Slovenia launches sovereign decarbonisation SLB

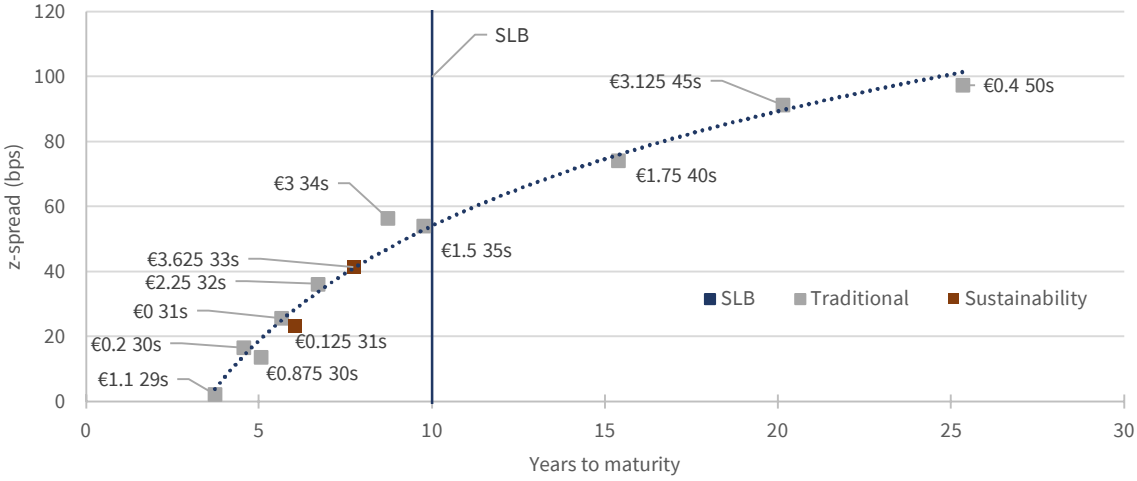
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The Republic of Slovenia (ticker SLOREP, rated AA / A3 / A[1]) is launching its inaugural sustainability-linked bond (SLB), complementing previous issuances of labelled bonds. This new structure, with a single performance target focused on absolute emissions and a dual step-up/step-down feature, is unique not only among European sovereign issuers but also in a global context.

The issuance has been mandated as a 10-year benchmark bond to fit with the issuer's standard pattern.[2] In short, the structure promises a final maturity bond coupon adjustment of +50bps if the issuer misses a 2030 target on emissions of -35% vs a 2005 baseline, and similarly -50bps if the issuer decarbonises more than -45%. This provides the issuer with multiple incentives to decarbonise to and beyond its current target. Key takeaways:

- Having one KPI linked to emissions has ramifications for pricing in the primary market as well as how to analyse pricing in future, as it will be possible to link it directly to the probability of Slovenia achieving its decarbonisation target. We view this simple structure linked to emissions as positive for investors.
- The targets appear ambitious, and we estimate a 50% probability of achieving SPT 1.1 (i.e. 50% probability of step up) and a 10% probability of achieving SPT 1.2 (i.e. 10% probability of step-down).
- The significantly higher probability of a step-up relative to a step-down means the net option value is positive for the investor (upfront value: 0.158%; running value: 1.8bps) and therefore the SLB should price at a lower spread than a vanilla bond of the same maturity.

Figure 1. SLOREP bonds (with maturities from 2029-50) and preliminary details on the SLB. Source: Bloomberg, AFII.



[1] S&P (recent upgrade: "Slovenia Long-Term Ratings Raised To 'AA' On Strong Public Finances And Sustained Growth; Outlook Stable", S&P Global, 6 Jun 2025) / Moody's and Fitch, both with a positive outlook.
[2] At the time of writing, investor marketing is ongoing. This note refers to parameters of the issuance as per the announcement of the mandate. Banks on the ticket are BARC, BNP, CACIB, DB, JPM and OTP Banka.

