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## A Note on Transition Bonds and Finance

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### Editorial Note

*In this chapter, we turn our focus to the transition from carbon-intensive production to zero emissions systems. Specifically, the authors tackle the following questions: Why have climate-branded debt products proliferated? Do all the new labels just lead to noise and/or does the creation of a distinct transition bond category serve a purpose? In order to effectively serve a purpose, what challenges must be overcome?*

*The subject of transition finance also urges the reader to consider their conception of what it will take to facilitate an effective and timely climate transition. Is it supporting only “green” projects, or will it also involve supporting the wind-down of fossil projects, as well as supporting systems-level coordination? Government*

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*transition plans are currently uncertain, if they exist at all. Instruments of transition finance could stimulate a dialogue between governments and companies. In the future, the hope would be for transition strategies to become increasingly defined and aligned on a common pathway.*

## Introduction

Transitioning from a high- to low-carbon global economy will require a tremendous mobilization of capital. A successful climate transition will involve overhauling fundamental building blocks of society, from energy systems to transportation infrastructure to food production technologies. In recognition of this significant undertaking, the developed country signatories of the Paris Agreement have already committed \$100 billion per year toward efforts to keep global warming below the IPCC's 2°C threshold. Even this sum, however, falls far short of the funding required to facilitate this climate transition. The International Energy Agency (IEA) estimated in 2014 that \$53 trillion would have to be spent between 2015 and 2035 on energy-related transition investments *alone* in order to achieve low-carbon targets, and that amount has only climbed throughout the last decade. In the absence of meaningful carbon pricing—transition finance offers businesses an alternative mechanism for funding their alignment to global climate targets. Under this umbrella term fall a number of types of purpose-built bonds, including green bonds, sustainability-linked bonds, and, more recently, transition bonds.

Given the apparent multiplication of these tools over the past several years, a number of questions naturally arise: Does the world really need another, separate, transition bond framework? What additional utility could another instrument offer, beyond what can already be achieved through other mechanisms, such as green bonds? And perhaps more critically, can these tools offer a meaningful way to fund climate transition, or do they largely serve as a form of greenwashing for corporate entities? This note will review the progression of development and spread of these financial instruments, but also question the motivation and effects of this proliferation.

To evaluate the effectiveness of transition finance, there must be some standard and metrics that define the scale, scope, and sequences of the transitions to be managed. In bare outline, political economic transitions necessarily imply a winding down of embedded production techniques and the adapted social, organizational, and financial systems around them, and a building out of the new technologies and reformed complements that allow them to replace the incomes, quality of life, and stability of what is being dismantled.

Transition, and therefore transition finance, will likely encompass not just the capital costs of new and on-time infrastructure and production facilities, but also the direct and administrative costs of adjustment to the dislocations required. And around such system-level changes, there are risks on both the downside and the upside that, if not managed efficiently, will increase the disruptive effects of disorder across the transition process or the residual damages from transition left undone.

## The Evolution of Transition Debt Instruments

### Green Bonds

Since their first issuance in 2007, green bonds have rapidly become the predominant purpose-built credit instrument used for climate transition. The volume of green bonds outstanding began at \$230 million in 2010 and rose sharply from around \$4.8 billion in 2013 to roughly \$142 billion by 2017 (CBI, 2018), with the latter growth representing a nearly 30-fold increase over four years. Annual green bond issuances showed similar patterns, experiencing a nearly 120-fold increase over the same period (Tolliver et. al., 2019).

Green bonds were created to fund projects that have a positive environmental or climate impact. This purpose prompts the question, what types of projects qualify as “green”? The Green Bond Principles, written by the International Capital Market Association (ICMA), provide one potential answer to this question by outlining an indicative list of “eligible” green projects, which include, but are not limited to: renewable energy, energy efficiency, pollution prevention and control, climate change adaptation, green buildings, clean transportation, and terrestrial and aquatic biodiversity.

