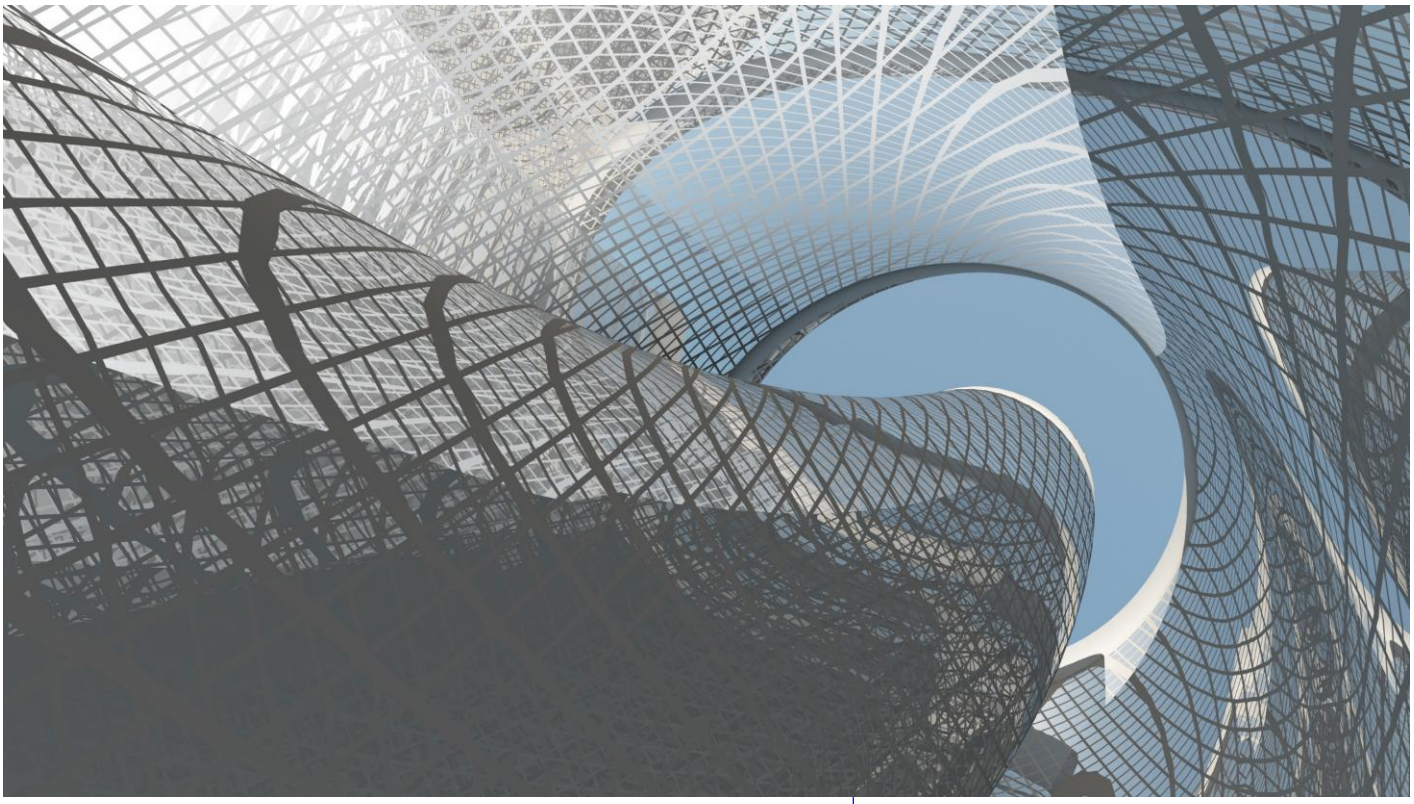


**Index Insights** | Sustainable Investment

# A forward-looking approach to climate ambition in sovereign bond indices

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# Introduction

As the upcoming 31st United Nations Climate Change Conference (COP31) brings national climate commitments back into focus, sovereign bond investors face a practical question: how can differences in countries' forward-looking transition ambitions be reflected systematically in government bond portfolios?

The FTSE Net Zero Ambition Government Bond Index Series proof of concept (PoC) explores one approach. It incorporates the LSEG Nationally Determined Contributions Implied Temperature Rise (NDC ITR)[1], a metric that expresses countries' stated climate commitments as a comparable temperature-based alignment metric, into sovereign index construction. Alongside this country-level measure, a security-level tilt gives greater weight to eligible green bonds within each country allocation[2].

The methodology adjusts country weights to target an aggregate index NDC ITR of 2°C or below, subject to defined portfolio construction constraints. Importantly, NDC ITR reflects the ambition of countries' stated climate commitments, rather than realised emissions reductions or the likelihood that those commitments will be achieved. Accordingly, the term "Net Zero Ambition" refers to the methodology's use of forward-looking national climate commitments and does not imply that the index, its constituents or the underlying sovereign bond portfolios are aligned with a realised net-zero emissions pathway.

