak target-setting, late enforcement, and issuer–investor misalignment. See Part 3.2.

reflects the broader normalization of Argentina's capital-market access following a macroeconomic stabilization program implemented by the country's government. The removal of capital controls, a sharp narrowing of the country-risk premium, and renewed engagement with international creditors reopened the external bond market. Several Argentine corporations (particularly in the energy and agribusiness sectors) took advantage of improved conditions to issue labeled instruments for the first time, positioning sustainability frameworks as part of a broader strategy to attract ESG-mandated foreign capital. The increase signals market re-entry rather than a structural deepening of the green bond market.

Notably, institutional commitment to Latin American sustainable finance continued even as market issuance contracted. In the fourth quarter of 2025, the Inter-American Development Bank issued a 1-billion-Australian-dollar (\$671 million) Amazonia Bond (the first benchmark-sized Amazon-focused transaction, jointly developed with the World Bank) dedicated to biodiversity conservation and sustainable development in the Amazon basin.

South Asia

India (-70 percent, \$2.5 billion) recorded the most severe single-country decline in emerging markets. India's GSSS bond market is almost entirely sovereign, making it uniquely exposed to disruptions in the government issuance calendar. The Reserve Bank of India applies the same pricing discipline to green bonds as to conventional securities, rejecting or devolving tranches whenever bids exceed its yield threshold. With a structural greenium of only 2–3 basis points, even modest

yield volatility is enough to push green bond bids outside the acceptable range. In the January 2025 auction, for example, nearly 80 per cent of the 30-year green tranche was devolved to primary dealers after a repricing of global rate expectations steepened the long end, and the June auction was canceled outright when a crude-oil spike lifted 30-year yields above the RBI's cut-off. The pattern echoes the May 2024 cancellation of a 10-year sovereign green bond, suggesting this is a recurring structural vulnerability rather than a one-off event.³⁰ The private sector did not fill the gap. With the central bank cutting rates and conventional bonds being absorbed at tightening spreads, labeling added compliance costs without delivering cheaper funding.

The contrast with East Asia is telling. Indonesia, Malaysia, and the Philippines have built regulatory frameworks that make labeling worthwhile even without a pricing premium, featuring grants, streamlined documentation, and principles-based standards (**Part 4.5**). India's sovereign green bond program, while pioneering among emerging markets, operates within the RBI's standard auction mechanism, where the structurally narrow greenium leaves little buffer against yield volatility. As the market evolves, complementary policy measures, such as those adopted by Southeast Asian peers, could help sustain issuance through periods of rate uncertainty.

Pakistan offered a modest counterpoint. In May 2025, the government issued a 32 billion rupee (approximately \$113 million) sovereign green sukuk, Pakistan's first. While the scale remains limited, the transaction signals growing appetite for Sharia-compliant sustainable instruments in South Asian frontier markets and broadens the

³⁰ Institute for Energy Economics and Financial Analysis (2025). "Disappearing greenium, global turbulence and pricing realities: What the RBI's shelved green bond really shows us," July 2025.

geographic footprint of sovereign green issuance beyond the Gulf states that have dominated Islamic sustainable finance.

4.7 Composition by Bond Type and Issuer

The type and borrower composition of emerging market GSSS bond issuance shifted markedly in 2025, with implications for both the character of the market and the interpretation of headline trends.

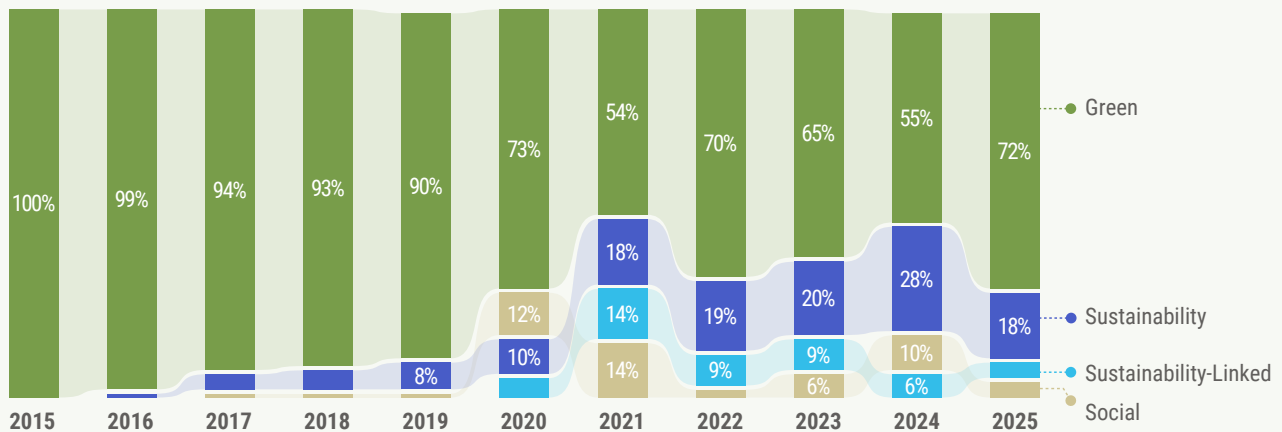
By bond type, green bonds strengthened their dominance, reaching \$134.9 billion and accounting

for 72 percent of overall emerging market GSSS bond issuance (up from 55 percent in 2024), with year-on-year growth of 33 percent (**Exhibit 10**). The increase was overwhelmingly driven by China (detailed in **Part 4.3**). Other developing economies recorded a modest 6 percent decline in green bond volumes, to \$33.9 billion. Sustainability bonds fell 33 percent to \$34.3 billion (18 percent of the total in 2025), with emerging markets outside China down 44 percent. The exception was the broader Asia-Pacific region excluding China (including both East and South Asia), where sustainability bonds grew 20 percent and their share of the regional total rose from 21 percent to 44 percent. Social bonds suffered the sharpest decline, falling 56 percent to \$8.3 billion (4

EXHIBIT 10

Green Bonds Continue to Dominate, Accounting for 72 Percent of Emerging Market GSSS Issuance in 2025

Emerging market GSSS bond issuance by label, 2012–2025



Source: Bloomberg, Climate Bonds Initiative, Environmental Finance, IFC

Note: These Exhibits show the contribution of each bond type to overall GSSS bond issuance (percent of total), per annum, in emerging markets—China and the rest. See Annex D for details on the underlying data.

percent of the total in 2025). Sustainability-linked bonds continued their slide from the 2021 peak, declining 17 percent to \$9.3 billion (5 percent of the total in 2025).

The issuer composition of emerging markets outside China underwent a significant structural shift. Sovereigns, which had accounted for 35 percent of issuance in 2020–2024, fell to 20 percent (\$14.8 billion, a 61 percent decline). As documented in **Part 4.6**, the immediate triggers vary by country but each played out in a global environment where the vanishing greenium (**Part 2**) had already eliminated the pricing reward for labeling. Sovereigns, as the most visible and fiscally constrained issuer class, are the first to shed labels when that reward disappears and local conditions become less forgiving. Consistently, issuance by government agencies also fell to 6.5 percent of the total (\$4.9 billion, a 39 percent decline). Financial institutions accounted for 33 percent (\$24.7 billion, down 23 percent).

As a result, corporates became the largest issuer group, rising to 38 percent of the total (from 27 percent) with \$28.9 billion of issuance, implying a modest 3 percent decline in absolute terms. Finally, municipal governments grew 70 percent but from a base of approximately 1 percent of the total in 2024 (to 3 percent in 2025).

The sovereign retreat in emerging markets outside China, therefore, reflects two forces operating simultaneously. A global force—the vanishing greenium, which removed the pricing reward for labeling everywhere—and a set of country-specific factors, namely the fiscal, macro, and market-structure shocks documented in **Part 4.6**, which raised the costs or reduced the feasibility of labeling. This distinguishes the emerging market pattern from that observed in advanced economies. In developed markets, the dominant dynamic is the maturing of the labeled segment, with refinancing increasingly occurring without re-labeling as sustainability considerations become

embedded in mainstream financing channels (**Part 3**). In emerging markets, greenium compression set the stage but the triggers differed on a case-by-case basis. The common thread is that the decline in labeled issuance appears to reflect changes in labeling incentives more than changes in investment behavior.

4.8 Maturity Profile and the Refinancing Challenge

The maturity structure of emerging market GSSS bonds adds a forward-looking dimension to the issuance analysis. The weighted average maturity across all developing economy GSSS bonds stands at approximately 5.9 years. China's average is shorter at 4.8 years, with 74 percent of outstanding bonds concentrated in three-to-five-year maturities. Emerging markets excluding China have longer profiles, averaging 7.5 years, with approximately 80 percent of bonds maturing beyond five years and 35 percent beyond 10 years.

Cumulative GSSS bond issuance since 2012 has reached \$6.5 trillion globally, with developed markets accounting for 70 percent and multilateral development banks for 15 percent. The outstanding stock of emerging market GSSS bonds stood at \$784.4 billion at the end of 2025, with China accounting for 39 percent and other emerging markets for the remaining 61 percent (\$477.5 billion).

EXHIBIT 11

**Short-Dated Chinese Issuance Drags Emerging Market
GSSS Weighted Average Maturity Below Five Years**

Weighted-average tenor of GSSS bond issuance by region, 2012–2025

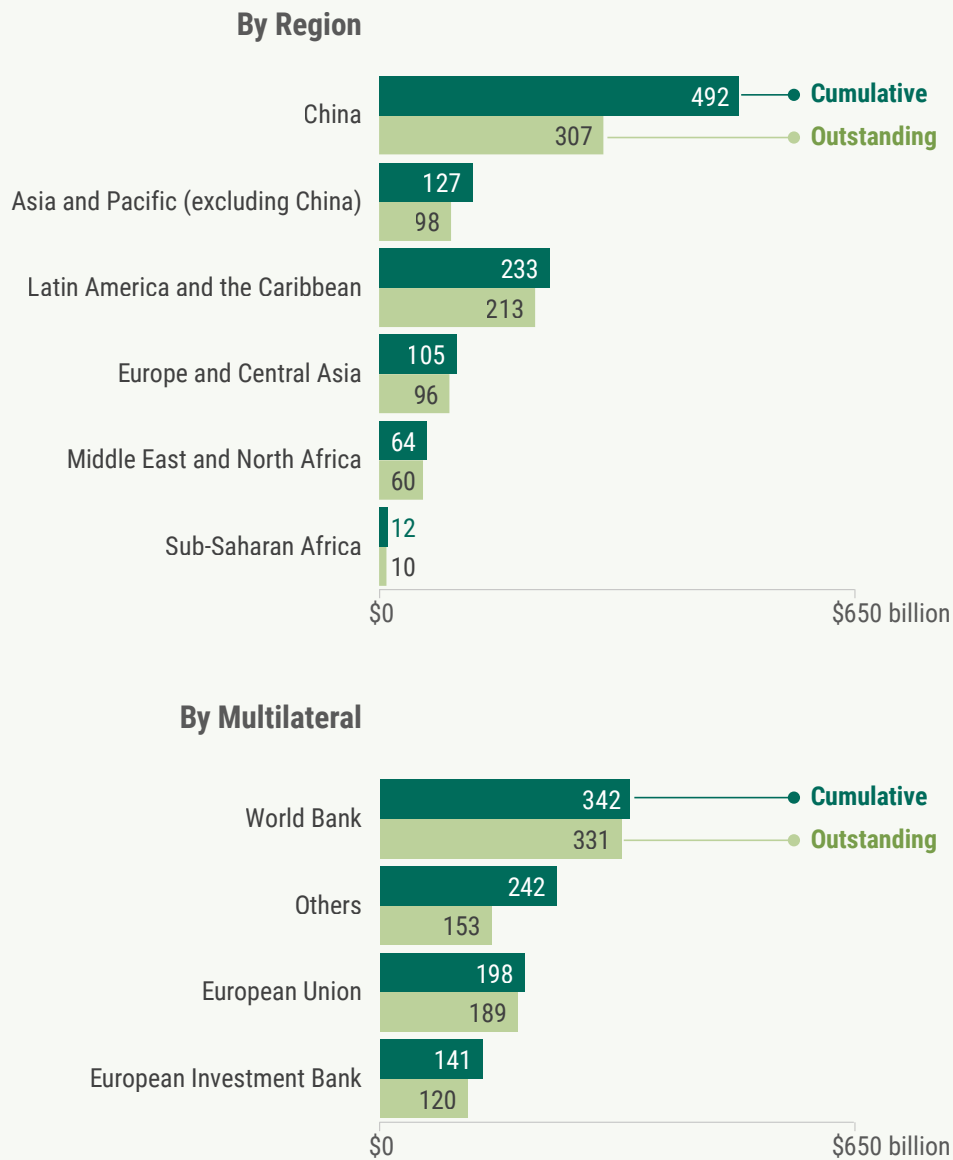


Source: Bloomberg, Climate Bonds Initiative, Environmental Finance, IFC

EXHIBIT 12-13

Cumulative Emerging Market GSSS Issuance Reaches \$1 Trillion, with Multilateral Institutions Contributing 15 Percent