Despite their meteoric rise in popularity over the past decade, green bonds face a number of critical challenges that threaten the efficacy of their administration. The availability of reliable data, and thus reliable reporting and verification, remains an issue, especially on post-issuance allocation of proceeds (Tolliver et al., 2019). In 2017, less than 10% of the green bonds reported post-issuance allocation, and less than 7% reported impact metrics (Tolliver et al., 2019). Second, the voluntary Green Bond Principles, formulated in 2013, have been reasonably comprehensive in specifying what is needed to capture quality data and to demonstrate additionality for green bonds. These principles are then suitably supported in terms of impact reporting by the Harmonized Framework for Impact Reporting for green

bonds (ICMA, 2020a). However, both frameworks are voluntary and flexible (using terms such as “recommend” and “encourage,” without being prescriptive), which leads to divergence in impact reporting. A majority of green bond fund investors report current green bond impact accounting to be inadequate, citing both under- and over-coverage of qualified fund uses, transparency, and standardization (EF, 2020).

A number of empirical studies have raised concerns around the performance of green bonds at the firm level, albeit with contradictory findings. Some investigations find that green bond issuances improve performance on financial metrics and environmental indicators (Flammer, 2020; Sebastiani, 2019). On the other hand, multiple studies find that green bond issuances are not correlated with statistically significant improved environmental performance and that green bonds do not result in a reduced cost of capital (Ehlers et al., 2020; Economist, 2020). While it is not straightforward to reconcile these results given differences in dataset and methodologies, this dispersion merits a strong note of caution about the incentives in voluntary regimes to label, monitor, report, and audit the quality of “green” financial assets (a theme carefully examined in the first part of this book).

While a broad gap between the pre-issuance intended deployment of green bond funding in projects and the disclosed use of proceeds plagues green bond reporting in many jurisdictions, the problem of the additionality of green bond funding is likely of greater consequence and concern. Unless the use of proceeds for declared and qualified green uses is disclosed at the portfolio (or even the associated financial group) level, even ring-fenced green bond funds may not add to the total investments in sustainable projects. Incentives to separate green and fossil value chains to attract dedicated green investors do nothing significant for a climate mission. As suggested in Chapter 3, the coincidence of a systemic lack of reliable data and questionable analytical metrics for additionality nominate the candidacy of green bonds for careful scrutiny of financial carbonwashing. For example, an investigation in 2019 found that at least one-third of green bond issuances in the last three years did not meet three well-known criteria, such as credible issuer Environmental, Social, and Governance (ESG) performance, alignment with the green bond framework, and measurable quantitative impact (Kendall, 2019; Flammer, 2020; Bachelet, 2019).

The record of green bonds is arguably consistent with a cycle of introducing new classes of green instruments that attract large capital flows followed by repeated industry or civil society efforts to organize high-quality standards for these new assets. Such efforts have persistently led to difficulties in agreeing or enforcing these standards. Rather than increasing investor

confidence in any label, new issuers prefer to replay this cycle around differentially designated green instruments. This may suggest that transition bonds will run the same course, and ought not to be welcomed.

## Transition Bonds

While experience with green bonds casts cautionary shadows of doubt over the added value of new classes of transition denominated financial assets, it does not exclude the possibility that a focus on transition itself calls for financings at a scale that have been excluded from creditable green bond qualification. Credit Suisse and the Climate Bonds Initiative, who partnered to publish a transition bond framework (CBI, 2020), articulate three reasons why a transition bond framework beyond (and potentially encompassing) the currently existing green bond frameworks is needed. First, investors are asking for greater diversity in the uses of proceeds than is widely accepted within green bonds practice, as well as for participation from more issuers. Second, many high-carbon emitters are looking for opportunities to invest in transition-related projects and are frustrated by the lack of opportunities. Finally, regulators are asking for capital markets to play an active role in financing corporate transitions. What seems common to these three criteria is a conviction that some features of the movement from high- to low-carbon systems still remain conventionally unconsidered or left out of what has been classified as Green Finance. An informal grouping of the uncovered features of transition might follow four lines of thought.

*Transition as project.* Much of the proposed use of proceeds of financial issuances around transition centers on equipment or physical hardware associated with low-carbon energy, transport, or industrial processes. The European Union's Green Taxonomy imagines a first such framework built by policy-makers and regulators to distinguish green from other investments by project type (EU, 2020). This guidance sets performance thresholds for economic activities that meet the following criteria: make a substantive contribution to one of the six environmental objectives (e.g., climate change mitigation, climate change adaptation, protection of water and marine resources, transition to a circular economy, pollution prevention and control, protection and restoration of biodiversity and ecosystems); do no significant harm to the other five; and meet minimum safeguards that are already established as standards (e.g., OECD Guidelines on Multinational Enterprises and the UN Guiding Principles on Business and Human Rights). While the EU is quite detailed in identifying approved economic activities, critics suggest its positive core listing of eligible transition investment may still be too prescriptive

and not flexible enough for industry (Harris, 2019). China also has produced a catalog for Green Bond classification with similar design and purpose.