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From SLB framework to issuance

The Sustainability-Linked Bond framework[3] covers the relevant factors and considerations in the context of Slovenia's climate agenda.[4] In line with the National Energy and Climate Plan (NECP), it outlines three key performance indicators (KPIs), each with a combination of sustainability performance targets (SPTs) that allow for both step-up and step-down scenarios. In this context, the upcoming issuance covers the following SPTs.[5]

Total annual greenhouse gas emissions (GHG), excluding land use, land use change and forestry (LULUCF); 2005 baseline: 20,595.82 kt CO_2e, 2022: 15,615.09 kt CO_2e

- SPT 1.1: 35% decrease by 2030 (absolute value: 13,387.28 kt CO_2e)
- SPT 1.2: 45% decrease by 2030 (absolute value: 11,327.70 kt CO_2e) – for step-down

The framework is aligned with the ICMA Sustainability-Linked Bond Principles (SLBP), ensuring adherence with best practices. In the second-party opinion (SPO), S&P classified the selection of the three KPIs as 'advanced', the highest category, and the calibration 'advanced' for SPT 1.[6] Importantly, performance reporting is tied to external review processes (i.e. UNFCCC and EU), ensuring data quality and governance.

Noteworthy are the "stretch targets" that incentivise and reward a strong performance beyond the base targets, resulting in a coupon step-down if achieved. The combination of step-up/step-downs implies a more symmetric outcome optionality and alleviates the perception of "punishment" tied to coupon step-ups but also adds some complexity in terms of pricing, which will be addressed later. In earlier work on sovereign NDC-tied SLBs[7], named "transition linkers", we have referred to combined step-up/step-down structures as 'zero-cost' as the targets can be constructed such that the option premiums balance out.

The upcoming bond issuance is expected to be a 10-year benchmark bond with a combined step-up/step-down structure (+/- 50bps), which would apply to the last coupon payment. Compared to the dominant SLB structure based on coupon step-ups, this combined structure could result in three possible outcomes: step-up (i.e. SPT 1.1 not achieved), no change, and step-down (i.e. SPT 1.2 achieved). The clear focus on one key KPI related to emissions (see details overleaf) is positive and ensures simplicity of the structure, helping investors to assess and price the structure.

[3] "Sustainability-Linked Bond Framework", Republic of Slovenia, Feb 2025.
[4] See Slovenian Development Strategy 2030 ("SDS 2030"), Resolution on the Long-Term Climate Strategy of Slovenia until 2050 ("Climate Strategy"), the Environmental Protection Act and the latest National Energy and Climate Plan ("NECP").
[5] The other KPIs outlined in the framework relate to share of renewable energy consumed in gross final energy consumption and energy efficiency, expressed as final energy consumption.
[6] "Second Party Opinion - Republic of Slovenia Sustainability-Linked Bond Framework", S&P Global, 21 Mar 2025.
[7] See "Transition Linkers", AFII, 18 Nov 2024.

Targets linked to emissions reduction

A positive is the direct link to absolute carbon emissions and the UNFCCC process. Besides the 2030 targets, the framework outlines targets for 2033.

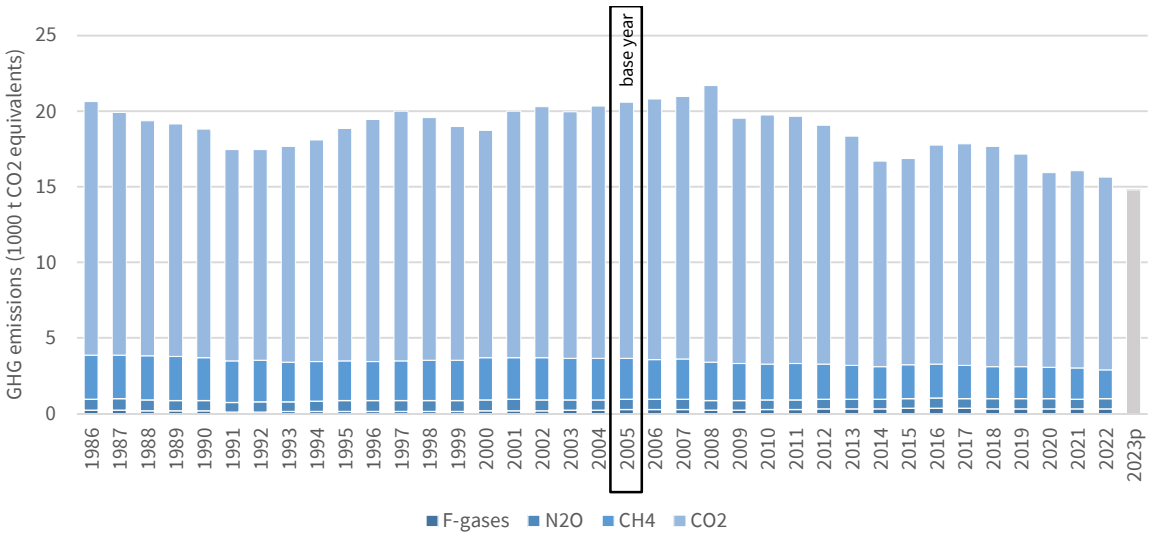
In this context, the Šoštanj Thermal Power Plant (TEŠ) plays a key role as one of the few remaining fossil fuel power plants in Slovenia, primarily fuelled by lignite. Accounting for around 24% of overall electricity production,[8] TEŠ is a major producer of electricity in the country and is an important provider of district heating in the local area. The state-owned power plant is also the country's largest GHG emitter with 2,745.9 kt CO_2 in 2023,[9] approximately 18.5% of total emissions, and a shutdown was planned by 2033 at the latest. Recent headlines point to an expedited timeline,[10] but there is some uncertainty about operations which is reflected in the target range between SPT 1.1 (-35%) and SPT 1.2 (-45%).

