Scaling a Credible Transition Finance Market in China: Opportunities for Electrical Utilities

Climate Bonds INITIATIVE

北京大学能源研究院
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This report was produced collaboratively by the Climate Bonds Initiative and the Peking University Institute of Energy Climate Change and Energy Transition Programme

Report summary

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To achieve the climate goals of the Paris Agreement and tackle climate change, all sectors of the global economy must urgently decarbonise. The rapid transformation of emission intensive industries is critical to this effort, which can be supported by a flexible, inclusive, and credible transition finance market.

Access to transition finance requires a credible transition plan that details the steps an entity intends to follow to decarbonise its activities, and the levers it will deploy. Such action plans allow investors to assess the ambition, progress, and credibility of the transition which reduces greenwashing risks, carbon lock-in and delayed climate action. This contributes to the integrity of the global and Chinese domestic transition finance market.

The power sector is the single most important source of greenhouse gas (GHG) emissions in China. Decarbonising electricity generation is pivotal to achieving national and international climate goals, given its role in the decarbonisation of other energy-intensive sectors via electrification. Therefore, the power sector needs to collaborate with multiple stakeholders to achieve the Chinese government peak emissions target by 2030 and carbon neutrality by 2060 (2030:2060 targets). Transition finance can contribute to this by optimising resource allocation, and supporting price discovery and risk management. Climate Bonds Initiative (Climate Bonds) is supporting this effort with a series of collaborative research reports focused on transition finance in China.

This report addresses the role of transition finance in the power sector, within the context of the national carbon goals, emphasising the importance of sound transition plans. The following aspects are explored:

- Guidance for non-financial and financial corporates to develop and disclose specific and credible transition plans which will underpin the development of a comprehensive transition finance market.
- The role of transition finance in attracting capital to support all stages of low-carbon development, including new renewable energy generation, upgrades to existing plants, retirement of emission-intensive assets to deliver a just and inclusive transition, energy storage, and grid optimisation.
- The selection by issuers of appropriate financing tools according to their transition plan objectives. These could include Use of Proceeds (UoP) bonds to support investment, or performance-related instruments such as sustainability-linked bonds (SLBs) or loans (SLLs) tied to relevant and material key performance indicators (KPIs).
- The emergent use of climate targets, transition pathways, disclosure framework alignment, and transition finance instruments by electrical utilities to support their goals. Additionally, the potential for improvement in transition-related capital expenditure planning and disclosure, and other quantitative financial indicators.

About the authors

About the Climate Bonds Initiative

Climate Bonds is an international non-profit organisation dedicated to mobilising global capital to address climate change. It promotes investments in projects and assets necessary for a rapid transition to a low-carbon, climate-resilient, and equitable economy. Climate Bonds focuses on helping reduce financing costs for large-scale climate-related infrastructure projects and supporting government departments aiming to achieve climate and greenhouse gas (GHG) emission reduction goals through increased capital market investments. Climate Bonds conducts market analysis, policy research, and market development work, providing advice to governments and regulatory bodies, and promotes climate-related bonds and entity certification mechanisms worldwide.

About the Climate Change and Energy Transition Program (CCETP), Institute of Energy, Peking University

Peking University Institute of Energy launched the Climate Change and Energy Transition Programme in March 2021, aiming to help China address climate change and promote energy transition to peak its carbon emissions by 2030 and achieve carbon neutrality by 2060. The programme provides policy recommendations and support to the Chinese government by setting science-based ambitious goals and formulating clear roadmaps and effective action plans. It also encourages China's energy industry to be safer, greener, and more efficient, and helps China reduce and ultimately phase out the use of fossil fuels.

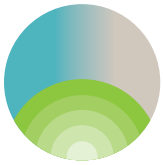
Introduction

Developments in transition finance

Transition finance aims to provide funding for emission-intensive sectors, such as the power sector, heavy industry, and agriculture, which traditionally fall outside the scope of green finance instruments. **While supporting their** transition to low-carbon or carbon neutral business practices, it also allows investors to support climate goals across a broader investment universe.

Globally, financial regulators are actively developing guidelines and standards to promote the orderly development of transition finance markets. As of March 2024, the European Union (EU), Japan, and Singapore had published transition finance standards. China's central bank, the People's Bank of China (PBOC), is actively supporting the development of transition finance standards, and various local governments have and are exploring transition finance pilots. For instance, provincial governments included in China's pilot zone project, such as Huzhou, Chongqing, Tianjin, Shanghai, and Hebei, have published local transition finance catalogues or standards. In 2024, the National Development and Reform Commission (NDRC) led the joint publication of the *Guidance Catalogue for Green and Low-Carbon Transition industries (2024 edition),* which for the first time, incorporates low-carbon transition elements into national classification standards.[1]

The advent of transition finance markets



Entities can deploy a range of transition finance instruments including green and sustainability UoP bonds, SLBs and SLLs, and other unlabelled financial instruments. Among these, the sustainability-linked format has established a clear link between sustainability performance and financing costs, providing clear formula for progress on sustainability ambitions.

SLBs have no restrictions on the UoP but issuers must establish sustainability performance targets (SPTs), the achievement of which are tied to the cost of financing. However, the lack of restrictions on the materiality or ambition of the SPTs obliges investors to assess the credibility of each deal. In 2024, Climate Bonds featured the high proportion of SLBs lacking alignment with the Climate Bonds SLB database methodology globally in a report titled *Sustainability-Linked Bonds: Building a High-Quality Market*. Despite this lack of market standardisation, financing tied to sustainability targets still has significant potential to accelerate the global economic transition towards decarbonisation. Realising this potential will require market guidance and regulation.[2]

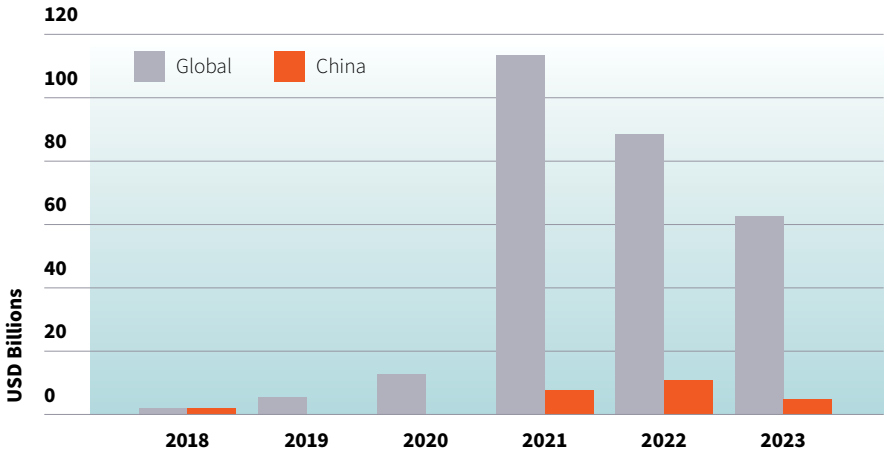
The transition bond label represents a small but growing segment of the market. In 2023, Climate Bonds recorded 19 labelled transition bonds, with cumulative volume of USD3.3bn. Among these, three were issued by Chinese entities with combined volume of USD560m. In February 2024, Japan issued the world's first sovereign climate transition bond, which received Climate Bonds Certification. The JPY1.6tn (USD11bn) deal showcases the leadership role that governments can play in earmarking financing to support decarbonisation expenditures.[3]