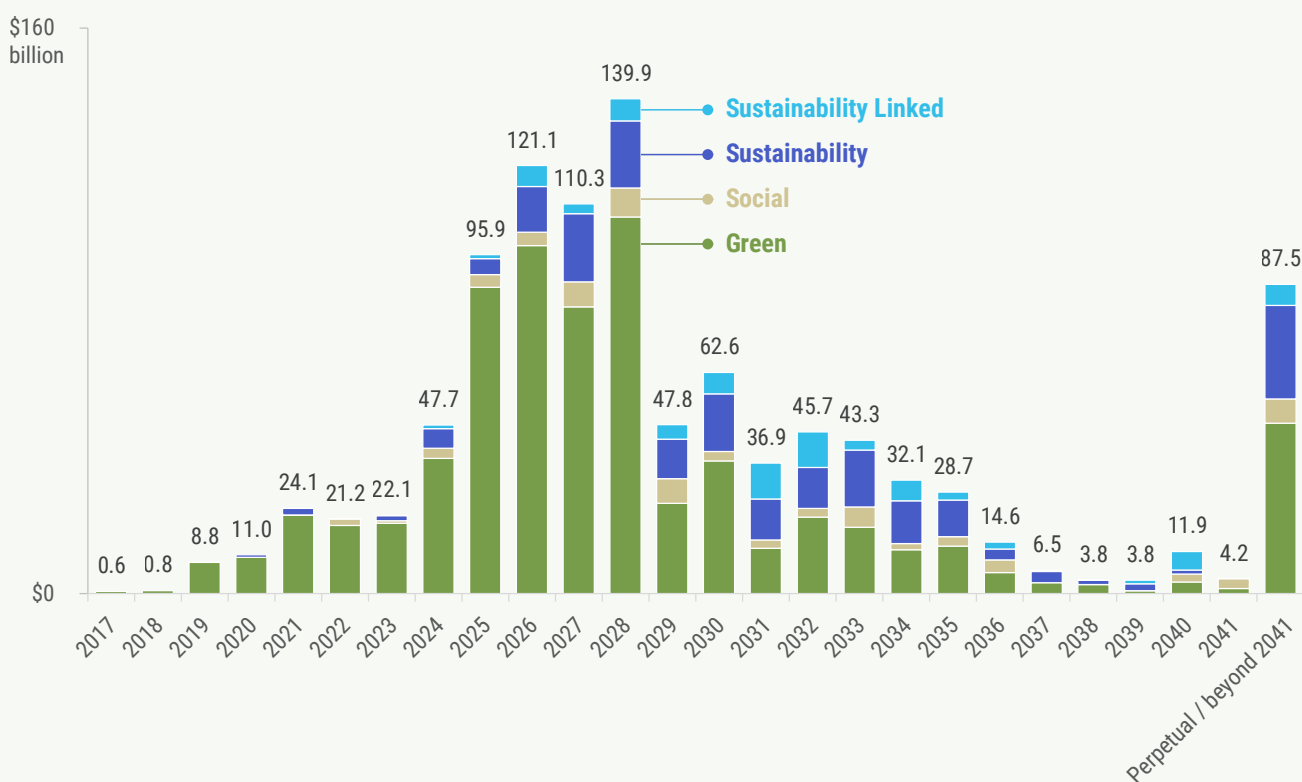
Cumulative 2012–2025



Source: Bloomberg, Climate Bonds Initiative, Environmental Finance, IFC

Note: This Exhibit shows outstanding GSSS bond issuance since 2012, on an absolute basis (billions of dollars), as a percentage of 2025 nominal GDP, and as a percentage of total bonds issued cumulatively over the same period. Data are global, broken down into IFC regions on the left, and Supranational issuers on the right. See Annex D for details on the underlying data.

EXHIBIT 14

\$371 Billion in Emerging Market GSSS Bonds Set to Mature by 2028*EM GSSS bond maturity schedule, 2025–2030+ (\$ billion)*

Source: Bloomberg, Climate Bonds Initiative, Environmental Finance, IFC

Note: This Exhibit shows the maturity schedule of GSSS bonds issued since 2012, with the amount in billions of dollars coming due every year. The breakdown of maturities per GSSS bond type is also shown. See Annex D for details on the underlying data.

The maturity wall.³¹ Emerging market GSSS bonds maturing in 2025 totaled approximately \$96 billion. The scheduled redemption profile is set to steepen sharply, with \$121.1 billion falling due in 2026, \$110.3 billion in 2027, and \$140 billion in 2028, for a three-year total of \$371.4 billion, equivalent to 45 percent of the outstanding stock (**Exhibit 14**).

Importantly, the maturity wall is particularly acute in China, consistent with relatively short terms on the country's GSSS bond issuance (**Exhibit 11**). Between 2026 and 2028, \$245.7 billion of GSSS bonds are expected to mature in China, representing 50 percent of the total amount ever issued, while \$306.8 billion remained outstanding as of end-2025. In other emerging economies, \$125.7 billion is expected to mature over

³¹ This refers to the volume of bonds reaching their scheduled redemption date in a given year.

the same period, equivalent to 23.3 percent of the total amount ever issued, with \$477.5 billion outstanding as of end-2025 (**Exhibit 15**).

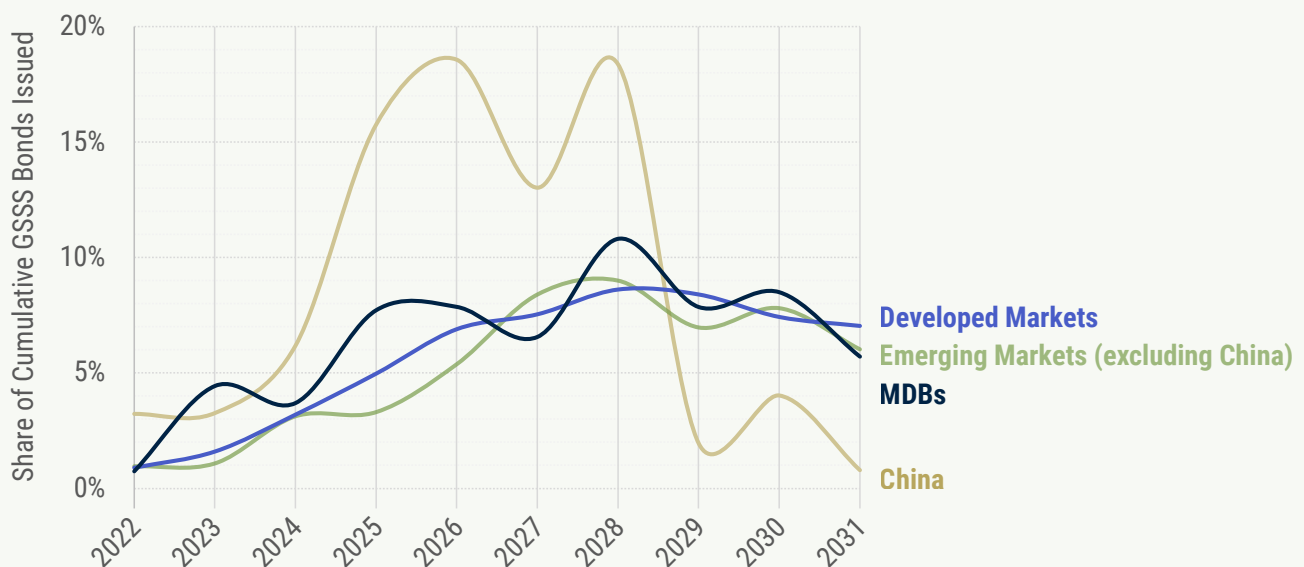
Maturities are rising faster than gross issuance. As a result, net issuance—gross issuance less matured bonds—has already halved from its 2023 peak of \$187 billion to \$91 billion in 2025. In other words, keeping net issuance flat in 2025 would have required gross issuance growth of 9 percent year-on-year, compared with the 2.2 percent recorded. Following the same logic, keeping net issuance flat in 2026 would require gross issuance growth of 11 percent year-on-year.

The maturity wall adds a distinct risk to the labeling dynamics documented in this section. In developed markets, where the labeled segment is already maturing, refinancing without re-labeling is the likely path for a significant share of maturing GSSS bonds. In emerging markets, the risk takes a different form. Country-specific pressures driving the current decline (currency shifts, macro disruption, auction failures) could resolve over time, but the vanishing greenium is structural rather than cyclical. If issuers receive no pricing benefit from keeping a sustainability label when refinancing, they are more likely to refinance through conventional financing, even if the underlying project remains green. The maturity wall is therefore not only a liquidity or rollover

EXHIBIT 15

China Faces the Steepest Maturity Wall, with Half Its GSSS Stock Due by 2028

China GSSS bond maturity schedule, 2025–2030+



Source: Bloomberg, Climate Bonds Initiative, Environmental Finance, IFC

challenge but also a labeling challenge. The trajectory of the outstanding emerging market GSSS bond stock over 2026–2028 will be determined not only by the pace of new issuance but by whether maturing bonds are refinanced with debt carrying sustainability labels. In the absence of a greenium, the policy measures discussed in **Parts 4.3–4.4** are critical not only for supporting gross issuance but also for preserving the market’s existing stock.

Part 5

Special Theme: Women's Economy Bonds in Emerging Markets

5.1 Defining Women's Economy Bonds

Women's economy bonds include GSSS securities where proceeds or performance targets are explicitly linked to women's economic empowerment. These bonds provide investors with a channel to direct capital toward issuers with a clear focus on women's employment, entrepreneurship, and leadership.³² They do not currently

constitute a standalone ICMA category, but they are identified through a two-step methodology developed by IFC's Banking on Women business team.³³ The first step tests intentionality and whether pre-issuance documentation in frameworks, prospectuses, or sustainability strategies demonstrates specific intent to

³² IFC's identification methodology was developed using a proprietary inventory of over 3,000 GSSS bonds, sourced from the Luxembourg Stock Exchange (LuxSE) and Bloomberg, supplemented by extensive desk research.

³³ The two criteria are applied through a multi-dimensional review of primary and secondary documentation, including sustainable bond frameworks, prospectuses, second-party opinions, investor presentations, press releases, and impact reports.

finance women's economic inclusion. The second tests credibility and whether the issuer reports quantifiable results through allocation data and impact indicators, with sex-disaggregated data as the critical accountability mechanism.