Simulations across three established FTSE Russell sovereign bond universes show how the methodology works in practice. Applied to the FTSE World Government Bond Index (FTSE WGBI), FTSE Emerging Markets Government Bond Index (FTSE EMGBI) and FTSE Emerging Markets USD Government Bond Index (FTSE EMUSDGBI), the PoC approach brings aggregate NDC ITR below 2°C in all three cases (Figure 1). The simulations also illustrate what meeting the methodology's constraints means for country allocations, index characteristics, performance, tracking error and green bond exposure.

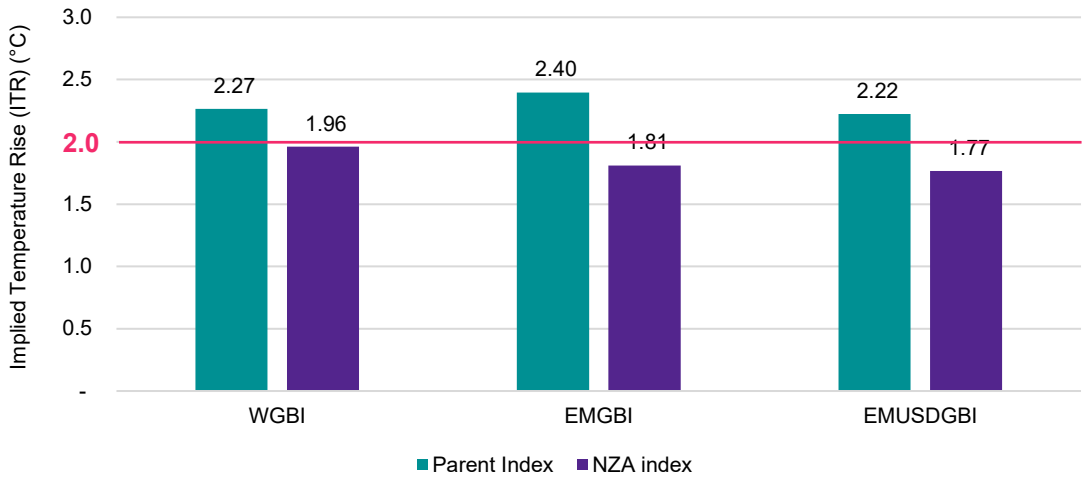
[1] LSEG Nationally Determined Contributions Implied Temperature Rise (NDC ITR) is a forward-looking temperature alignment metric that estimates the implied global warming that would result if all countries adopted climate commitments with the same level of ambition as the country being assessed. Lower values indicate stronger alignment with global climate goals. For more information, see LSEG's Climate Transition Data.

[2] Green bonds are bonds that carry green and/or equivalent labels such as climate or environmental and whose proceeds are applied to finance or re-finance eligible green projects. The categorisation of bonds is based on the examination of the use of proceeds and/or the self-claimed label of each bond. Green bond data are sourced from LSEG Data & Analytics Fixed Income ESG Data.

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**Figure 1. FTSE Net Zero Ambition Government Bond Index Series PoC simulations bring aggregate NDC ITR below 2°C across 3 sovereign universes**




Source: Index weights and simulated performance: FTSE Russell, July 2026 month-end index profiles. NDC ITR inputs: LSEG Data & Analytics, data as of December 2025. Results shown are simulated and are intended for illustrative purposes only. Please see the end for important legal disclosures.

# From sovereign ambition to bond selection: a two-level index approach

The FTSE Net Zero Ambition Government Bond Index Series PoC combines two dimensions of climate-aware sovereign investing. At the country level, it uses NDC ITR as a forward-looking measure of sovereign transition ambition. At the security level, it gives greater weight to eligible green bonds within each country allocation.

## Index construction

### 1. Start with an established FTSE Russell government bond universe

Each Net Zero Ambition index starts from an existing FTSE Russell sovereign bond index. The respective base universes are WGBI, EMGBI and EMUSDGBI.

### 2. Measure each country's forward-looking transition ambition using NDC ITR

Each eligible sovereign is assigned an NDC ITR. The metric assesses NDCs submitted under the Paris Agreement and translates the associated emissions pathways into an implied temperature outcome expressed in degrees Celsius. It represents the global temperature outcome that would be implied if all countries adopted commitments and policies with the same level of ambition as the country being assessed[3]

[3] For more information on the methodology, see Evaluating national climate commitments using implied temperature rise | LSEG.

The metric therefore provides a comparable, forward-looking measure of the ambition embedded in countries' NDCs. Importantly, it reflects national climate commitments, rather than actual emissions reductions or the likelihood of the countries achieving their stated targets.[4] A lower NDC ITR indicates stronger stated climate ambition as embedded in a country's NDC commitments and corresponding implied temperature outcome. It should not be interpreted as a measure of realised emissions reductions or policy implementation.

**3. Reweight countries to target a below-2°C portfolio**

The methodology applies an optimisation process to determine country allocations. It seeks to minimise deviations from the parent index's country weights while satisfying two climate-related constraints:

– An aggregate index NDC ITR at or below 2°C.

– At least 70% of index weight allocated to countries with an individual NDC ITR at or below 2°C.

Rather than excluding countries that exceed the 2°C threshold, the approach adjusts their relative weights to meet the portfolio-level NDC ITR target. This maintains exposure to the underlying sovereign bond universe while favouring countries with stronger stated forward-looking climate ambition, as measured by NDC ITR.