The issuing firm or financial institution that funds a portfolio of such firm and project-specific investments may seek transition credentials tied to either the particular installation of low-carbon gear or, increasingly, to a longer-term transition plan to which the organization announces its commitment. For such project-based investments within an issuing firm, whether funded through project-specific or general corporate bonds, there seems little reason to distinguish transition from green bond recognition. Moreover, green bond qualification has also begun to migrate from immediate projects to future plans that might otherwise distinguish transition from more generic green finance. The overlap between green product-based taxonomies and this particular claim to transition finance reinforces the seemingly questionable value of generating a new instrument class for this reason alone.

*Transition as (low-carbon) bridge.* More problematic discussion concentrates on other transition bonds where proposed uses of investment proceeds are currently disqualified as eligible for green bond qualification. Assertions of green- or carbonwashing have circulated around transition bond issuances or uses of proceeds inconsistent with widely subscribed norms or standards, most often linked to investments in “lighter fossil” solutions such as higher efficiency coal-fired generation or natural gas refineries, pipelines or liquefaction. A Repsol green bond in 2017 came under attack because neither its intended use of proceeds, nor its broader corporate strategy were at the time aligned with the Paris Agreement (CBI, 2020). Similar disrepute followed a SNAM Climate Action Bond in 2019 seeking finance to support a methane leakage target, which increased from 25% to 40% over time (CBI, 2020). More generally, transition bonds have been deplored as non-additional toward approved activities, such as bond issuances not resulting in improvement in carbon intensity at the firm level (Ehlers et al., 2020). In all of these cases, advocates of an added transition bond status argued that their proposed investments would play a necessary role in moving from a higher-toward a lower-carbon economy. Especially in industry sectors and geographies where the costs of low-carbon technologies at relevant scale remain significantly above currently available, reduced carbon fossil alternatives, investments in solutions that would maintain economic and social stability during a *transitional* period would better satisfy joint climate and employment/consumer concerns. In effect, these non-green transition bonds constitute implicit industry claims about (in)feasible rates of technology change, and the present economic value of continuity in largely fossil-dependent policy, business models, and finance. Those who resist these plans and contest the transition

bond label, are essentially raising the question of who gets to define the shape and timing of transition.

*Transition as systems.* While early issuances of, and debate over, transition bonds has concentrated on funding of essentially green projects or asserted bridges to future zero carbon technologies through more efficient or less carbon heavy fossil alternatives, transition finance might principally be targeted at investments that complement zero carbon technologies through systems integration, policy reform, business model reorganization, or financial innovation. The fundamental insight of a focus on systemic transition is that the added economic value of new technologies emerges only with accompanying changes in the soft infrastructure that adapts the organizational and political context in which these technologies become widespread. Ready-at-hand investment needs for low-carbon energy still lack financing for control software, market re-design, intelligence services, and flexible capacity development. Similar systemic investment opportunities lie in precision agriculture or automated vehicle computation that may conceptually fall into green finance taxonomies, but are not represented in current investment portfolios. While deficits in systemic investment often signal issues in blended financial structuring or mispricing of infrastructure returns, these deficits help explain the slow pace of transition that transition bonds might relieve.

*Transition as restructuring.* If transition as systems looks to speeding the build-out of low-carbon technologies, the record of transition more broadly would equally call for transition finance as dedicated investment in the winding down of embedded firms, industries, and whole economies. Transition plans that could meet the shrinking windows for agreed climate stabilization will be defined against a standard of rapidly accelerated systemic reorganization across core economic sectors with massive unamortized investment in capital, production know-how, consumer tariffs, and jobs. Disruptions of returns and price expectations can create near-term and concentrated losses that impede effective transition. In addition, effective restructuring will often recognize, in existing firms in declining sectors, spheres of excellence in research and development that can be segregated and ported with high economic returns and shortened timelines into the redesigned systems that successful transition prioritizes and requires.

