



Systemic  
Climate Action  
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# Sustainability-Linked Bonds for Nature & Biodiversity:

*Market Background and Challenges*



November 2025

# What are SLBs and How Do They Work?

## Key Features of SLBs



### Performance-Based Structure

SLBs tie the bond's terms, like interest rates, to the issuer's performance against specific sustainability goals. If the issuer fails to meet the targets, the coupon may increase (a "step-up" penalty). Conversely, in some structures, the coupon may decrease (a "step-down") if the issuer meets or exceeds the sustainability performance targets.



### General Use of Proceeds

Proceeds from SLBs are not restricted to specific projects. This flexibility allows issuers to allocate funds as needed, while still committing to overarching sustainability objectives. This approach enables a broader range of issuers to participate in sustainable finance.



### Transparency and Accountability

Issuers are expected to regularly report on their progress toward sustainability targets, providing transparency to investors and stakeholders. Regular disclosures help maintain investor confidence and ensure that issuers are held accountable for their ESG commitments.



### Alignment with Sustainability Strategies

SLBs encourage issuers to integrate sustainability into their overall business strategies, promoting long-term ESG improvements. This alignment ensures that sustainability goals are embedded in the issuer's core decision-making processes.

## How Do They Work?

Price: **100**    Coupon: **4.5%**  
Due June 2032  
Yield to maturity: **4.5%**



**EVENT: Sustainable performance target missed**  
→ Coupon steps up 50bps (from 4.5% to 5.0%)



Price: **96.50**    Coupon: **5%**  
Yield to maturity: **5.2%**

### Why Might the Price Drop?

- ESG-focused investors lose confidence and exit positions.
- Reputational risk damages issuer credibility.
- Some investors sell due to missed target.
- Price declines due to market revaluation.

# Growth of the SLB Market and Issuance Trends



## Rapid Growth Phase (2019 to 2021)

- First SLB issued by Enel in 2019 (Italian utility).
- Market expanded sharply from **\$9.43 billion in 2020** to **\$96.22 billion in 2021**.
- SLBs became major driver of sustainable debt market growth.



## Market Contraction After 2021

- Issuance declined to **\$76 billion in 2022**, then to approximately **\$66 billion in 2023**.
- 2024 showed continued slowdown - volumes nearly 50% below 2023 levels at approximately **\$34 billion**.