**4. Give additional weight to green bonds within each country**

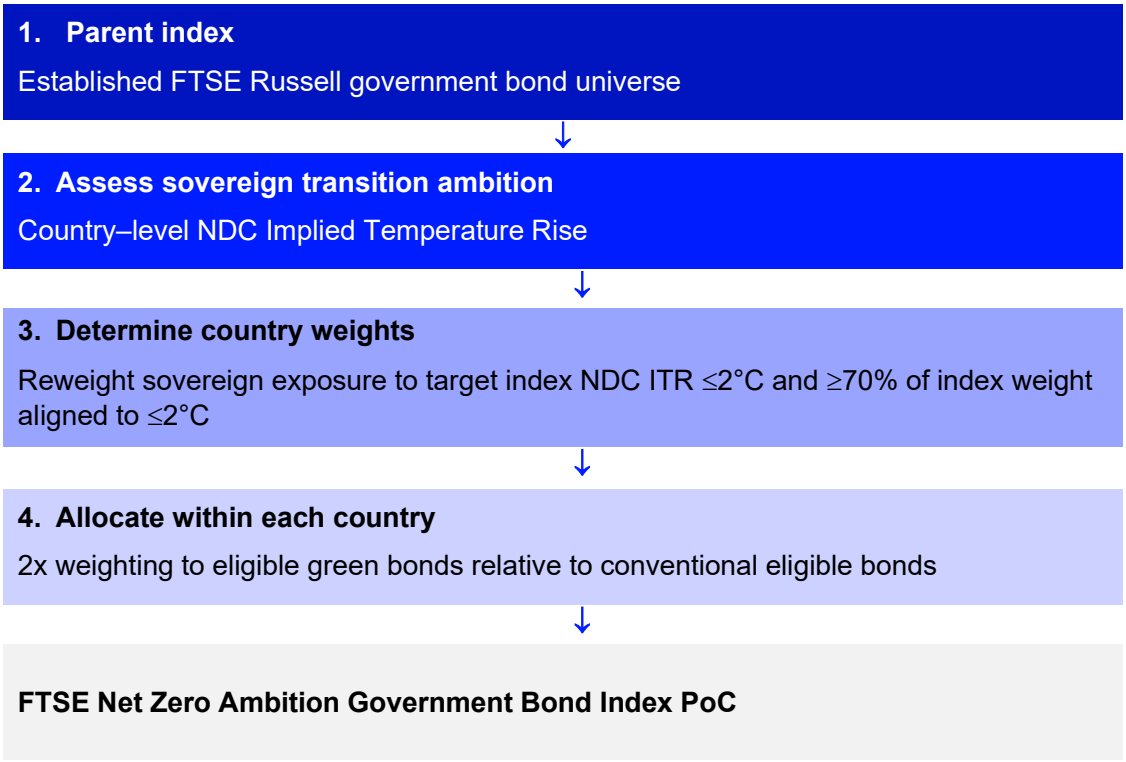
After setting country allocations, the methodology introduces a second level of climate differentiation within each sovereign allocation.

Eligible green bonds receive a 2x weighting factor relative to other eligible bonds from the same country. The bond weights are then normalised so that the country's overall allocation remains unchanged compared to the previous step in the methodology.

Together, these two steps—country and security reallocations—incorporate both sovereign issuers' forward-looking climate ambition and a preference for eligible green bonds within each sovereign allocation (Figure 2).[5]

[4] NDC ITR is not a forecast of realised global warming. It is an alignment metric derived from countries' stated commitments. In addition, national commitments will not necessarily translate into policy implementation or realised emissions reductions.
[5] The green bond tilt increases exposure to eligible green government bonds but does not, in itself, demonstrate additionality, verify the allocation of proceeds or measure realised environmental impact.

**Figure 2. A two-level approach to sovereign and security allocation in the FTSE Net Zero Ambition Government Bond Index Series PoC**



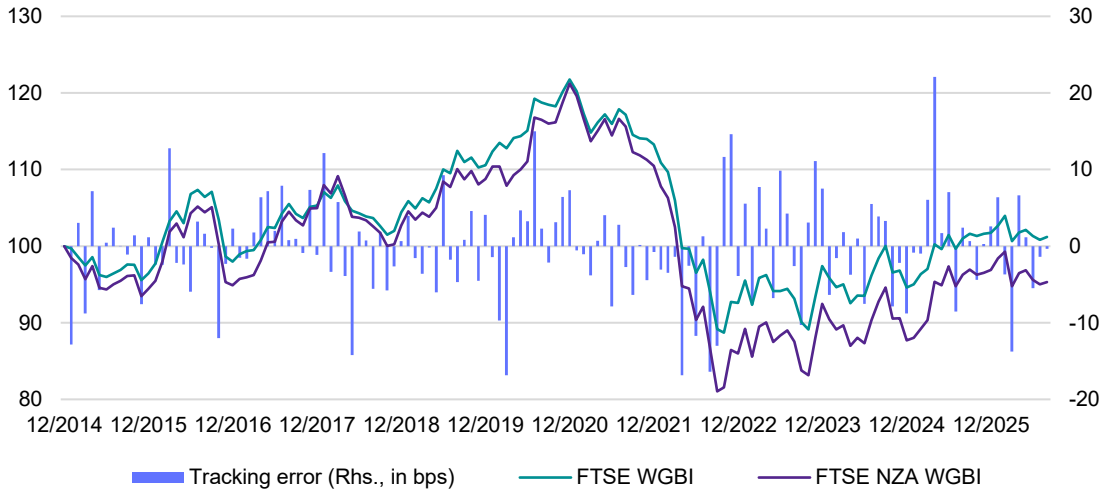

# Applying the methodology to bring sovereign bond universes at or below 2°C

To examine how the methodology operates across different sovereign bond markets, we apply the PoC to three established FTSE Russell universes.

