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Unlocking climate capital for emerging markets and developing economies:

an adaptive regulatory and policy reform agenda

A CETEx Discussion Paper

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Executive summary

Cross-border climate finance for emerging markets and developing economies (EMDEs) falls far short of what is required for the net zero transition. Meeting global needs will demand roughly US$4.4 to US$6.7 trillion annually by 2030. EMDEs (excluding China) will need about US$2.4 trillion each year, of which around US$1 trillion must come from external sources, rising to US$1.3 trillion by 2035. Today, international flows cover only a fraction of this requirement. It is a longstanding debate in international macroeconomics that global savings do not naturally flow to EMDEs, where investment returns are higher and financing needs are greatest. This paper sets out a sequenced and pragmatic policy agenda to help close the gap.

Barriers to closing the investment gap are mutually reinforcing. Prudential settings penalise long-duration green assets in EMDEs. Sovereign rating methodologies amplify climate risk premiums and under-recognise risk-sharing by multilateral development banks (MDBs). Foreign exchange and convertibility risks are compounded by scarce long-tenor hedges. Additional barriers include fragmented taxonomies and disclosures, under-used guarantees and mandates that bias investors towards home or investment-grade exposures, raising pro-cyclical risk premiums. **Together, these constraints trap EMDEs in a cycle where high-risk premiums deter investment, which in turn limits market depth and reinforces risk perceptions.**

Mobilising and climate-aligning capital flows into EMDEs requires prudential regulatory and policy reforms that fully and adequately integrate climate risk. In the Basel framework, climate-related risk is treated as a driver of traditional risks such as credit, liquidity, operational and market risk. Progress has been made in encouraging banks and supervisors to recognise its impact, but current frameworks still misprice risk. **Basel III and related prudential rules must be recalibrated so that MDB guarantees, long-term green assets and resilience investments are recognised and no longer systematically penalised.** However, Basel III was conceived to curb financial exuberance, enhance asset transparency, and contain leverage, bubbles, and volatility—all factors that had previously undermined capital adequacy, liquidity, and financial stability, including in EMDEs. The regulatory reforms proposed here aim to redirect incentives towards long-term climate investment without weakening the prudential safeguards that underpin financial resilience. On the contrary, they seek to preserve the core principles of Basel III—sound capital, liquidity, and risk management—while adapting its application to support the financing of the climate transition.

Banks remain essential as originators, aggregators and intermediaries, and Basel III alignment is therefore critical to unlock their potential. **But banks alone cannot provide the scale of long-term patient capital required, given their business models and shorter lending horizons.** Recent pullbacks in climate lending illustrate these limits. The larger and more patient pools of capital sit with institutional investors – sovereign wealth funds, pensions and insurers – whose participation depends on risk reduction, credit enhancement and investable pipelines.

No single reform will close EMDEs' US$1.3 trillion annual climate finance gap. Only a coherent package – spanning prudential adjustments, MDB reforms, institutional investor mobilisation and predictable concessional anchors – can materially lower risk premiums and help shift capital at scale.

MDBs have a uniquely catalytic role, yet their potential remains underused. Beyond incremental reforms, MDBs must expand balance sheets through capital increases, operationalise callable capital and lower internal capital charges for guarantees. Recognition of MDB risk-sharing in prudential rules and by credit rating agencies (CRAs) is critical to ensure that guarantees provide real capital relief for banks and institutional investors alike. Public guarantees provided by MDBs, donors or bilateral agencies could also mobilise much larger flows if better designed and implemented.

New financial technologies can play a complementary role by reducing frictions and lowering costs. Artificial intelligence (AI)-enabled reporting and verification can improve data credibility; tokenisation and distributed ledger technology can make cash flows traceable and assets easier to aggregate; and smart contracts can enable automated disbursements and parametric insurance. Multi-central bank digital currency (CBDC) and real-time foreign exchange (FX) settlement platforms could also

shrink convertibility and at least settlement risks. These tools can enhance transparency, reduce transaction costs and strengthen confidence in EMDE climate investment.

Therefore, a sequenced regulatory and broader policy reform agenda could be:

Prudential regulation, supervision and disclosure (Part II.1): converge taxonomies and align disclosure with the International Sustainability Standards Board (ISSB); embed forward-looking climate stress tests into supervisory processes; and recalibrate Basel III capital, liquidity and leverage rules, including the treatment of MDB guarantees, to remove disincentives.

Central bank and reserve policies (Part II.2): open a structured debate on the bounded use of monetary and reserve toolkits, including making high-quality green assets eligible as collateral, exploring rigorously designed green asset purchase programmes, with strict green taxonomy, and allowing limited reserve diversification into pooled green bond vehicles, while preserving credibility on mandates and market neutrality.

International reforms to mobilise institutional capital (Part II.3): implement MDB reforms such as capital increases, recognition of callable capital and lower internal capital for guarantees; reform credit rating methodologies that unduly amplify EMDE premiums; establish pooled FX-hedging facilities and local currency windows; adapt non-bank rules to unlock investment by sovereign wealth funds, pensions and insurers; scale up green bonds via special purpose vehicles (SPVs) and credit enhancement; build and strengthen carbon market infrastructure, including Paris Accord Article 6 readiness; expand the use of decarbonised stock indices and extend them to EMDEs; and secure predictable concessional funding through strengthened climate funds and international levies.

Implementation and governance must emphasise sequencing, coalitions of the willing and interoperability. Without coordination across prudential, supervisory and standard-setting bodies, reforms will not be recognised consistently, and cross-border capital will remain constrained. This paper recognises that the proposed regulatory and policy reforms are necessary, but they are not a "silver bullet" for unlocking climate finance in EMDEs. In addition, these reforms will be most effective when aligned with climate-consistent macroeconomic frameworks adapted to the Green Swan era of persistent supply shocks.

The good news is that closing the external financing gap is feasible. Although this paper remains deliberately cautious—recognising that not all proposals will materialise as expected, at the estimated scale, or simultaneously—it demonstrates through numerical illustrations that there is, in principle, a solid basis for cautious optimism. With the proposed reforms in this paper, EMDEs (excluding China) could mobilise the US$1.3 trillion needed annually: US$650bn from private flows, US$300bn from MDBs, US$100bn from bilateral sources, US$50bn from South–South cooperation and US$200bn from concessional and innovative mechanisms. Institutional investors manage assets totalling around US$180 trillion; reallocating just 0.5% of these assets would cover the private finance need, while MDB balance sheet reform could unlock a further US$300bn. Bilateral and concessional flows could be scaled through climate fund replenishments, debt-for-nature swaps and solidarity levies. The breakdown is as follows.

1. International private finance (US$650bn/year):
    - Institutional investors manage over US$180 trillion; even a 0.5% reallocation could yield US$900bn, fully covering the gap
    - MDB-backed SPVs and guarantees lowering EMDE borrowing costs by ~200 basis points (bps) could crowd in US$100–200bn/year (≈15–30%)
    - Blended finance scaled 5× could add US$50bn/year (≈8%)
      → Coverage potential: mobilisation at scale could close or exceed the full gap.
2. MDB finance (US$300bn/year):
    - Recognition of 25–35% of callable capital could unlock US$100–150bn/year
    - A general capital increase (GCI) could add another US$100–150bn/year
      → Coverage potential: callable capital + GCI could cover ≈100% of the gap

3. **Bilateral finance (US$100bn/year):**
    - Scaling up the Green Climate Fund (GCF)/Climate Investment Funds (CIF) and bilateral channels to US$60–90bn/year (≈60–90%)
    - Debt-for-nature swaps could contribute US$10–20bn/year
      → Coverage potential: together, these can plausibly close the gap
4. **South–South cooperation (US$50bn/year):**
    - Article 6 carbon markets (US$40/$tCO_2$ price differential) could yield US$20–30bn/year
    - Multi-CBDC settlement systems and country platforms could mobilise another US$20–30bn/year
      → Coverage potential: ≈100% of the gap
5. **Other concessional/innovative finance (US$200bn/year):**
    - Global solidarity levies (aviation, shipping) could raise US$150–350bn/year (≈75–175%)
    - The Tropical Forest Forever Facility (TFFF) targets US$125bn (≈60%)
    - A Global Green Fund (levies + taxes) could add further predictable flows
      → Coverage potential: solidarity levies alone could close the gap; the combined measures exceed 200%
6. **Cross-cutting reserves (additional source):**
    - Reallocating by adequate diversification, 1–2% of global central bank reserves (~US$12 trillion) could generate US$120–240bn/year
      → Coverage potential: equivalent to ≈18–37% of the private finance gap or ≈100% of the MDB gap

This report shows that with the right reforms – mobilising institutional investors, unlocking MDB balance sheets, scaling bilateral funds, harnessing Article 6 markets and implementing solidarity levies – each of the identified financing gaps can realistically be closed by 2035. In some categories (private finance, concessional levies), the potential exceeds the gaps, suggesting that there is room to build buffers for adaptation and just transition needs. However, closing climate finance gaps is within reach, but only if governments, central banks, regulators and MDBs act decisively to implement a consistent and broad regulatory and policy agenda and provide predictable international revenues with concessional components.

Introduction and key messages

The problem of insufficient cross-border climate finance capital flows into emerging markets and developing economies (EMDEs) is well identified. It is a longstanding debate in international macroeconomics that global savings do not naturally flow to emerging and developing economies, where investment returns are higher and financing needs are greatest. The transition to net zero and climate-resilient development requires significant increases in foreign investment into EMDEs to decarbonise their economies and strengthen adaptation capacity, but current flows fall far short of the investment gap. These needs vary not only by the type of financing (public, private, market-based, or concessional), but also by country characteristics such as income level, credit rating and natural endowments.

EMDEs face significant external financing needs for both mitigating and adapting to climate change. The optimal balance between mitigation and adaptation varies by country, but the two present very different financing constraints. Mitigation typically requires subsidies to address externalities, whereas adaptation generally has better-aligned incentives – borrowers have a direct interest in adaptation – but is constrained more by country risk than by incentives to act. For many EMDEs, adaptation finance is critical to ensure growth and fiscal stability, yet faces acute underinvestment because resilience projects rarely generate predictable revenue streams. Concessional anchors, guarantees and insurance mechanisms are therefore indispensable complements to market-based mitigation finance. These differences suggest that mitigation and adaptation should be treated distinctly in financing strategies.

Over the past decade, the international financial architecture and regulatory community has begun to grapple with this challenge. The Basel Committee has issued guidance on climate risk, but largely through qualitative FAQs and voluntary disclosure frameworks. The Network for Greening the Financial System (NGFS) has advanced climate stress testing. The G20's Capital Adequacy Framework (CAF) review has proposed ways to optimise multilateral development bank (MDB) balance sheets. At the same time, initiatives such as the International Sustainability Standards Board (ISSB) standards and the EU–China Common Ground Taxonomy aim to bring greater convergence in disclosure and definitions.

Despite these efforts, progress remains limited. Cross-border flows to EMDEs have barely increased, MDB guarantees are still under-recognised in prudential frameworks, sovereign rating methodologies amplify rather than mitigate premiums and foreign exchange risk facilities remain scarce. In practice, the scale of mobilisation remains a fraction of what is needed. This paper therefore builds on existing efforts, but argues that a more comprehensive and sequenced reform agenda is required to address the structural barriers holding back cross-border climate finance.

The policy response must be multi-layered. Some reforms can be implemented within the mandates of central banks and regulators. Others will require more debate and consensus-building within this community, to ensure that measures are seen as robust and not as ad hoc measures that can increase the risk of "greenwashing". The greater the consensus, the more these policies can enable synergies with private sector financing. Beyond this, certain policy reforms lie outside the mandate of monetary and regulatory authorities and call for active involvement of governments, particularly Ministries of Finance. Technologies in the finance industry can also play a supportive role by sharing risk and lowering costs, thereby helping to trigger additional capital flows. Finally, governance and coordination mechanisms are essential: reforms must be credible, sequenced and clearly assigned to institutions that can deliver them.

The key messages are:

1. **The integration of climate risk into prudential regulation must improve**. Climate-related risk is not recognised as a risk per se in the Basel framework, but it is treated as a driver of the traditional financial risks, such as credit, liquidity, operational and market risk. Much has been done to encourage banks and supervisors to recognise this, but current frameworks can be further enhanced by making them more explicitly climate-aligned, in particular Basel III. Beyond the political challenges, the conceptual challenge lies in integrating climate-related risks and

incentives within a prudential framework originally conceived to safeguard short-term solvency and liquidity. Basel III was designed to strengthen capital adequacy, enhance transparency, and curb excessive leverage and volatility. The objective of the reforms proposed here is therefore not to dilute those safeguards but to extend their spirit: to ensure that prudential regulation continues to protect stability while also aligning financial incentives with the long-term risks and opportunities of the climate transition.