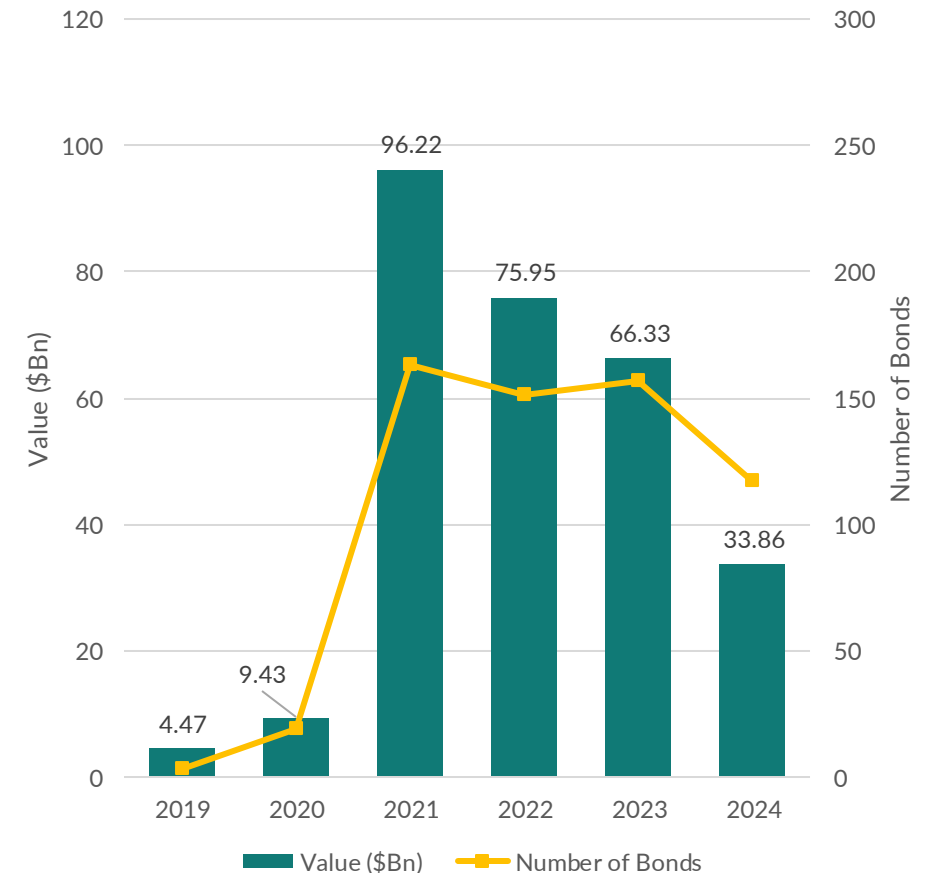


## Issuer Participation Trends

- Around 190 unique issuers in 2021, marking peak activity.
- Issuer numbers held steady in 2022 and 2023.
- Decline seen in 2024 with only 56 issuers in the first half, representing a 33 percent drop year-on-year.

*The SLB market experienced a remarkable rise between 2019 and 2021, becoming a key engine of sustainable finance. However, since 2022, both issuance volumes and issuer participation have steadily declined, signaling investor caution and market recalibration.*

## Rise and Fall of SLBs



Source: Environmental Finance Data

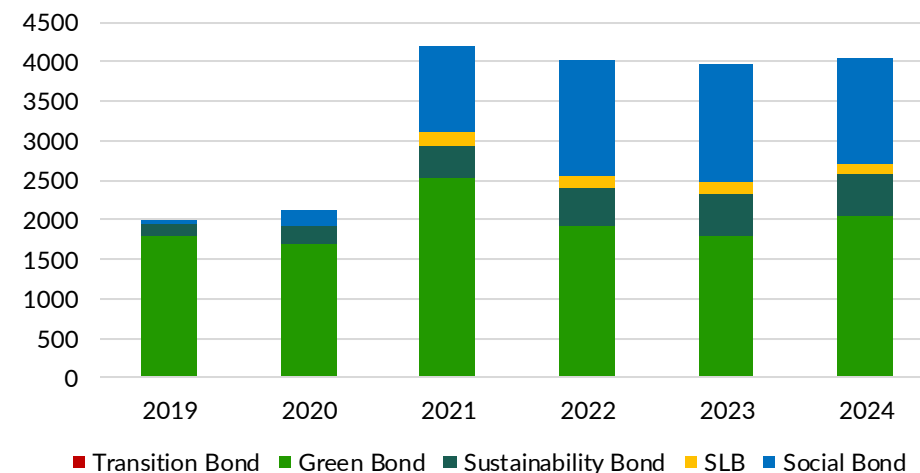
[SLBs: 2024 issuance slumps as issuer wariness grows :: Environmental Finance](#)