## FTSE World Government Bond Index

Applied to the FTSE World Government Bond Index (WGBI), the methodology reduces aggregate NDC ITR from 2.27°C to 1.96°C, bringing the simulation below the 2°C target.

**Figure 3. Comparison of WGBI parent and FTSE Net Zero Ambition WGBI PoC**




| Metric | FTSE WGBI | FTSE NZA WGBI |
|---|---|---|
| Annualised Return | 0.10% | -0.41% |
| Annualised Volatility | 6.57% | 8.27% |
| Risk-Adjusted Return | 0.02 | -0.05 |
| Annualised Tracking Error | | 0.22% |
| Return Correlation | | 98.00% |
| Yield to Maturity* | 3.75% | 3.83% |
| Effective Duration* | 6.50 | 7.05 |
| NDC Implied Temperature Rise*, ** | 2.27°C | 1.96°C |
| 2°C Alignment* | 33.6% | 70.0% |
| Green bond weight* | 1.21% | 4.31% |

* Based on July 2026 month-end index profiles. ** in °C in 2100, according to each country NDC.

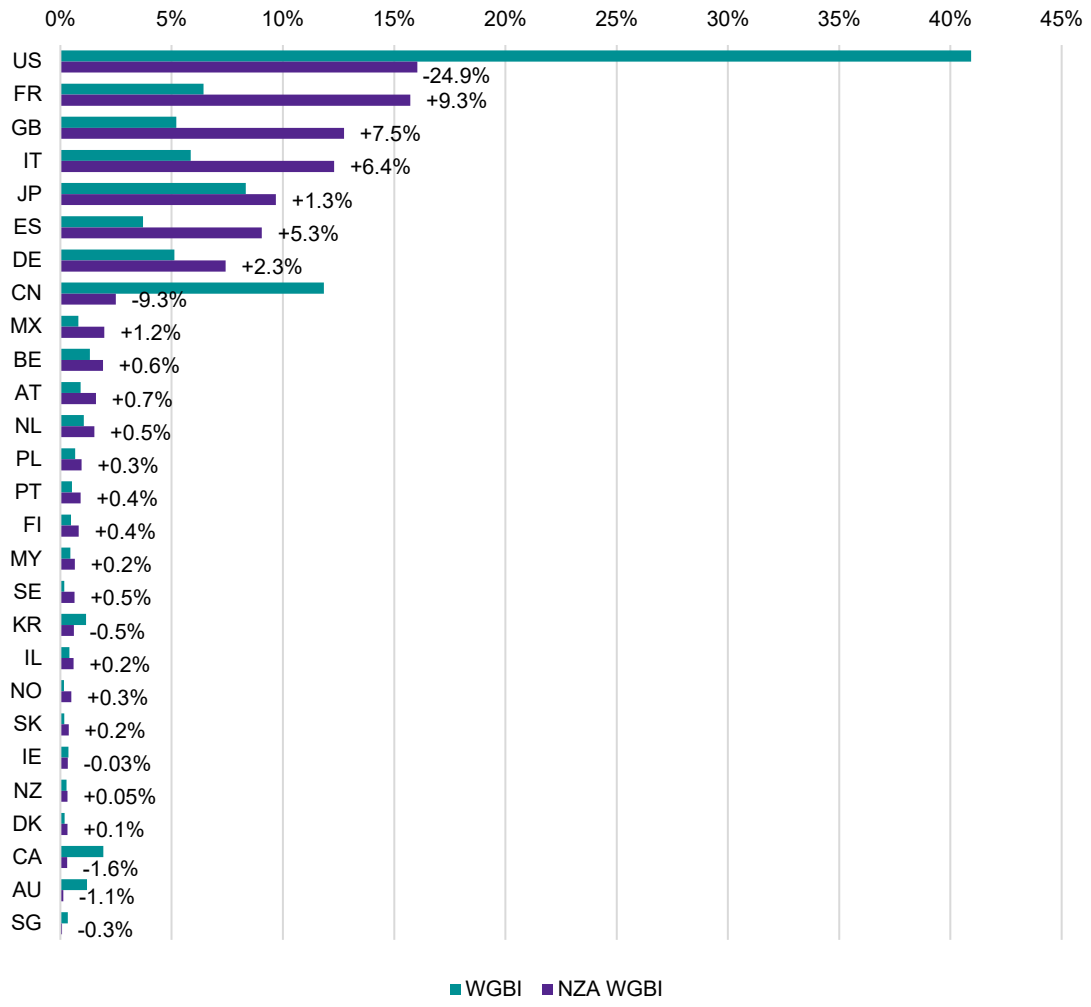
Source: Index weights and simulated performance (USD unhedged): FTSE Russell, data through 31 July 2026. Yield, duration and portfolio profile measures: July 2026 month-end index profiles. NDC ITR inputs: LSEG Data & Analytics, data as of December 2025. Green bond data: LSEG Data & Analytics, data as of September 2026. Past performance is not a guide to future returns. Results shown are simulated and are intended for illustrative purposes only. Please see the end for important legal disclosures.