2. **Supportive regulation is necessary but not sufficient.** Converging taxonomies and aligning disclosures with those of the ISSB, embedding forward-looking climate stress tests into supervisory processes, and recalibrating Basel III capital, liquidity, and leverage rules—including the treatment of MDB guarantees to remove disincentives—are all necessary steps. However, these proposed regulatory and policy reforms are not a "silver bullet." Prudential improvements are important, but they must be complemented by efforts to mobilise institutional investors, expand the use of guarantees, and harness new financial technologies.

3. **Banks are indeed important but so are institutional investors.** Banks remain critical as originators, aggregators and intermediaries, and Basel III alignment is needed to unlock their potential. But banks alone cannot provide the scale of long-term patient capital required, given shorter lending horizons and recent pullbacks in climate lending. Institutional investors – sovereign wealth funds, pensions and insurers – hold much larger pools of capital, though their mobilisation depends on reducing risk premiums, reforming credit rating methodologies, expanding the use of decarbonised financial stock indices to EMDEs, and creating credible pipelines of investable projects.

4. **Public sector guarantees can unlock private flows.** MDBs, donors, or bilateral agencies could play a greater role in mobilising private capital flows, if better designed and implemented. Such guarantees could:

    - Correct regulatory mispricing and 'upgrade' assets to make them bank-financeable
    - Reduce residual risk by pooling financing across a wide set of EMDEs, offering diversification benefits, especially for physical climate risks
    - Develop investment-grade instruments, such as green bonds, that could attract institutional investors by establishing them as a recognised investable asset class

5. **Technology can complement and strengthen reforms.** Distributed ledger technologies (DLT), tokenisation, smart contracts, artificial intelligence (AI)-enabled monitoring and multi-central bank digital currency (CBDC) settlement platforms can be instrumental in producing risk-sharing mechanisms (and enhancing payment efficiency) that can mitigate risk even for low-income countries (LICs). These emerging technologies could also support financing by enabling granular tracking of climate-related outcomes, thereby reducing moral hazard and adverse selection. While such innovations may expand financing opportunities on the demand side, they are likely to serve as a complementary rather than a primary driver of change.

6. **Policy action must be sequenced and politically realistic.** Reforms should start with the 'low-hanging fruit' of regulatory improvements within the existing mandates of central banks and regulators and then move to less 'consensual' policies, while continuing to work on coordinating other reforms and policies with governments. Building community consensus under models of 'coalitions of the willing' is important to provide legitimacy for the relevant changes that can trigger additional private investment and make them effective. The greater the consensus on any reform or policy, the greater the incentive for investors to act and the greater the probability of a positive effect on capital flows. The suggested regulatory and policy reforms will be most effective when implemented within a climate-consistent set of macroeconomic policies, adapted to the Green Swan era of severe and persistent supply shocks.

7. **Closing the US$1.3 trillion external climate finance gap for EMDEs is feasible with the proposed package of reforms and measures.** While this paper remains cautious—acknowledging that not all proposals will materialise as expected or be implemented simultaneously—it shows through

numerical analysis that there is reason for measured optimism. The gap can be closed by roughly US$650bn via private flows, US$300bn from MDBs, US$100bn via bilateral flows, US$50bn via South–South flows and US$200bn from concessional or innovative sources. Institutional investors, with US$180 trillion in assets under management, could cover the private gap with an allocation of just 0.5%, especially if MDB guarantees, foreign exchange (FX) facilities and blended finance reduce risk premiums. MDBs could provide their share through recognition of 25–35% of callable capital and a general capital increase (GCI). Bilateral flows could double or treble via scaling of the Green Climate Fund (GCF) or Climate Investment Funds (CIF), complemented by debt-for-nature swaps. South–South contributions could be mobilised through Article 6 carbon markets and digital FX platforms. Concessional anchors – including global solidarity levies on aviation and shipping (US$150–350bn annually), facilities like the Tropical Forest Forever (TFFF) (US$125bn target) and a Global Green Fund – could more than cover the concessional gap. In parallel, diversifying just 1–2% of the world's US$12 trillion in central bank reserves would unlock an additional US$120–240bn annually. Together, these reforms show that with political will and regulatory coordination, closing EMDE climate finance gaps is within reach.

Finally, **this paper assumes that normal domestic and global macroeconomic conditions hold, and changes in either are outside its scope.** In particular, we do not address local and global macroeconomic dynamics, well-known push and pull factors driving capital flows, or the role of global shocks and country-specific policy developments that may alter risk perceptions. That said, we acknowledge that the global financial system is undergoing a period of redefinition that will affect capital flows, including those among advanced economies (AEs). There are potential changes in relative country risk premiums that will affect the traditional role of US debt instruments as a global 'zero risk' benchmark and safe haven asset. Recent volatility in US Treasury markets, linked to trade tensions, policy uncertainty and erratic policy communication under the current administration, suggests that the perceived safety of this asset class is changing. Paradoxically, this reversal could work to the advantage of EMDEs, as it may narrow perceived risk differentials and thereby strengthen the relative attractiveness of climate-related investment opportunities in these economies.

Indeed, in EMDEs, vulnerabilities such as fiscal deficits, high debt, exchange rate volatility and policy uncertainty have long translated directly into higher risk premiums and steeper yield curves, with capital outflows intensifying during global stress. By contrast, AEs, especially the US, have traditionally benefited from a safe haven effect, with crises driving inflows into Treasuries, compressing term premiums and supporting the dollar. Recent episodes, however, suggest that this advantage is eroding. Policy unpredictability, fiscal drift and trade tensions under the Trump administration have pushed US yields higher in ways that resemble emerging market dynamics, somehow akin to the UK gilt sell-off under the 2022 Truss government. This convergence reduces the relative risk gap between EMDEs and AEs, which, if combined with credible reforms and transparent green investment pipelines, could improve the attractiveness of EMDE climate finance and help mobilise the flows needed for the transition.

This discussion is summarised in Appendix Box 3, but we set it aside in what follows.

Part I. The net zero investment gap in emerging markets and developing economies

I.1. The transition investment gap

I.1.1. Global investment gap for a net zero transition

Global investment requirements or needs for a net zero transition refer to the total capital needed worldwide – across energy, transport, buildings, industry and land use – to shift from carbon-intensive systems to low-carbon ones by mid-century. The global investment gap is the extra spending compared to a baseline where no climate action is taken (i.e. business-as-usual investment levels). See Box I.1.

Box I.1. Investment requirements or needs versus investment gap

1. **Investment requirements or needs**

Definition: The total amount of capital required to achieve specific climate goals – such as limiting global warming to 1.5°C, achieving net-zero emissions by 2050, or implementing nationally determined contributions (NDCs). It includes: (a) decarbonising energy systems (renewables, grids); (b) low-carbon transport and buildings; (c) adaptation infrastructure (e.g. flood defences); (d) nature-based solutions and land use changes.

Purpose: A benchmark for what must be mobilised – public and private – across all sectors and geographies to stay on a net-zero pathway.

2. **Investment gap or additional investment**

Definition: The shortfall between investment needs and actual/expected investment flows. It quantifies how much additional financing is required to meet the identified needs.

Calculated as: Investment needs – actual or projected investment = investment gap

3. **External investment gap**

Definition: The portion of the investment gap that must come from international sources as cross-border capital flows to EMDEs.

Purpose: A diagnostic tool highlighting where additional efforts are required – especially in emerging and developing economies (EMDEs), where the gap is largest.

To ensure coherence and comparability, this report adopts a single framing, described in Box I.1.

Another useful clarification upfront is that **total investment needs cover both mitigation and adaptation expenditures, which might require distinct financing architectures and coordination with national planning structures** (for example, Pisani and Mahfouz (2023) provide a fully quantified, coordinated, and detailed exercise for France).

For mitigation (aimed at reducing or avoiding greenhouse gas emissions), **the focus is on instruments that mobilise capital around predictable, bankable cash flows.** These include:

- Carbon revenue models
- Credit enhancement for utility-scale renewable assets
- Green bonds supported by recognition from credit rating agencies (CRAs) and MDBs
- Long-tenor power purchase agreements (PPAs), made investable through FX facilities that hedge currency risks. These are long-term contracts—often 10 to 25 years—between an electricity producer (such as a renewable energy project) and a buyer (usually a utility, government agency, or large corporation).

By contrast, for adaptation (aimed at reducing vulnerability and enhancing resilience to climate impacts), instruments typically lack predictable cash flows and rely on concessional anchors and de-risking structures such as guarantees, political risk insurance and resilience- or nature-focused investment vehicles. Indeed, the focus is on instruments that:

- Strengthen resilience and reduce vulnerability through financial, fiscal, and policy tools; contingent credit lines, adaptive budgeting, and social protection mechanisms; insurance and pooled resources channelled through country platforms to help resilience and crowd in private co-investment
- Mobilise finance for adaptation via resilience bonds, concessional funds, and climate-risk insurance
- Invest in climate-resilient infrastructure in key sectors such as water, agriculture, transport, and coastal protection
- Promote nature-based solutions like mangrove restoration and watershed management
- Enhance preparedness through early-warning systems, data platforms, and climate information services
- Integrate adaptation into national development planning to ensure long-term sustainability and equity

Estimates of the resources required for the transition vary, but they all point to the same conclusion: several trillion dollars in new investment will be needed every year, far beyond today's levels. This implies both a major reallocation of capital away from fossil fuels and a large increase in new spending on clean technologies, infrastructure and adaptation. Early estimates, such as those by the Energy Transitions Commission and McKinsey (2023) suggested that an additional US$3.5 trillion per year would be necessary to reach net zero by mid-century. More recent assessments place the figure significantly higher, as the scale of climate- and nature-related investment needs has become clearer.

The Independent High-Level Expert Group (IHLEG), for example, in its report ***Raising Ambition and Accelerating Delivery of Climate Finance*** (Bhattacharya et al., 2024), **estimates that global climate investment needs amount to US$6.3–6.7 trillion per year by 2030**, rising to US$8 trillion annually by 2035. The 2030 estimate is distributed as follows:

- US$2.7–2.8 trillion in AEs
- US$1.3–1.4 trillion in China
- US$2.3–2.5 trillion in EMDEs excluding China

BloombergNEF's *Energy Transition Investment Trends* report (BloombergNEF, 2025) reaches similar conclusions, projecting that an average of US$5.6 trillion per year will be required between 2025 and 2030 to remain aligned with a net zero pathway. Sector-specific analysis underscores the challenge: the **World Economic Forum's *Net Zero Industry Tracker*** (WEF, 2024) estimates that hard-to-abate

industries such as steel, cement, aluminium and shipping alone will need US$30 trillion by 2050, which is almost half of the additional capital needed globally, with the majority directed towards enabling infrastructure such as clean power and hydrogen.

Current flows remain far below this benchmark. According to **Climate Policy Initiative (CPI)**, in its ***Global Landscape of Climate Finance 2025*** (CPI, 2025), climate finance reached US$1.9 trillion in 2023 and is projected to exceed US$2 trillion in 2024, only representing around one-third of the levels required. Even under the lowest-needs scenarios, annual investment must at least double to US$4.4 trillion by 2030, and in more realistic scenarios it must treble or more.

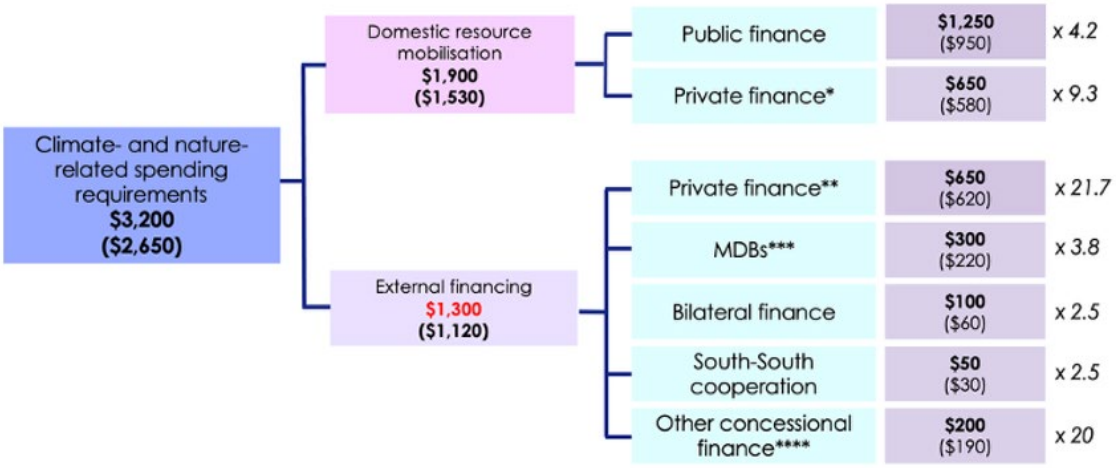
In summary, meeting global net zero targets requires scaling investment from today's US$2 trillion to roughly US$6–7 trillion annually by 2030, rising to US$8 trillion by 2035. Within this, EMDEs excluding China will need about US$2.3–2.5 trillion per year by 2030, rising to US$3.1–3.5 trillion by 2035. Because domestic resources cannot meet this scale, a large share must come from external finance, underscoring the urgency of scaling cross-border climate flows.