# SLBs in the Thematic Context

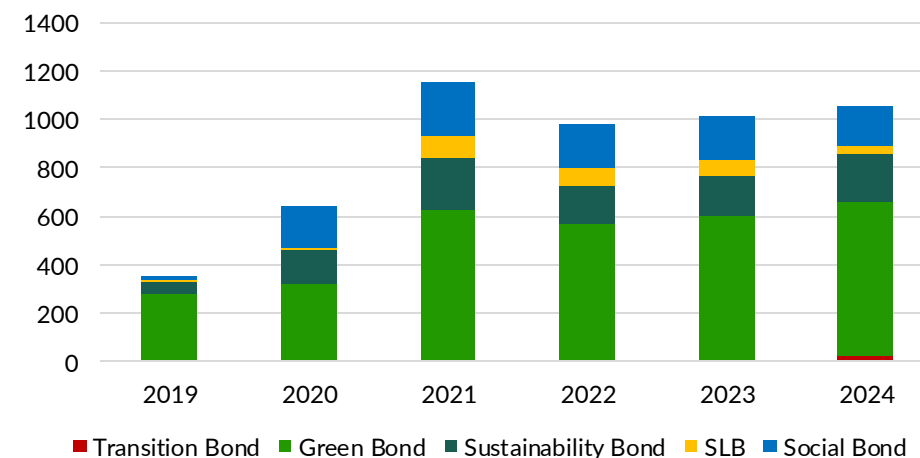
| Dimension                | Green Bonds                                                                              | SLBs                                                                                       |
|--------------------------|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| Structure                | Use-of-proceeds: funds earmarked for eligible green projects                             | General purpose: tied to achievement of sustainability KPIs                                |
| Market Size              | ~\$635 billion issued in 2024 (~60% of total sustainable bonds)                          | ~\$34 billion issued in 2024 (~5% of total sustainable bonds)                              |
| Issuers                  | Broad base: sovereigns, corporates, multilateral development banks                       | Mostly corporates (~88% in 2022), emerging sovereigns (Chile, Uruguay, Thailand, Slovenia) |
| Investor Trust           | Broad and stable investor base; preferred for ESG integration                            | Cautious investor sentiment; strong frameworks required to attract interest                |
| Accountability           | No financial penalty for project failure; relies on transparency and reporting           | Coupon step-up if KPIs missed; incentivises performance                                    |
| Integrity Challenges     | Greenwashing risk via vague project definitions or refinancing                           | KPI ambition concerns: lenient targets, long timeframes, minor penalties                   |
| Regulatory/Market Trends | Strong standards (e.g., ICMA Principles, EU taxonomy); sovereign best practices emerging | ICMA SLB Principles updated; demand rising if KPI credibility ensured                      |
| Use Case Fit             | Best for asset-heavy green projects                                                      | Suitable for high-impact issuers lacking earmarkable green projects                        |

*Despite high interest rates, green, social, and sustainability bond issuance remained resilient in 2023. SLBs, in contrast, have declined for two consecutive years - highlighting structural credibility concerns, not just market conditions.*

Number of GSSSB+ issued



Value of GSSSB+ (\$Bn)



Source: Environmental Finance Database

# Sovereign vs Corporate Issuance



## Dominance of Corporate SLBs

- Non-financial corporates accounted for 96% of total SLB volume in 2024.
- Corporates (financial and non-financial) represent over 84% of cumulative SLB issuance.



## Sovereign SLBs are an Emerging Segment

- Only four sovereign issuers to date: Chile, Uruguay, Thailand and Slovenia. Two issued SLBs in 2022, one in late 2024, and one in 2025.
- Other countries exploring SLBs: South Africa, Kenya, Rwanda, Mongolia.

## Why Corporates Lead the SLB Market



### Flexibility and Speed

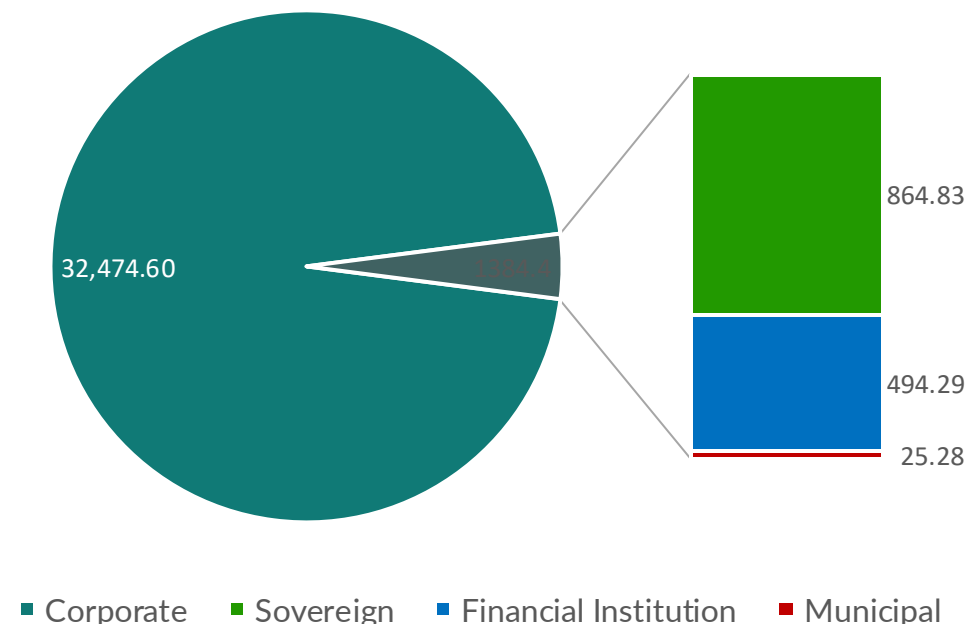
Fewer bureaucratic hurdles mean corporates are generally able to make decisions much faster than sovereigns, allowing them to move quickly with new instruments such as SLBs. Sovereigns, on the other hand, face slower, politically complex processes when attempting to issue a new new instruments such as SLBs.