## What drives the temperature reduction?

The index's lower implied temperature rise is accompanied by meaningful changes in country allocations (Figure 4). The methodology reduces exposure to some of the largest sovereign issuers while increasing allocations to countries with stronger stated climate ambitions, as measured by NDC ITR:

- US weight falls from approximately **40.9% to 16.0%**
- China falls from approximately **11.8% to 2.5%**
- France rises from approximately **6.4% to 15.7%**
- UK rises from approximately **5.2% to 12.7%**
- Italy rises from approximately **5.9% to 12.3%**

**Figure 4. Country exposure: WGBI vs FTSE Net Zero Ambition Index WGBI PoC simulation**




Source: Index weights and simulated performance: FTSE Russell, July 2026 month-end index profiles. Results shown are simulated and are intended for illustrative purposes only. Please see the end for important legal disclosures.

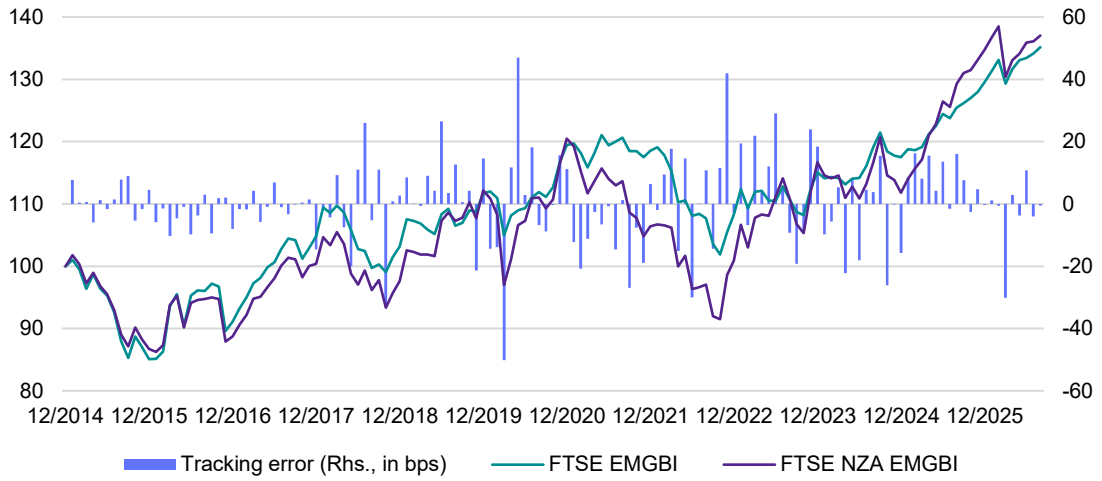
These allocation shifts illustrate an important characteristic of the index methodology: the climate target translates into notable changes in sovereign bond exposures. With these adjustments, the simulated index provides a diversified exposure to the underlying government bond universe.

## FTSE Emerging Markets Government Bond Index

The EMGBI simulation applies the methodology to a more heterogeneous emerging market sovereign universe.

Aggregate NDC ITR falls from approximately 2.40°C to 1.81°C, representing the largest temperature reduction among the three simulations. At the same time, the share of the index allocated to countries with an NDC ITR at or below 2°C increases from 21.5% to 70%.