China's SLB and transition bond issuance guidance were published in 2021 and 2022 respectively, marking the beginning of domestic transition bond market.[4] In 2021, transition bonds were limited to bullet bonds but asset-backed instruments emerged in 2022. In 2023, China was the source of the largest number of SLBs which comparable to China's UoP market, tend to be short dated.

The Climate Bonds SLB database had recorded cumulative global SLB volume of USD283bn by the end of 2023. China ranks third globally in cumulative volume, following Italy and Chile. Italy's SLBs are primarily issued by national electric utility Enel, while Chile's volumes are dominated by its sovereign SLBs. Notably, the majority of SLBs (81.2%) issued in 2023 included one or more GHG emission reduction targets, indicating that issuers are increasingly focused on climate financing and directly linking KPIs to decarbonisation efforts.

Despite the progress made, studies have observed a lack of clear cost advantages, insufficient incentive mechanisms, and a limited understanding by issuers of how to identify appropriate transition projects.[5] Additionally, the credibility of transition finance products relies on issuers' carbon management capabilities and disclosure practices, which are in the development stage. As China's transition finance policies advance and carbon accounting systems are established, transition finance products are expected to present greater opportunities to support decarbonisation.[6]

Figure 1: Cumulative SLB volume was USD283bn by the end of 2023



Note: The above SLB volumes are representative of overall issuance volumes, and include deals considered aligned and not aligned with the Climate Bonds SLB Database Methodology.

Source: Climate Bonds Initiative SLB Database

Transition bonds and updates to Climate Bonds' screening methodology

Historically, Climate Bonds tracked but did not screen bonds bearing the transition label. As of January 2024, Climate Bonds regards such bonds as a sub-set of the green label and screens them against its Green Bond Dataset (GBD) Methodology.[10] Regardless of the label used, or the issuer's sector classification, if the instruments are labelled green or transition and meet the UoP requirements of the Climate Bonds GBD Methodology, they are eligible for inclusion.

While transition bonds were originally intended for issuance by hard-to-abate sectors like cement, steel, mining, and others, Climate Bonds has expanded its Taxonomy to define green assets, activities, and measures for these hard-to-abate sectors. Accordingly, the Climate Bonds GBD Methodology reflects the new coverage of the steel, cement, and basic chemicals sectors.

Summary of China's electrical utility sector transition

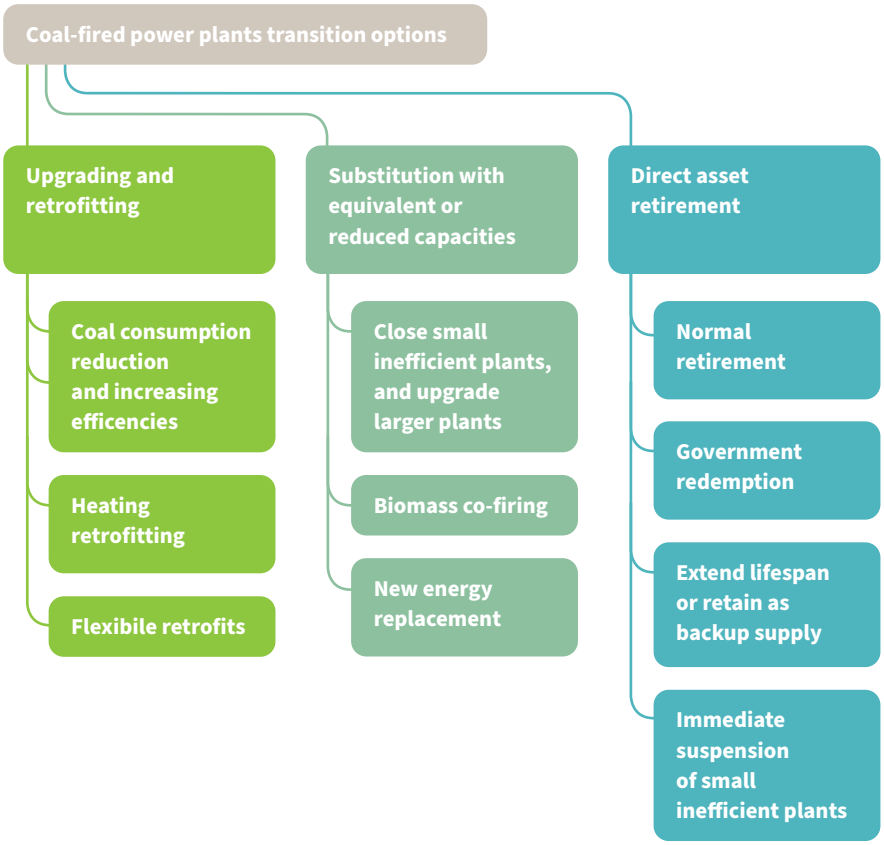
China's power sector must decarbonise to meet to the nation's 2030:2060 targets. In 2022, China's carbon dioxide (CO_2) emissions from thermal power generation were approximately 4.85bn tCO_2e, accounting for around 40% of total emissions.[7]

At end of 2022, China's installed capacity of electricity generation reached 2.57bn kilowatts (kW), with coal-fired capacity accounting for some 1.12bn kW (approx. 43.8%). Coal-fired capacity decreased 3% compared to 2021, and the share of coal-fired electricity generation as a share of total output declined 1.3%, dropping below 60% for the first time.[8] Over the past two decades, both the emission intensity per unit of electricity generated and per unit of thermal power generation have decreased consistently. According to the China Electricity Council (CEC), in 2022 the emission intensity of thermal power generation was approximately 824g CO_2/kWh, representing a small 0.48% reduction compared to 2021.