### Sovereign Supply Gap

Sovereigns are underrepresented in the SLB market not because of investor reluctance, but because the pool of viable issuers is much smaller. Corporates: Around 2,850 rated globally, with over 93% investment-grade ([Fitch](#), [Neuberger Berman](#)). Sovereigns: Just 143 rated, and only 56% are investment-grade ([Moody's](#)). Debt distress: 38% of rated sovereigns are in or near default risk ([IMF](#)). Limited pool: Only 41% of IG sovereigns are [OECD](#); the rest often face policy or capacity hurdles.

Value of SLBs (\$M) in 2024 by Issuer Type



Corporate SLBs dominate the market today, but sovereign SLBs are slowly gaining traction and could become a key tool for climate and sustainability finance in the years ahead.

# Common SLB KPIs

## Some Examples of Commonly Used SLB KPIs



### GHG Emissions Reductions

The most common SLB KPI, linking bond terms to cutting absolute CO<sub>2</sub> emissions or emissions intensity, aligned with climate goals.

**Examples:** Chile's sovereign SLB targets national GHG emissions reduction. Corporate SLBs from utilities, energy, and manufacturing sectors often align with Paris Agreement pathways.



### Renewable Energy

SLBs frequently target renewable energy capacity growth or energy efficiency improvements to promote clean energy transitions.

**Examples:** SLB issued by Italian green energy company Enel in 2019 linked to achieving renewable electricity capacity. Chile's sovereign SLB includes targets for 50% renewable power by 2028 and 60% by 2032.



### Other Environmental Metrics

Sector-specific SLBs include KPIs for water use, waste reduction, circular economy initiatives, and pollution management. **Example:** SLB issued by Brazilian pulp and paper company Suzano includes a target to reduce water intake per ton of product by 15% by 2026.



### Social and Governance

Some SLBs include targets for social outcomes like diversity or healthcare, with occasional governance-linked metrics.

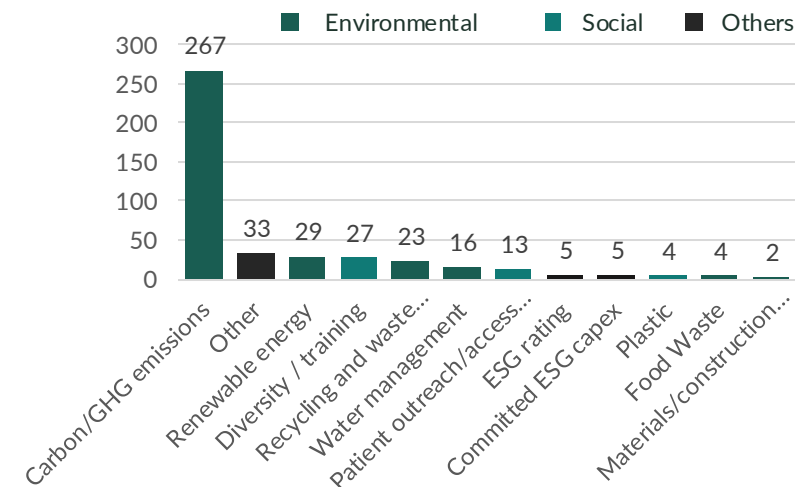
**Example:** Suzano's SLB sets a target for 30% female leadership by 2025. SLB issued by Development Bank of Rwanda ties targets to improved ESG standards and women-led business financing.