5.2 Market Overview

Over the past decade, women's economy bonds have grown into a sizeable segment of emerging market sustainable debt. Cumulative emerging market issuance has reached \$57 billion, supported by over 100 issuers across more than 40 countries, not including issuance by multilateral development banks. Annual issuance stood

at \$9.3 billion in 2025, a figure expected to rise as post-transaction disclosures are verified, consistent with the pattern observed in 2024 (**Exhibit 16**).

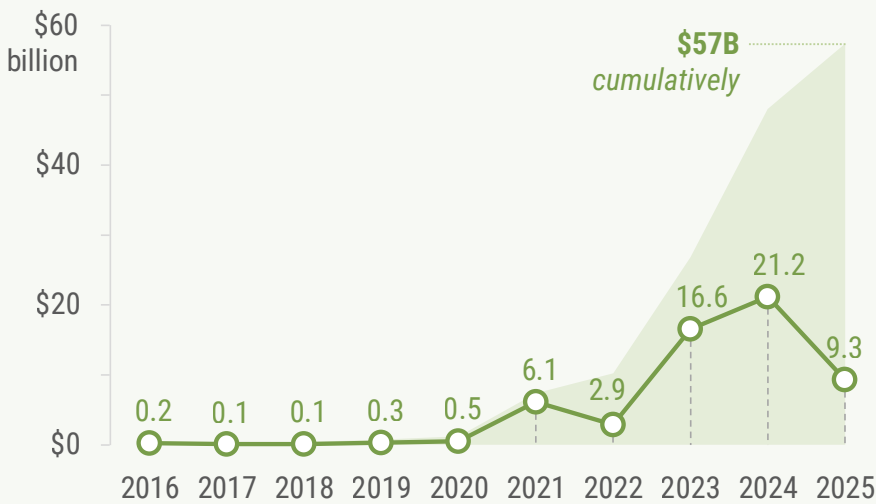
The issuer base is broadly split between the public and private sectors. Private-sector banks and corporations account for roughly half of total volumes with a focus on financing women entrepreneurs and creating employment, while sovereigns contribute to just under one-third, channeling funds toward broad social programs that advance women's socioeconomic opportunities. The private-sector share varies by region (reaching 68 percent in Europe and Central Asia and 57 percent in East Asia and the Pacific) underscoring the growing commercial appetite for financing women's

economic participation. By currency, dollars and euros together represent approximately 68 percent of issuance (**Table 2**).

EXHIBIT 16

Women's Economy Bonds Reach \$57 Billion From Over 100 Issuers

Annual issuance as of 31 December 2025



Source: IFC's Banking on Women Team., LSEG

TABLE 2

Even Split Between Public and Private Sector Issuance of Women's Economy Bonds

Cumulative women's economy bond issuance by entity type, 2016–2025

Entity Types	Issued Amount	
	\$ million	% of Total
Corporate	1,909.8	3.3%
Financial Services Company	4,767.8	8.3%
Government Agency	824.4	1.4%
Local Development Bank	4,420.0	7.7%
Private Sector Bank	21,027.7	36.7%
Sovereign	17,518.4	30.6%
SPV	105.6	0.2%
State-Owned Bank	6,775.6	11.8%
Grand Total	57,349.3	100.0%

Source: IFC's Banking on Women Team., LSEG

5.3 Regional Breakdown

Latin America and the Caribbean lead with \$23 billion

(40 percent of the emerging market total; **Exhibit 17**). Sovereign issuers account for roughly half of the region's volume, with large individual issuances exceeding \$1 billion from Brazil, Chile, and Mexico. Among notable transactions, Chile sold a sustainability-linked bond in 2023 worth 1.75 trillion Chilean pesos with a coupon step-up tied to women's board representation.³⁴ Mexico's Banobras issued a 2.47 billion Mexican peso sustainability bond in 2022, directing proceeds toward infrastructure services addressing vulnerabilities faced by women.

Europe and Central Asia have issued \$16 billion (27.5 percent of the emerging market total),

with over three-quarters of issuance originating from Türkiye. The region has undergone a marked compositional shift since 2024, and private-sector banks and corporates now account for 68 percent of volumes, in a market previously led by sovereign issuers. Croatia's Meritus Ulaganja issued a 40 million euro sustainability-linked bond in 2022 with a performance indicator tied to increasing the number of women in management over eight years.

East Asia and the Pacific is the fastest-growing

region, reaching \$9.2 billion (15.7 percent of the emerging market total) since its first issuance in 2019. Issuance volumes tripled between 2023 and 2025, driven by new and repeat participation from banks and corporates across Indonesia, the Philippines, Thailand, and Vietnam. VPBank's \$300 million sustainability bond in 2025 (Vietnam's first from a private-sector bank) combined lending to women-owned small and medium-sized enterprises with energy efficiency projects to support

³⁴ Chile's Law 21.757 mandates increased women's leadership on corporate boards and establishes reporting requirements for companies supervised by the Financial Market Commission.

job creation across the country, showcasing the dual-purpose structure that is increasingly characteristic of the region.

Africa, the Middle East, and South Asia together represent less than 20 percent of emerging market volumes yet account for one-third of issuers,

and momentum is building. Local debt markets have not yet mobilized capital for women at the same scale as other regions, though individual transactions demonstrate market feasibility. Ecobank Côte d'Ivoire's 10 billion franc social bond in 2025—issued under the bank's Ellever program for women entrepreneurs—is a

prominent example, directing proceeds toward women-owned micro, small, and medium-sized enterprises and addressing the credit demand faced by women entrepreneurs in West Africa.

5.4 Bond Structures

Women's economy bonds fall into two structural categories. **Use-of-proceeds bonds** account for approximately 84 percent of the total. These are predominantly social and sustainability bonds for which proceeds are used for activities to finance women's

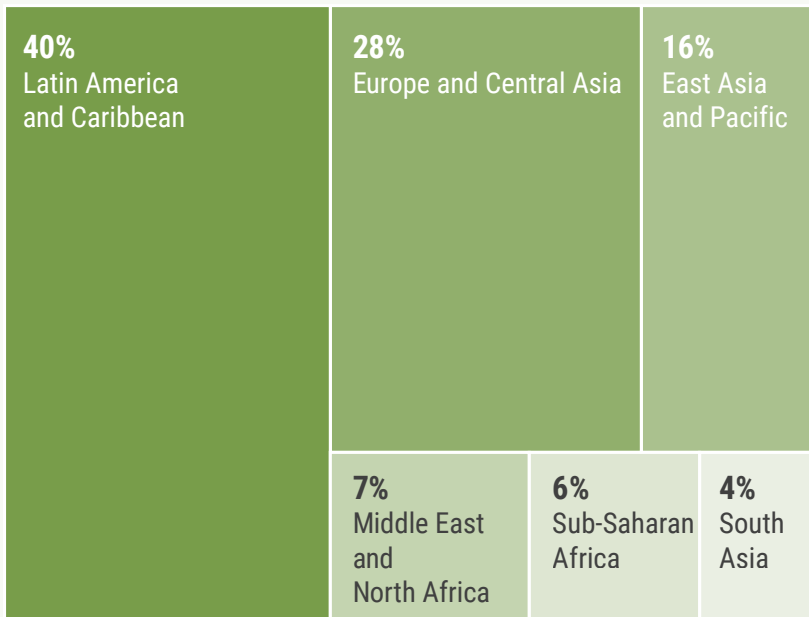
economic empowerment, most commonly lending to women-owned micro, small, and medium-sized enterprises, but also advancing women's labor participation and access to resources and services spanning education, healthcare, housing, agriculture, and infrastructure. **Sustainability-linked bonds** make up the remaining 16 percent, tying coupon adjustments to predetermined performance indicators such as women's representation in leadership or board positions and the share of lending directed to women-owned businesses.

Women's economy bonds remain underrepresented within green bonds despite potential synergies due to women being both customers and decision makers in many sustainability-themed activities. The sustainability-linked bond segment, while smaller, has demonstrated

EXHIBIT 17

Latin America Leads Women's Economy Bond Issuance

Cumulative regional shares as of 31 December 2025



Source: IFC's Banking on Women Team., LSEG

the capacity to embed targets for women’s economic empowerment into sovereign and corporate capital structures alike, as the Chilean and Croatian case studies above illustrate (**Exhibit 18**).

5.5 The Economic Case and Path Forward

The scale of the gender financing gap underscores why capital mobilization matters, even if labeled bonds can only ever be one instrument among many. Estimates suggest that achieving gender parity could add \$342 trillion to the global economy by 2050, while the cost of inaction is valued at \$160 trillion in lost human capital wealth.³⁵ Women’s economy bonds are one among many

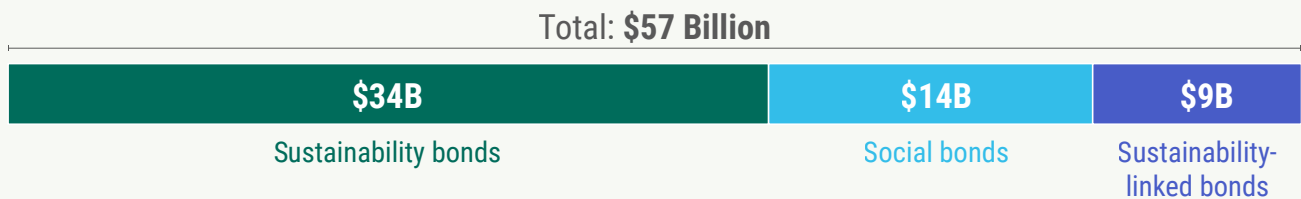
capital-markets solutions and stand out for helping to channel attention, credible action, and reporting discipline toward these objectives. However, as with the broader GSSS market, their impact depends on whether the proceeds finance genuinely incremental intervention to empower women or simply continue gender-neutral activities with limited or accidental outcomes for the female population.

Sustaining the momentum requires progress on three fronts, starting with standardization. Dedicated bond principles and clear guidance on eligible activities would facilitate broader investor participation and reduce due-diligence costs. Second, data and transparency. Wider adoption of sex-disaggregated data and robust post-issuance reporting are essential to strengthen the

EXHIBIT 18

Women's Economy Bonds Are Small But Growing Share of GSSS Markets

Breakdown of women’s economy bonds by GSSS category



Source: IFC’s Banking on Women Team., LSEG

³⁵ UN Women (2025). “Unfinished Business: Private Sector and Gender Equality — Transforming Corporate Commitments into Equality for All Women and Girls,” September 2025.

credibility of the asset class. Third, market infrastructure in Africa, the Middle East, and South Asia (which together account for less than a fifth of emerging market volumes) needs to develop to create conditions for a liquid, lasting market. The regulatory catalysts are already visible. Chile's board diversity mandate, policy frameworks aligned with Saudi Arabia's Vision 2030, and the growing presence of private sector issuers across East Asia and the Pacific all point toward a market that is maturing in structure as it expands in scale. The first decade of Women's Economy Bonds demonstrates that channeling capital to women's employment, entrepreneurship, and leadership is commercially viable and increasingly scalable, with the regional pattern documented in **Part 5.3** indicating replicability. With \$57 billion issued across 40 countries by more than 100 borrowers, this is becoming an established asset class that can mobilize financing for women's economic growth and participation across emerging markets.

Part 6

The Investment Gap

6.1 The Quantitative Gap

Global clean energy investment reached a record high of approximately \$2.2 trillion in 2025, 10 percent higher than the previous year and accounting for 65 percent of total energy capex worldwide. Clean energy drove almost all the expansion since 2018 while fossil-fuel investment remained flat over the same period (**Exhibit 19**). Yet current levels remain fundamentally misaligned with net-zero requirements. Under the International Energy Agency's Net Zero Emissions scenario for 2026–2030, emerging markets excluding China would need to roughly triple their clean energy investment to approximately \$950 billion per year, from the \$310 billion estimated for 2025.