Predictions indicate that China's overall electricity demand will continue to grow during the late stages of the 14th Five-Year Plan (FYP), the 15th FYP, and the 16th FYP, albeit at a slower pace.[9] Against the backdrop of carbon peak and carbon neutrality, the low-carbon transformation of the power industry will focus on three key pathways:

- High proportion of renewable energy development: during the carbon peak phase (<2030), renewable energy should replace incremental fossil fuel-based power generation; during the carbon neutrality phase (2030-2060), renewable energy should replace existing fossil fuel-based power generation.
- Diversification of non-coal large-scale controllable power sources and new energy storage: developing flexibility resources such as demand response to ensure secure power operation.
- Transitioning the role of coal-fired power plants from foundational supply to flexibility services.

Figure 2: Transition options for coal power plants under discussion



The optimisation roadmaps for coal-fired power plants include three levers: upgrading and retrofitting coal-fired units, substitution with equivalent or reduced capacity, and direct asset retirement. During the 14th FYP period, the focus will be controlling new coal capacity and accelerating improvements to grid flexibility. Coal-fired power plants should provide baseload support and maximise system stability. Over the course of the 15th FYP period, efforts should be made to unlock the flexibility potential of existing coal-fired units and promote their gradual retirement. Finally, during the 16th FYP, a more rapid and orderly exit from coal-fired power will be necessary.

Under the Chinese 2030:2060 targets, the power industry needs to adopt a multi-stakeholder coordinated electrification development path to achieve low-carbon transformation. The Climate Change and Energy Transformation Project (CCETP) established by the Peking University Energy Research Institute predicts that under the accelerated electrification scenario, coal power installed capacity (excluding backup units) will reach a peak of 1.18bn kW in 2025 and gradually decrease thereafter. The power generation and carbon emissions of the coal power sector will also peak in 2025 and plateau around 2030. Transition finance can support the development of optimal resource allocation, price discovery, and risk management.

Credible transition financing for electrical utilities

The importance of transition plans

The credibility of transition finance is a key concern for market stakeholders. To address the lack of standardisation, issues with ambition and transparency, and greenwashing risks, market participants require that credible and ambitious transition plans underpin financing efforts. Robust transition plans with clear decarbonisation pathways and the identification of appropriate levers can be used as reference points to select material KPIs and SPTs for use in performance linked instruments such as SLBs or SLLS, and can also identify expenditures which are appropriate for inclusion in UoP instruments.

A transition plan can be divided into two key parts: planning and disclosure. A transition plan which describes the organisation's strategy and roadmap to net zero, needs to be time-bound and trackable, and include an action plan rooted in climate science.[11]

Transition plans are already reflected in numerous climate initiatives including Climate Bonds, Assessing low-Carbon Transition (ACT) initiative, Climate Action 100+ (CA100+), CDP, Climate Policy Initiative (CPI), Glasgow Financial Alliance for Net Zero (GFANZ), International Capital Market Association (ICMA), Science Based Targets Initiative (SBTi), Transition Plan Taskforce (TPT), among others.[12] By the end of 2023, financial regulators and standard-setters such as the G7, the International Sustainability Standards Board (ISSB), and the governments of Australia, the EU, Hong Kong, Japan, Singapore, Switzerland, the UK, and the USA had also begun to emphasise the importance of transition plans and programmes.[13] For example, the UK's TPT is based on disclosure guidance from the ISSB and is in line with the International Financial Reporting Standard on Sustainability Disclosures (IFRS S2), as well as the GFANZ Transition Finance Guidance.[14] Overall, there is clear and broad consensus on the importance of transition plans, and their further development by both non-financial and financial corporates as the next step in the evolution of the transition finance market.

Figure 3: How transition plans relate to financial institutions and issuers

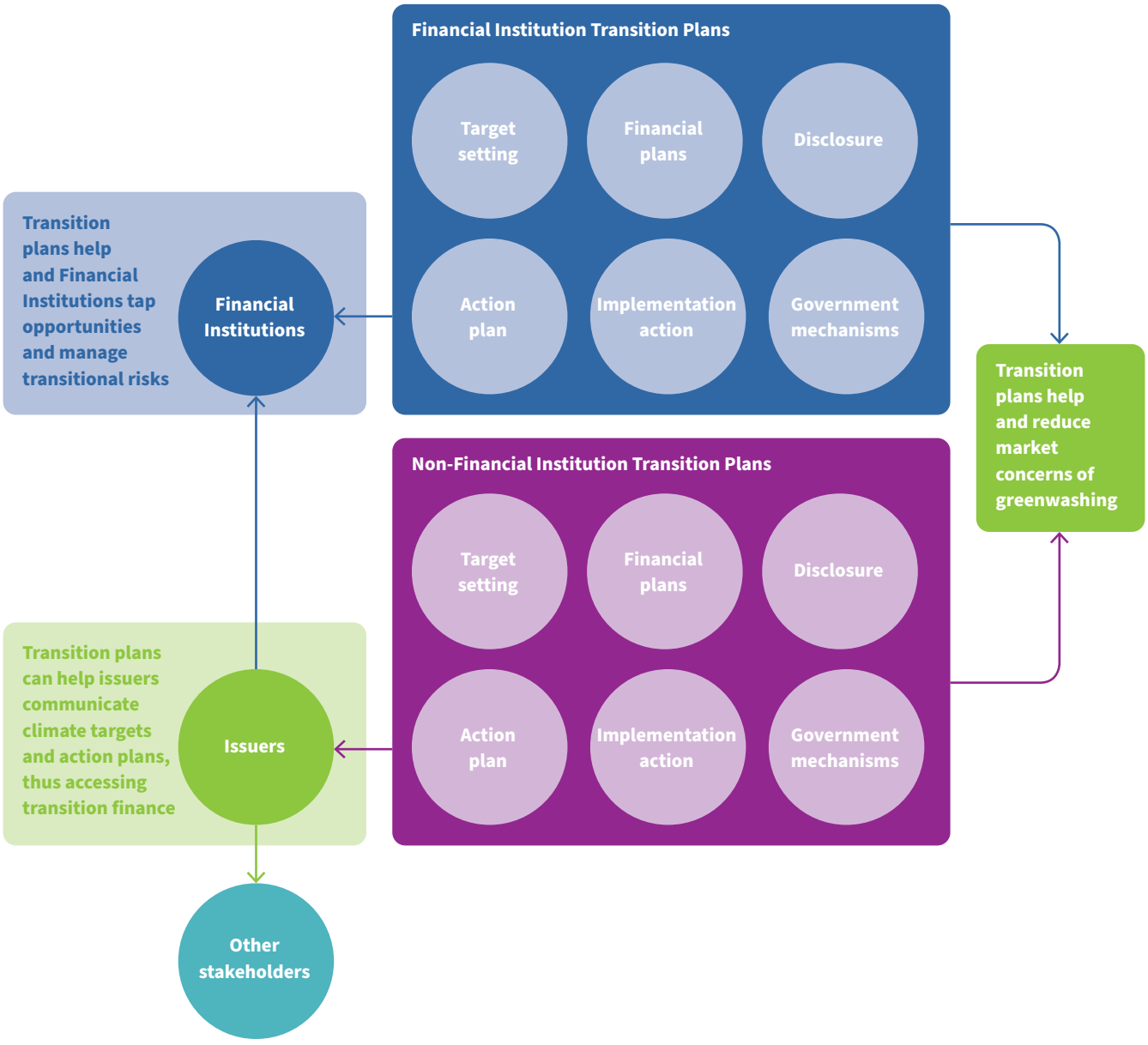


Figure 4: Credible transition plan framework and key elements and Climate Bonds Five Hallmarks