## Emerging Nature and Biodiversity KPIs in SLBs



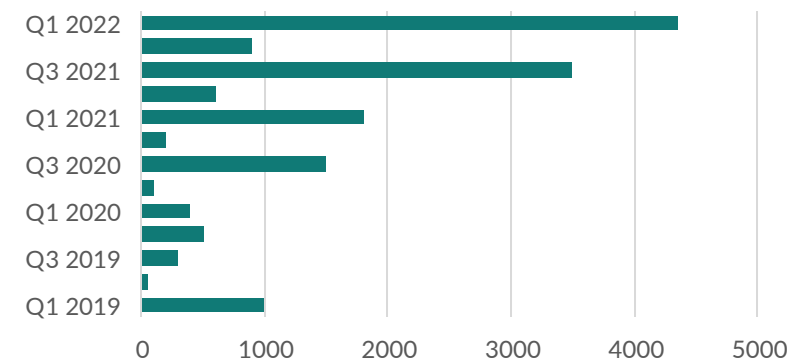
- Nature and biodiversity KPIs remain rare in SLBs but are slowly increasing, as noted in the market trends.
- Uruguay's sovereign SLB was the first major deal to include a legally binding KPI for forest preservation, setting a market precedent.
- Following ICMA's SLB Principles 2024, biodiversity KPIs are expected to grow, with early corporate adopters like Suzano targeting 500,000 hectares of habitat restoration by 2030.

## Number of KPIs



Source: NatWest, Bloomberg

## Sustainability-linked bonds with biodiversity, deforestation, reforestation and nature KPIs (\$M)



Source: GlobalData

# Notable SLB Transactions

Below is a list of reference SLB issuances across sovereign, sub-sovereign, and corporate categories, highlighting key details of each:

| Issuer (Year)                     | Type                                 | Size & Tenor                           | KPI Themes                                     | Key Features / Intermediaries                                                                                                                                                                                                                      |
|-----------------------------------|--------------------------------------|----------------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Republic of Chile (2022)          | Sovereign (Emerging Markets)         | \$2.0 billion, 20-year (2042)          | Climate: GHG Emissions; Renewable Energy       | First sovereign SLB with 12.5bps step-up per missed target (25bps max). KPIs aligned to Chile's NDC: CO <sub>2</sub> reduction and ≥50% renewables by 2028. Managed by BNP Paribas, Crédit Agricole, Société Générale.                             |
| Republic of Uruguay (2022)        | Sovereign (Emerging Markets)         | \$1.5 billion, 12-year (2034)          | Climate: GHG Intensity; Nature: Forest         | First sovereign SLB with coupon step-down feature. KPIs: reduce GHG per GDP and prevent deforestation. 15bps step-up per missed target (30bps max), 15bps step-down for exceeding targets. Supported by the Inter-American Development Bank (IDB). |
| Zagreb Holding (2023)             | Sub-sovereign (Croatia)              | €305 million, 5-year (2028)            | Urban Environment: Waste & Renewables          | First city-owned SLB in Eastern Europe. KPIs: waste management, renewable energy in city services. Coupon tied to municipal targets. European Bank of Reconstruction and Development (EBRD) anchor investor, technical support provided.           |
| Development Bank of Rwanda (2023) | Financial Institution (National DFI) | RWF 30 billion (~\$25M), 7-year (2030) | Inclusive Finance: ESG; Gender; Housing        | First SLB by a national development bank. KPIs: ESG at partner banks, women-led business loans, affordable housing. Coupon step-down only if targets met, backed by World Bank credit guarantee.                                                   |
| Suzano S.A. (2021)                | Corporate (Brazil, Forestry/Pulp)    | \$1.0 billion, 10-year (2032)          | Environmental: Water; Social: Gender Diversity | Corporate SLB. KPIs: 15% water use reduction by 2026, ≥30% female leadership by 2025. 12.5bps step-up per missed target (25bps max). Later issued biodiversity-linked SLB for habitat conservation.                                                |

## Notable Observations:

- The sovereign SLBs (Chile, Uruguay) tie national policy targets (climate mitigation and forest conservation) directly to debt costs, marking an innovative approach to sovereign finance. Chile's deal showed investors would accept a modest step-up (25bps), while Uruguay introduced a two-way coupon (reward and penalty).
- The sub-sovereign SLB (Zagreb) illustrates how cities can use SLBs to pursue local sustainability goals such as waste management and renewable energy, supported by development banks.
- The development bank SLB (Rwanda) demonstrates how financial institutions can issue local-currency SLBs for broad SDG outcomes, with World Bank guarantees mitigating risk.
- The corporate SLB (Suzano) reflects how companies integrate ESG factors such as water efficiency and gender inclusion into financing, with subsequent biodiversity-linked KPIs signaling nature-based target growth.