**Figure 5. Comparison of EMGBI parent and FTSE Net Zero Ambition EMGBI PoC**



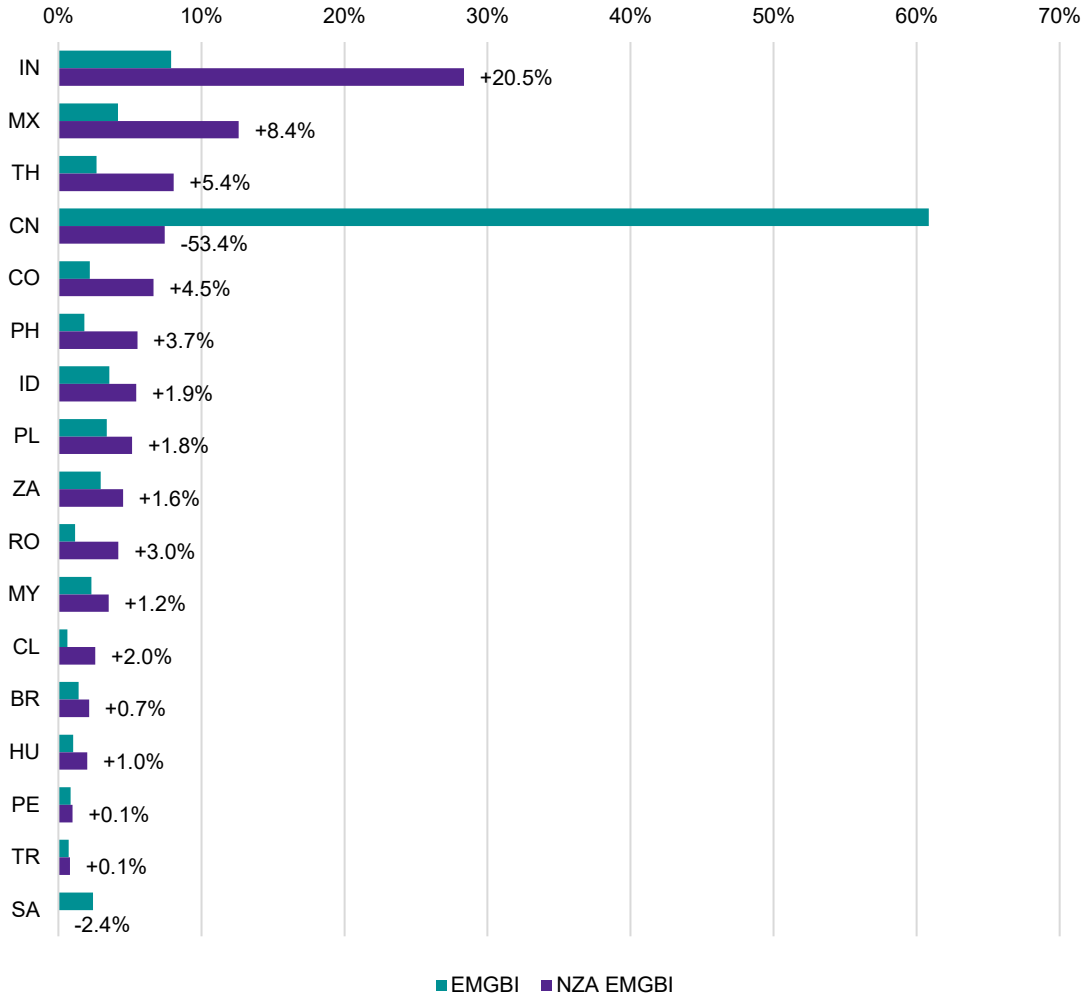

| Metric | FTSE EMGBI | FTSE NZA EMGBI |
|---|---|---|
| Annualised Return | 2.62% | 2.74% |
| Annualised Volatility | 7.70% | 10.22% |
| Risk-Adjusted Return | 0.34 | 0.27 |
| Annualised Tracking Error | | 0.47% |
| Return Correlation | | 90.09% |
| Yield to Maturity* | 3.80% | 6.87% |
| Effective Duration* | 5.57 | 5.63 |
| NDC Implied Temperature Rise*, ** | 2.40°C | 1.81°C |
| 2°C Alignment* | 21.5% | 70.0% |
| Green bond weight* | 0.07% | 0.35% |

* Based on July 2026 month-end index profiles. ** in °C in 2100, according to each country NDC.

Source: Index weights and simulated performance (USD unhedged): FTSE Russell, data through 31 July 2026. Yield, duration and portfolio profile measures: July 2026 month-end index profiles. NDC ITR inputs: LSEG Data & Analytics, data as of December 2025. Green bond data: LSEG Data & Analytics, data as of September 2026. Past performance is not a guide to future returns. Results shown are simulated and are intended for illustrative purposes only. Please see the end for important legal disclosures.

The reweighting also affects traditional fixed income characteristics. The yield to maturity rises from **3.80% for the parent index to 6.87% for the NZA EMGBI**. This increase is primarily driven by changes in country allocations, particularly the substantial reduction in exposure to China (from 60.9% to 7.4%), whose yield is relatively low at 1.4%. The reallocation increases exposure to higher-yielding sovereign markets, including India (from 7.9% to 28.4%), Mexico (from 4.2% to 12.6%) and Colombia (from 2.2% to 6.7%) (Figure 6).

**Figure 6. Country exposure: EMGBI vs FTSE Net Zero Ambition Index EMGBI PoC simulation**




Source: Index weights and simulated performance: FTSE Russell, July 2026 month-end index profiles. Results shown are simulated and are intended for illustrative purposes only. Please see the end for important legal disclosures.

These results illustrate the extent to which the targeting of stated climate ambitions, as measured by NDC ITR, can affect conventional portfolio characteristics, highlighting the importance of assessing both climate and financial outcomes.