Ambition	Action		Accountability	
Targets	**Robust plans**	**Specific actions**	**Governance mechanisms**	**Disclosure**
• Climate change mitigation • Climate change adaptation and resilience • Nature and biodiversity • Orderly and just transition*	• Vision • Strategy • Action plans covering Scope 1, 2, and 3 GHG emissions • Action plans for other KPIs • Internal corporate climate management policies • Climate change transition risk and opportunity sensitivity analysis	• Short- and medium-term milestones • Annual progress verification	• Board and senior management oversight • Setting and monitoring of KPIs and plans • Corrections and updates to corporate strategy	• Disclosure data • Compatibility and accessibility
Hallmark 1	**Hallmark 2 and 3**		**Hallmark 4 and 5**	

Climate Bonds Five Hallmarks: Climate Bonds identified five hallmarks of a credibly transitioning company. These are the elements required to drive transformative changes across a whole business and align efforts with the Paris Agreement.

*The climate transition has a wide range of impacts on industry, business, and workers, and the focus of a just transition is to ensure equal access to opportunities, prevent the transition and climate change impacts from exacerbating inequalities, and safeguard rapid climate action.

Source: Climate Bonds Initiative

Transition plans are an appropriate tool for companies to communicate the economic and environmental integrity of their business strategy to investors and financial institutions.[15] Transition plans are a platform for issuers to explain their goals, commitments, actions, and progress on climate action and sustainability, how they will maintain financial performance and competitiveness, and better finance their transition.

Transition plans can support investment decisions and help institutions to explore opportunities in climate transition, while better managing their own transition risks.[16] Credible transition plans help capital market stakeholders to identify genuine efforts to transition and channel capital into investments that will support those initiatives.[17]

The number of companies with transition plans is growing. According to CDP, among the 18,600 companies participating in its questionnaire in 2022, 4,100 indicated that they had a 1.5°C aligned transition plan in place, and 6,520 said they plan on having a transition plan in place within the next two years.[18]

The financial sector and transition to net zero

The financial sector has a vital role to support the transition to net-zero emissions. As the world's largest alliance of financial institutions (FIs) supporting net zero, the Glasgow Financial Alliance for Net Zero (GFANZ) has more than 500 members, including asset managers, asset owners, auditors, banks, data providers, exchanges, insurance companies, rating agencies, and more.[26]

Transition plans and financial instruments

Bond instruments

Entities can deploy transition-related UoP bonds or performance-linked instruments to finance their transition:[19]

- UoP bonds: Bonds falling into the green or sustainability themes, including those bearing the transition label can be used to finance projects, activities, assets, or expenditures with specific environmental and/or social benefits.
- Performance-linked bonds: SLBs can support general purpose financing, where the issuer sets entity-level KPIs, and there are financial penalties/rewards for the achievement of pre-determined SPTs.

Transition plans underpin performance -linked instruments

The goals and action plan described in a transition plan should inform the selection of KPIs and SPTs used in performance-linked instruments. Issuers must begin by designing a comprehensive transition plan at the entity level, referencing sector-specific pathways to reaching net zero, and describing which levers the entity will deploy to achieve decarbonisation. It should include short-, medium-, and long-term goals for achieving net-zero emissions.

For power generation companies, key levers of transition include adding new clean power generation equipment, upgrading and retrofitting existing generation equipment, decommissioning high-carbon generation equipment, ensuring a just transition, and enhancing grid and storage capacities. The Climate Bonds Electrical Utilities Criteria sets science-based requirements for companies to assess climate transition finance, and Financing a Credible Coal Transition provides a framework to assess climate and social outcomes of coal transition mechanisms.[20,21] Issuers need to identify performance targets and develop financial plans based on the assets and business models required for their transition.

To inform SLB structures, issuers can select KPIs from their transition plans, such as achieving a stated percentage of reduction in greenhouse gas emissions by a specific date compared to a given baseline. The proceeds from an SLB are not restricted and can be used for general corporate purposes. The transition element of the instrument comes from the accountability supported by the KPIs and SPTs, so it is crucial that those are both material and ambitious.

Climate Bonds sustainability-linked bond database

Climate Bonds screens self-labelled sustainability-linked bonds (SLBs) from all jurisdictions against the Climate Bonds SLB database methodology to inform the size, credibility, and ambition of deals in the SLB market globally.

Aligned deals in the SLB database reflect issuers which tie their cost of capital to credible and ambitious decarbonisation targets, in line with a 1.5°C transition.

A summary of the assessment process is illustrated below, with the full methodology available in Chinese and English on the Climate Bonds website.[27]