Crucially, the climate context is now forcing a shift from mitigation toward adaptation. With global temperatures already around 1.5°C above pre-industrial levels³⁶ and the probability of staying at or sinking below that threshold effectively zero under current policies,³⁷ adaptation finance has moved from a secondary concern to a front-line priority. However, it remains significantly underfunded. Just 0.9 percent of green bond proceeds financed adaptation in 2024, and over 95 percent of adaptation finance came from public entities.³⁸

At COP30, parties agreed to triple adaptation finance by 2035 to around \$120 billion annually, though this remains within the unchanged \$300 billion envelope agreed at COP29, implying a reallocation from mitigation rather

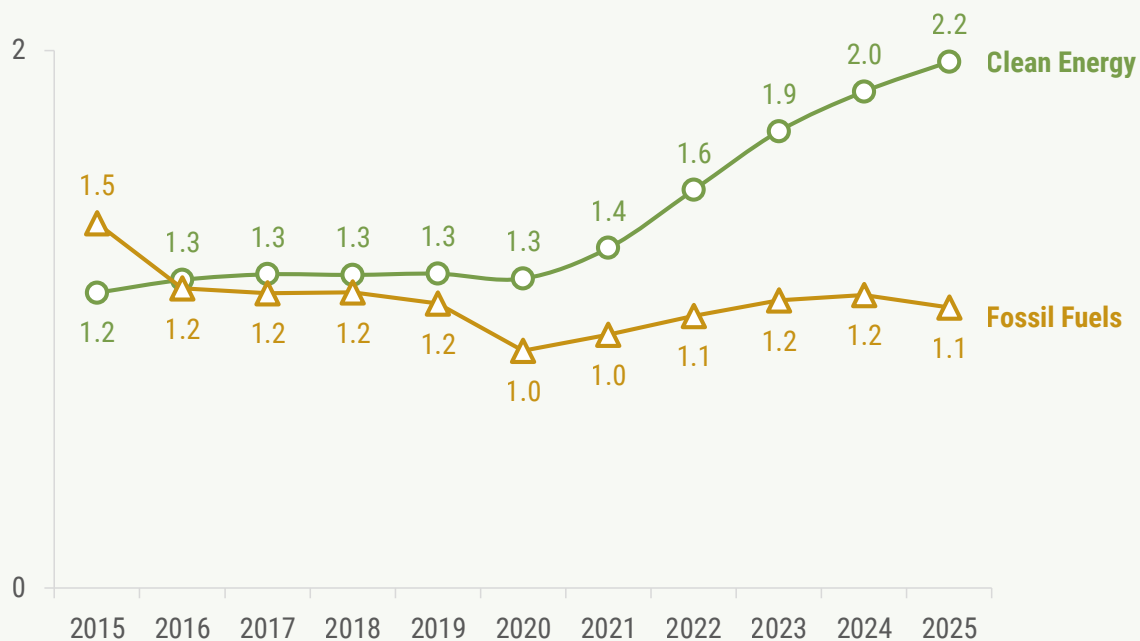
³⁶ https://www.jkclimate.fr/Dashboard2025/figures/Global_mean_temperature.pdf

³⁷ UNEP (2025). "Emissions Gap Report 2025," November 2025.

³⁸ MainStreet Partners (2025). "Green, Social and Sustainability Bonds: Market Trends – When Mitigation Falls Short. The Growing Need for Adaptation Finance," October 2025.

EXHIBIT 19

Clean Energy Investment Hits \$2.2 Trillion in 2025, Clean vs. Fossil Fuels, 2015–2025



Source: IEA

than additional resources. The latest UNEP Adaptation Gap Report 2025 places developing-country adaptation needs in a central range of \$310 billion–\$365 billion per year by 2035 (constant 2023 prices), against international public adaptation finance flows of \$26 billion in 2023, implying an adaptation finance gap of \$284 billion–\$339 billion per year, or 12–14 times current flows. Under current trajectories, the Glasgow Climate Pact target of doubling 2019 flows by 2025 will be missed; the COP30 Baku to Belém Roadmap to mobilize \$1.3 trillion per year by 2035 sets out a path that draws on a wider mix of public and private sources. UNEP also estimates that the

private sector could deliver 15–20 percent of national adaptation needs (around \$50 billion per year), against current tracked flows of about \$5 billion, a gap that itself frames a capital-market opportunity for blended-finance and de-risking instruments.

Capital-market issuance is starting to address adaptation. In October 2025, the Tokyo Metropolitan Government issued the world's first resilience bond certified under the expanded Climate Bonds Standard. The Netherlands' sovereign green bond framework finances nature-based flood-risk solutions in the Dutch

Delta Program. Adaptation- and nature-related projects collectively accounted for around 22 percent of green and sustainability bond categories in 2025, up from 16 percent in 2020 (Moody's 2026 Sustainable Finance Outlook).

Moody's analysis estimates that physical climate risks could drive a global economic loss of around 17 percent of GDP by 2050 under current policies, while natural-catastrophe losses already totaled \$135 billion in the first half of 2025 according to Swiss Re. Not every adaptation project will be financed via labeled instruments, but resilience-linked bonds, blue-bond frameworks, and adaptation-focused taxonomies expand the channels through which capital markets can contribute alongside multilateral development bank and blended-finance instruments.

6.2 Fiscal Constraints

The adaptation financing challenge is intensified by shrinking fiscal space. Official development assistance fell by approximately 18 percent in 2025 and is projected to decline by a further 11 percent in 2026.³⁹ Meanwhile, nearly half of low-income countries are rated at high risk of debt distress or already in distress,⁴⁰ further narrowing the space for discretionary green expenditure.

³⁹ DonorTracker (November 2025) notes that these cuts are likely to be disproportionately concentrated in low-income countries, compounding existing vulnerabilities.

⁴⁰ World Bank–IMF Debt Sustainability Analyses, September 2025. Available at: <https://www.worldbank.org/en/programs/debt-toolkit/dsa>

Part 7

Regulatory Developments

This section examines three regulatory developments that are reshaping the GSSS bond market in developing economies: the publication of ICMA's Climate Transition Bond Guidelines, advances in the compatibility of different taxonomies, and the flexibilization of the EU Taxonomy. Together, these set the stage for the outlook and market projections discussed in Part 8.

7.1 ICMA's Climate Transition Bond Guidelines

ICMA launched its Climate Transition Bond Guidelines (CTBG) in Tokyo November 2025 against a backdrop of market and policy momentum in Asia. In Japan, sovereign transition-bond initiatives were signaling strong public-sector support for the label with over \$17

billion raised in transition bonds in 2024,⁴¹ boosted by Japan's Green Transformation plan.⁴² This program has helped frame transition finance as financial activities contributing to emissions reductions, particularly in hard-to-abate sectors as well as in emerging markets where finance needs are high yet support from green finance is limited.⁴³

ICMA's earlier work (including its February 2024 report "Transition Finance in the Debt Capital Market") documented that 68 percent of sustainability-linked bond issuers were associated with activities in renewable energy, clean transport, and green buildings. This took place against a backdrop of increasing financing needs from fossil-fuel and hard-to-abate sectors which accounted for 3.6 percent of GSSS bond issuance until 2024.⁴⁴

⁴¹ Environmental Finance (2025), "Japan: The Case for Transition Bonds," January 16, 2025. <https://www.environmental-finance.com/content/analysis/japan-the-case-for-transition-bonds.html#:~:text=According%20to%20Environmental%20Finance%20Data,raised%20more%20than%20%2417%20billion.>

⁴² Amundi (2025), "Japan Green Transformation: Ambition to Speed Up the Transition in Asia," August 7, 2025. <https://www.amundi.com/institutional/article/japan-green-transformation-ambition-speed-transition-asia>

⁴³ IEA (2025), "Scaling Up Transition Finance," October 16, 2025. <https://www.iea.org/reports/scaling-up-transition-finance>

⁴⁴ ICMA (2024), "Transition Finance in the Debt Capital Market." <https://www.icmagroup.org/assets/Transition-Finance-in-the-Debt-Capital-Market-paper-ICMA-14022024.pdf>

ICMA's CTBG introduces the Climate Transition Bond (CTB) as a standalone use-of-proceeds label for projects that support the transition of high-emitting and hard-to-abate sectors.

Central to the transition bond is the concept of Climate Transition projects that deliver substantial and quantifiable greenhouse-gas emissions avoidance, reduction or removal, and that complement green projects in pursuit of Paris-aligned goals.

The Guidelines require five core safeguards⁴⁵ for Climate Transition Projects.

1. An issuer-level sustainability or climate transition strategy disclosed in line with the Climate Transition Finance Handbook⁴⁶
2. Analysis demonstrating that low-carbon alternatives are technologically or economically unfeasible
3. Alignment or compatibility with official taxonomies, decarbonization pathways and roadmaps
4. Mitigation of emissions beyond business-as-usual
5. Identification, mitigation, and disclosure of carbon-lock-in risks.

The Guidelines also provide a preliminary list of eligible CT Project categories and offer guidance for sustainability-linked bonds issued by high-emission firms to ensure transition goals.

By codifying a standalone transition bond label with issuer-level guardrails, these guidelines strengthen transparency and reduce greenwashing risk, although maximizing the impact would require global adoption.

The guidelines were explicitly drafted to be globally applicable, and regions with large industrial bases in emerging markets are expected to make early use of transition tools where they fit national strategies.⁴⁷ As displayed in Japan, sovereign issuances can play a catalytic role.

Implementation will notably depend on market actors aligning around independent validation. Second-party opinions and dedicated transition assessments will be critical to demonstrate the credibility of financed activities.

The first transition-bond framework completed under the new ICMA guidelines was published in December 2025 by FirstRand Limited, a South African financial institution; the use-of-proceeds framework spans five eligible categories: energy efficiency, power and energy, cement, agriculture, and metals and mining. Moody's 2026 forecast points to around \$40 billion of transition-bond issuance, close to double the \$21 billion record set in 2024, within an overall global sustainable-bond forecast of \$900 billion (green \$530 billion, social \$115 billion, sustainability \$190 billion, transition \$40 billion, and sustainability-linked bonds (SLB) \$25 billion). Uptake is likely to be uneven as issuers navigate disparate investor expectations on what constitutes a credible

⁴⁵ ICMA (2025), "Climate Transition Bond Guidelines." <https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/climate-transition-finance-handbook/>

⁴⁶ ICMA (2025), "Climate Transition Finance Handbook." <https://www.icmagroup.org/assets/documents/Sustainable-finance/2025-updates/Climate-Transition-Finance-Handbook-November-2025.pdf>

⁴⁷ Natixis (2025), "Making Sense of Global Transition Finance Guidelines" <https://home.cib.natixis.com/articles/making-sense-of-global-transition-finance-guidelines>

transition project. In the European Union's proposed Article 7 fund labeling under the updated Sustainable Finance Disclosure Regulation is identified by Moody's as a potential support to the transition-debt ecosystem over time.⁴⁸

The transition label coexists with SLBs rather than displacing them. Use-of-proceeds transition bonds finance specific decarbonization projects, while SLBs link funding terms to entity-level performance against pre-defined sustainability-related targets. The two structures address different needs and are complementary, with potential substitution at the margin where investors place greater weight on project-level credibility. Some scope items remain contested: Japan's GX-program eligibility list, which includes activities such as ammonia co-firing in coal and gas plants and certain hydrogen applications, has been the subject of debate among international investors as to alignment with global standards.