I.1.2 Investment needs of EMDEs (excluding China)

The global picture outlined above makes clear that EMDEs are central to the net zero transition. Building on the IHLEG report, Accelerating Sustainable Finance for Emerging Markets and Developing Economies (IHLEG, 2024), and the updated IHLEG 2025 estimates (forthcoming) (Figure I.1), the **climate- and nature-related spending requirements for EMDEs excluding China will amount to US$2.4 trillion per year by 2030,** while they are projected to reach US$3.2 trillion per year by 2035, compared with approximately US$2.65 trillion in 2023. **By 2035, around US$1.9 trillion would need to come from domestic resource mobilisation and US$1.3 trillion from external financing**.

The composition of these flows is as important as the headline figures. (See Box I.2). On the domestic side, public finance would have to rise to around **US$1.25 trillion** (from US$950bn today), while private finance would need to increase to **US$650bn** (from US$580bn). The challenge is particularly stark for private international capital. At present, such flows to EMDE climate investment are only about US$30bn annually. Meeting the 2035 requirement would require them to expand more than 20-fold to **US$650bn** each year. MDBs would have to treble their annual climate-related support to about **US$300bn** (from US$220bn), while bilateral finance would need to increase to **US$100bn** (from US$60bn). South–South cooperation would double to **US$50bn**, and other concessional finance – such as philanthropic or innovative sources – would need to rise modestly to **US$200bn** (from US$190bn).

Figure I.1 Total investment needs (and investment gap) for EMDEs excluding China ($ bn per year by 2035, increment fro current in parentheses)



Notes: *Includes household savings. **A significant proportion of this private finance would be directly and indirectly catalysed by MDBs, other development finance institutions and bilateral finance. ***Includes multilateral climate funds. ****Includes international flows from carbon markets and innovative finance including SDRs, debt swaps and Global Solidarity Levies.
Source: Independent High-Level Expert Group (IHLEG) revised estimates in Climate Finance 2025 report (forthcoming, presented at the COP30 Presidency economists' group meetings 2025)

Box I.2. Assumptions of IHLEG estimates for EMDE climate finance needs

The IHLEG's Third Report (2024) presents the widely cited figure on mobilising US$1 trillion per year of external climate finance for EMDEs (excluding China) by 2030, derived as follows:

1. Investment needs baseline

The total investment requirement of US$2.4 trillion per year by 2030 (rising to US$3.2 trillion by 2035) is taken from energy system and macroeconomic models produced by the IEA (Net Zero Roadmap 2023), the IPCC (AR6 Synthesis Report 2023) and the NGFS (Climate Scenarios for Central Banks and Supervisors 2022). These models provide estimates of mitigation, adaptation and natural capital investment compatible with a 1.5–2°C trajectory (IEA, 2023; IPCC, 2023; NGFS, 2022).

2. Domestic versus external split

The report assumes that approximately 60–65% of needs can be met domestically, extrapolating from observed trends in national climate investment in large EMDEs (e.g. India, Brazil, South Africa). This yields US$1.4 trillion/year in projected domestic finance by 2030, leaving a residual US$1 trillion/year external financing gap (IHLEG, 2024).

3. Allocation of the external gap

The external gap is then distributed across key actors using policy-driven assumptions rather than model outputs:

International private finance (US$450–500bn): Based on the potential of global institutional investors (≈US$180 trillion assets under management (AUM)), even a 0.25–0.5% reallocation could close the gap (IHLEG 2024).

MDBs (US$180–200bn): Scenarios from the G20 Independent Review of MDBs' Capital Adequacy Frameworks (2022) show that callable capital recognition and a general capital increase could roughly treble annual MDB flows (G20, 2022).

Bilateral donors (US$80–100bn): This figure assumes at least a doubling of current official development assistance (ODA)-type climate finance (≈US$40–45bn) (IHLEG, 2024).

South–South cooperation (US$50bn): This is a pragmatic target based on potential contributions from Gulf sovereign wealth funds, India, Brazil and Article 6 carbon market flows (IHLEG, 2024).

Concessional/innovative sources (US$150bn): This figure is founded on scenario-based estimates of potential revenues from global solidarity levies (airline ticket, maritime, financial transaction tax (FTT), crypto), SDR recycling, carbon markets, debt-for-nature swaps and philanthropy (UNCTAD, 2022; IMF, 2023; IHLEG, 2024).

4. Nature of the estimates

The IHLEG stresses that these are orders of magnitude and plausible targets – not precise forecasts. They combine model-based sectoral needs – mainly IEA (2023), IPCC (2023), NGFS (2022) - accounting assumptions (domestic versus external) and policy judgements (MDB reforms, private mobilisation, innovative levies). The US$1 trillion figure is thus not a single-model output but the result of a hybrid methodology: model-based needs, adjusted by domestic financing assumptions, and apportioned to actors through policy-driven scenarios. This provides a practical roadmap for negotiations, while acknowledging uncertainty and the need for sustained reform.

Sources: G20 (2022), IHLEG (2024), IEA (2023), IMF (2023), IPCC (2023), NGFS (2022), UNCTAD (2022)

The sectoral breakdown of needs further highlights the scale of the challenge. Of the US$2.4 trillion needed annually by 2030, the largest share – about US$1.6 trillion – is for clean energy infrastructure. A further US$250bn is required for adaptation and resilience, and another US$250bn for loss and damage. Around US$300bn would support natural capital and sustainable agriculture, while approximately US$40bn is needed to foster a just transition. Investments in transport and green industry are not listed separately, as they are embedded within the clean energy and industrial transformation components. In this spirit, and importantly, Boissinot (2022) emphasises the need to align all financial flows – not only funding directed to "green projects." That is, beyond allocating capital to renewable energy, the key question is whether all investments are consistent with a net-zero future.

I.1.3. Current climate finance flows, global, private–public and to EMDEs

Despite rapid growth in recent years, global climate finance flows remain far below required levels. According to CPI's *Global Landscape of Climate Finance 2025* (CPI, 2025), climate-related investment reached an all-time high of US$1.9 trillion in 2023 and is estimated to have exceeded US$2 trillion in 2024, marking a 26% increase since 2021. A notable shift occurred in 2023, when public flows declined by about 8% and private climate finance surpassed public finance globally for the first time, contributing more than US$1 trillion. Yet almost 80% of these flows were mobilised domestically, primarily in AEs.

By contrast, **international climate finance to EMDEs stood at only US$196bn in 2023,** and was still dominated by public sources (78%), underscoring how little of the surge in global private capital is reaching developing economies.

Mitigation accounted for the overwhelming majority of global flows (US$1.78 trillion), while adaptation finance remained very small at just US$65bn, and dual-benefit finance stood at US$58bn. This imbalance underscores both the growing role of private capital and the persistent underfunding of adaptation in EMDEs.

Comparison with official development assistance (general financing)

The gap becomes even clearer when compared with broader resource transfers. According to the Organisation for Economic Co-operation and Development (OECD) (OECD, 2023), official development assistance (ODA) from Development Assistance Committee (DAC) countries reached a record US$223.3bn in 2023, equivalent to 0.37% of donors' combined gross national income. The US was the largest donor, providing US$65bn, followed by Germany, Japan, the UK and France. Yet most of this was not climate-targeted. In 2024, ODA fell to US$212.1bn, a 7.1% real decline, with cuts in humanitarian assistance (-9.6%), support to Ukraine (-16.7%) and contributions to multilateral organisations (-10.9%) (OECD, 2025). Bilateral aid also contracted by 5.8%. Spending on 'in-donor' refugee costs fell by 17.3% but still accounted for US$27.8bn, or 13.1% of total ODA. As a share of national income, ODA dropped to 0.33% of combined gross national income (GNI), down from 0.37% in 2023. Only four countries – Norway, Luxembourg, Sweden and Denmark – continue to meet the UN's 0.7% target.

This downward trend highlights both the scarcity and fragility of concessional finance.

Comparison with foreign direct investment to developing economies (general financing)

According to the World Bank (2025), foreign direct investment (FDI) inflows to developing economies fell to US$435bn in 2023, the lowest level since 2005, while high-income economies received only US$336bn. For developing economies, FDI represented just 2.3% of GDP in 2023, about half the share recorded in 2008. Nearly 90% of FDI flowing into developing economies over the past decade originated from AEs, and two-thirds went to just 10 large recipients, including China, Brazil and India, whereas most poorer EMDEs attracted negligible amounts.

This pattern reinforces the broader financing gap: if general FDI flows are already limited and concentrated, mobilising large-scale climate-aligned investment into smaller and poorer EMDEs will require far stronger risk-sharing mechanisms and targeted international support.

I.1.4. Policy implications: the underfunding of climate flows

By 2035, EMDEs excluding China will require about US$1.3 trillion per year in external climate finance. Yet in 2023, they only received US$196bn, equivalent to just 15% of the identified need. Other international flows, while larger in volume, do not address the climate gap: ODA (US$223bn in 2023, falling to US$212bn in 2024) and FDI (US$435bn in 2023) serve general development or commercial purposes rather than climate-specific needs, and both are highly constrained.

As shown in Table I.1, even climate-related ODA flows from major donors remain modest compared to EMDEs' external financing needs. The EU's public climate finance has averaged €23–29bn annually in recent years, while the US committed around US$9–10bn in 2023, China reported an average of US$3.8bn per year over 2013–2022 and the UK has provided roughly GBP 1.8bn per year more recently. Even when adding cumulative or mobilised amounts, these flows cover only a tiny share of the US$1.3 trillion annual external climate finance requirement for EMDEs excluding China by 2035. In percentage terms, combined donor ODA for climate on the order of tens of billions annually, represents well under 5% of the external financing gap. Box I.3 provides a snapshot of the main providers of international climate finance and their differing approaches, underscoring both the scale and the limits of current flows.

This comparison underscores two messages. First, current international climate finance leaves EMDEs systematically underfunded. Second, reliance on traditional channels such as ODA and FDI will not close the gap: both are too small, too uncertain and insufficiently targeted. Closing the gap requires new and scalable measures that can leverage far larger volumes of private and institutional capital, including stronger MDB mobilisation, expanded guarantee use, pooled FX risk facilities and predictable concessional anchors.

Box I.3. Key providers of climate finance flows

EU leadership: The EU remains the biggest provider of public climate finance to EMDEs. Contributions rose from €23.39bn in 2020 to €28.6bn in 2023.

US: US commitments increased from US$1.5bn in FY 2021 to US$5.8bn in FY 2022. They were expected to reach US$9.5bn in FY 2023, though confirmation is limited. Adaptation is a growing focus, with US$2.3bn earmarked for it in FY 2022.

China: China is playing a larger role. The Center for Global Development estimates it provided about US$3.8bn a year between 2013 and 2022, adding up to US$34.3bn by 2021, mostly through loans for energy and transport. The government itself says it has mobilised over ¥177bn (=US$24.5bn) since 2016. However, most of this is loan-based, not grant-equivalent.

UK: The UK has pledged £11.6bn (=US$14.7bn) over 2021–2026 in International Climate Finance (ICF). Annual spending reached a record £1.82bn (=US$2.3bn) in 2023–2024, but disbursements need to rise further to meet the pledge. UK reporting also highlights mobilisation: since 2011, ICF interventions have leveraged £8.4bn in public finance and £7.9bn in private finance.

Different modalities: The EU, US and UK mainly use grants, concessional loans, or direct budget support, often through ODA or EU institutions. China's approach is more of a mix: bilateral public finance, multilateral funds and export credits. Only about 3% of China's climate finance qualifies as grant-equivalent.

Sectoral focus: Sectoral data is not always clear, but when it is, the patterns are quite distinct. EU institutions and Chinese banks put a lot into renewables and energy efficiency, while the US has emphasised adaptation (e.g. the PREPARE initiative). Research suggests that more than half of China's money goes into energy projects, especially solar, hydro and wind.