Although tight carbon budgets increasingly conflict with the historically slow pace of economic transitions, customized institutions and processes for restructuring declining firms and industries are available. In the United States, Chapter 13 of the bankruptcy code empowers specialized receivers or trustees to consider the several concerns of capital, labor, communities, and existing and incoming investors in corporate restructurings. The World Bank has

developed an inclusive program to examine the upside and downside aspects of transition in economies dependent on fossil exports (Peszko et al., 2021). Exceptional wartime agencies or the special purpose vehicle (Truehandanstalt) created by the German government during the process of reunification to manage the restructuring of the former East Germany's industrial conglomerates have been charged with the social and political, as well as the economic, reorganization of systemic transitions. Though the destination of effective transition finance will evolve toward transition as restructuring, as discussed below and in Chapter 9, this practice still lies mainly across the horizon.

## Transition Finance Frameworks and Pathways

An effective transition finance framework must perform three essential functions. First, a transition bond framework must align with well-defined *climate goals*, such as the 2°C temperature target agreed in the Paris Conference of the Parties (IPCC, 2015), and soon refined down to 1.5°C. Second, the framework provider needs to be able to define and certify *transition pathways*, or linear paths to Net Zero by 2050. Third, it needs to specify *business level activities*, such as investments in solar power plants, systems integration software, carbon capture equipment, sequestration pipelines and sites, precision agriculture, and synthetic protein manufacture. Associated business strategies, production models, labor needs, investment sources, complementary policy reforms, and risk management would need to be specified credibly at the firm level as well (Ehlers et al., 2020).

However, a transition bond framework also needs to allow for flexibility in getting to climate goals. The IPCC identifies multiple pathways to get to a 1.5°C target (IPCC, 2019; RMI, 2020), demonstrating a tension between stringency and flexibility of choosing pathways and associated activities. One IPCC pathway blesses an estimated increase of natural gas consumption by 85% by 2050, while another estimates an 88% reduction over the same time period. Although more constrained rosters of pathway choices would reach climate targets in a more certain manner, they will ignore the value of industry creativity and competitive strategies in making the required transition. (CBI, 2020). More inclusive approved portfolios of pathways will foster flexibility in getting to climate goals, but also facilitate the carbon-washing that discredits green markets. In the current state of transition play, with competing voluntary associations proposing diverse metrics, controversy centers on whether a pathway framework (and associated qualification of



transition financing instruments) should begin with climate science-driven emissions or temperature goals derived from global carbon targets and work down to firm level applications (top down), or whether pathways are better grounded in low-carbon technology patterns to be aggregated up into normative systemic change (bottom up) (Brest and Honigsberg, 2020).

*Top down frameworks.* The framework from the Transition Pathway Initiative (TPI 2020) engages its subscribing companies through both setting pathways and scoring compliance. It uses a top down sectoral decarbonization approach (SDA) to assign differentiated transition pathways to industrial sectors and individual firms within them (Krabbe et al., 2015), and measures their performance against these transition pathways over time. However, it neither specifies actual business level activities to get to these transition pathways nor allows flexibility around a prescribed sectoral timing schedule. Because TPI appears to focus only on Scope 1 and 2 emissions, its sense of transition will miss the more comprehensive strategies for emission reductions covered by Scope 3 (Shrimali, 2021).

By contrast, the framework offered by the Science Based Targets Initiative (SBTi, 2020) sets out pathways that both recognize the role of flexibility in setting transition pathways and the need for minimum rates of transition. It prescribes these rates for the 2°C and 1.5°C climate targets, at 2.5% and 4.2% per year. Science Based Targets Initiative is working with measurement frameworks designed for specific industry groups (e.g., CDP, 2020; PCAF 2020; PRI, 2020), which include all scopes of emissions. However, this framework remains highly aggregated with sparse-specific guidance on how actual business models and strategies can be fitted to the arithmetic contours of the transition pathways.