7.2 Taxonomy Interoperability

Over the past year, progress toward aligning sustainability frameworks across jurisdictions has accelerated. The EU–China Common Ground Taxonomy (CGT)⁴⁹ remains a landmark initiative, improving comparability and transparency for cross-border investments and serving as a blueprint for other emerging markets seeking globally credible taxonomies. In Asia, the ASEAN Taxonomy for Sustainable Finance⁵⁰

advances a similar goal through its tiered structure, enabling countries at different stages of market maturity to align progressively with international standards while retaining local flexibility. Latin America and Africa are following suit, with Colombia and South Africa adapting EU and CGT frameworks to ensure their definitions of sustainable activities are legible to global investors.

The publication of the Principles for Taxonomy Interoperability⁵¹ in November 2025 has further strengthened this convergence. The principles were developed under the Taxonomy Roadmap Initiative, launched at COP29 by IFC, the Sustainable Banking and Finance Network (SBFN), the Central Bank of Azerbaijan, and UNDP, with the partnership expanded at COP30 to include UNEP FI, PRI, the Climate Bonds Initiative, GIZ, and the Brazilian Ministry of Finance. The principles establish a global reference for mapping and aligning taxonomies without undermining domestic policy objectives, resting on three pillars: transparency in methodology, consistency in environmental objectives, and mutual recognition mechanisms that enable cross-border usability. According to the SBFN 2025 Global Progress Report, 60 sustainable-finance taxonomies are now in place or under development globally, of which 40 are in emerging markets—an indication of the growing role of taxonomy work in developing economies as a building block for sustainable finance.

For investors, interoperability is more than regulatory alignment, it is a catalyst for market efficiency and

⁴⁸ Moody's (2026). *Outlooks 2026: Global Sustainable Finance*, January 2026.

⁴⁹ IPSF (2021), "Common Ground Taxonomy - Climate Change Mitigation." https://finance.ec.europa.eu/system/files/2021-12/211104-ipsf-common-ground-taxonomy-instruction-report-2021_en.pdf

⁵⁰ ACMF (2025), "ASEAN Taxonomy for Sustainable Finance Version 4." <https://www.theacmf.org/sustainable-finance/publications/asean-taxonomy-for-sustainable-finance-version-4>

⁵¹ UNEP (2025), "Principles for Taxonomy Interoperability." <https://www.unepfi.org/publications/principles-for-taxonomy-interoperability/>

portfolio scalability. Harmonized taxonomies reduce due diligence complexity, lower transaction costs, and enhance confidence in sustainability claims. This clarity allows funds with exposure to emerging market GSSS bonds to integrate these assets more seamlessly into global strategies, improving diversification and impact measurement.

Interoperability also underpins blended finance and de-risking mechanisms (structures that use concessional capital, guarantees, and first-loss instruments to mobilize commercial investment), which are critical tools for scaling sustainable investment in emerging markets. Consistent definitions enable development finance institutions and multilateral banks to structure guarantees or co-investment vehicles that attract institutional capital at scale. Multilateral development banks — which accounted for 17 percent of global GSSS bond issuance in 2025 — are well positioned to anchor such structures, given their institutional mandates and capacity to absorb first-loss risk. Issuers benefit from lower funding costs and improved access to international markets, while investors gain greater visibility into sustainability performance.

As taxonomies align under shared principles, emerging market issuers face fewer barriers to global capital, and investors allocate more decisively to sustainable assets. Over time, this alignment can help normalize risk premiums, deepen liquidity, and mobilize long-term capital toward climate and social priorities. Interoperability is fast becoming the backbone of

global sustainable finance, elevating emerging market sustainable bonds from niche positions to essential building blocks of diversified, impact-oriented portfolios.

7.3 EU Taxonomy Flexibilization

The European Union's recent adjustments to its sustainable finance framework mark a pragmatic evolution which could have meaningful implications for emerging market GSSS bonds and funds. The Delegated Act amending the Taxonomy Disclosures, Climate and Environmental Delegated Acts, adopted in July 2025 and effective from January 2026, reflects the EU's intent to make its taxonomy more usable without diluting ambition.⁵² In 2025, the European Commission launched a new Platform on Sustainable Finance to simplify the framework. As Commissioner Maria Luís Albuquerque noted, the new Platform on Sustainable Finance will help "make the EU Taxonomy and the wider sustainable finance framework simpler, clearer, and more usable, without lowering the level of ambition."⁵³

The package introduces targeted simplifications designed to reduce administrative burdens and enhance competitiveness.⁵⁴ For non-financial companies, the most notable change is the introduction of materiality relief. Firms may now elect not to assess taxonomy eligibility or alignment for activities or operating expenditures that are not material to their business model. Instead, they can report total operating expenditure and explain non-materiality, rather than

⁵² European Commission (2025), "Commission to Cut EU Taxonomy Red Tape for Companies." https://finance.ec.europa.eu/publications/commission-cut-eu-taxonomy-red-tape-companies_en

⁵³ European Commission (2026), "Commission Announces Members of Third Platform on Sustainable Finance." https://finance.ec.europa.eu/news/commission-announces-members-third-platform-sustainable-finance-2026-01-21_en

⁵⁴ European Commission (2025), "Reality Check on the EU Taxonomy." https://finance.ec.europa.eu/events/reality-check-eu-taxonomy-2025-09-01_en

publishing detailed key performance indicator ratios.⁵⁵ Complementary amendments to the “Do No Significant Harm” (DNSH) criteria, particularly those related to chemicals, address implementation challenges raised by industry practitioners.⁵⁶ These adjustments are expected to lower compliance costs and improve proportionality, especially for smaller companies and service-oriented firms.⁵⁷

For financial institutions, the reforms introduce a 10 percent de minimis threshold that exempts small exposures from full taxonomy alignment assessments, alongside streamlined templates that significantly reduce data points and reporting scope. While firms must still maintain internal data inventories for audit purposes, these changes are expected to reduce operational costs and improve the usability of sustainability data.

This simplification package is not a retreat from ambition, but a recalibration, acknowledging that the taxonomy’s 2023 expansion⁵⁸ to all six environmental objectives⁵⁹ and tighter technical screening criteria had increased complexity.⁶⁰ The new Platform on Sustainable Finance, now composed primarily of representatives from non-financial companies,⁶¹ is tasked with preserving the

taxonomy’s integrity while ensuring it remains practical.⁶² The platform will also be expected throughout 2026 to advise the European Commission on sustainability topics, notably transition finance, which comes concomitantly with the new Climate Transition Bond Guidelines.

For emerging markets, these developments offer both opportunity and insight. The EU’s move toward proportionality and usability underscores the importance of designing taxonomies and disclosure frameworks that balance rigor with feasibility. As emerging market regulators and issuers continue to develop or refine their own sustainable finance taxonomies, the EU’s experience highlights the value of iterative, feedback-driven adjustments that maintain credibility while enabling scale.

The EU’s concurrent review of the Sustainable Finance Disclosure Regulation signals a broader move toward clarity and interoperability. Simplified disclosure rules could lower the alignment costs for emerging market issuers and funds seeking to meet European investor expectations, facilitating cross-border capital flows into transition and green projects.

⁵⁵ European Commission (2025), “Questions and Answers on EU Taxonomy Simplifications to Cut Red Tape for Companies.” https://ec.europa.eu/commission/presscorner/detail/en/qanda_25_1726

⁵⁶ European Commission (2025), “Annex to the Commission Delegated Regulation.” https://finance.ec.europa.eu/document/download/82b0a7bd-75d8-4ab2-9b3d-499e47d7a221_en?filename=taxonomy-regulation-delegated-act-2025-4568-annexes_en.pdf

⁵⁷ European Commission (2025), “Questions and Answers on EU Taxonomy Simplifications to Cut Red Tape for Companies.” https://ec.europa.eu/commission/presscorner/detail/en/qanda_25_1726

⁵⁸ Applied since January 2024

⁵⁹ Climate change mitigation, Climate change adaptation, Sustainable use and protection of water and marine resources, Transition to a circular economy, Pollution prevention and control, Protection and restoration of biodiversity and ecosystems

⁶⁰ European Commission (2023), “Questions and Answers.” https://ec.europa.eu/commission/presscorner/detail/en/qanda_23_3194

⁶¹ Appointed by the Commission on 22 January 2026

⁶² IPE (2026), “EU Names New Advisers to Revamp Green Taxonomy.” <https://www.ipe.com/news/eu-names-new-advisers-to-revamp-green-taxonomy/10134728.article>

Part 8

Outlook 2026–2027

8.1 Gross and Net Issuance Projections

The preceding sections have documented the forces shaping sustainable bond issuance in emerging markets, namely a vanishing greenium (**Part 2**), maturation of labeled markets in developed countries (**Part 3**), diverging regional issuance patterns (**Part 4**), a formidable and growing investment gap (**Part 6**), and regulation that is tightening in developed economies while loosening in parts of Asia (**Part 7**). This section translates those structural dynamics into quantitative projections for 2026–2027.

Gross issuance is forecast to remain broadly stable.

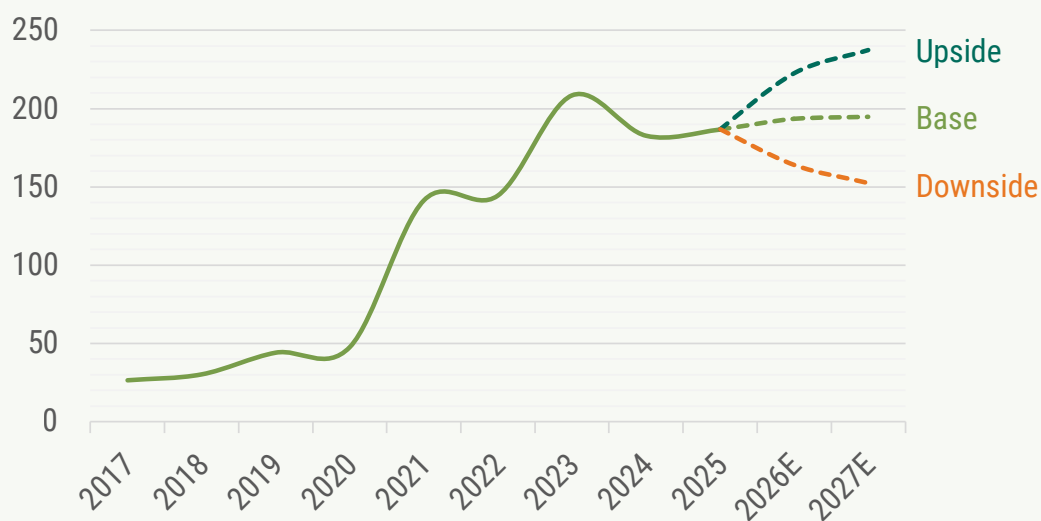
Total emerging market GSSS bond sales are projected to rise 3.5 percent from the previous year, to approximately \$193 billion in 2026. The following year it is set to grow a

further 0.8 percent to \$195 billion in 2027.⁶³ The headline stability, however, conceals a significant compositional shift between China and other emerging markets discussed in **Part 8.2** below.

Net issuance taking into account bond redemptions, tells a different story.

The emerging market sustainable bond market faces a maturity wall of unprecedented scale. Approximately \$121.6 billion in GSSS bonds will come due in 2026, \$110 billion in 2027, and \$140 billion in 2028. That adds up to \$371 billion over three years, representing 47 percent of the \$784.4 billion outstanding stock at the end of 2025.