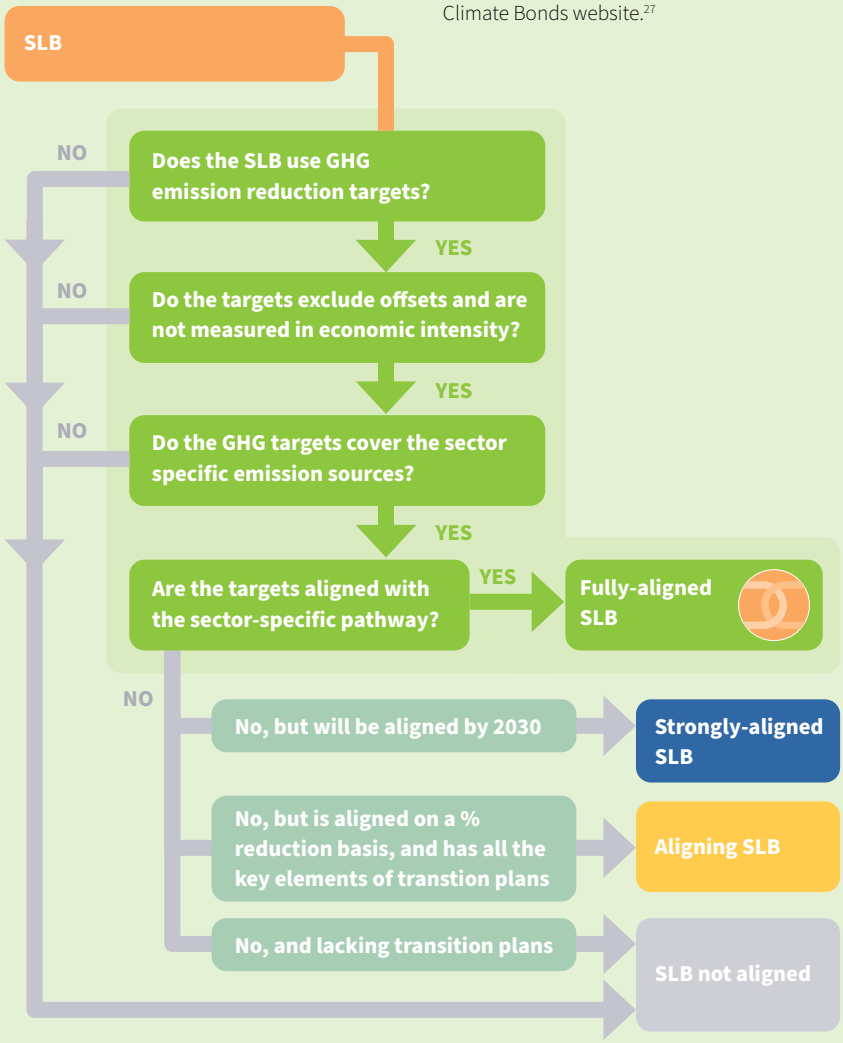
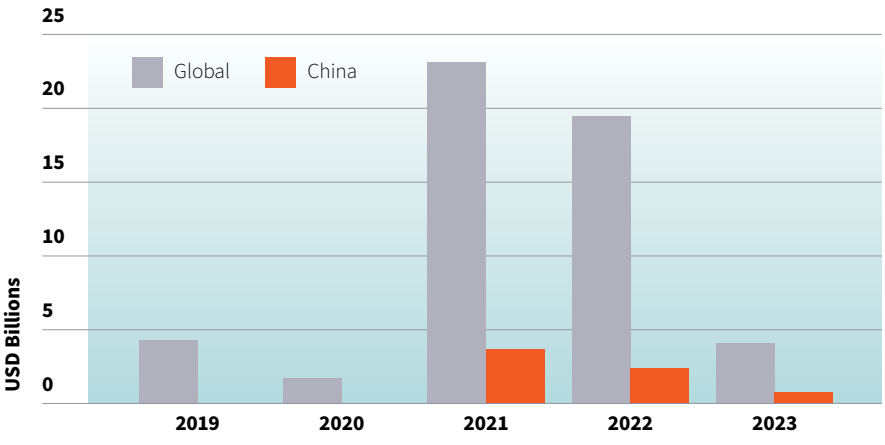


Figure 6: Total SLB volumes from electrical utilities



Source: Climate Bonds Initiative

The views of Chief Financial Officers on labelled debt instruments

Chief Financial Officers (CFOs) play a crucial role in uncovering low-carbon transition opportunities and managing risks. The Climate Bonds 2023 report *The Role of the CFO in Driving Credible Transitions* explored the intersection between finance and sustainability. The report was based on interviews with more than 30 CFOs representing companies with a total market capitalisation of USD930bn.[28]

The Climate Bonds 2022 survey of Chinese green bond investors revealed that respondents are actively seeking to diversify their green bond investments, with renewable energy being the most favoured sector. Both domestic and international respondents expressed a desire to increase their holdings of Chinese green bonds, provided these bonds meet appropriate standards. Respondents emphasized the importance of green credentials and fundamental credit quality.[29]

Figure 5: CFO Views on labelled debt instruments

	Advantages	Disadvantages
Green bonds	• Mature tool, strong investor demand • Well-established format and framework, aligns with ESG-related regulatory principles • Enhances reputation • Increases dialogue with investors • Potential for pricing advantage	• Requires large quantity of eligible green projects • May take a long time to prepare bond framework and structure • Restricted UoP • Additional costs and disclosure requirements
SLBs	• Investors are highly interested in integrating the issuer's operations, financing, and forward-looking assessment systems; this tool can integrate multiple elements of low-carbon transition • Unrestricted use of proceeds; easier to issue bonds once the framework is established • Increases dialogue with investors • Potential to increase sectoral diversity (for investors)	• There is ongoing debate about the climate benefits and credibility of this instrument • Requires significant effort to coordinate all business units (in the development of an entity-level transition plan) • Concerns about meeting performance targets, leading to hesitation in issuing linked debt

Transition plans for electrical utilities

Electrical utilities have started focusing on elements of the transition

The power sector is currently the main source of global GHG emissions according to the International Energy Agency (IEA), accounting for about 42% of global energy-related CO_2 emissions in 2020.[22] Decarbonising the power generation industry is crucial as it will assist in decarbonising other industries through electrification. The share of electricity in total final energy consumption is expected to exceed 50% by 2050.[23]

Electrical utilities have made progress in increasing renewable energy capacity towards the transition of the industry. Transition plans should include a description of financial expenditure plans and quantitative indicators related to low-carbon initiatives. Among the power companies participating in the CDP questionnaire, 28% indicated that they had established transition plans and shareholder feedback mechanisms, the highest proportion among all industries.[24] According to the World Benchmarking Alliance (WBA) 2023 assessment of the transition plans of 68 major global power companies, there is a significant trend in increasing renewable energy capacity. However, current transition plans do not clearly outline the phase-out of fossil fuels, with 84% of the sample companies not setting net-zero targets aligned with the 1.5°C pathway.[25] Among the 44 power sector SLB issuers tracked by Climate Bonds, only five issuers have formulated transition plans that include sustainable frameworks and low-carbon transition financial plans.

Electrical Utilities are the largest source of SLBs

According to Climate Bonds data, as of December 2023, global electrical utilities issuers have cumulatively issued USD52.9bn in SLBs, accounting for 19% of the total SLB market, which makes electric utilities the largest source of SLBs. The most frequently selected KPI by Chinese domestic electric utilities issuers is related to increasing renewable energy capacity, with 79% of the KPIs chosen being associated with renewable energy installations.

Climate Bonds' SLB database methodology requires issuers to address all three scopes of GHGs, which for electric utilities are primarily from scope 1. Further details are provided in the table below.