Table Box I.3 Magnitudes of ODA, FDI and climate finance flows to EMDEs

Flow type	Year	Amount (US$ bn)
ODA	2023	223.3
ODA	2024	212.1
FDI flows to developing economies	2023	435.0
International climate finance to EMDEs	2023	196.0

Sources: CPI (2025), OECD (2025a, 2025b), World Bank (2025)

Table I.1 ODA climate flows from major donors

Year	Donor	Type of financing flow	Instrumental channel	Currency	Amount (bn)
2020	EU	Public climate finance (grants and loans)	Bilateral ODA/Grants & loans via EU budget and EIB	EUR	23.39
2021	EU	Public climate finance (grants and loans)	Bilateral ODA/Grants & loans via EU budget and EIB	EUR	23.04
2022	EU	Public climate finance (total)	Bilateral ODA/Grants & loans via EU budget and EIB	EUR	28.50
2022	EIB	Direct investment in new or existing projects (loans)	Multilateral development bank (EIB)	EUR	2.52
2023	EU	Public climate finance (total)	Bilateral ODA/Grants & loans via EU institutions and EIB	EUR	28.60
2021	US	Public climate finance (budgetary support and investments)	Bilateral ODA (USAID, Department of State)	USD	1.50
2022	US	Public climate finance (budgetary support and investments)	Bilateral ODA (USAID, Department of State)	USD	5.80
2022	US	Budgetary support (adaptation finance)	Bilateral ODA (USAID and other US agencies)	USD	2.30
2023	US	Public climate finance (planned/scale-up)	Bilateral ODA (USAID, Department of State)	USD	9.50
2013–2022	China	Climate-related finance (average annual estimate)	Bilateral, multilateral and export credits	USD	3.80
2023	China	Direct investment in new projects (loans)	National development banks (CHEXIM)	USD	0.50
2016	China	Climate-related finance (cumulative)	Various bilateral and regional mechanisms	USD	24.50
2013–2021	China	Climate-related finance (cumulative)	Bilateral, multilateral and export credits	USD	34.30
2023-2024	UK	International climate finance (budgetary support)	Bilateral ODA, Multilateral (ICF)	GBP	1.82
2011-2023 (cumulative)	UK	International climate finance (mobilised public finance)	Bilateral/leveraged	GBP	8.41
2011-2023 (cumulative)	UK	International climate finance (mobilised private finance)	Leveraged private capital	GBP	7.85

Sources: Asia Society Policy Institute (2023), Boston University Global Development Policy Center (2024), CAN Europe (2021), Carbon Brief (2024), Council of the European Union (2023), Dialogue Earth (2024), ECDPM (2025), European Commission (2023, 2024), Executive Office of the President of the United States (2023), UK Government (2024)

I.2. Barriers to closing the investment gap: why capital isn't flowing where it is needed

The comparisons in Section I.1 underscore the scale of underfunding and the structural misalignment of global capital, highlighting the urgency of scaling up international climate finance. While EMDEs face investment needs of US$2.4 trillion annually by 2030, international flows amounted to just US$196bn in 2023 – less than 10% of the requirement. The persistence of this gap is not due to a lack of global savings, but to a series to barriers that prevent capital from flowing to where it is most needed.

These barriers echo a longstanding issue in international macroeconomics related to the 'old' Feldstein–Horioka puzzle (see Appendix Box 1): **even with ostensibly open and integrated capital markets, investment is still financed largely at home** because cross-border frictions keep global savings from flowing to where returns and social value are high. In climate finance to EMDEs, prudential risk weights and supervisory practices raise the cost of bank intermediation; sovereign rating methodologies compound climate-related premiums; FX and convertibility risks – compounded by scarce long-tenor hedges – erode project returns; fragmented taxonomies and disclosures raise compliance costs; guarantees and political risk insurance are underused; and institutional mandates/home bias steer portfolios towards investment-grade domestic assets. Together, these mechanisms depress risk-sharing and make international flows pro-cyclical, reproducing the empirical pattern that domestic saving and investment move together and keeping green capital from reaching EMDE projects at scale.

I.2.1. Prudential regulation and supervisory practices

The literature highlights several recurring themes. First, **political and technical hurdles** remain significant: integrating climate factors into the one-year capital adequacy horizon poses conceptual difficulties, and poorly designed incentives risk encouraging 'greenwashing' rather than genuine risk reduction.

Second, **there is broad recognition of the need for reform**. Proposals range from explicitly introducing 'green differentiated capital requirements' to more sophisticated calibrations based on empirical loss data. Yet, so far, the Bank for International Settlements (BIS) Basel Committee on Banking Supervision (BCBS) has limited itself to voluntary disclosure guidance and Frequently Asked Questions (FAQs) on climate risk management, leaving banks to determine how best to integrate climate considerations into credit, market, operational and liquidity risk frameworks.

A third recurring theme is the constraint imposed on EMDEs by high capital charges under Basel III. Projects in EMDEs are often deemed high risk and assigned 100% or higher risk weights, making lending more capital intensive and dampening banks' appetite to finance renewables or climate-resilient infrastructure. Several authors highlight that this misalignment is problematic: renewable energy and energy efficiency projects tend to exhibit lower default rates than fossil fuel investments, a reality not yet reflected in current prudential rules (see Rojas-Suarez, 2025). In addition to the IHLEG ongoing work for the COP30, and the Circle of Ministers of Finance, the Paris Pact for People and the Planet EPG group is also addressing this issue.

Indeed, prudential regulation as currently applied creates barriers to climate finance by requiring banks to hold higher capital against investments in developing countries, where climate projects are often assigned higher risk weights due to sovereign and project risks. The result is that cross-border climate bank lending becomes more expensive and less attractive, limiting the role that financial institutions can play in scaling EMDE climate finance.

I.2.2. Sovereign credit ratings

Sovereign credit ratings by CRAs directly impact the cost and availability of climate finance in EMDEs. **Lower ratings (meaning higher risk) raise borrowing costs and reduce investor appetite for climate projects, and climate vulnerability is increasingly recognised as a factor affecting sovereign creditworthiness.**

The literature identifies several recurring themes. Empirical studies demonstrate that countries highly exposed to climate risks face higher borrowing costs, with a 2018 UN Environment Programme–Imperial College–SOAS report estimating that climate vulnerability can add roughly 1–1.5 percentage points to the cost of capital for a country. Researchers also project that rising temperatures and associated physical damages could lead to widespread sovereign credit rating downgrades by 2030, carrying major fiscal consequences for climate-vulnerable economies. In response, the literature stresses the policy need for greater reliance on concessional finance and debt relief to mitigate this climate risk premium, alongside greater transparency from CRAs on how climate factors are incorporated into their assessments.

I.2.3. Currency and convertibility

Currency and convertibility risks deter climate finance flows by creating uncertainty about investors' ability to repatriate returns. **Exchange rate volatility, capital controls and currency instability can significantly erode project viability.**

The literature repeatedly underscores the mismatch between local currency revenues and hard currency debt in climate projects: while returns are often denominated in local currencies, financing is typically in dollars or euros, exposing investors to volatile exchange rates and convertibility restrictions that undermine long-term returns and deter capital commitments. A second recurring theme is the high cost and limited availability of hedging instruments. In many EMDEs, long-maturity hedging (10–20 years) is either prohibitively expensive or unavailable, adding several percentage points to financing costs. To address these barriers, reports propose the creation of exchange rate coverage facilities, an expansion of local currency lending by multilateral development banks and donors, and the pooling of currency risk at the portfolio level.

I.2.4. Regulatory fragmentation and uncertainty

Fragmented regulatory frameworks create significant barriers to climate finance by imposing inconsistent standards, high compliance costs and uncertainty across jurisdictions. Investors face difficulties navigating different regulatory requirements, which discourages cross-border flows.

The literature highlights that differing taxonomies and disclosure frameworks across jurisdictions, often described as an 'alphabet soup' of standards, raise compliance costs and complicate comparability. At the same time, there is no consensus on how climate risk should be treated in prudential regulation: while the Basel Committee acknowledges climate risk as a driver of existing risk categories, it has avoided mandating new capital requirements, leaving banks and supervisors to interpret integration individually, resulting in patchwork implementation. Consequently, numerous reports stress the urgent need for harmonisation through internationally consistent definitions, reporting standards and supervisory expectations in order to reduce friction and strengthen investor confidence.

I.2.5. Limited de-risking instruments (guarantees and related measures)

The limited availability of de-risking instruments (such as guarantees, political risk insurance and blended-finance mechanisms) **constrains climate finance flows by leaving investors exposed to risks that could otherwise be mitigated.**

The literature stresses the underutilisation of guarantees in climate finance. While MDBs, donors and bilateral agencies do provide guarantees and political risk insurance, their use remains limited compared to demand. Barriers include non-standardised documentation, complex structures and a lack of regulatory recognition. Evidence shows that well-designed guarantees can mobilise significant multiples of private capital, yet existing programmes achieve only modest leverage ratios because they remain concentrated in a narrow set of countries and sectors. In light of this, many studies call for scaling up of guarantee schemes, streamlining of eligibility criteria and formal recognition of MDB guarantees by prudential frameworks, allowing banks to benefit from capital relief and extend more finance to EMDEs.

I.2.6. Institutional biases, mandates and lack of international regulatory coordination

Institutional biases in developed country financial institutions often undervalue climate projects in developing countries, while restrictive mandates may bar investment in certain jurisdictions or sectors. Uncoordinated sustainable finance approaches further exacerbate these barriers.

The literature consistently points to structural barriers that restrict capital flows into climate projects in EMDEs. A strong home bias persists among investors in AEs, whose mandates and risk management practices typically favour investment-grade assets and familiar markets, leaving EMDE projects – often lower rated or lacking track records – at a disadvantage. Compounding this, fragmentation also plays a major role: the proliferation of divergent taxonomies, disclosure frameworks and investment guidelines has created the above-mentioned alphabet soup of standards. These inconsistencies increase compliance costs, generate uncertainty and reduce comparability, discouraging cross-border flows.

To overcome these barriers, scholars often propose the establishment of a global green investment protocol to harmonise standards, align mandates and reduce institutional frictions. Others highlight the importance of reforming the governance of international climate finance to ensure fairer representation for EMDEs and clearer mandates for institutions tasked with mobilising capital at scale.

I.2.7. Cross-cutting observations and typology of developing countries and specific constraints

The constraints described above are not uniform across all EMDEs. They vary by level of development – often proxied by per capita income and sovereign risk rating, which usually determine access to global capital markets – as well as by level of endowment, which can serve as financial collateral. Resource endowments can mitigate the intrinsic risk of an asset class and make projects more attractive to potential investors. In practice, investment barriers are most severe for low income countries (LICs) without strong collateral or established market access, while middle-income countries (MICs) with higher ratings or resource endowments may attract more private flows. See Table I.2 for a typology of developing countries and specific constraints.

Recognising these distinctions is critical: a one-size-fits-all policy approach would risk overlooking the differentiated financing needs and constraints across the EMDE spectrum. Tailored strategies are therefore essential to ensure that reforms and instruments – whether regulatory, guarantee-based, or concessional – are effective across diverse country contexts.

Table I.2. Typology of EMDEs and specific constraints

Country type	Characteristics	Key financial constraints
Middle-Income Countries (above Investment Grade)	Market access, exposure to global volatility	Risk aversion, narrow greenium, macro shocks
Middle-Income Countries (below Investment Grade)	Limited access, excluded from IG mandates	Credit spreads, FX risk, short duration of instruments
Low-Income Countries (LICs) with collateral	Access via natural resources or public assets	Commodity price volatility, reduced fiscal space
Low-Income Countries (LICs) without collateral	No market access, dependent on ODA	Weak institutions, absorption limits, high perceived project risk

Source: Author

Therefore, across these barriers, common recommendations include reforming regulatory frameworks to account for climate risk, improving data and disclosure standards, scaling up de-risking mechanisms and enhancing coordination among donors, MDBs and local institutions. A recurring message in the literature is clear: without global alignment and stronger risk-sharing instruments, high capital costs and uncertainty will continue to constrain climate finance flows to EMDEs. The next part of this report sets out a sequenced and pragmatic package of reforms to address these challenges.

Part II. Policy reforms to enhance cross-border climate finance

Policy actions must be multi-pronged and politically realistic. Reforms should begin with the 'low-hanging fruit' of regulatory improvements that lie within the existing mandates of central banks, supervisors and financial regulators and then extend to less consensual measures requiring broader political debate, while coordinating with governments on fiscal and international reforms (see Appendix 1).