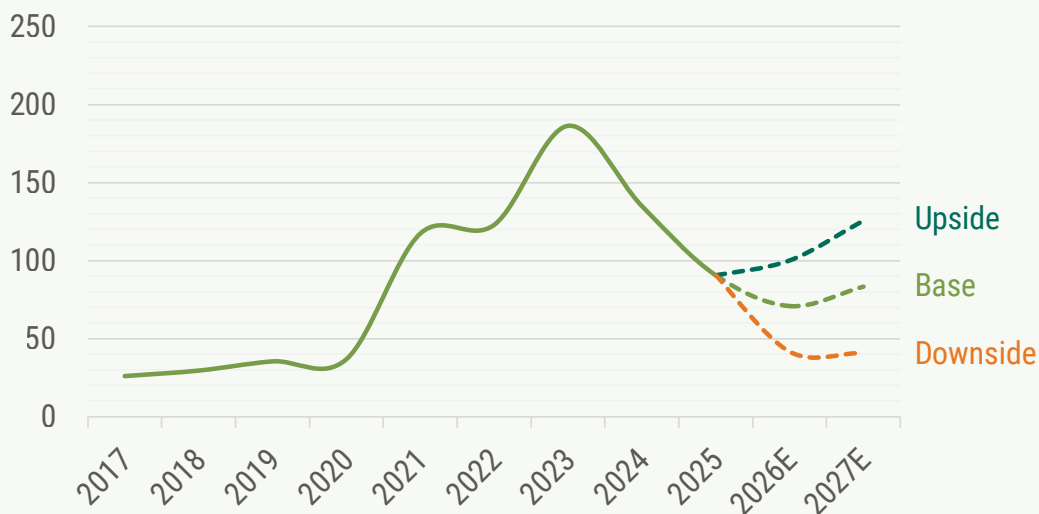
⁶³ Forecasts are based on a hierarchical auto-ARIMA framework applied to monthly issuance data from January 2015 to December 2025, reconciled using a MinTrace (WLS) algorithm. Prediction intervals are generated via residual-based and re-estimation bootstrap at 80 and 95 percent confidence levels. See Annex E for full methodology.

EXHIBIT 20**Gross Emerging Market GSSS Issuance Projected to Edge Up 3.5 Percent in 2026...***Issuance 2017–2025 and projections 2026–2027***Source:** Amundi, Bloomberg, Climate Bonds Initiative, Environmental Finance, IFC

Net bond sales are projected to fall to approximately \$72 billion in 2026 and \$85 billion in 2027, down from a peak of roughly \$200 billion in 2023. Cumulative maturities over 2026–2027 alone (approximately \$231 billion) will exceed a single year’s gross issuance. Outstanding stock growth will therefore decelerate sharply and could turn negative if a significant share of maturing issuers choose not to re-label their refinancing, a realistic risk given the label avoidance documented in **Part 3**.

To offset maturing bonds and maintain current levels of outstanding stock in 2026, gross issuance would need to grow by approximately 14 percent year-on-year, which is unrealistic given that growth in 2025 was 2.2 percent. The maturity wall is a legacy of the rapid issuance growth of 2020–2022, when large volumes of shorter-tenor bonds were issued that are now coming due.⁶⁴ In emerging markets this concentration is markedly more compressed than among issuers from developed markets

⁶⁴ The weighted average maturity (WAM) of 2025 issuance was 5.9 years for emerging markets, 4.8 years for China (with 74 percent concentrated in the 3–5 year bucket), and 7.5 years for emerging markets excluding China (with approximately 80 percent above 5 years and 35 percent above 10 years).

EXHIBIT 21**...But Net Issuance Falls to \$72 Billion as the Maturity Wall Bites***Issuance 2017–2025 and projections 2026–2027*

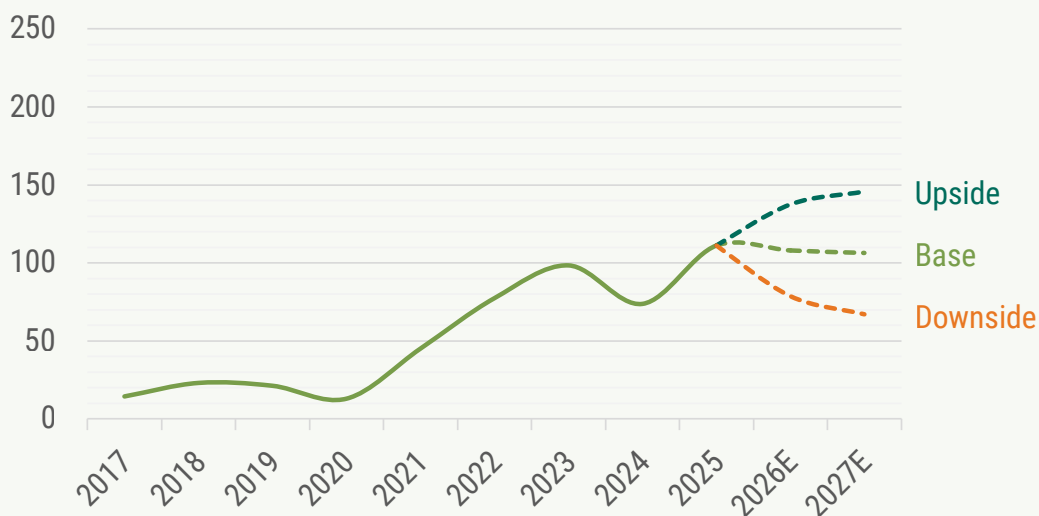
Source: Amundi, Bloomberg, Climate Bonds Initiative, Environmental Finance, IFC

or multilateral institutions, where approximately one-third of the outstanding stock will mature over the same three-year horizon.

8.2 China Versus Other Emerging Markets

The forecasts are produced at three levels of aggregation—total emerging markets, China, and emerging markets excluding China—and the divergence between the latter two is the most consequential feature of the outlook.

China's green issuance is expected to moderate to \$108 billion–\$106 billion in 2026–2027 from the \$111 billion recorded in 2025. The 51 percent surge in 2025 reflected a combination of the policy architecture documented in **Part 4.3** (central bank lending facilities, macro-prudential integration, broadened taxonomy eligibility) and a one-off “anti-involution” campaign that is unlikely to recur at the same intensity. Nonetheless, the structural incentives for Chinese financial institutions to issue labeled debt remain intact. Green and transition finance is embedded in industrial and macroeconomic policy, and the market structure (local-currency, onshore, bank-dominated) insulates it from global ESG sentiment swings. China is therefore expected to continue to account for over half of total emerging market GSSS bond

EXHIBIT 22**China's Green Issuance Expected to Plateau Near \$108 Billion in 2026–2027***Issuance 2017–2025 and projections 2026–2027*

Source: Amundi, Bloomberg, Climate Bonds Initiative, Environmental Finance, IFC

issuance over the forecast horizon (55 percent in 2026 and 56 percent in 2027), down from 60 percent in 2025.

Sustainable bond issuance in emerging markets outside China is projected to rebound to \$85 billion–\$89 billion in 2026–2027 from \$76 billion in 2025. A significant part of this recovery reflects a rebound from the exceptionally deep contraction in 2024, which was driven by one-off shocks in several large markets. Some pick-up is likely even without new catalysts.

8.3 Risks and the Path Ahead

The dominant risk to the outlook is the maturity wall. With \$371 billion in emerging market GSSS bonds set to

mature over 2026–2028, or 45 percent of the outstanding stock, the window for institutional innovations to translate into new labeled issuance is narrow. The forecasts project a stabilization in gross volumes but not an acceleration, and the resulting net issuance squeeze implies that the outstanding stock of emerging market sustainable bonds could contract for the first time in the asset class's history if label attrition during refinancing is significant.

Several developments could alter this trajectory.

The ICMA Climate Transition Bond Guidelines, if adopted rapidly in emerging Asia, would open credible pathways for carbon-intensive sectors that have been excluded from green labeling. Progress on taxonomy

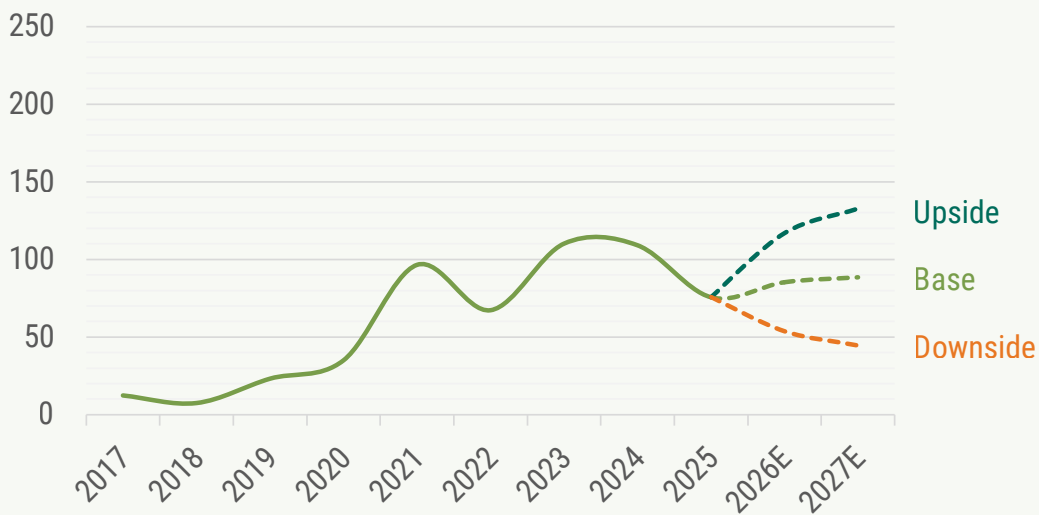
interoperability would reduce cross-border issuance frictions. The EU’s taxonomy flexibilization, if it signals a broader shift toward proportionality, could slow the label avoidance that has depressed issuance in advanced economies. Meanwhile, continued policy support in China, the Middle East, and Southeast Asia provides a structural floor that does not depend on market-based pricing incentives. None of these factors are incorporated in the baseline forecasts.

Whether these developments will be sufficient to offset the maturity wall and restore net issuance growth remains an open question. For now, the pattern is clear. Gross issuance has stabilized on the back of Chinese and Asian policy support, but net supply is contracting amid rising maturities of existing bonds. The labeling gap persists, and the sustainable bond market’s capacity to channel capital toward the investment needs documented in this report is being tested as never before.

EXHIBIT 23

Emerging Markets (Excluding China) Issuance to Rebound to \$85 Billion – \$89 Billion, Led by Sovereign Re-Entry

Issuance 2017–2025 and projections 2026–2027



Source: Amundi, Bloomberg, Climate Bonds Initiative, Environmental Finance, IFC

Part 9

Conclusion

The evidence compiled suggests the sustainable bond market's slower growth in 2025 does not appear to stem from a lack of financing needs or investor demand but from weaknesses in the institutional design of labeled debt markets. Capital continues to flow toward sustainability-related investment and emerging market clean energy capex reached \$1 trillion in 2025. Investor demand for sustainable assets also remains robust. What has broken down is the intermediate layer: the set of labels, standards, pricing signals, and regulatory incentives that once connected sustainable investment to sustainable finance. Repairing that layer is the central task ahead if labeled issuance growth is to resume.

The most important lesson from the regional divergence documented in this report is that labels are a policy variable, not a market constant. Where authorities treated labeling as part of a broader policy architecture (embedding it in lending facilities, macro-prudential frameworks, cost-subsidy schemes, and strategic investment programs) labeled issuance grew. The

implication is that policymakers who want labeled markets to function must support the economic viability of labeling, particularly during periods when market-based incentives weaken. The Asian experience is not an anomaly, it is a template.