Table 1: Requirements for emission targets in the Climate Bonds SLB database methodology for electrical utilities

Issuer sector	Emission scope coverage
Electric utilities	**Scope 1*** *If the issuer has fossil-fuel based operations, scope 2 and 3 are also required, or 80% of total issuer emissions Hydropower and geothermal require scope 1; reservoir emission and biomass require scope 3.

Vattenfall

Vattenfall is a major electric and energy company headquartered in Sweden, and one of the largest energy companies in Europe. This company has a high proportion of renewable energy generation and provides electricity for fossil-free steel production. The case study introduces Vattenfall's practices in climate targets, transition planning, actions, and low-carbon transition financing.

Performance targets: The company's vision is to achieve a fossil-free status within a generation, aiming to do so responsibly.[30] The company aims to reach net zero by 2040. In the interim, the company aims to reduce scopes 1 and 2 by more than 77% and scope 3 by 54.6% by 2030, compared to 2017, which has been approved by the Science Base Target initiative.[31]

Robust plans: Vattenfall plans to achieve net zero by 2040, which means reducing emissions across its entire value chain by approximately 95%, with the remaining emissions being offset through negative emissions. The company plans to phase out coal by 2030.[32]

Action: In 2022, Vattenfall allocated 81% of its research and development (R&D) expenditure to developing low-carbon technologies. This includes the HYBRIT project, a hydrogen-based zero-fossil steel initiative.[33]

Vattenfall issued its first green bond in June 2019. From 2019 to 2023, investments under the company's green bond framework were earmarked for wind (total capacity 2843 MW) and fossil-free steel (HYBRIT) projects. By year-end 2023, Vattenfall had a total of SEK25.2bn in outstanding green bonds and invested a total of SEK43.6bn.[34]

Governance: The company's CEO and board of directors are responsible for its sustainability work and impact, which is integrated into its group strategy, target-setting, decision making, and risk management.[35]

Disclosure: According to the company's annual report, most of Vattenfall's 2022 revenue, operating expenses, and capital expenditures were assessed as eligible and aligned with the technical screening criteria of the EU Taxonomy. The specific proportions are illustrated below.[36]

Figure 7: Alignment of Vattenfall's financial indicators with the EU Taxonomy

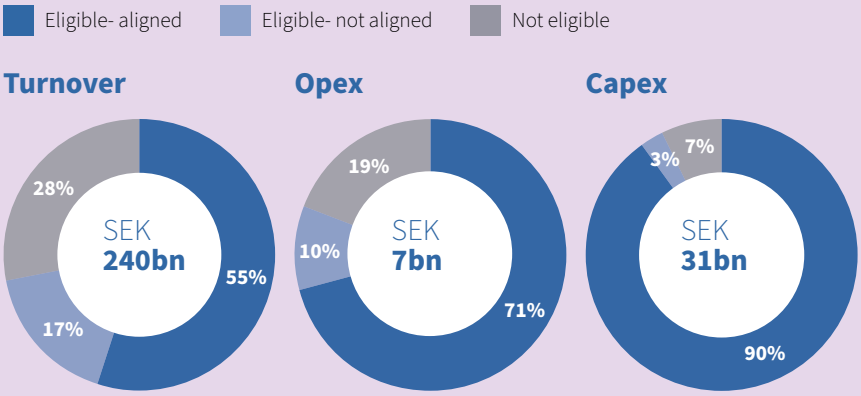


Image source: Vattenfall[37]

Figure 8: Vattenfall's emission reporting and low-carbon transition pathway

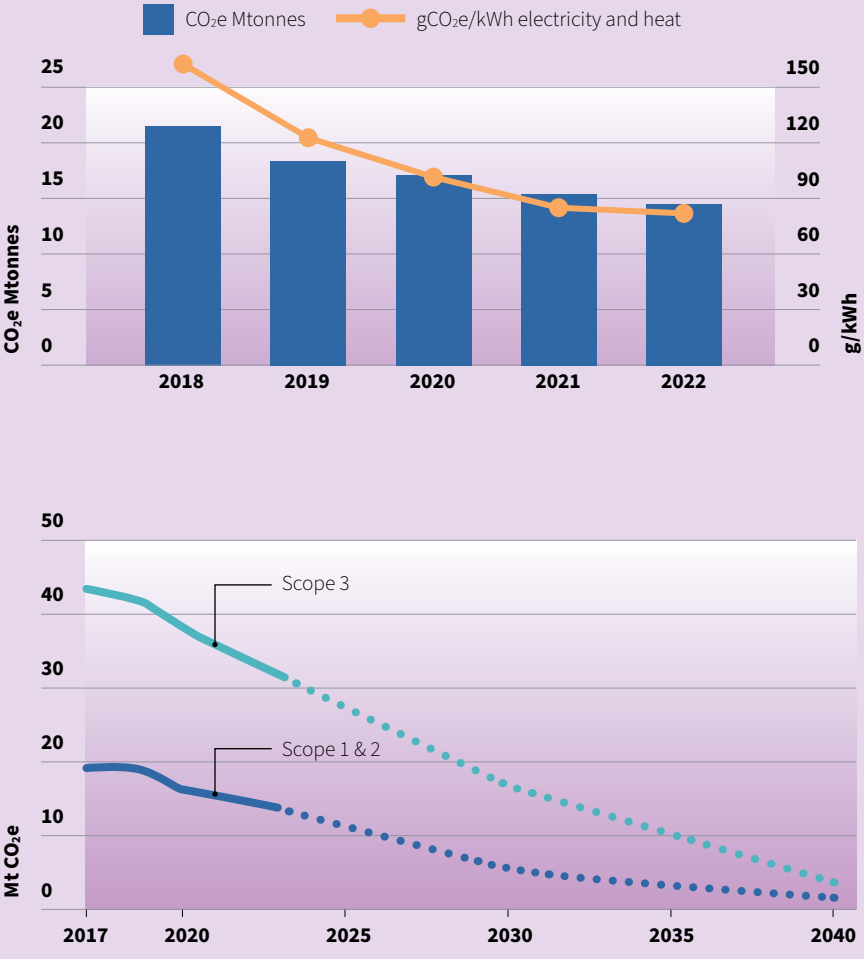


Image sources: Vattenfall[38,39]

Enel

Enel is an Italian multinational manufacturer and distributor of electricity and gas. Its businesses include green and thermal power generation, electricity distribution, and retail electricity and gas. Although Enel is the largest corporate issuer of SLBs, only one SLB is included in the Climate Bonds SLB database. This case study introduces the company's transition plan and compares the issued SLBs with Climate Bonds SLB database methodology.