# FTSE Emerging Markets USD Government Bond Index

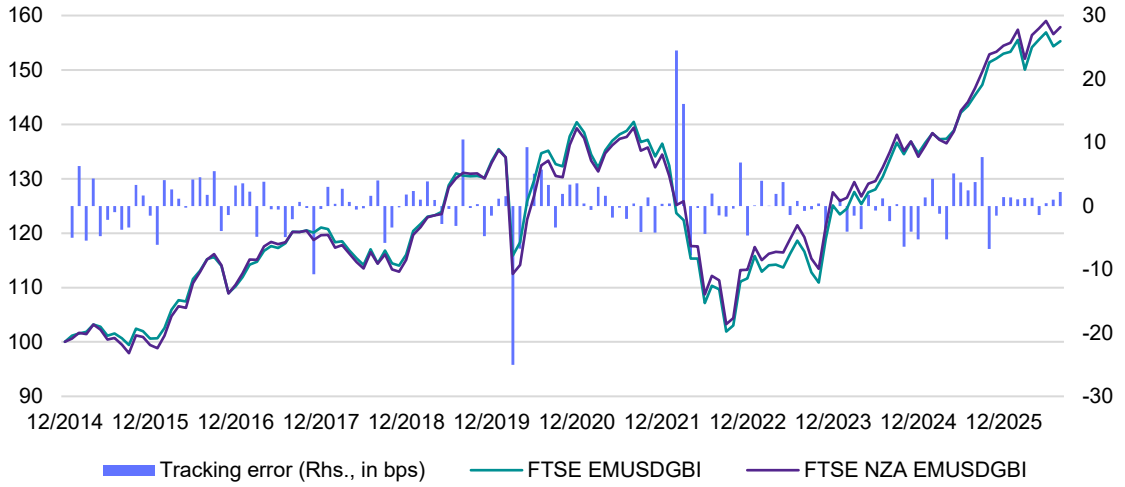
The hard-currency emerging-market simulation provides a third perspective.

Aggregate NDC ITR falls from 2.22°C to 1.77°C. The share allocated to countries with an NDC ITR at or below 2°C increases from 39.6% to 70%.

Compared with the local-currency emerging-market simulation, changes in traditional fixed income characteristics are relatively limited: the yield to maturity decreases slightly from 6.70% to 6.60%, while the effective duration increases from 6.71 to 6.85 years.

The investment implications of incorporating sovereign climate ambitions therefore depend on the composition and characteristics of the underlying bond universe.

**Figure 7. Comparison of EMUSDGBI parent and FTSE Net Zero Ambition EMUSDGBI PoC**




| Metric | FTSE EMUSDGBI | FTSE NZA EMUSDGBI |
|---|---|---|
| Annualised Return | 3.84% | 3.99% |
| Annualised Volatility | 9.00% | 9.61% |
| Risk-Adjusted Return | 0.43 | 0.42 |
| Annualised Tracking Error | | 0.17% |
| Return Correlation | | 98.64% |
| Yield to Maturity* | 6.70% | 6.60% |
| Effective Duration* | 6.71 | 6.85 |
| NDC Implied Temperature Rise*, ** | 2.22°C | 1.77°C |
| 2°C Alignment* | 39.6% | 70.0% |
| Green bond weight* | 0.85% | 1.79% |

* Based on July 2026 month-end index profiles. ** in °C in 2100, according to each country NDC.

Source: Index weights and simulated performance (USD unhedged): FTSE Russell, data through 31 July 2026. Yield, duration and portfolio profile measures: July 2026 month-end index profiles. NDC ITR inputs: LSEG Data & Analytics, data as of December 2025. Green bond data: LSEG Data & Analytics, data as of September 2026. Past performance is not a guide to future returns. Results shown are simulated and are intended for illustrative purposes only. Please see the end for important legal disclosures.

# Key insights from the simulations

## Balancing climate ambition with portfolio characteristics

The simulations described in this paper demonstrate how incorporating forward-looking sovereign climate ambition into government bond indices can reduce the portfolio-level NDC Implied Temperature Rise metric, while maintaining exposure to established sovereign bond markets.

Although the optimisation seeks to minimise deviations from the parent index's country weights, the resulting allocations can still differ meaningfully from traditional market-value-weighted benchmarks. For example, in the WGBI simulation, the US allocation decreases from 40.9% to 16.0%, reducing exposure to the largest sovereign issuer while increasing allocations to several other sovereign markets[6]

These reallocations can affect traditional fixed income characteristics in different ways across sovereign bond universes. For instance, yield changes are relatively limited in the WGBI and EMUSDGBI simulations. In contrast, the EMGBI simulation shows a more pronounced increase, driven mainly by shifts in country weights.

The results highlight the importance of considering portfolio-level climate objectives alongside diversification and other investment considerations, including yield, duration and tracking error.

## Increasing exposure to green government bonds

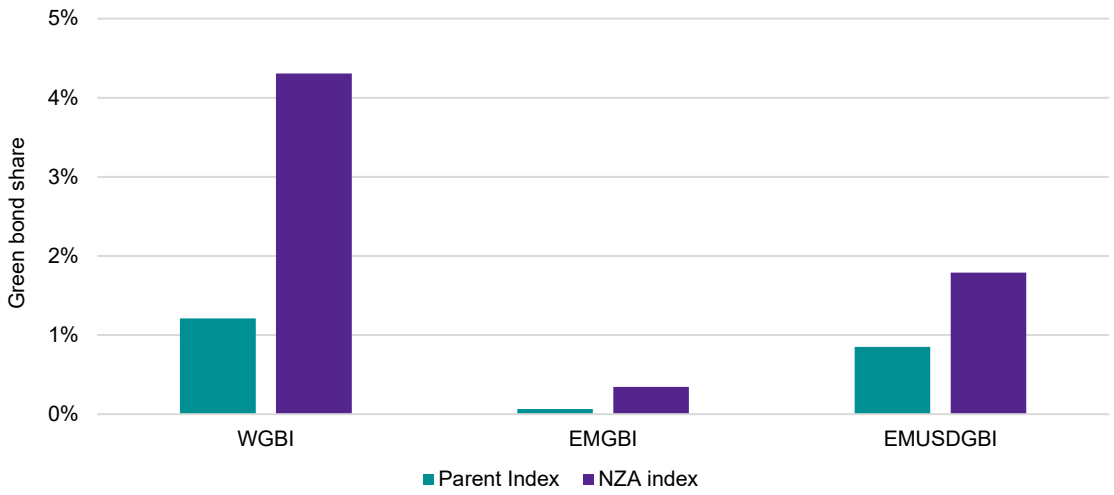
While the country-level optimisation reflects differences in sovereign transition ambitions, the security-level tilt introduces an additional dimension by increasing exposure to eligible green government bonds.