In developed markets, the labeled-bond segment is showing signs of maturity. Disclosure standards, verification frameworks, and taxonomy eligibility criteria put in place after the expansion phase have raised the cost of attaching a label, and the data are consistent with issuers deploying capital to sustainable projects through mainstream financing channels rather than through explicit labels. The European Union's 2025 simplification package and the November 2025 Principles for Taxonomy Interoperability point to ongoing recalibration of the

framework, with proportionality in disclosure and cross-border alignment as observable areas of work.⁶⁵

For emerging markets outside China, the challenge is different and, in many ways, harder. The labeling rate was already low before 2025, and green bond issuance never exceeded 2 percent of clean energy capex in emerging markets excluding China. Structural under-penetration (i.e., small share of total fixed-income issuance) reflects barriers that regulation alone cannot address, namely limited numbers of potential issuers in emerging markets, mostly due to small firm size, limited institutional investor bases, currency risk, and the fixed costs of external review and verification that are prohibitive for smaller borrowers. Closing the \$640 billion annual gap between current emerging market clean energy capex and net-zero-aligned requirements will require not just better labels but deeper capital markets, stronger local currency frameworks, and blended finance structures that reduce the cost of first-time labeled issuance. Multilateral development banks, which accounted for 17 percent of global GSSS bond issuance in 2025, have a particular role to play, especially through blended-finance structures that reduce issuance costs for first-time sovereign and corporate issuers, in anchoring such structures.

The emergence of women's economy bonds (\$57 billion in cumulative issuance across more than 40 countries) demonstrates that labeled instruments can mobilize capital toward women's economic participation. Scaling the market will require standardized bond principles, wider adoption of gender-disaggregated data, and deeper market infrastructure in regions where issuance remains nascent.

Transition finance remains a critical and underdeveloped frontier. In practice, the industries where emerging markets face the largest decarbonization costs (power generation, heavy industry, transport) are precisely the sectors that the existing green bond framework was not designed to serve. The ICMA Climate Transition Bond Guidelines, published in November 2025, create a credible pathway for these issuers but adoption will be neither automatic nor fast. Transition bonds require entity-level transition plans, which most emerging market corporates in carbon-intensive sectors have not yet developed. They require verifiers who understand industrial decarbonization, not just renewable energy. And they require investors willing to accept exposure to brown-to-green trajectories rather than pure-green portfolios. Building this ecosystem (from corporate capacity to market infrastructure to investor appetite) is a multi-year undertaking that will test whether the labeled bond market can evolve beyond its green origins.

A continued decline in the share of sustainable investment financed through labeled instruments would have implications far beyond the bond market. If labeled instruments continue to lose ground as an intermediation channel, investors will face a shrinking universe of assets offering the transparency, additionality, and impact reporting required by sustainability mandates. This would occur even as underlying transition investment continues to expand, with clean energy investment reaching \$2.2 trillion in 2025, or 65 percent of global energy capex. At the same time, emerging market sustainable finance continues to broaden through new transition-bond frameworks, sustainability-linked sovereign and

⁶⁵ The EU's pragmatic flexibilization of the Taxonomy and the U.K. Transition Plan Taskforce framework suggest that regulatory design is beginning to move in this direction, but the pace and scope remain uncertain.

sub-sovereign instruments, resilience bonds, gender-focused financing, and expanding sustainable-finance taxonomies. The overall trend is therefore not a decline in sustainability investment, but a widening of the channels through which capital markets support sustainability outcomes in emerging markets.

Annex

Methodology and Data

A. Sharpe Ratio Analysis

As a complement to absolute returns, this report introduces Sharpe ratios—a measure of how an asset performs relative to risk—as an additional lens (see **Annex Table A1**). The Sharpe ratio here is calculated as the annualized return divided by the standard deviation of monthly returns. While these measures should be interpreted with care, particularly given changing index composition and the relatively short history of the asset class, they help assess whether excess performance is being delivered efficiently, rather than simply reflecting higher volatility.

In 2025, emerging market GSSS corporates recorded a Sharpe ratio of 4.6, which compares favorably with both emerging sovereigns (4.4) and developing economy corporates (4.1). In other words, emerging market GSSS corporate bonds not only delivered strong absolute

performance in 2025 but did so with particularly favorable risk-adjusted outcomes.

The contrast with other market regimes is instructive. In 2024, a year characterized by a pronounced “risk-on” environment, emerging market GSSS corporates posted a Sharpe ratio of just 0.7, well below the 2 recorded by corporates in developing economies. By contrast, in 2025, risk appetite remained strong but the macro environment simultaneously rewarded duration as easing expectations took hold. The structural tilt of the GSSS market toward higher-rated, longer-duration instruments proved advantageous. Taken together, these episodes suggest that GSSS outperformance is conditional rather than persistent. It tends to emerge when rate dynamics complement the structural characteristics of the GSSS market.

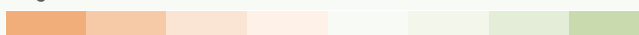
TABLE A1

GSSS Bond Sharpe Ratios (Annualized), 2018–25

	Index name	2018	2019	2020	2021	2022	2023	2024	2025
Green Bonds	GENIE	-0.8	1.6	1.4	-1.5	-1.6	1.0	-0.3	2.0
GSS Bonds	GSS	-0.8	1.6	1.4	-1.5	-1.6	1.0	-0.2	2.2
EM GSS Bonds Corporates	EM Credit GSS Bond Diversified Index (GESSIE)	-0.5	3.5	0.9	-0.9	-1.5	1.2	0.7	4.6
EM Bonds - Sovereigns	EMBI Global Diversified Index	-0.8	2.9	0.3	-0.3	-1.2	1.2	1.2	4.4
EM Bonds - Corporates	CEMBI Broad Diversified Core Index	-0.7	5.0	0.5	0.1	-1.3	1.3	2.0	4.1
EM Corporate Bonds: GSS vs Total		0.2	-1.5	0.4	-1.0	-0.2	-0.1	-1.3	0.5
US Bonds : IG	GCI US Domestic IG	-0.7	3.3	0.9	-0.3	-1.5	0.8	0.4	2.8
US Bonds : HY	GCI US Domestic HY	-0.6	2.8	0.4	2.0	-1.0	1.9	2.5	3.1
US Bonds : IG vs HY		-0.2	0.6	0.5	-2.3	-0.5	-1.0	-2.1	-0.3
European Bonds : IG	GCI EUR Western Europe IG	-1.6	2.4	0.3	-0.5	-1.5	1.9	1.7	2.0
European Bonds : HY	GCI EUR Western Europe HY	-1.3	3.1	0.1	2.1	-0.9	2.9	6.3	2.7
European Bonds : IG vs HY		-0.3	-0.7	0.2	-2.6	-0.6	-1.0	-4.6	-0.7

Negative returns

Positive returns



Source: Amundi, Bloomberg

B. Methodology for Estimating the Green Premium (Greenium)

The greenium (defined as the yield differential between a green bond and a comparable conventional bond from the same issuer) is estimated using a bottom-up, matched-pair approach. This methodology isolates the pricing effect of the green label by controlling for issuer-specific credit risk, currency, seniority, and maturity.

Matching Procedure

For each green bond in the sample, a conventional bond from the same issuer is identified as a comparator, subject to the following criteria: (i) same currency of denomination; (ii) same seniority in the capital structure; (iii) residual maturity within two years of the green bond; and (iv) sufficient secondary-market liquidity, as proxied by bid–ask spread availability. Where multiple conventional bonds satisfy these criteria, the bond with the closest residual maturity is selected.

The greenium for each matched pair is calculated as the yield spread of the green bond minus the yield spread of the conventional comparator, both measured relative to a common benchmark (typically the relevant government yield curve). A negative greenium indicates that the green bond trades at a lower yield (tighter spread) than its conventional comparator, implying a pricing advantage for the issuer.

Sample and Coverage

The greenium analysis covers the period from 2019 to 2025. The sample is drawn from the universe of investment-grade green bonds denominated in euros, dollars, or British pounds for which a valid conventional comparator can be identified. The sample is refreshed annually and expanded as new issuances enter the secondary market. As of December 2025, the matched-pair sample comprises over 900 green bonds across sovereign, agency, financial, and corporate issuers.

Limitations

The matched-pair approach is subject to several limitations. First, not all green bonds have a suitable conventional comparator, particularly in markets with limited issuer diversity or low issuance frequency. This introduces survivorship and selection bias toward larger, more liquid issuers. Second, residual maturity differences between the green and conventional bond may introduce duration effects that are not fully captured by the matching procedure. Third, the greenium may reflect factors beyond the green label, including differences in investor base composition and secondary-market demand dynamics. Results should therefore be interpreted as indicative estimates rather than precise measures of the green label's pricing impact.

C. Greenium: Detailed Estimates and Currency Decomposition

Based on observed transactions through 2025, the global greenium, defined here as the yield advantage on green bonds relative to comparable non-labeled bonds, has fallen below 1 basis point, compared with around 1.2 basis points in 2024 and an average of roughly 2.4 basis points over 2019–2024. A similar compression is observed in developed markets: after averaging about 2.3 basis points over 2019–2024 and 1.3 basis points in 2024, the greenium has shifted to a small discount of under 1 basis point in 2025. In emerging markets, green bonds have historically exhibited wider premia, but recent estimates for 2023–25 are statistically insignificant, reflecting both limited issuance volumes and elevated yield volatility.

Pricing patterns also differ markedly across currencies. Euro-denominated green bonds show no statistically significant greenium in 2025, following a negligible and insignificant premium in 2024 and an average of around 1.9 basis points over 2019–2024. By contrast, dollar-denominated green bonds continue to exhibit a positive premium, estimated at around 1.8 basis points in 2025, down from 3 basis points in 2024 and an average of 4.3 basis points over 2019–2024. Green premia in other currencies strengthened in 2025, reaching approximately 2 basis points and becoming statistically significant.

Survey-based evidence is consistent with these findings. According to Royal Bank of Canada, the greenium has compressed steadily over time (from around 2–2.5 basis points in 2022 to approximately 1.5 basis points by 2024), with the widest premia observed in euro-denominated GSSS bonds and the narrowest in dollar markets. Across instruments, green bonds tend to command slightly larger premia than sustainability-linked bonds, for which the pricing advantage appears minimal.⁶⁶

⁶⁶ Royal Bank of Canada (2025). “2025 Global ESG Fixed Income Investor Survey,” February 2025.

EXHIBIT C1

Greenium Evolution by Markets, 2019–2025



TABLE C1

Greenium Statistical Summary by Markets, 2019–2025

		2019	2020	2021	2022	2023	2024	2025
Developed Markets	Mean	-2.06	-2.31	-2.61	-3.32	-2.2	-1.32	-0.84
	Stdev	8.6	11.2	7.1	15.8	18.1	11	8.9
	Average Observations	170	221	278	350	453	734	798
	Tstat	-3.13	-3.08	-6.17	-3.94	-2.59	-3.27	-2.68
	Level 90%	-1.65	-1.65	-1.65	-1.65	-1.65	-1.65	-1.65
	Level 95%	-1.97	-1.97	-1.97	-1.97	-1.97	-1.96	-1.96
	Level 99%	-2.61	-2.6	-2.59	-2.59	-2.59	-2.58	-2.58
	Emerging Markets	Mean	-3.39	-2.31	-4.45	-6.81	-5.41	0.25
Stdev		8.9	11.5	9.8	20.4	22.1	14.3	10.5
Average Observations		21	27	30	37	42	93	91
Tstat		-1.72	-1.05	-2.49	-2.02	-1.58	0.17	-0.77
Level 90%		-1.72	-1.7	-1.7	-1.69	-1.68	-1.66	-1.66
Level 95%		-2.09	-2.05	-2.05	-2.03	-2.02	-1.99	-1.99
Level 99%		-2.85	-2.77	-2.76	-2.72	-2.7	-2.63	-2.63
Global		Mean	-2.2	-2.31	-2.79	-3.65	-2.47	-1.15
	Stdev	8.6	11.2	7.4	16.3	18.5	11.4	9.1
	Average Observations	191	248	308	387	494	828	889
	Tstat	-3.52	-3.25	-6.63	-4.41	-2.98	-2.91	-2.78
	Level 90%	-1.65	-1.65	-1.65	-1.65	-1.65	-1.65	-1.65
	Level 95%	-1.97	-1.97	-1.97	-1.97	-1.96	-1.96	-1.96
	Level 99%	-2.6	-2.6	-2.59	-2.59	-2.59	-2.58	-2.58

Source: Amundi **Note:** This Table shows the summary statistics for each of the years when the greenium was estimated. Highlighted t-stats indicate statistically significant estimates: Dark, medium and light green refer to estimates that are significant at, respectively, 99%, 95% and 90%. Otherwise (i.e., not highlighted), estimates are not statistically significant at conventional levels. Annex B details the methodology used to make these estimates.