As of June 2023, Enel had issued 30 SLBs worth USD31.1bn, four of which are tied to renewable energy installed capacity targets, one deal to GHG scope 1 and 3 targets, and the remainder to GHG scope 1 targets. In 2022, Enel reported emissions of 132.9 $MtCO_2eq$, of which around 40% were scope 1, 3% were scope 2, and 57% were scope 3.[40] Their scope 1 and 3 bond (described below) covered a total of 77.6% of their total emission footprint and is the only one of their bonds categorised as aligned in the Climate Bonds SLB database. Enel missed its SLB targets, the sustainability performance targets (SPT) of which were set to reduce emissions to 148gCO_2eq/kWh by 2023, while the performance was 160gCO_2eq/kWh by 2023. The failure to hit targets triggered a 25bps coupon step-up for 10 bonds, five euro-denominated bonds (EUR5.6bn) and five US dollar bonds (USD4.8bn).[41]

Performance Targets: **Enel has short-, mid-, and long-term targets for all material scopes of emissions that align with the 1.5°C pathway for electrical utilities.** These were revised in 2022 to increase the ambition of the decarbonisation pathway, targeting a reduction of 78% by 2030 (73 gCO_2eq/kWh) and 100% by 2040 (0 gCO_2eq/kWh) in scope 1 and 3 GHG emission intensity relating to integrated power (gCO_2eq/kWh), both against 2017 baselines (332 gCO_2eq/kWh).[42] This included a 90% reduction in absolute emissions for all scopes by 2040, vs 2017.

Robust plans: **Enel has published detailed transition plans**, reliant on exiting its existing coal by 2027 and fossil gas businesses by 2040, replacing them with large-scale renewable energy installed capacity, and investments in its transmission and distribution arm, as well as smart energy demand management. Enel's commitment to phasing out the stranded fossil-based assets, supported by a robust investment plan, is to be commended.

Action: Enel has committed EUR210bn between 2021–30 to increase its renewables energy mix (43%), continue the expansion of its distribution and transmission networks (44%), as well as its energy management business and support services (10%), with minimal investments in its conventional energy sources (3%). Overall, low-carbon business areas represented 92% of total capex in 2022. While Enel's detailed financial commitment is notable, both GHG emissions and revenues from coal plants have increased year-on-year. Therefore, the front-loading of emission reductions and implementation of planned decarbonisation levers should commence as soon as is feasible.

Governance: **This vision is supported by Enel's sound governance structure**. Progress on transition-related key performance indicators (KPIs) is reported directly to the Board and executive remuneration is tied to transition performance targets.

Disclosure: Enel reports on a range of transition-related transition KPIs in its annual reports, and its SLB portfolio is tied to scope 1 emission and renewable energy targets.

Amount Issued EUR750.0m (USD800.6m)

Issue Date: 20 February 2023	**Maturity date:** 20 February 2043	
Financial Mechanism: Step-up 25bps if the SPTs are not met		
Key performance indicator(s)	GHG emissions intensity (Scope 1, 3 – related to integrated power)	GHG emissions (Scope 3 – related to gas retail)
Sustainability performance target	0 gCO_2e/kWh	0 Mt CO_2e
Assessment: Fully Aligned (Climate Bonds SLB methodology)		

Emission sources required by SLB Database Methodology for sector

Scope 1* or 80% of total emissions
*If entity has fossil fuel-based business segment, scopes 2 and 3 are also required

China Huaneng Group Co., Ltd.

China Huaneng Group Co., Ltd. (Huaneng) is one of China's five major state-owned electric power producers, and one of the main issuers, using green bonds and SLBs to finance its low-carbon transition. It engages in the investment, construction, operation, and management of electric power production assets, as well as power generation and sales.

Huaneng issued its first green bond in 2016 and has since issued around RMB83.8bn (USD12.4bn) through 98 green bonds. In 2021, Huaneng issued its first SLBs, and by mid-2024, had priced eight SLBs totalling RMB13.5bn (USD2bn), all of which are linked to renewable energy targets.

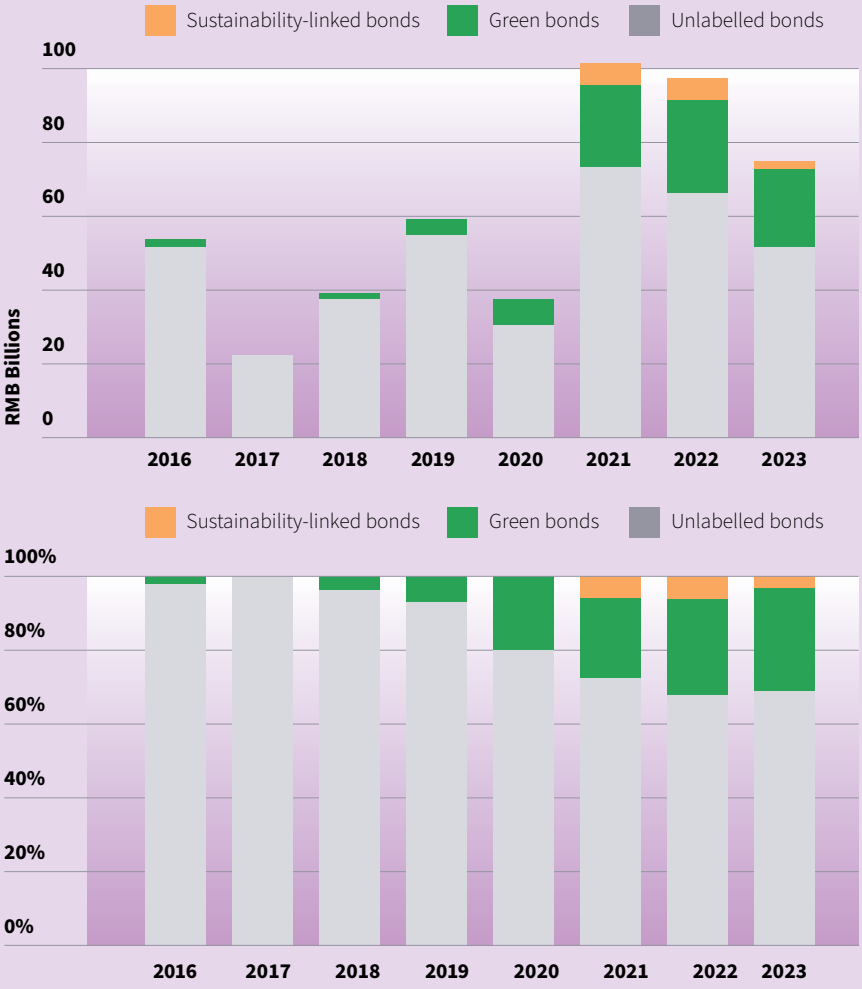
Of Huaneng's green bonds, 67.4% of the volume, totalling RMB56.6bn (USD8.3bn) has been recorded in the Climate Bonds Green Bonds Dataset. Among the bonds excluded from the dataset, 17.1% of the volume includes operational capital in the UoP and 13.4% lacks the required UoP disclosure.