# Example: Kingdom of Thailand SLB

Thailand launched its Sustainability-Linked Bond to strengthen credibility around its climate commitments by directly tying financing costs to progress on national emissions reduction and clean transport goals. The focus on GHG emissions and Zero Emission Vehicles reflects the country's major sources of pollution and its policy push toward carbon pricing, EV adoption, and renewable energy. We highlight Thailand because it is the **first Asian sovereign** to issue an SLB, setting an important precedent for how emerging markets can mobilize sustainable finance while advancing their climate transition.



## Snapshot of Key Data

**Value (M):** THB 29,900

**Interest Payment Date:** Fixed rate, semi-annually (payable on 17 June and 17 December of every year throughout the terms of the Bond).

**Tenor:** 15 years

**Coupon:** 2.7%

**Private placement:** No

## SPT1: Total Greenhouse Gas (GHG) Emission

~99%

**Target:** Reduce emissions to **388,500 ktCO<sub>2</sub>e by 2030** (30% cut from BAU, aligned with NDC).  
**Progress:** In 2022 emissions were **385,941 ktCO<sub>2</sub>e** - already just below the target, but rising again post-COVID. Risk of overshoot if growth continues.

## SPT2: Zero Emission Vehicle (ZEV)

16%

**Target:** Reach **440,000 annual ZEV registrations by 2030** (a 476% increase).  
**Progress:** In 2024, **70,582 ZEVs registered** (10.9% market share). That's ~16% of the 2030 target, supported by subsidies and EV policy packages.

## Timeline

Feb 14 - Pricing Date  
Feb 20 - Settlement Date  
Jun 17 - Maturity countdown begins

Dec 31 - KPI testing date for both: SPT2 (Zero Emission Vehicles) and SPT1 (Total Greenhouse Gas Emissions)

Jun 17 - Final maturity

2025

2030

2040

2031 2032

2035 2036

Jun 30, 2031 - ZEV (SPT2) test results reported  
Dec 17, 2031 - ZEV adjustment effective date ( $\pm 0.025\%$ )  
Jun 17, 2032 - First coupon paid at SPT2 Adjusted Rate

Jun 30, 2035 - GHG emissions (SPT1) test results reported  
Dec 17, 2035 - GHG adjustment effective date ( $\pm 0.025\%$  applied to SPT2 Adjusted Rate)  
Jun 17, 2036 - First coupon paid at SPT1 Adjusted Rate

# Systemic Barriers and Integrity Issues in the SLB Market

## Systematic Barriers



### Weak Capital Markets

Many developing countries lack stable financial markets, institutional capacity, and coordinated agencies needed to issue SLBs effectively ([OECD, 2024](#)). Sovereign debt managers cite inter-agency coordination as a major hurdle.



### Absence of Frameworks

Globally applicable ICMA Principles exist, but many developing markets lack tailored national SLB regulations, risking inconsistent standards and low market confidence.



### Data Constraints

Fewer than 50% of low-income countries publish basic sustainability data (e.g., GHG inventories). ([UN, 2024](#)) Technical gaps hinder reliable baselines, ongoing reporting, and credible KPI monitoring.



### KPI Concerns

86% of SLBs assessed by Climate Bonds Initiative ([CBI, 2024](#)) were not aligned with 1.5°C climate goals. Risk of weak, immaterial, or unambitious targets undermines market trust.



### Misaligned Incentives

Typical SLB coupon step-up is only 25bps, which is small relative to national sustainability investment costs. Structural loopholes (e.g., callable bonds, targets set beyond maturity) dilute accountability.