Building consensus within 'coalitions of the willing' – for example, among the central banks – can provide legitimacy and momentum. The stronger the consensus on any reform, the greater the incentive for investors to act and the greater the probability of positive effects on capital flows, whether through reduced uncertainty, improved expectations, or behavioural change. Various expert groups such as the Independent High-Level Expert Group, the group convened by the COP30 President, the Circle of Ministers of Finance under the Brazilian G20 Presidency, the group 4P for Paris Pact for People and the Planet, the ECF team for the Global Solidarity Levies task force are all exploring related issues to contribute to this reform agenda. These on-going efforts are part of a long process of international climate analytical work and diplomatic negotiations illustrating that climate change has become one of the most polarising issues of our time (Tubiana and Guérin, 2025).

II.1 Prudential regulation, supervision and disclosure

II.1.1. Improve climate data, taxonomies and disclosure

Policy reforms in sustainable finance should prioritise convergence and interoperability across jurisdictions. National and regional differences in the definition of green assets – such as between the EU taxonomy, Association of Southeast Asian Nations (ASEAN) frameworks and China's approach – along with divergent disclosure and prudential requirements under the International Sustainability Standards Board (ISSB) and the Basel Committee on Banking Supervision (BCBS) – complicate cross-border investment and raise transaction costs. To address this, reforms should promote alignment around international disclosure standards such as those of the ISSB (which now integrate the TCFD recommendations) and greater coherence with prudential frameworks developed by the BCBS, while fostering mutual recognition of taxonomy interoperability through initiatives such as the EU–ASEAN and EU–China Common Ground Taxonomy. In parallel, emerging platforms for sustainable finance, such as Project Gaia (see Box II.1), should be developed to coordinate rulemaking and extract verifiable key performance indicators from company reports. Harnessing the potential of generative AI and large language models (LLMs) could further improve transparency and comparability.

II.1.2. Enhance climate risk stress testing and supervision

Enhancing climate risk stress testing and supervision requires a shift towards more forward-looking and comprehensive approaches. Regulators should mandate the use of climate scenario stress tests with longer time horizons, aligned with NGFS guidelines, as these can help reduce information asymmetries, improve risk pricing and incentivise green investment – particularly in developing countries. A further priority is the integration of climate risk into the Internal Capital Adequacy Assessment Process (ICAAP), transforming it from a backward-looking compliance exercise into a forward-looking strategic tool that strengthens banks' capital bases, informs risk-based pricing and builds investor confidence. Supervisors should closely monitor systemic transition risk exposures, such as those arising from carbon pricing, abrupt policy changes, or technological disruptions, which can affect entire sectors like energy, transport and heavy industry, and trigger correlated losses across the financial system. Leveraging digital tools to track these risks in real time would prevent mispricing, enhance investor confidence and improve capital allocation, with direct benefits for scaling climate investment in EMDEs.

Box II.1. Project Gaia: towards a digital infrastructure for sustainable finance

Project Gaia is an initiative of the BIS Innovation Hub, developed in partnership with the Deutsche Bundesbank, the European Central Bank, and later the Bank of Spain, to explore how artificial intelligence can improve access to climate-related financial data.

Its first phase developed a proof of concept demonstrating that large language models (LLMs) can automatically extract and structure climate-related indicators, such as total emissions, green bond issuance, and net-zero commitments, from publicly available corporate reports. This proof of concept enabled faster and more consistent analysis of climate-related financial risks, helping central banks and supervisors compare disclosures across jurisdictions with differing standards and definitions.

The project's second phase is now developing a robust and scalable data-extraction pipeline, designed to keep pace with evolving AI capabilities and remain adaptable for broader central bank use. Gaia aims to make data extraction reliable, versatile, and easily deployable across the financial sector.

Looking ahead, Project Gaia could serve as a foundation for a broader public digital infrastructure for sustainable finance. If scaled up, it could enable interoperability across taxonomies (EU, ASEAN, China's Common Ground Taxonomy) and disclosure frameworks (ISSB, TCFD), addressing today's fragmentation in climate data. By providing verifiable, machine-readable information as a public good, such a system could enhance transparency, reduce transaction costs, and ultimately lower the cost of capital for climate-aligned investment, especially in EMDEs.

Source: BIS (2023)

II.1.3. Adjust prudential regulation for climate finance

Prudential regulation can be improved to better reflect climate-related risks. While climate-related risk is not recognised in the Basel framework as a risk per se, it is treated as a driver of traditional financial risks that are recognised – credit, liquidity, operational and market. There is good will for improvement, since much has been done to encourage banks and supervisors to recognise the impact of climate-related risk in the banking activities (e.g. systemic risk to financial stability in the form of 'green swans'; see Bolton et al., 2020).[1] However, current frameworks still fail to align risk treatment with climate priorities. For example, the treatment of illiquidity and maturity mismatch risk for MDB-backed long-term infrastructure needs to be improved, while for internationally active banks it necessary to address the liquidity coverage ratio (LCR) and net stable funding ratio (NSFR) disincentives for long-term lending and the holding of illiquid green assets (e.g. solar infrastructure, resilience projects).

[1] The concept of "green swan" was coined at the Bank for International Settlements (BIS) in The Green Swan: Central Banking and Financial Stability in the Age of Climate Change (2020). Related to Nassim Nicholas Taleb's concept of the "black swan," it differs by being not a tail-of-distribution, rare, event but being an inevitable climate-related permanent systemic 'super shock' combining sudden events (natural disasters) with slow-moving, gradual phenomena (sea level rise, desertification) with significant macroeconomic effects. Public awareness is growing with the frequency of extreme weather events and of ecological tipping points – whose systemic financial consequences are already foreseeable. For central banks, this implies integrating climate risks into stress testing, scenario analysis, and financial stability frameworks, acknowledging climate change as a core determinant of macro-financial stability. In other words, it means acknowledging that climate is now a key determinant of macroeconomic and financial stability and that it affects central banks' ability to fulfil their mandates. This, in turn, creates an obligation to act.

Such improvements can reduce the tendency to underprice climate risk, especially transition risk in brown assets; to overprice the risk of climate-aligned assets, especially in developing countries; and to misallocate credit away from long-duration green investment.

Enhancements could thus include:

- Reassess risk weights (RWs) for climate-aligned assets:
    - (a) Reassess risk-weighted assets (RWAs) for climate-aligned long-term infrastructure projects with concessional or blended finance components, especially when co-financed by MDBs.
    - (b) Open a discussion on adjusting risk weights according to the carbon footprint of financial assets. This would involve assessing the potential benefits – such as providing explicit regulatory incentives and lowering the cost of capital for genuinely green projects – against potential risks, including the possibility of "greenwashing assets." Such an approach requires first a careful debate on these trade-offs and, crucially, a credible and consistent taxonomy to measure rigorously the carbon content of assets in order eventually to be able to unequivocally distinguish "green" from "brown" assets; otherwise, it could fuel "green bubbles" and heighten uncertainty and financial opportunism in transition financing.[2]
- Reassess liquidity requirements (LCR and NSFR) for systemically important financial institutions (SIFIs), e.g. banks, insurance companies, or other financial institutions whose failure might trigger a financial crisis ('too big to fail'):
    - (a) Broaden eligible collateral in the LCR. Include high-quality green bonds (e.g. sovereign green bonds, MDB bonds, or regulated green asset-backed securities - ABS) as level 2A/2B assets for the purpose of liquidity calculation.[3]
    - (b) Study the inclusion of green project loans in the NSFR as stable funding if supported by long-term institutional capital, or embedded in PPPs or MDB de-risking structures.
- Reassess leverage ratio and exposure:
    - (a) Implement differentiated treatment of certain low-risk, publicly guaranteed green loans in leverage exposure denominator.
    - (b) Improve recognition of synthetic risk transfers: For example, credit insurance or guarantee tranching in climate blended finance. Can be important for smaller domestic banks in EMDEs, where there is no proportionality regulation, that face balance sheet constraints but want to originate green credit.
- Treatment of MDB guarantees by adjusting risk factors for guarantees from MDBs:
    - Adjust credit conversion factors and RWAs to reflect partial or full de-risking by public entities. Special attention is needed to increase the uptake of green guarantees in developing countries by addressing regulatory constraints within the Basel III framework. A key issue is the strict 'timeliness' condition (condition 4) for guarantees to qualify for capital relief, which currently disqualifies many MDB-issued guarantees that are subject

[2] Indeed, differentiated "green" capital requirements can sometimes have unintended effects, for instance, crowding out clean lending if applied indiscriminately, underscoring the need for careful calibration and empirical grounding (Oehmke and Opp, 2025).

[3] Under the Basel III Liquidity Coverage Ratio (LCR) framework, banks are required to hold a buffer of High-Quality Liquid Assets (HQLA) to withstand short-term liquidity stress. These assets are classified into: (i) Level 1 assets (highest quality, e.g., cash, central bank reserves, sovereign bonds); (ii) Level 2A and 2B assets (still liquid but with slightly higher haircuts and limits). Recognizing MDB bonds (issued by Multilateral Development Banks) or regulated green asset-backed securities (ABS) as Level 2A/2B assets would mean that banks could count them towards their mandatory liquidity buffers.

to longer payout or claims processes. Regulators could consider adopting a risk-based interpretation of this condition to reflect the high credit quality and reliability of MDB guarantees.

- In parallel, banking supervisors should develop methodologies allowing banks to recognise capital relief from partial and sometimes complex MDB guarantees under the standardised approach to credit risk – ensuring consistency with the Basel framework.

Evidence from the Global Emerging Markets Risk Database (GEMs) Consortium (2024) confirms that MDB-backed and sovereign-linked assets consistently show lower default rates and higher recoveries than market premiums suggest. Yet these outcomes are not reflected in Basel risk-weighting, reinforcing the case for recalibrating the treatment of long-duration green assets and recognising MDB guarantees more fully.

In practice, these reforms mainly affect systemically important financial institutions (or SIFIs) in developed countries. However, to the extent that they free up capital, they can create incentives for increased lending to climate-related projects globally. Further, prudential fine-tuning can make banks more effective as originators, improving warehousing and aggregation into vehicles that institutional investors will ultimately buy.

In summary, Basel III adjustments are needed and can contribute to more accurate risk pricing in the financing of the transition for EMDEs. The measures proposed above should be carefully considered and debated, as poorly designed or ad hoc changes to Basel III risk creating "green financial repression" or fuelling greenwashing. Any adjustments must be analytically robust, evidence-based, and internationally coordinated to avoid fragmentation. Going forward, these proposed prudential adjustments could also inform ongoing international work on the monitoring of Basel III implementation. Initiatives led by the Financial Stability Board and Basel Committee could provide useful platforms to assess how such reforms are applied across jurisdictions and to identify opportunities for harmonisation.

It is also important to recognise that, even with these improvements, the centre of gravity for scale currently sits with non-bank institutional capital (sovereign wealth funds, pensions, insurers), which will be examined in Section II.3.

II.2. Central bank and reserve policies

Many of the policy reforms discussed in this section remain contentious within the community of central banks, supervisors and regulators. Critics say that some are beyond current mandates, can create more distortions and go beyond established practices, departing from the principle of market neutrality for monetary policy or entailing taking unwarranted or excessive risks. Supporters respond that such measures could in fact enhance the fulfilment of current mandates (especially financial stability) and were actually used, one way or another, during the emergency of the Covid-19 crisis. Therefore, if climate can be seen as an even more severe negative supply shock (also with large negative demand consequences), termed, as mentioned before as a 'green swan' by the BIS, with a different and longer time horizon, there are grounds to suggest that these policies should at least be discussed in the community.

II.2.1. Leverage central bank monetary and reserve operations

Leveraging central bank monetary policy operations and reserve management offers a powerful set of measures to support market development and reduce risk premiums for green financial instruments. This approach includes several complementary levers. First, central banks can incorporate green bonds into the pool of eligible collateral for refinancing and lending operations – such as repos or standing facilities – as well their own pension fund portfolios, thereby strengthening demand and liquidity for such assets. Second, they can apply preferential risk-weighted haircuts or adopt green collateral frameworks, rewarding climate-aligned assets and lowering financing costs. Finally, central banks can deploy signal-based policies, using climate-adjusted risk frameworks, disclosures and stress tests to steer market behaviour and promote the accurate pricing of climate-related risks.

Together, these measures would not only enhance the role of central banks in supporting the net zero transition but also create more stable and attractive conditions for investors.