Considering the importance of decommissioning TEŠ, the emission targets reflect a pivotal point in Slovenia's decarbonisation strategy being tied specifically to the coal phase-out.

As shown in Figure 2, CO_2 accounts for the vast majority of GHG emissions and has been the main constituent of the overall reduction of 24.2% from 2005 to 2022, with more recent data pointing to a continued reduction in 2023. Looking at the drivers of emissions, energy accounts for around 80%, followed by agriculture (10%) and industrial processes (5%).[11]

On a more granular level, transport is the sector with the highest share (37%), which has been growing in recent years.[12] Accordingly, rail transport, sustainable mobility and transport-related energy consumption (e.g. energy-efficient vehicles) are policy priorities. As stated in the SLB framework, "*Reducing GHG emissions targets in the transport sector (the single largest sectoral source of GHG emissions in Slovenia) is a significant challenge, largely due to the industry's dependence on external factors.*"

Figure 2. Slovenia's total annual GHG emissions excluding LULUCF (1986-2022, 2023 proxy). Source: Environmental Agency of the Republic of Slovenia, European Environment Agency, AFII.

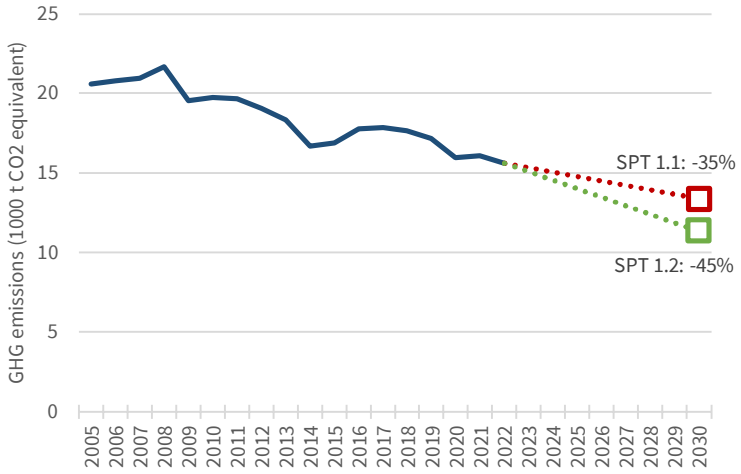


[8] "Production of electric energy and coal consumption", TEŠ, accessed 5 Jun 2025.
[9] "Annual report 2023", TEŠ, accessed 5 Jun 2025.
[10] "Šoštanj coal power station to be bailed out before phaseout", Slovenia Times, 12 Dec 2024,
[11] "Climate Watch - Slovenia", accessed 5 Jun 2025.
[12] "Slovenian Environment Agency - GHG Emissions", accessed 5 Jun 2025.

Slovenia's Climate Strategy adopted in 2021, the 2024 Integrated National Energy and Climate Plan (NCEP) and the proposed climate law set the foundation for the decarbonisation pathway. Based on the emissions path from 2005 to 2022 (see Figure 3), the average annual reduction was 1.5%. Continuing on this historical trajectory would be insufficient to reach SPT 1.1 with a required reduction of 14.3% from 2022 to 2030 (annual: -1.9%), while SPT 1.2 requires -27.5% (annual: -3.9%).