### Economic Conditions

Post-2021 sustainable bond issuance fell due to rising rates and investor risk aversion. Some low-income sovereigns face double-digit yields, making SLBs financially unattractive.

## Criticisms of SLB KPI Frameworks and Market Integrity



### Penalty Debate

A 25bps penalty on a \$2 billion sovereign SLB equals just \$5 million per year offering limited real financial incentive. However, overly large penalties may raise investor concerns around credit risk and affordability, limiting issuer appetite.



### Structural Weaknesses

Late-dated KPIs and call options allow issuers to escape penalties by refinancing or timing exits strategically ([ECGI, 2022](#)). Inadequate structural safeguards expose sovereign issuers to reputational risk and investor skepticism.



### Lack of Additionality

Many SLBs set targets that issuers were already planning to meet, offering little behavioural change or additionality ([FBF, 2022](#)). Targets often lack materiality or incremental value, leading to concerns about superficial commitments ([ICMA, 2023](#)).



### Greenwashing

Proceeds in SLBs are unrestricted, raising higher risks of greenwashing compared to use-of-proceeds bonds ([OECD, 2024](#)). Despite some progress, SLBs still face trust issues due to inconsistent ambition and verification practices ([ICMA, 2023](#)).



### Immaterial KPIs

A high share of SLBs assessed lacked robust transition plans or structural integrity in their KPI design ([CBI, 2024](#)). Use of indirect indicators like ESG scores instead of emissions or biodiversity KPIs undermines accountability.

*To realise the full potential of SLBs in emerging economies, systemic market gaps must be addressed alongside reforms to KPI credibility, structural integrity, and investor confidence.*

# Insights for Improving Issuer and Investor Uptake



## Leverage Institutions

- MDBs like the World Bank, IDB, and EBRD have acted as structuring advisors, investors, or guarantors in multiple SLB transactions (e.g., Rwanda, Uruguay, Zagreb (Croatia)).
- OECD and IMF recommend that donors provide outcome-based support, with some IMF climate programmes already embedding KPI-linked monitoring.



## Improve Data Transparency

- Both Chile and Uruguay publish annual SLB progress reports, setting a precedent for transparent sovereign performance reporting ([UNDP, 2023](#)).
- Countries are experimenting with digital tracking tools, including Chile's public SLB dashboards and forest monitoring via satellite systems.



## Set Ambitious Targets

- The World Bank's FAB Matrix is already being used by issuers as a logic-based approach to ensure credible KPI setting ([OECD, 2024](#)).
- Sovereigns are beginning to go beyond NDC targets - e.g., Uruguay KPI tied to zero net loss of native forest, not just existing climate pledges ([IDB, 2022](#)).



## Develop Guidelines

- OECD ([2024](#)) advises countries or regions to develop locally adapted SLB guidelines to reflect context and build credibility.
- ICMA is currently working on sovereign SLB guidance in collaboration with stakeholders to improve standardisation and ambition ([World Bank, 2023](#)).



## Penalties and Rewards

- Uruguay's SLB introduced a 30bps two-way adjustment - a rare example of sovereigns including both penalty and reward ([IDB, 2022](#)).
- The World Bank proposes 'pay-for-success' bonus mechanisms funded by DFIs or donors for over-achievement ([World Bank, 2023](#)).



## Credit Enhancement and Blended Finance

- Rwanda's SLB included a World Bank-backed partial credit guarantee, lowering risk and enabling domestic issuance ([World Bank, 2023](#)).
- Proposals are advancing for first-loss donor structures to buy SLBs from climate-progressive sovereigns and enhance credit quality ([World Bank, 2023](#)).



## Strengthen Frameworks

- Uruguay's SLB framework was developed with World Bank support, including inter-ministerial coordination and KPI verification ([IDB, 2022](#)).
- OECD ([2024](#)) calls for long-term donor-backed capacity building, with examples of pre- and post-issuance technical assistance already underway.



## Standardisation and Simplicity

- ICMA and MDBs are working on standardised SLB term sheets, improving replicability and reducing complexity ([World Bank, 2023](#)).
- Sovereign issuers increasingly follow a 'plain vanilla + KPI' structure to attract broader investor interest.

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