II.2.2. Implement green asset purchase programmes

Green asset purchase programmes would involve central banks or public financial institutions acquiring climate-aligned financial assets at scale, inspired by the logic of quantitative easing (QE) **but focused specifically on green or transition-compatible instruments**. Purchases could include sovereign or sub-sovereign green bonds, MDB-enhanced climate instruments, or sustainability-linked assets issued in both local and reserve currencies. Depending on risk appetite and legal issues, these purchases can be limited to each central bank's own sovereign or extend to others, provided they fulfil investment-grade criteria or other adequate eligibility criteria. Special emphasis could be placed on middle-income country (MIC) assets that incorporate risk-sharing features provided by MDBs or development finance institutions (DFIs), such as partial guarantees or credit enhancements, thereby lowering perceived risk and attracting broader market participation. To ensure credibility and avoid market distortions, these programmes would require rigorously designed rules governing asset eligibility, transparent pricing mechanisms and robust disclosure requirements. If properly implemented, green asset purchase programmes could provide strong signals to markets, reduce financing costs for climate projects and catalyse investment flows into priority sectors.

II.2.3. Allocate space in central bank reserves for green capital assets

Central banks and other official institutions could strengthen the role of reserves in supporting the net zero transition by allocating a defined share of foreign exchange holdings to green bond funds, such as the BIS Investment Pool (BISIP).[4] This reserve diversification into green pools is a modest, rules-based reallocation (eligibility, liquidity, safety), distinct from using reserves to backstop FX facilities. This would involve setting clear eligibility conditions – liquidity, return and safety – while also considering the type of guarantees attached, whether provided by MDBs or other public entities. In parallel, reserve-backed guarantee pools could be established to enhance the liquidity of green assets, drawing on the precedent of the Green Bond Investment Pool (BISIP G1) launched in 2019. This initiative created a pooled investment vehicle for central banks and international financial institutions that are BIS members or customers, investing exclusively in high-quality green bonds issued by sovereigns, supranationals such as the World Bank or European Investment Bank (EIB), and agencies, including Kreditanstalt für Wiederaufbau (KfW) and the African Development Bank, with all instruments aligned to the International Capital Market Association (ICMA) Green Bond Principles. By replicating and scaling this model, reserves could be mobilised as a catalyst for deepening green bond markets and reducing financing costs for climate-aligned projects.

As of 2025, global central bank foreign exchange reserves amount to roughly US$12 trillion, of which an estimated 60–65% (~US$7–8 trillion) is invested in US Treasuries, making them the dominant reserve asset. However, given potential uncertainties about the direction of US policies and its possible effects on excessive volatility in the US Treasury market, some marginal diversification of reserves, including towards other sovereign including green bonds, could become a reasonable and prudent strategy for many central banks, see Wolf (2025) and Wan and Becker (2025).

II.2.4. The discussion on other reserve assets: SDR and green SDRs

The issuance of Special Drawing Rights (SDRs) is governed by the Articles of Agreement of the International Monetary Fund (IMF). SDRs are reserve assets rather than currency, but they can be exchanged for freely usable currencies among members through voluntary trading arrangements coordinated by the IMF. Approval for a new issuance requires an 85% majority of the total voting power of IMF members, and the proceeds are allocated to countries in proportion to their IMF quotas (i.e., their

[4] The Bank for International Settlements Investment Pool (BISIP) is a structure used by the BIS Asset Management arm for fixed-income funds, including green bond funds for central banks and official institutions. The BISIP green bond funds invest in high-quality green bonds complying with standards such as the ICMA Green Bond Principles and/or Climate Bond Standard (BIS, 2021).

shareholdings). As a result, advanced economies receive the largest share – about two-thirds of any new issuance – while low-income and emerging economies receive less.

Since around 2010, there has been an active discussion within the IMF and in academic circles regarding the potential to enhance the climate relevance of SDRs. This includes:

(i) Rechannelling unused SDRs from advanced economies to multilateral development banks (MDBs) or climate funds (for example, through the IMF's Resilience and Sustainability Trust or other dedicated vehicles);

(ii) Issuing "green SDRs" directly linked to climate objectives – creating reserve assets with an explicit sustainability mandate; and

(iii) Using SDRs to leverage additional private finance, for instance by backing green bonds or blended-finance instruments.

The issuance of green SDRs specifically refers to proposals to use these reserve assets to mobilise additional financing for climate and sustainable development goals. Under this approach, new SDR allocations – or the rechannelling of existing ones – would be earmarked for green purposes, such as funding climate-mitigation and adaptation projects, supporting green investment EMDEs, or capitalising multilateral climate facilities.

The rationale is to increase global liquidity for green investment without exacerbating debt vulnerabilities, while aligning the international monetary system with climate goals. However, as of mid-2025, the discussion on major new green SDR issuances has not made significant progress.

II.3. International reforms to mobilise institutional capital

The measures in this section are outside the mandates of central banks, regulators and supervisors of the financial system. Nevertheless, they represent **critical levers to facilitate cross-border capital flows into EMDEs and need to be discussed in adequate forums between monetary and fiscal authorities both domestically and globally.** As with other areas, the greater the consensus reached in broader forums, the more effective and credible the measures will be.

If prudential reforms can unlock banks at the margin, and central bank policies can reduce risk premiums and support liquidity, the real scaling engine for EMDE climate finance lies in mobilising institutional investors – sovereign wealth funds, pension funds and insurers – which collectively manage more than US$180 trillion in assets. Yet their participation in EMDE climate projects remains negligible due to barriers such as high perceived risk, credit constraints and a lack of investable pipelines. Addressing these barriers requires reforms that expand MDB capacity, reshape credit rating methodologies, provide robust FX hedging tools, adapt investor rules and build scalable green market infrastructure.

II.3.1. Mobilising institutional non-bank investors

The reforms discussed so far are essentially bank-centric. Prudential regulation focuses on bank capital and supervision, while disclosure and taxonomy reforms are mainly framed through the lens of financial institutions broadly, with mechanisms drawn from bank regulatory architecture. However, mobilising non-bank institutional investors is essential. **Sovereign wealth funds, public pension funds, large asset managers and insurers hold the bulk of long-term capital that could flow into climate investment and operate under different regulatory regimes.** Banks and Basel reforms will help as originators and arrangers, but institutional investors will ultimately be the end buyers.

Indeed, bank regulation is not necessarily the main gatekeeper for green capital flows from institutional investors. Prudential and fiduciary rules that apply to these entities (e.g. IORP II in the EU for pensions, national public pension investment mandates, sovereign investment law frameworks) also need to be part of the discussion. Strategies are needed to adapt portfolio allocation rules, risk/return assessment methodologies and Environmental, Social, and Governance or ESG/fiduciary standards to increase allocation to EMDE green infrastructure. Coordination is required with non-bank regulators,

such as the International Organization of Securities Commissions (IOSCO) for asset managers, OECD for pension fund guidelines and the International Forum of Sovereign Wealth Funds.

Global sovereign wealth funds (SWFs) (~US$11 trillion assets under management – AUM), pension funds (~US$60 trillion) and asset managers (~US$110 trillion) represent the largest pool of long-term patient capital (WEF, 2023; OECD, 2025c). These investors are not constrained by Basel rules, but more by liquidity mandates, risk ratings and political oversight. Unlocking their capital requires a great deal of financial engineering in order to pull different levers – credit enhancement, green bond benchmarks, investment-grade aggregation vehicles (SPVs), sovereign guarantee frameworks and regulatory clarity on ESG mandates. The insurance sector is also critical both as a provider of capital and in building resilience. Yet Solvency II requirements remain a major constraint on insurance flows to EMDEs.

Indeed, allocations remain small versus capacity. Pension funds and public reserve funds still only allocate low single digits of AUM to infrastructure, and the bulk is in AEs; EMDEs exposures are a minor share despite >US$50 trillion in pension assets globally. Recent OECD surveys confirm the pattern and slow movement.

Flows into EMDEs assets are cyclical and benchmark driven. Foreign portfolio flows recovered in 2024 but remain below pre-2019 averages; index events (e.g. India's 2024 inclusion in the JP Morgan Government Bond–Emerging Market Index – GBI-EM) mechanically pull in billions, illustrating how benchmarks shape allocations.

Several structural barriers are documented in several reports and studies (e.g. OECD, 2023; IMF, 2024) **and explain the limited participation of these investors:**

- High perceived risk: Political uncertainty, weak institutions and FX volatility deter large allocations.
- Credit constraints: Many EMDE climate projects are below investment grade, excluding them from the mandates of most pensions, insurers and asset managers.
- Project fragmentation: Deals are often too small or illiquid for institutional portfolios that prefer scale and standardisation.
- Regulatory and fiduciary limits: Rules such as the EU's prudential regulatory framework Solvency II for insurers (designed to ensure that insurers can meet their long-term obligations to policyholders — even under stress) or strict allocation caps for public pensions restrict exposure to higher-risk EMDE assets.
- Pipeline and disclosure gaps: The shortage of bankable projects, coupled with inconsistent reporting, raises due diligence costs and undermines confidence

Addressing these barriers requires reforms that reduce both real and perceived risks, expand the pool of investable projects and align institutional mandates with climate goals. This is the context in which the following recommendations are made:

- Clarify the practical interpretation of fiduciary duty (e.g., the obligation to manage assets in the best interests of those beneficiaries; applies to trustees, fund managers, directors, and other intermediaries in pension funds, insurance companies, or investment advisors) to integrate climate risk and sustainability into investment decisions. Emphasis should be placed on improving understanding of how environmental and climate factors influence long-term financial outcomes, consistent with existing fiduciary frameworks (see Financial Markets Law Committee, 2024). This involves updating guidance for trustees, fund managers, and institutional investors to reflect that managing climate-related risks is part of acting in beneficiaries' best financial interests.
- Adjust portfolio allocation and solvency rules to permit higher exposure to infrastructure, nature-based solutions and EMDE green assets

- Establish standardised green bond and blended finance benchmarks to reduce transaction costs and perceived risk
- Coordinate with relevant standard-setters, including IOSCO, OECD, the International Forum of Sovereign Wealth Funds and the International Organization of Pension Supervisors
- Encourage disclosure alignment across banks and non-banks to facilitate comparability and integration into global capital flows

An important additional avenue is the more extensive use of green or decarbonised financial indices (Bolton et al., 2022; Jondeau et al., 2021). These indices can play a catalytic role in mobilising institutional investors' capital towards the net-zero transition by reorienting portfolios towards low-carbon firms without sacrificing diversification or returns. Evidence suggests that their effects on firms' cost of capital are measured in tens of basis points, but can influence corporate disclosure and strategy and influence market valuations and corporate behaviour by lowering the cost of capital for transition-aligned companies. As these methodologies and benchmarks expand to EMDEs, they can help channel international and domestic savings into listed firms contributing to the transition, thereby deepening local capital markets, while maintaining awareness of their limitations (see Box II.2).

Moreover, these specific decarbonised indices are more directly carbon-aligned than the increasingly widespread use of ESG criteria. ESG investing has expanded rapidly, surpassing US$30 trillion in assets, yet it remains poorly understood, as ESG is not a single, coherent objective. It covers a wide range of purposes – from ethical or values-based investing to market-risk management and even the substitution of government regulation. Because of this multiplicity of aims, what it means to be "ESG-compliant" varies considerably across funds and investors.

Using ESG indices can therefore serve as a preliminary proxy of policy goodwill, and this report refers to them as such. However, over time, institutional investors are expected to evolve towards more accurate metrics of climate risk for their portfolio allocations.

Box II.2. Using decarbonised stock indices to accelerate the low-carbon transition

Principle: The proposal for decarbonised stock benchmark indices is designed to reduce carbon exposure while maintaining financial performance comparable to that of traditional indices. The objective is to mobilise financial markets to shift capital from high-carbon to low-carbon firms through portfolio reallocation rather than direct regulation.

Mechanism: Decarbonised indices replicate the risk–return characteristics of conventional market indices (for example, MSCI World or S&P 500) but with a systematically lower carbon footprint. They achieve this by underweighting or excluding companies with high carbon intensity or slow transition progress, overweighting low-carbon firms or those credibly reducing emissions, and ensuring diversification and market neutrality so that investors are not penalised in performance (FTSE Russell, 2022). By steering capital in this way, financial markets internalise part of the climate externality. As more investors adopt these benchmarks, the cost of capital increases for carbon-intensive firms, declines for low-carbon and transitioning firms, and market valuations begin to reflect long-term transition risk.

Economic rationale: The proposal frames this approach as a risk-hedging strategy. Climate change creates physical and transition risks that threaten asset values. Decarbonising portfolios therefore reduces exposure to future stranded assets and aligns investment with the transition to net zero.

Practical examples: The concept has already been applied in several real-world contexts – notably by the AP4 Swedish pension fund, which reduced its equity portfolio's carbon footprint by roughly 50 per cent without sacrificing returns; by the Amundi MSCI Low Carbon Leaders Index (Heldmann, Dang and Brückner, 2025); and by the EU Climate Transition and Paris-Aligned Benchmarks (CTB/PAB), introduced in 2020, which institutionalise similar principles (State Street Global Advisors, 2023).

