

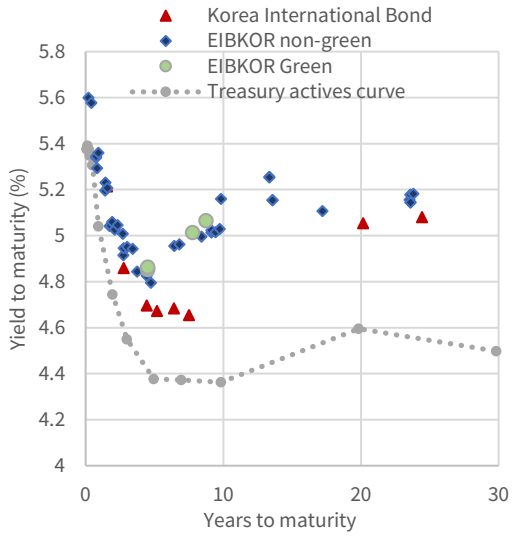
Proposal: South Korea USD new bond issuance

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South Korea recently sent out a request for proposal for a new offshore bond issuance. This brief note proposes that South Korea issues in a 10y7ystep SLB format, which would achieve a funding cost 5bps inside the traditional USD Korea International Bond curve, (see Table 1).

Beyond providing cheap finance, it would also signal a commitment to the Nationally Determined Contributions (NDC) of decarbonisation. The structure we propose would entail a step-up if South Korea does not reach its 2030 target of a 40% reduction in greenhouse gas emissions reduction from 2018 peak year, and a step-down for achieving a further 5% carbon reduction.

Figure 1. South Korea sovereign and EIBKOR USD bond curves. Source: Bloomberg, AFII.



We estimate a 50%/15% probability for the issuer to reach the 40%/45% target, which makes the total expected running value of the coupon changes ("the option premium") to be -5.2bps. The total value of the step-up is 13.5bps in running costs, or $1.11 in cash terms. Very roughly estimated, assuming a flat curve from the current KOREA $1.75 2031 (7.5yrs, trades at G+21.5bps, Figure 1), this would be equivalent to about TSY10y+16bps, excluding any new issue premium.

Table 1. Korea International Bond 10y USD SLB term sheet proposal. Source: AFII.

Maturity	**10y, Apr 2034**
Observation and step date	31-Dec-2030, 1 Mar 2031
SPT 1	NDC target: -40% CO_2 reduction at 2030 from 2018 baseline, to ~436Mt pa.
SPT 2	-45% CO_2 reduction at 2030 from 2018 baseline, to ~399Mt pa.
Coupon adjustment	+50 bp on not achieving SPT1 -37.5bp on achieving SPT2
Pricing	Korea International Bond 10y -5.2bps
of which:	-6.8bps option value of SPT1 assuming 50% probability
	+1.5bps option value of SPT2 assuming 15% probability
	Indicatively TSY10+16bps

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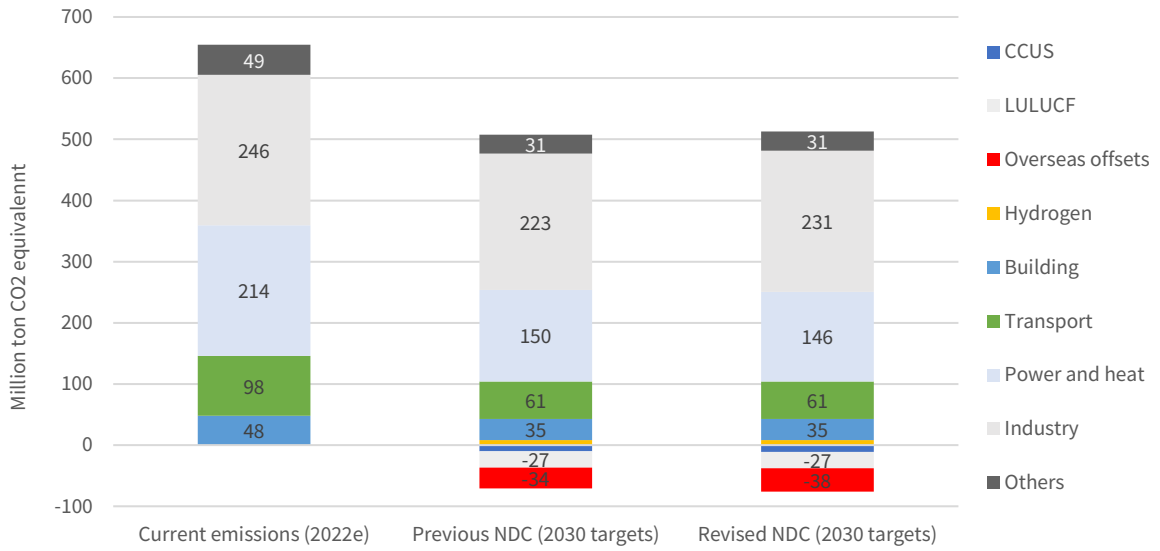
South Korea decarbonisation plans and commitments

South Korea has a 2050 net zero target that was codified into law in March 2022.[1] Its NDC target was submitted in December 2021, setting a goal of reducing emissions by 40%[2] (inclusive of the impact of land use) by 2030 relative to 2018 levels. It proposed a fairly smooth reduction pathway - a 3.6% targeting decline in 2024, growing to 4.0% in 2027, then 4.5% in 2030. This represented deeper targeted emission reductions relative to the previous NDC (24.4% below a 2017 baseline).[3]

In March 2023, a revised NDC was outlined by the new government under President Yoon. It targets the same 2030 goal of a 40% reduction, but allows for a slower decline in domestic industrial emissions (11.5% reduction by 2030, compared to 14.5% previously), and incorporates a slightly expanded use of international offsets, as well as more carbon capture utilisation and storage (CCUS).[4] As shown in Figure 2 below, the biggest expected reduction comes from power and heat.