*Bottom up frameworks.* Traveling in the opposite direction, the framework from the Energy Transitions Commission (ETC, 2020) is a bottom up approach, focusing on plans for conversions of production to selected low-carbon technologies required to get to Net Zero pathways consistent with the 1.5°C target. These activities include renewable power, electrification of buildings and transportation, green hydrogen, and bioenergy with carbon capture and storage. Like other comparably constructed frameworks that substitute physical proxies and linked investment calendars for temperature or emissions metrics aligned with decarbonization goals and interim carbon budgets, this framework presents major challenges assigning activities to different plausible transition pathways even within the 1.5°C target. The gap between all highly aggregated and standardized pathways and credible firm-level transition commitments (time-specific packages of technology and

business-line conversions, R&D programs, acquisitions and mergers, insurance and financial hedges) that add up to a low-carbon transition across an entire economy threatens to remain beyond the reach of voluntary carbon initiatives.

## Market and Regulatory Approaches to Transition Finance

### A Market Approach

In the continuing search for market-based solutions that inform and encourage quality transition finance, looking beyond stakeholder (firms and investors) agreement on sector-based transition metrics, a formidable challenge awaits around the quality of information that supports evaluation of issuance and performance claims made for transition finance instruments. A familiar approach to this challenge builds on the know-how of existing ratings agencies to evaluate the underlying ambitions of planned investments or portfolio strategies of funds announced with climate targets and associations with transition pathways. These transition ratings, which would be separate from the credit ratings, would also appropriately bypass the debate around the need to incorporate the climate risk aspects into credit ratings (SP, 2020).

Reliance on a transition-focused rating system would assume the practicality of defining Paris or Net Zero consistent climate pathways, with a focus on demonstrating their additionality compared to business-as-usual, using both simple and sophisticated statistical techniques (Ehlers et al., 2020; Flammer, 2020). For ratings purposes, transition bond issuances would be assigned to such agreed targets, pathways and activities. Special purpose vehicles would be created to segregate and account for the proceeds of the bonds. Credible external verification methods would be certified to demonstrate that the proceeds in these special purpose vehicles are actually allocated to the promised activities, pathways and targets. The verification of allocations and their additionality generally relies on incorporating procedures for independent and trusted third party agencies (UNFCCC, 2020). It is arguable that a highly rated transition bond may attract more capital due to higher demand by investors with ambitious climate preferences and command a lower cost of capital. However, even if markets are not explicitly incorporating transition risk, transition bond ratings could be directly linked to contractual terms like those of sustainability linked bonds (ICMA, 2020b), where the cost of capital would be reduced contingent on meeting stated targets.

Claims for best practice in defining transition pathways and activities have clustered around metrics that offer detailed guidance on transition pathways as well as mitigation activities, where the pathways are outputs of integrated assessment models (IAMs), and the sector-specific mitigation options are inclusive rather than narrow. Other characteristics that have been suggested to benefit the spread and effectiveness of transition bond ratings include: (1) transition pathways set with reference to the Scope 3 emissions of the firm, to ensure that supply chain emissions are accounted for, and not simply transferred to the ledgers of less transparent or less regulated associated entities (*leakage*) (Song et al., 2020; Shrimali, 2021); (2) a focus on the overall transition record of the issuing firm or financial institution relative to specific climate targets and a transition pathway, which would be updated if the organization-level commitment or performance changes over time; and (3) appropriate data with a high-degree of transparency and accuracy. In all these regards, transition bond issuance and performance ratings mirror principles developed earlier for green bonds (ICMA, 2018) and have also been recently reiterated not only for green bonds (NPSI, 2020) but also for sustainability linked bonds (ICMA, 2020b). At the same time, in new transition bond markets, caution regarding regulation of the use and asset quality of offsets, whose effects on the credibility of transition compliance are discussed in Chapter 7, will demand particular attention. In all, experience with these now well-rehearsed scripts for market-driven financial solutions are as likely to compromise as to reinforce the record of implementation under voluntary frameworks.

## A Regulatory Approach

The market for transition bond frameworks is already populated by numerous coalitions, with prevailing inconsistency of definitions and frameworks (TCFD, 2020). As found in the analysis of the aggregate confusion investors face in ESG markets (Berg et al., 2019), without convergence toward commonly accepted definitions, it is difficult to lay claim to time-relevant effectiveness, efficiency, and integrity in a market-driven industry-led approach (Piemonte et al., 2019; FT, 2020, EF, 2020). Looking at these issues historically, Brest and Honigsberg argue that we need not only robust internal mechanisms (i.e., processes and procedures) to accurately measure progress toward stated targets, but also strong external mechanisms such as auditing and regulatory enforcement (Brest and Honigsberg, 2020). Researchers concur that, even in financial reporting, which is the backbone of well-functioning financial markets, strong regulatory interventions were needed