Policy relevance: Properly designed decarbonised indices can complement public policy by using market instruments to reward transition-aligned firms and penalise laggards They should be seen as one element of a broader policy mix.

II.3.2. Reform of the MDB capital and financing rules

Reforming the capital and financing rules for MDBs to explicitly integrate climate considerations is essential, both to expand their lending capacity and to align their operations with the scale and urgency of the global transition challenge. Indeed, given the importance of blended finance and the need to mobilise private capital flows, it is of the utmost importance to: (1) strengthen the catalytic role of MDBs through augmenting their capital base and (2) expand the mobilisation of guarantees by MDBs to the private sector.

General capital increase (GCI)

While recognising the political and operational complexities, shareholders should also consider that **a well-timed and adequately sized GCI could be a critical lever to accelerate MDB climate and development lending in the current decade, rather than only as a long-term contingency**. Capital adequacy reforms, balance sheet optimisation and innovative instruments are necessary and should be pursued in parallel; however, in the face of unprecedented investment needs and compounding crises, a GCI – combined with ongoing reforms – would enable MDBs to scale up support at the speed and scale required to meet global climate and development goals. Recent proposals, such as the Centre for Economic Transformation Expertise's (CETEx's)*Private Capital Mobilisation for Climate Action in Developing Countries* (Saffar, forthcoming), have suggested that donors commit to increasing blended finance by fivefold, from a 2023 baseline of US$10bn to US$50bn annually by 2030. Adopting quantified targets of this kind would help focus donor strategies, create accountability and indicate to markets that mobilisation of private capital is a central objective of international public climate finance. Such capital increases, designed with clear performance commitments and climate alignment safeguards, can preserve credit quality, enhance countercyclical capacity and send a strong political signal of shareholder commitment to the transition.

Callable capital of multilateral development banks

Building on the 2022–2024 G20 Capital Adequacy Frameworks (CAF) recommendations, **MDBs and their shareholders should move from exploration to implementation in enhancing the value of callable capital as a low-cost lever for expanding lending headroom.** This requires:

- Explicitly integrating callable capital recognition targets into CAF reform roadmaps
- Establishing a joint MDB–shareholder task force to engage with CRAs on harmonised methodologies
- Considering legal and structural adjustments to strengthen enforceability and transparency.

As an indicative benchmark, MDBs could aim for recognition of at least 25–35% of callable capital by CRAs within a 2027 horizon, subject to sound risk management. Achieving this would substantially increase MDB lending capacity without undermining credit quality, while reinforcing shareholder commitment to the multilateral system.

Relax capital requirements for guarantees within multilateral development banks

To unlock the full potential of guarantees as a tool for private capital mobilisation, **MDBs and shareholders should align internal capital treatment of guarantees with their historically low default risk and strong recovery record**. As part of CAF implementation, MDBs should:

- Harmonise guarantee accounting across institutions

- Explore treating guarantees more like off-balance-sheet commitments with proportionally lower capital charges

- Consider using callable capital or dedicated guarantee facilities to backstop portfolios, thereby reducing risk-weighting in internal models.

In parallel, MDBs should work with CRAs and regulatory bodies to ensure that assets benefiting from MDB guarantees receive commensurate ratings uplift and capital relief for the holders of those assets, enhancing the attractiveness and systemic impact of MDB risk mitigation instruments. Such reforms could substantially scale up the use of guarantees, crowd in more private finance and preserve MDB financial strength.

Use the Finance in Common network of multilateral development banks

The Finance in Common (FiCS) network – bringing together over 500 public development banks, including MDBs and national development banks (NDBs) – could play a stronger role in linking MDB reform agendas with operational innovation and implementation. **Beyond its current technical assistance role, the network could serve as a continuous multi-actor platform to**:

- Monitor progress on the G20 MDB Roadmap and CAF implementation

- Test and scale new instruments (e.g. guarantees, hybrid capital, nature-linked finance) jointly between MDBs and NDBs

- Report regularly to the G20 and COP presidencies, and shareholders on reform outcomes

Leveraging FiCS's annual summit and specialised working groups would help avoid siloing between shareholder-level reform discussions and the practical deployment of tools on the ground, ensuring that capital optimisation, risk mitigation and climate alignment measures are embedded across the entire development bank system.

Establish country platforms as investment vehicles to address how capital meets real projects

To make the best use of MDB reforms, effective mobilisation ultimately depends on mechanisms at the country level. 'Country platforms', nationally led mechanisms that consolidate climate strategies, investment pipelines and financing arrangements, are critical to turning de-risked finance into actual projects on the ground. These platforms provide a focal point for aligning donor support, MDB engagement and private sector participation around clear sectoral priorities (such as renewable energy, adaptation, or just transition). To be effective, platforms need to have robust governance that embeds Ministries of Finance, regulators, MDBs and private investors in decision-making, as well as credible and transparent pipelines for bankable projects, supported by technical assistance. As highlighted in CETEx's *Private capital mobilisation for climate action in developing countries* (Saffar, forthcoming), expanding the use of such platforms can help reduce transaction costs, improve coordination and ensure that mobilised private capital flows are anchored in country-defined priorities rather than fragmented initiatives.

More generally, Mazzucato and Heher (2025) advocate that country platforms should evolve from fragmented coordination tools into mission-oriented investment frameworks that align national priorities with global goals such as climate, health, and equity. Rather than serving as donor-driven aid mechanisms, these platforms should mobilise and govern finance strategically, fostering public–private collaboration guided by a clear purpose and measurable outcomes. They emphasise that effective platforms require strong state capacity, cross-sectoral governance, and accountability, enabling countries to steer innovation and investment towards long-term transformation.

An example of this approach can be found in the Brazil Climate & Ecological Transformation Investment Platform (BIP), launched in 2024. It is a government-led investment platform coordinated by the Brazilian Development Bank (BNDES) in partnership with the ministries of Finance, Environment & Climate Change, Mines & Energy, and Development, Industry, Trade and Services. It is supported by Bloomberg Philanthropies, Glasgow Financial Alliance for Net Zero (GFANZ) and the Green Climate Fund.

Another example is the Just Energy Transition Partnerships (JETPs) in South Africa, Indonesia and Vietnam, which function as proto-country platforms, mobilising concessional and private capital under government-led decarbonisation strategies, are an example of such platforms. In addition, the G20 Independent Review of MDBs' Capital Adequacy Frameworks (2022) and subsequent IHLEG on Climate Finance (2022–2025) promoted country platforms as a core mechanism to scale climate investment in EMDEs.

II.3.3. Reform the role and methodologies of credit rating agencies

CRAs play a central role in global financial markets and influence the behaviour of investors. Their ratings assess the creditworthiness of sovereigns, corporations and financial instruments, influencing borrowing costs, investor allocations and regulatory capital requirements. CRAs are private companies, but they are supervised by public authorities in the main jurisdictions where they operate. In the US, the Securities and Exchange Commission (SEC) oversees nationally recognised statistical rating organisations (NRSROs), including the 'big three' (Moody's, S&P, Fitch). In the EU, CRAs are supervised directly by the European Securities and Markets Authority (ESMA), which has the authority to register, inspect and, in theory, withdraw their licences. Other jurisdictions, such as Japan, Canada, or Brazil, also have national regulators responsible for oversight, often coordinated through IOSCO, which issues global principles for CRA conduct.

CRAs play a central role in shaping the cost of capital for EMDEs, yet there is evidence that their methodologies embed some degree of bias. Not all rating gaps are 'bias': a large proportion are explained by fundamentals and default history, so attribution needs careful controls. However, how CRAs treat institutions, data gaps, commodity terms-of-trade risk and legal protections (e.g. preferred creditor status) can swing EMDE outcomes. Their ratings are also criticised for pro-cyclicality – downgrades often occur during or after crises, exacerbating market stress – and for being lagged, with ratings failing to anticipate turning points or structural vulnerabilities.

These shortcomings can take different forms: 'level bias', where sovereign ratings are systematically lower than macroeconomic fundamentals would predict; 'home or affiliation bias', where issuers closer to the agencies' headquarters are favoured; and 'procyclicality', where downgrades come quickly in crises but upgrades are slow in recoveries, amplifying volatility for EMDEs. For example, agencies failed to anticipate the Asian crisis and the 2007–2009 global financial crisis (GFC) (see Box II.3) and then downgraded rapidly, exacerbating fiscal stress.

The GFC also highlighted deeper credibility issues in the CRA model, notably the intrinsic conflict of interest in the 'issuer pays' model and a reliance on incomplete due diligence that contributed to severe mispricing of risk in structured products.

UN Trade and Development's policy reviews (UNCTAD, 2025) also stresses 'scorecard interpretation bias', in which indicator weights penalise EMDEs more than AEs, and 'context misclassification', where exposures backed by multilateral protections are treated like ordinary commercial risk. GEMs (2024) data further confirm that EMDE credit risks, particularly when supported by MDBs, are systematically overstated by prevailing ratings. This disconnect between fundamentals and assessed risk highlights the need to reform CRA methodologies to recognise MDB risk-sharing and climate-aligned investment.

Box II.3. The role and shortcomings of credit rating agencies during the global financial crisis

CRAs' shortcomings were starkly exposed during the 2007–2009 GFC, when they were singled out for their central role in amplifying systemic risk. Before the GFC, by assigning overly generous ratings – often AAA – to mortgage-backed securities and collateralised debt obligations that later collapsed, Moody's, Standard & Poor's (S&P) and Fitch were accused of having misled investors and contributed to the scale of the crisis. Their methodologies, opaque and prone to conflicts of interest, came under severe scrutiny.

In the US, the response combined legal and regulatory action. The Department of Justice and several states launched lawsuits alleging that CRAs knowingly inflated ratings. These culminated in

large settlements – US$1.375bn for S&P (2015) and US$864 million for Moody's (2017) – though without criminal convictions. Fitch largely avoided major sanctions. Parallel reforms through the Dodd–Frank Act (2010) sought to reduce regulatory reliance on ratings, enhance CRA liability and strengthen oversight by the SEC. In Europe, the emphasis was on structural reform rather than sanctions. A trilogy of regulations (CRA I–III, 2009–2013) established direct supervision under the European Securities and Markets Authority (ESMA), imposed civil liability for gross negligence, mandated rotation rules for structured product ratings and tightened disclosure and conflict-of-interest requirements. Unlike in the US, no major fines were levied, but compliance costs and institutional oversight increased significantly. At the global level, the Financial Stability Board (FSB) and the G20 recommended reducing "mechanistic reliance" on CRA ratings in prudential regulation, strengthening internal credit risk assessment capacities among banks and investors, and encouraging alternatives to the dominant oligopoly. The FSB also launched peer reviews to track countries' progress, while IOSCO revised its Code of Conduct (2008, 2013) to reinforce transparency, independence and responsibilities towards issuers and investors.

These reforms brought tangible progress: nearly all jurisdictions now require CRA registration and oversight; disclosure standards have improved; and explicit references to ratings in regulation have been reduced in many cases. Yet challenges remain. Mechanistic reliance is hard to eliminate entirely, especially in banking regulation. Implementation is uneven across jurisdictions, with emerging markets lagging behind. Data and methodological gaps hinder full evaluation of reforms, while fundamental incentive problems tied to the issuer pays model remain unresolved. The bottom line is that post-GFC reforms improved transparency, oversight and regulatory diversity in the use of ratings, and imposed meaningful sanctions in the US, but the CRAs remain powerful oligopolists and their influence on markets and regulations is still substantial. The core vulnerabilities – procyclicality, opacity and structural reliance on a handful of private providers – were only partly addressed.

Methodologically, CRAs rely on a mix of quantitative indicators and qualitative judgements (such as debt-to-GDP, fiscal balances, and external accounts, governance, policy credibility and institutional quality). Sovereign ratings combine objective indicators with discretionary judgements on governance and institutions, leaving ample space for subjective overlays. Their reliance on limited or inconsistent data in EMDEs further amplifies measurement issues, since missing or noisy variables are often interpreted negatively. Ratings remain opaque – methodological choices, weightings and qualitative overlays are rarely disclosed in a way that allows replication or challenge. This opacity is compounded by the oligopolistic structure of the industry and the conflicts of interest inherent in the issuer pays model[5].