Within each country allocation, eligible green bonds receive twice the weighting factor of conventional government bonds. Weights are then normalised to preserve the previously targeted country allocation. The resulting increase in green bond exposure reflects the combined effects of sovereign country reweighting and the security-level green bond tilt. Their magnitude depends on country allocations and the availability of eligible green bonds within each underlying universe.

All three simulations show higher green bond exposure than their respective parent index (Figure 8). For example, green bond exposure increases from 1.21% to 4.31% in the WGBI simulation, compared with an increase from 0.07% to 0.35% in EMGBI.

[6] FTSE Russell also offers alternative sovereign weighting approaches, such as the FTSE GDP-Weighted Government Bond Index Series, which weights country exposures based on GDP rather than outstanding government debt.

**Figure 8. Green government bond exposure: parent indexes vs FTSE Net Zero Ambition Index PoC simulations**




Source: Index weights and simulated performance: FTSE Russell, July 2026 month-end index profiles. Green bonds data: LSEG Data & Analytics, data as of September 2026. Results shown are simulated and are intended for illustrative purposes only. Please see the end for important legal disclosures.

The methodology thus combines two complementary dimensions: differentiating sovereign issuers according to the ambition embedded in national climate commitments and increasing the representation of green government bonds within the resulting country allocations.

## Different climate objectives, different index approaches

Climate-aware sovereign investors may pursue different objectives, from managing climate-related risks to reflecting the ambition of countries' transition commitments.

FTSE Russell's Climate Risk-Adjusted Government Bond Index Series and The Net Zero Ambition Government Bond Index Series PoC address different investor objectives and can be presented as two complementary approaches to incorporating climate considerations into sovereign bond benchmarks (Figure 9):

– FTSE Russell's Climate Risk-Adjusted WGBI focuses on climate-risk and resilience. It incorporates multiple dimensions including physical risk, transition risk, climate opportunity, adaptation capacity and carbon exposure. Its construction therefore takes a multidimensional approach to sovereign climate risk.

– The Net Zero Ambition Government Bond Index Series PoC starts from a different focus: the ambition embedded in national climate commitments. It uses NDC ITR as the sovereign-level signal and targeting a portfolio temperature outcome at or below 2°C, reflecting countries' stated climate ambitions rather than their actual emissions trajectories.

Both approaches illustrate how government bond indices can systematically incorporate climate considerations to address different investor objectives.

**Figure 9. Two FTSE Russell sovereign climate approaches**

| | Climate Risk-Adjusted WGBI | Net Zero Ambition WGBI PoC |
|---|---|---|
| Investor objective | Climate risk and resilience | Forward-looking sovereign transition ambition based on stated NDCs |
| Primary lens | Multi-dimensional climate risk and preparedness | Forward-looking commitments and implied pathways |
| Climate inputs | Physical risk, transition risk, opportunity, resilience, carbon | NDC Implied Temperature Rise, Green Bonds |
| Portfolio objective | Improve climate-risk profile | Aggregate portfolio NDC ITR at or below 2°C |
| Role | Broad climate-risk approach | Focused approach based on stated transition ambition |

# Looking ahead: evolving sovereign indices alongside climate ambition

As COP31 renews attention on national climate commitments, sovereign investors face the challenge of translating countries' ambition into practical portfolio decisions.

The FTSE Net Zero Ambition Government Bond Index Series PoC combines a forward-looking measure of sovereign stated climate ambition, as measured by NDC ITR, with systematic index construction. Across three government bond universes, country reweighting achieves an aggregate NDC ITR below 2°C within the methodology's constraints and assumptions. A complementary green bond tilt increases exposure to eligible green government bonds.

The results also highlight that the implications for country allocations, green bond exposure and traditional index characteristics can vary across sovereign bond markets. This reinforces the importance of considering climate-related outcomes alongside broader investment implications.

### Important information

The FTSE Net Zero Ambition Government Bond Index Series is a proof of concept based on countries' stated Nationally Determined Contributions (NDCs). NDC ITR is a forward-looking temperature alignment metric derived from countries' stated commitments and should not be interpreted as a forecast of future global temperatures, realised emissions reductions, policy implementation or the likelihood that individual countries will achieve their stated targets. Results shown are simulated and are intended for illustrative purposes only.

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