in developed economies (Habib et al., 2014; Leuz and Wysocki, 2016), led by the US Securities Exchange Commission (SEC) and the International Financial Reporting Standards Foundation (IFRS). Brest and Honigsburg further recognize that financial regulators may need to work together with environmental regulators to create such regulations, including for transition bonds. The empirical case for mandatory reporting to approach required climate finance outcomes has also been suggested in an initial analysis of France's TECV law that was found to have curtailed fossil fuel financing by institutional investors by 39% (BF, 2021).

## States and Transition Management

This chapter notes that the direction of travel in low-carbon transition planning and finance will be from green projects toward systemic restructurings. Because these restructurings target core industrial sectors, their impacts will be felt across whole economies and marked by heightened physical and transitional risks across the accelerated time frames that climate dynamics impose. Climate risks, as they become systemic or collectively significant, will lie with the state agencies—central banks and financial regulators—charged with the stability and strength of the sovereign balance sheets to which they will ultimately migrate. Systemic risks of transitions in the form of restructuring will fall on or be transferred to states. These risks require management from the state. The risks and associated management decisions include: trade-offs between deferred and higher cost (incomplete) transitions and residual physical risk in the long-term; costs of dislocation of human and financial resources stranded by well-managed, mismanaged, or failed transitions, especially where there is a history of legal or political-economic transfers of concentrated losses to sovereign accounts; coordination of upside (low-carbon) and downside (high-carbon) orderly transition over time; and implementing vehicles for distributing transition costs including transition-specific funds, social insurance, and international transition assistance.

Where credible estimates of transition risks and any post-transition residual physical risks present systemic political or financial problems for which someone must be accountable, these risks lie neither in the self-interest nor capacity of private actors to manage. Structural transition from high- to low-carbon systems then suggests a management process that runs from a state-driven accounting of systemic risk metrics and planning; through to state delegations of assigned risk management obligations, whether to sub-national governments and to private actors or associations with better sector-specific knowledge, organizational competence, and tools; and finally

to the redistribution of income streams and wealth around the consequences of transition through a network of targeted investment funds, customized transition financings, and reformed delivery vehicles for social insurance. A reverse transition governance process that works up from private actors and then patches on state management of revealed gaps of unmanaged systemic risk is futile because private actors will behave strategically, shifting climate risk back to sovereign balance sheets in what appears as disorderly transition. The real question of transition is neither its direction nor its governance, but which vehicles states can deploy that combine an efficient strategy for climate risk management, the well-timed wind down and coordinated wind up of production systems, and sufficiently just distributions of post-transition outcomes across a politically subdivided world.

When the demands of climate change are recognized as the management of orderly transition at an accelerated, perhaps breakneck pace, the focal point of transition finance logically shifts to structured instruments—public, blended, and private—that mobilize funds aligned with the state-organized process and objectives that define the systemic transition. In Chapter 9 we turn to a more detailed discussion of transition finance in this expanded sense through analysis of securitization structures with systemic ambitions in the United States. More comprehensive prospects for the definition and uses of transition bonds, including two immediate applications in India, may be found in Shrimali (2020) and Koberle and Shrimali (2020).

## Conclusion

This chapter explored the rationale, goals, and challenges of a transition bond framework, and investigated lessons learned from experience with green bonds and other climate finance instruments that have proliferated in number and volume of funds raised in the past decade. These frameworks are predicated on creating markets around widely accepted quality standards for transition bonds that allow for appropriate sector- and firm-specific flexibility in issuance, but also avoid green- or carbonwashing in gaps between announced transition plans and discordant performance.

## Key Takeaways:

- Transition bonds have the potential to add to the current green finance toolbox by going beyond existing project focused definitions of climate transition.
- Directions of travel in transition finance will turn to transition pathways and timelines that focus on *transitional* sequences, low-carbon systems, and economic restructuring.
- Effective market-based frameworks will need to connect transition pathways to transition bond ratings to provide appropriate and credible signals to investors.
- States, as enabled regulators, and as the bearers of sovereign risk in economies exposed to increasing transition impacts, will have primary responsibility for orderly transition.

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