Of note, reflecting the higher trajectory, cumulative emissions under the revised NDC exceed the existing version by 520 million tonnes, according to analysis of the revised NDC[5] by Plan 1.5, a South Korean NGO.[6] Plan 1.5 also observes that "the basic plan proposed by the current government has significantly increased its reliance on highly uncertain mitigation measures such as international mitigation, CCUS, and hydrogen and ammonia power generation compared to the existing '21 NDC"[7]. The bulk of expected reductions under the revised NDC occurs after the expiry of President Yoon's term in 2027, and appears very ambitious as illustrated in Figure 3.

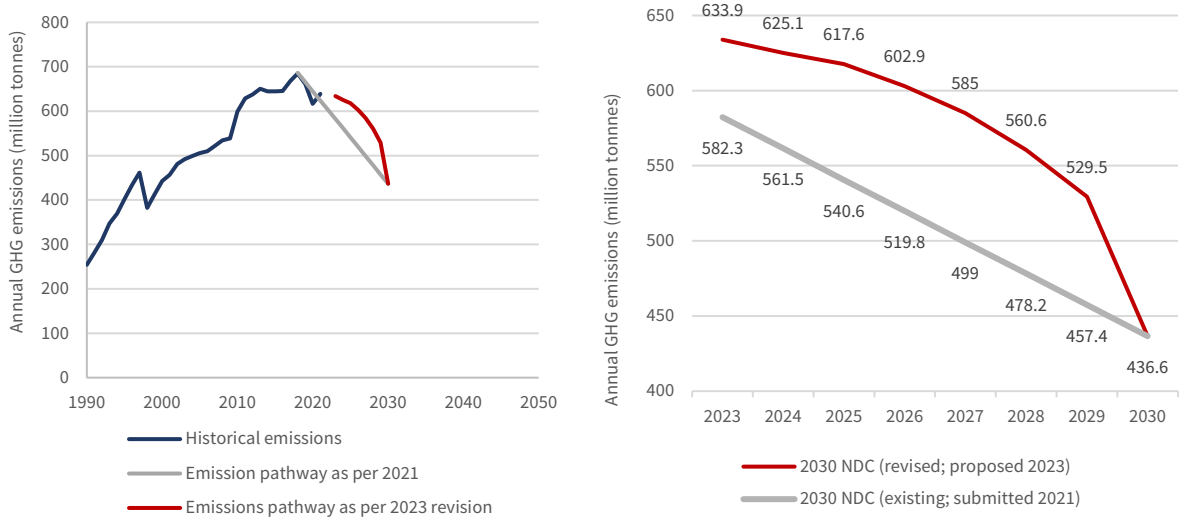
Figure 2. South Korea's current and targeted greenhouse gas emissions. Source: Bloomberg NEF.



[1] South Korea, 17 Jul 2023 update, Climate Action Tracker, accessed 11 Apr 2024.
[2] The 40% target would see emissions reduce to 437 million tonnes, and is inclusive of the impact of Land Use, Land-Use Change and Forestry ('LULUCF'), as well as international carbon credits. Excluding these two elements, Climate Action Tracker estimates the targeted 2030 emission level at 501 million tonnes.
[3] "Rep. of Korea's Enhanced Update of its First Nationally Determined Contribution", UNFCC, 23 Dec 2021.
[4] "2H 2023 South Korea Market Outlook: En Route to Reform", Bloomberg NEF, 14 Dec 2023.
[5] "1st Basic Plan for Carbon Neutrality and Green Growth (Basic Plan)" *(Korean version only),* South Korean government, 12 April 2023.
[6] "Feasible net-zero" and the backwards master plan" *(Korean version only)*, Plan 1.5, 2023.
[7] Ibid.

In terms of assessing probability required to value an SLB option, we would normally assume a higher-than 50% probability of a government reaching an environmental target. With the uncertainties noted above, the South Korea plans seem more uncertain than a typical case, which is why we believe a 50% probability is a fair assessment.[8] Using a quantitative approach and applying the AFII SLB option pricing model,[9] we estimate drift currently at -2.6% and a volatility of 4.9%, which in turn prices the optionality at 11.6bps running.

Figure 3. Additional cumulative emissions of the basic plan reduction pathway compared to the NDC upward draft. Source: Plan 1.5.



The proposed structure has substantial step sizes of 0.5% and 0.375%, and using the quantitative pricing, it almost qualifies as a "greenback" SLB. This is an AFII-developed term to describe an SLB with an expected option value of at least $1, inidicating an ambitious and highly incentivising financial structure (see "Greenback SLBs: an impact standardisation proposal", AFII, 10 May 2023, for more details).

[8] Refer to "Transition power, A JGB SLB, prints in USD", AFII, 7 Feb 2024, for a similar discussion.
[9] See "An option pricing approach for Sustainability Linked Bonds", AFII, 11 Aug 2022; "Notes on risk-neutral pricing of SLBs and step-down structures", AFII, 25 Oct 2022.

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