EXHIBIT C2

Greenium by Currency, 2019–2025

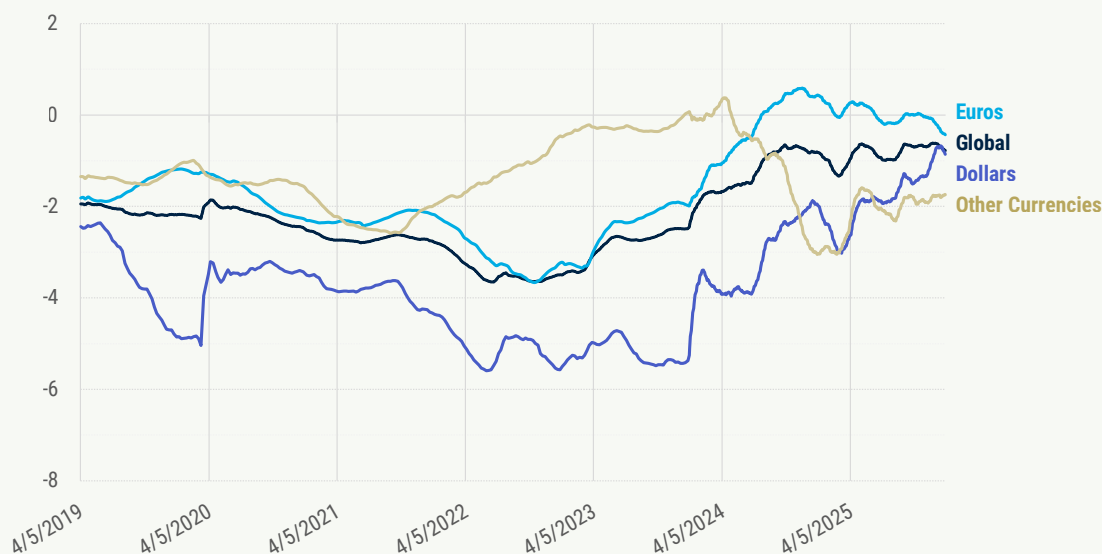


TABLE C2

Greenium Statistical Summary by Currency, 2019–2025

		2019	2020	2021	2022	2023	2024	2025
Euros	Mean	-1.28	-2.09	-2.23	-3.45	-2	-0.18	-0.05
	Stdev	8.2	7.6	6.1	16.2	20.3	11.1	8.7
	Average Observations	105	139	171	212	296	449	506
	Tstat	-1.6	-3.22	-4.79	-3.1	-1.69	-0.34	-0.13
	Level 90%	-1.66	-1.66	-1.65	-1.65	-1.65	-1.65	-1.65
	Level 95%	-1.98	-1.98	-1.97	-1.97	-1.97	-1.97	-1.96
	Level 99%	-2.62	-2.61	-2.61	-2.6	-2.59	-2.59	-2.59
Dollars	Mean	-4.48	-3.27	-4.16	-5.51	-5.14	-2.95	-1.78
	Stdev	10.6	17.8	9.5	19.3	18.5	12.9	9.3
	Average Observations	55	66	88	116	122	244	221
	Tstat	-3.13	-1.5	-4.13	-3.07	-3.07	-3.58	-2.83
	Level 90%	-1.67	-1.67	-1.66	-1.66	-1.66	-1.65	-1.65
	Level 95%	-2	-2	-1.99	-1.98	-1.98	-1.97	-1.97
	Level 99%	-2.67	-2.65	-2.63	-2.62	-2.62	-2.6	-2.6
Other Currencies	Mean	-1.29	-1.54	-2.35	-0.71	-0.06	-1.12	-2.04
	Stdev	4.8	6.6	7	7.1	6.7	8.7	9.6
	Average Observations	32	43	50	59	76	134	162
	Tstat	-1.52	-1.52	-2.37	-0.77	-0.08	-1.49	-2.7
	Level 90%	-1.7	-1.68	-1.68	-1.67	-1.67	-1.66	-1.65
	Level 95%	-2.04	-2.02	-2.01	-2	-1.99	-1.98	-1.97
	Level 99%	-2.74	-2.7	-2.68	-2.66	-2.64	-2.61	-2.61

Source: Amundi **Note:** This Table shows the summary statistics for each of the years when the greenium was estimated. Highlighted t-stats indicate statistically significant estimates: Dark, medium and light green refer to estimates that are significant at, respectively, 99%, 95% and 90%. Otherwise (i.e., not highlighted), estimates are not statistically significant at conventional levels. Annex B details the methodology used to make these estimates.

D. GSSS Bond Database

The analysis in this report draws on a proprietary database of GSSS bonds compiled and maintained jointly by IFC and Amundi. The database aggregates information from multiple commercial and public sources, including Bloomberg, Dealogic, the Climate Bonds Initiative, and issuer disclosures, and is cross-referenced to ensure consistency and accuracy.

Bond Classification

Bonds are classified as GSSS if they carry an explicit green, social, sustainability, or sustainability-linked label at the time of issuance. Classification follows the definitions established by the International ICMA under its Green Bond Principles, Social Bond Principles, Sustainability Bond Guidelines, and Sustainability-Linked Bond Principles. Transition bonds issued under ICMA's Climate Transition Bond Guidelines (November 2025) are included where they meet the use-of-proceeds or criteria linked to key performance indicators specified in the guidelines.

Bonds are included regardless of currency, tenor, or listing venue, provided they have a minimum original maturity of one year. Sovereign, sub-sovereign, corporate, and financial institution issuances are all covered. Multilateral development bank issuances are reported separately where indicated.

Emerging Market Definition

The report defines emerging markets using the World Bank's income-based classification. Countries classified as low-income, lower-middle-income, or upper-middle-income economies are included in the emerging market aggregate. This classification is updated annually; the analysis in this edition reflects the income groupings as of July 2025. China is reported both within and separately from the emerging market aggregate given its outsized share of total GSSS issuance.

Regional Groupings

Regional groupings follow the World Bank's standard geographic classification: East Asia and Pacific (EAP), Europe and Central Asia (ECA), Latin America and the Caribbean (LAC), Middle East and North Africa (MENA), South Asia (SA), and Sub-Saharan Africa (SSA). Where indicated, developed market figures are shown for comparison.

Data Coverage and Cut-Off

The database covers GSSS bonds issued from 2012 through 31 December 2025. Issuance volumes are reported on a settlement-date basis and converted to dollars using the exchange rate prevailing at the time of settlement. Outstanding stock figures reflect gross cumulative issuance net of maturities and early redemptions as of year-end 2025.

Penetration rates are calculated as GSSS bond issuance divided by total fixed-income issuance in the corresponding market segment and period, using Dealogic as the source for total issuance.

E. GSSS Bond Issuance Forecasting Methodology

The issuance forecasts presented in **Part 8** are produced by Amundi using a time-series modeling framework applied to GSSS bond issuance data.

Data and Structure

The forecasts are based on a hierarchical system of seven monthly time series covering global, developed market, and emerging markets issuance (the latter split between China and emerging markets excluding China), with emerging markets further disaggregated by bond type. The data run from January 2015 to December 2025, providing a consistent panel of monthly observations.

Time-Series Modeling

Each series is modeled independently using Auto-ARIMA models with drift, selected via root mean squared error (RMSE). The ARIMA framework accommodates a range of autoregressive and moving-average dynamics and is well suited to the non-stationary structure of monthly issuance data.

ARIMA models rely on the assumption that the stochastic relationship between past and future observations remains stable over time. If the maturity of labeled markets in advanced economies constitutes a genuine regime change, the historical time-series relationship between past and future issuance may be partially disrupted, introducing additional uncertainty beyond what the prediction intervals capture.

Forecast Reconciliation

To ensure internal consistency across aggregation levels, base forecasts are reconciled using the MinTrace (WLS) algorithm. This procedure produces variance-minimizing coherent forecasts by adjusting the initial projections so that they satisfy the linear aggregation constraints imposed by the hierarchical structure (e.g., global = DM + EM; EM = China + EM excluding China). As a result, published forecasts remain fully consistent across all reported segments.

Uncertainty

Prediction intervals are generated using both residual-based and re-estimation bootstrap simulations, producing coherent uncertainty bands at the 80 percent and 95 percent confidence levels. The residual bootstrap reflects innovation uncertainty under fixed parameters, while the re-estimation bootstrap additionally captures parameter uncertainty. These intervals should be interpreted as indicative ranges rather than precise bounds, as they do not incorporate potential future structural regime shifts.

Amundi Asset Management (Amundi) and International Finance Corporation (IFC) produced this report. All trademarks and logos belong to their respective owners.

© 2026 Amundi Asset Management and International Finance Corporation. All rights reserved.

Amundi and IFC agree that the copyright and all related intellectual property rights in the materials in this Report are jointly owned by them. Copying and/or transmitting portions or all of these materials without permission may be a violation of applicable law.

Amundi and IFC each encourages dissemination of its materials and will ordinarily grant permission to reproduce portions of the materials promptly for non-commercial or educational uses without a fee, subject to such attributions and notices as may be required. Any other use of the materials shall require the joint agreement of Amundi and IFC. Neither Amundi nor IFC guarantees the accuracy, reliability or completeness of the content included in the materials, or for the conclusions or judgments described herein, and accepts no responsibility or liability for any omissions or errors (including without limitation any typographical or technical errors) in the content whatsoever or for reliance thereon.

The contents of the materials herein are intended for general informational purposes only and are not intended to constitute legal or securities or investment advice. Amundi and IFC and its affiliates may have an investment in, provide other advice or services to, or otherwise have a financial interest in certain of the entities referred to in these materials. The boundaries, colors, denominations and other information shown on any map in this document do not imply any judgment on the part of IFC or the World Bank concerning the legal status of any territory or the endorsement or acceptance of such boundaries.

All queries on rights and licenses, including subsidiary rights, should be addressed to IFC's Corporate Relations Department at 2121 Pennsylvania Avenue, N.W., Washington, DC 20433, U.S.A.

IFC is an international organization established by Articles of Agreement among its member countries, and it is a member of the World Bank Group. All names, logos and trademarks are the property of IFC, and you may not use any of such materials for any purpose without the express written consent of IFC. Additionally, "International Finance Corporation" and "IFC" are registered trademarks of IFC and are protected under international law. Any queries on rights and licenses, including subsidiary rights, pertaining to IFC should be addressed to IFC Communications, 2121 Pennsylvania Avenue, N.W., Washington, DC, 20433.

All other queries should be directed to Amundi. Amundi Asset Management, French "Société par Actions Simplifiée" – SAS with share capital of €1,086,262,605 – Portfolio Management Company licensed by the AMF (French securities regulator) under no. GP 04000036 Registered office: 90 boulevard Pasteur – 75015 Paris – France – 437 574 452 RCS Paris. Website: www.amundi.com.