Taking the 2005-2022 period as reference, the pace of decarbonisation needs to increase somewhat to reach SPT 1.1 and more meaningfully to reach SPT 1.2 by 2030. Based on recent data published by the European Environment Agency,[13] emissions declined by around 5% in 2023, suggesting continued progress.

Figure 3. Slovenia's total annual GHG emissions excluding LULUCF (2005-2022) and 2030 SPTs. Source: Ministry of Finance of the Republic of Slovenia, AFII.



In terms of reporting, verified emissions data results in time lags and annual progress reports will be published with 36 months after each year-end according to the framework. Meanwhile, data providers (e.g. European Environment Agency) allows investors to monitor emission trends with a somewhat shorter time lag.

Option pricing analysis

Building on our extensive work on SLB pricing,[14] we use an option pricing model to assess the bond structure.

As a first step, we look at the historical annual drift and volatility of the change in emissions to derive a probability of SPT1.1 and SPT 1.2 being achieved. As summarised in Table 1, data from 2005-2022 shows an average annual drift of -1.53% and volatility of 4.17%. Incorporating the data proxy for 2023, has a negligible impact on volatility but results in a drift of -1.73%.

Table 1. Annual drift and volatility of changes in Slovenia's GHG emissions. Source: AFII.

	Drift (average)	Volatility
2005-2022	-1.53%	4.17%
2005-2023p	-1.73%	4.14%

We then rely on a Black-Scholes approach to price the step-up/step-down feature of the SLBs.[15] Using this methodology as a reference point and accounting for some uncertainty, this approach indicates a 50% probability of achieving SPT 1.1 (i.e. 50% probability of step up) and a 10% probability of achieving SPT 1.2 (i.e. 10% probability of step down). Overall, our analysis suggests that the targets are ambitious, particularly SPT 1.2 as it would require a considerably higher emissions reduction compared to the historical trajectory, which S&P also concluded in its SPO.

[13] EEA greenhouse gases - data viewer, accessed 5 Jun 2025.
[14] For more details on Sustainability-Linked Bond option pricing please see "Sustainability Linked Bond Handbook", AFII, 12 May 2024.
[15] For full details please see "An option pricing approach for sustainability-linked bonds", AFII, 8 Nov 2022.

The combined structure could result in three possible outcomes, resulting for the investor in a positive option value from the potential coupon step-up but also a negative one from the potential coupon step-down, subject to assumptions on pricing parameters. Looking at this specific bond, the significantly higher probability of a step-up (50%) relative to a step-down (10%) means the net option value is positive (upfront value: 0.158%, running value: 1.8bps) and therefore it is possible that the SLB could price at a somewhat lower spread than a plain vanilla bond. While the 50bps coupon adjustment is relatively high, it only applies to the last coupon payment in 2035, which limits the option value.

Conclusions

After issuing Use of Proceeds (UoP) bonds in past years, including two sustainability bonds in EUR (2031s 0.125% and 2033s 3.625%) and a dual-tranche social bond in JPY (2027s 0.75% and 2029s 0.890%), the Republic of Slovenia complements its labelled bond offering with an inaugural SLB issuance. All these bond transactions underpin Slovenia's commitment to sustainability and channel capital to related objectives. Aligned with EU regulation,[16] Slovenia aims to achieve net zero emissions by 2050, with the potential for climate neutrality by 2045 as outlined in the draft proposal for a new climate law.[17]

The SLB issuance is an important step of the decarbonisation pathway, setting strong incentives for emissions reduction and providing investors an opportunity to actively support related efforts.

Our analysis suggests that the targets are ambitious, particularly SPT 1.2 as it would require a considerably higher emissions reduction compared to the historical trajectory. The significantly higher probability of a step-up relative to a step-down means the net option value is positive for the investor.

An important point on this type of bond structure is that it creates a hedge for investors against a failure to transition. If an investor believes that equity assets will perform worse in high global temperature scenarios, tying bond coupons to the achievement of decarbonisation targets creates (more) negative correlation between the sovereign bond portfolio and equity assets, and thus provides additional portfolio benefits.[18]

[16] "Regulation - 2021/1119 - EN - EUR-Lex", EU, 30 Jun 2021.
[17] "Slovenia's climate action strategy", European Parliament, Mar 2025.
[18] See "Transition Linkers", AFII, 18 Nov 2024.

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