Huaneng's SLBs are all linked to renewable energy capacity targets. As of mid-2024, the issuer had not stated GHG targets, which are a prerequisite for alignment with the Climate Bonds SLB database methodology. As a result, these SLBs were recorded as Not Aligned in the Climate Bonds SLB database methodology.

Performance Targets: Huaneng has aligned with China's 2030:2060 targets but has not yet established more detailed short-, medium-, or long-term emission reduction targets.

Robust plans: Similar to many other large state-owned electrical utilities, Huaneng is undergoing a low-carbon transformation, although formal transition plan documents have not yet been developed. According to Huaneng's 2022 annual report, the company's transition action plan includes measures such as deploying CO_2 capture, storage, and utilisation technology, accelerating the increase in the proportion of clean energy, exploring the potential for energy conservation and carbon reduction in existing coal-fired power generation, implementing energy conservation and carbon reduction renovations, and actively expanding into the heating market.

Figure 9: Increasing proportion of Huaneng Group's liabilities bears a sustainability label



Source: Climate Bonds Initiative, Wind

Action: Huaneng's disclosed capital expenditure in the annual report reflects the direction and ambition of Huaneng's low-carbon transformation. In 2022 and 2023, Huaneng plans to invest about two-thirds of its annual capital expenditure of approximately RMB40bn into clean energy development, including hydropower, solar power, and wind power. Capital expenditure on thermal power generation is reduced from RMB2.3bn to zero, while capital expenditure on coal decreases from 14.7% to 13.4%, and expenditure on technological transformation increases from 17.9% to 19.9%.

Governance: In terms of governance, Huaneng Group has a sound management structure supporting its climate transition, with the Environmental Protection Department responsible for environmental and transition policies. The company has not yet disclosed comprehensive greenhouse gas emissions and corresponding third-party certifications.

Disclosure: The key performance indicator (KPI) currently used by Huaneng is GHG emission intensity. The company has not disclosed all its sources of GHG emissions and has not specified scopes 1, 2, and 3. Over the five-year period from 2018 to 2022, Huaneng's GHG emission intensity decreased by approximately 5.8% (from 661.29 to 623 grams of GHG emissions per kilowatt-hour).

Outlook

Enhancing transparency and credibility will support the growth of transition finance

At the current stage of the transition finance market, enhancing credibility is essential for market development. Investment institutions need to fully understand the plans, performance, and actions of the companies in which they invest. Companies should publish transition plans following the guidance provided by existing frameworks, such as *Climate Bonds guidance to assess transition plans*.[43]

Transition plans can attract capital to support the transformation of energy utilities

Credible transition plans can encourage investors to support the transformation of power generation companies. As renewable energy infrastructure begins to gain price advantages, investors will be more inclined to move away from investments in coal-fired power generation, leading to a decline in newly added coal-fired power generation capacity. This capital shift can be supported by credible transition planning.

Where green expenditures are required, UoP instruments can be deployed. New business plans, employee training, etc., can be funded through equity or performance-linked debt instruments which do not restrict the UoP.

Appendix

Considerations and recommendations for financing the low-carbon transition of electrical utilities

The transformation of electrical utilities requires significant financial support, which can be provided by the thriving labelled debt market. Debt instruments with restricted UoP and KPI class debt instruments both provide possibilities for financing electrical utilities. Corporate issuers of debt instruments can meet their financing needs and maintain market credibility, by heeding the following steps:

Step 1: Develop an entity-level transition plan

- Conduct a comprehensive assessment of the business's geographical and industrial characteristics and formulate a corporate-level transition plan that covers achieving net-zero emissions in the long term. Issuers can develop a low-carbon transformation roadmap, detailing the greenhouse gas emission reduction achievements targeted for 2030, 2050, and 2060 plans.
- For electrical utilities, the main dimensions to consider include the addition of clean power generation equipment, upgrading and retrofitting existing power generation equipment, retiring high-carbon power generation equipment, conducting fair transitions, and investing in grid and energy storage. Additionally, the identification of performance targets based on the assets and business models required for the company's transition and formulation of financial plans.

Step 2: Choose the appropriate types of financing tools to meet the entity's financing needs

- Issuers can utilise bonds with restricted UoP or KPI-linked bonds in the capital markets according to their financing needs.
- The use of debt finance instruments should align with the entity's transition plan. For example, UoP bonds can finance assets or decarbonisation levers identified within the transition plan, while KPI-linked instruments can be tied to entity target achievement (e.g., a 30% reduction in emissions by 2030 for Company X).

Green bond framework

1. Introduction to the entity
2. Sustainability-related disclosure and reporting
3. Description of transition plan
4. Rationale for establishing a green bond framework
5. Alignment of green bond with the ICMA green bond principles
   a. UoP
   b. Process for project evaluation and selection
   c. Management of proceeds
   d. Reporting
6. Information on the possible engagement with external providers of review of alignment of the bond framework with ICMA principles or other bond standards
7. Commitment of the issuer to obtain an external verification on allocation and impact reporting.

Sustainability-linked bond framework

1. Introduction to the entity
2. Sustainability-related disclosure and reporting
3. Description of transition plan
4. Rationale for establishing a sustainability-linked bond framework
5. Sustainability-linked bond
   a. Selection of KPIs
   b. Calibration of SPTs
   c. Bond characteristics
   d. Reporting
   e. Verification
6. Information on possible engagement with external providers of review of alignment of the bond framework with ICMA principles or other bond standards

Step 3: Develop the bond framework

- Financial service institutions can assist corporate issuers in developing issuance frameworks for UoP/KPI-linked bonds.

Step 4: Bond issuance

- Evaluate whether second-party opinions or third-party certification is required or supportive to the bond issuance process.

Step 5: Post-issuance disclosure of bond information

- Following the initial bond issuance, progress and/or impact data must be disclosed to market participants. UoP bonds disclose the flow of funds raised, and relevant impact metrics. KPI-linked bonds disclose the issuer's progress and achievement against the selected KPIs.

Step 6: Evaluation of fund use and impact

- The entity should internally review the issuance and performance process, evaluate the materiality of KPI achievement, and ensure alignment with the overall transition plan to optimise subsequent updates to the transition plan, as well as action and financing plans.

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