CRAs' biases and methodological shortcomings have direct implications for financing the net zero transition in EMDEs. Sovereign borrowing to finance climate mitigation or adaptation is often treated as a pure liability by CRAs, without accounting for the long-term resilience and growth benefits such investments bring. In practice, this means that climate projects raise debt ratios and trigger negative rating outlooks, reinforcing investor reluctance to finance them. The result is a vicious circle: EMDEs, already constrained by lower ratings and higher spreads, are penalised further when they attempt to invest in the very projects that could improve long-term sustainability. In this way, the shortcomings of CRA methodologies not only sustain a structural bias against EMDEs, but also compound the obstacles they face in mobilising private finance for the transition.

The persistence of opaque methodologies is increasingly incompatible with today's information needs. CRAs continue to rely on proprietary models that embed pro-cyclical biases, use simplistic debt sustainability ratios and often lag behind market signals – yet they rarely disclose the underlying assumptions or provide transparency around key judgements. In the age of AI and big data, when far

[5] The entity issuing the financial instrument (the borrower) — for example, a government or corporation — pays the rating agency to assess and publish a credit rating for its bonds. As a result, there is a potential bias towards inflating ratings to attract or retain business — one of the factors criticised after the 2008 financial crisis, when highly rated mortgage-backed securities turned out to be far riskier than advertised.

more granular, timely and transparent risk assessments are technically feasible, this opacity is no longer defensible.

AI and machine learning (ML) offer a credible way to modernise sovereign risk assessment. Unlike traditional ratings – vulnerable to bias, procyclicality and conflicts of interest – AI can harness large, diverse datasets ranging from macroeconomic indicators and market spreads to alternative information such as satellite trade flows or climate risk models. This data-rich foundation reduces reliance on discretionary overlays and enables more robust, transparent assessments. ML techniques can also update scores dynamically in near real time, avoiding the rating inertia and sudden cliff downgrades that amplify crises. Importantly, explainability tools allow users to see which variables drive results, turning the 'black box' into an auditable framework.

For EMDEs, fairness constraints and peer benchmarking can ensure that sovereigns are judged against comparable economies rather than AE standards, reducing the structural disadvantage they often face. By integrating forward-looking risks such as climate change or geopolitical shocks and allowing for pluralism through open-source or regional models, AI and ML not only promise more efficient and equitable assessments, but also introduce competition into a market dominated by three global players. This combination of efficiency, equity, and transparency makes them a credible complement to – or, in time, a replacement for – parts of the CRA function.

The policy implications are significant. Research by Fouliard et al. (2021) recommends that online ML tools are integrated into macroprudential frameworks at central banks, the BIS, International Monetary Fund (IMF), or European Systemic Risk Board (ESRB), deploying them alongside traditional monitoring. They call for expanding datasets to include not only credit and housing indicators, but also liquidity measures, capital flows and forward-looking risks such as climate and cyber shocks. This methodological pluralism, embedded in institutional practice, would give regulators and investors time-consistent and actionable signals of crisis risk – well before cliff effects force sudden downgrades or capital flight. In short, by embedding online sequential learning into financial surveillance, researchers demonstrate how AI/ML can deliver earlier, more robust and more transparent warnings of systemic fragility, providing a strong rationale for complementing or even replacing parts of the CRA function in sovereign risk assessment.

This strengthens the case for a comprehensive overhaul of the role, methodologies, governance and practices of CRAs, led by independent international experts under the supervision of academia, international financial institutions and the G20. Their methodologies must move beyond pro-cyclical, backward-looking assessments based on inter alia simplistic debt-to-GDP ratios, and towards forward-looking, transparent and comprehensive evaluations that integrate climate risks alongside growth potential and debt composition. Reform is also needed to better align their assessments with the requirements of sustainable investment.

First, integration of climate-related risks is essential: both physical risks, such as extreme weather events, and transition risks, such as abrupt changes in carbon pricing, technological shifts, or regulatory tightening, must be systematically embedded into sovereign and sub-sovereign credit assessments.

Second, methodologies should explicitly recognise the credit-enhancing role of MDBs. Instruments such as guarantees, preferred creditor status and policy-based lending are proven risk mitigants, yet they are often underweighted or ignored in current rating models, leading to higher financing costs for climate-aligned projects in EMDEs.

Finally, there is a pressing need to develop dedicated green rating benchmarks that complement traditional credit risk metrics by evaluating the climate and sustainability performance of both countries and individual projects. Such benchmarks would help shift capital allocation towards investments that are not only financially sound but also consistent with the objectives of the net zero transition, providing investors with clearer signals and reducing systemic biases against climate-aligned assets.

Despite their major shortcomings before the 2008 GFC, CRAs have retained extraordinary market power, largely because their ratings are embedded (e.g., standardised approach) in financial

regulations such as Basel capital requirements, investment mandates and collateral frameworks. Closing or replacing a CRA would legally require regulators to revoke its licence (e.g. SEC registration in the US or ESMA registration in the EU), but in practice this has never been done, even after the GFC, when their failures were widely acknowledged. The absence of sanctions, penalties, or structural reform reflects both political reluctance and market dependence on CRA ratings, which continue to serve as reference points for trillions of dollars of financial assets.

In sequencing reforms of CRA roles and methodologies, the G20, international financial institutions and academia should prioritise a phased approach:

- **Near term (12–24 months):** formal recognition of MDB guarantees and preferred creditor status (PCS); publication of transparent annexes detailing how climate factors are incorporated; and explicit methodologies for FX-hedged structures.
- **Medium term:** redesign sovereign rating templates that incorporate transition and physical climate risks and green investment efforts, and pilot the use of 'green co-ratings' or sustainability labels alongside traditional credit ratings.
- **Long term:** develop AI-enabled, public-good assessment platforms hosted by bodies such as BIS, IMF, or NGFS (see Box II.4). These platforms would leverage open data, generative AI and ML to produce transparent, reproducible and forward-looking ratings. Unlike private CRAs, such platforms would operate under independent oversight and provide open methodologies, reducing systemic pro-cyclicality and allowing investors and regulators to price both financial and climate risks properly. Building such alternatives would not only discipline the existing CRA oligopoly, but also lay the foundation for a more stable and sustainable global financial system.

Box II.4. An artificial intelligence/machine learning proposal for credit risk assessment to support emerging markets and developing economies and climate investment

Traditional CRA methodologies often disadvantage EMDEs. Ratings tend to penalise structural features such as lower income per capita, volatile exchange rates, or weaker institutions, even when market fundamentals suggest resilience. Procyclical downgrades amplify capital outflows and raise spreads, worsening debt sustainability. Similarly, borrowing for green projects is typically treated as an additional liability, while the long-term growth, resilience and avoided damages from climate investment are ignored. Climate vulnerability lowers ratings without factoring in the benefits of adaptation, deterring EMDEs from issuing green debt.

AI/ML can help rebalance this picture. ML models can cluster sovereigns into relevant peer groups (commodity exporters, small open economies, frontier markets), benchmark performance within those cohorts and apply fairness constraints to limit systematic disadvantages experienced by EMDEs. Alternative datasets – such as satellite trade flows, remittance patterns, digital payments, or climate resilience indicators – can be integrated to provide a richer picture of creditworthiness where traditional data is sparse. Probabilistic scoring replaces cliff ratings, smoothing the abrupt transitions from investment grade to sub-investment grade that disproportionately affect EMDEs.

For climate-related borrowing, AI/ML models can incorporate NGFS scenarios, hazard maps and transition pathways to assess both risks and benefits. By treating adaptation and mitigation investments as resilience-enhancing rather than purely debt-increasing, these models produce forward-looking credit assessments that better reflect medium-term solvency. Scenario analysis can compare sovereign resilience with and without climate investment, showing explicitly how green borrowing can strengthen debt sustainability. Unlike static CRA scorecards, ML models can dynamically update weights on climate indicators as new evidence accumulates.

The systemic impact would be significant. EMDEs could access financing on fairer terms, freeing fiscal space for countercyclical and climate spending. Climate investment would be recognised as solvency-enhancing, reducing the 'green premium' and crowding in private capital. For MDBs and

investors, AI/ML provides more credible and transparent forward-looking assessments, increasing the effectiveness of guarantees, callable capital and blended finance instruments.

Policy proposals include:

1. AI-enhanced debt sustainability analysis (DSA): Integrate ML-based sovereign risk scores into IMF/World Bank frameworks, explicitly adjusting for climate investment
2. Green rating overlays: Ensure that models treat adaptation and mitigation projects as risk-reducing
3. Regional AI platforms: Empower MDBs in Africa, Latin America and Asia to host tailored sovereign risk models, reducing dependence on the 'big three' CRAs
4. Investor engagement: Publish AI/ML sovereign risk dashboards with climate-adjusted scenarios to guide institutional investors towards EMDE green bonds

Bottom line: AI/ML sovereign risk models offer a pathway to fairer, more dynamic and climate-aligned assessments. By embedding resilience benefits directly into credit analysis, they can transform green borrowing from a ratings penalty into a solvency enhancer – an essential step if EMDEs are to mobilise the trillions required for the net zero transition.

II.3.4. Mitigate foreign exchange (FX) risk through structured finance facilities

FX risk arises when projects in EMDEs generate revenues in local currency, while financing is provided in hard currency (USD, EUR, JPY). **Mismatches between cash flows and debt service can severely affect project viability if local currencies depreciate, especially given the long horizons of climate investments.** In addition, the cost and limited availability of long-tenor hedging products in EMDEs make managing FX exposures prohibitively expensive for many investors.

Mitigating FX risk through structured finance facilities is therefore crucial. Such mechanisms can pool and hedge exposures, lower hedging costs and provide investors with greater confidence to commit long-term capital to climate projects. These facilities should be backed by MDB callable capital – possibly reinsured or pooled with private partners (e.g. TCX) – but not funded or guaranteed by central banks and their international reserves. Reserve diversification initiatives (such as BIS-type green investment pools) and FX risk facilities are complementary but distinct: the former concern strategic asset allocation, while the latter act as contingent risk-sharing backstops anchored in MDB guarantees.

Role of special purpose vehicles (SPVs)

Structured finance vehicles can be designed to incorporate FX risk mitigation. **SPVs, established as bankruptcy-remote entities and backed by MDB credit enhancement, can pool diversified portfolios of green and resilience projects across countries and sectors.** By bundling smaller assets, SPVs can reduce issuance costs; achieve higher credit ratings through diversification and MDB first-loss tranches or guarantees; and issue green bonds at institutional scale, meeting ticket-size requirements of large investors. Crucially, SPVs can embed long-term FX hedging at portfolio level, smoothing risks across projects and geographies, while enabling MDBs to recycle capital and crowd in private capital at scale.

Operational modalities

Such facilities would combine asset aggregation with FX risk-sharing mechanisms:

- Long-term currency hedging products (swaps, forwards, cross-currency guarantees) at portfolio level

- Pooled guarantee schemes to absorb mismatches across multiple countries
- Local currency lending windows backed by international partners
- Derivatives or public guarantees to smooth FX volatility over multi-year horizons

Complementary innovations

Fast payment systems and multilateral settlement platforms developed under the BIS — for example, Project mBridge (BIS, 2022) and Nexus (BIS, 2024) — can reduce settlement risk in cross-border transactions. However, while they address operational and counterparty risks in payment processing, they cannot eliminate the underlying FX risk stemming from currency mismatches between revenues and debt service.

Examples of such programmes

Eco Invest Brasil illustrates how structured approaches can mitigate FX risk. The Inter-American Development Bank (IDB) issues derivatives, the central bank intermediates, local banks distribute products to the private sector and concessional support lowers hedging costs to 2–3% over 10–15 years. In this model, the MDB ultimately absorbs FX risk, enabling local projects to secure long-term foreign investment.

II.3.5. Develop carbon market infrastructure

Carbon pricing — through taxes or emissions trading systems (ETS) — is commonly regarded by economists as a cornerstone of efficient climate policy. By assigning a monetary value to greenhouse gas emissions, it internalises the environmental cost of carbon into economic decisions. In principle, this price signal is meant to encourage firms and consumers to reduce emissions, innovate in clean technologies, and reallocate capital towards low-carbon activities.

Carbon markets extend this logic by allowing trading of emission allowances or credits. When well-designed, they create flexibility: firms that can reduce emissions sell allowances to those facing higher abatement costs, ensuring that overall targets are achieved at lower economic cost. For EMDEs, participation in such markets — particularly under Article 6 of the Paris Agreement — can attract new investment, generate exportable carbon credits, and finance climate-aligned development projects.

Yet carbon pricing remains controversial, both economically and politically.

- Large price disparities exist across jurisdictions: from a few dollars per ton in some voluntary markets to over €100 per ton in the EU ETS. This unevenness undermines competitiveness and creates risks of carbon leakage or "green selective protectionism."
- Economists debate the optimal price path (Pigouvian tax vs. dynamic innovation incentives), the distributional effects on households and sectors, and whether market mechanisms alone can deliver the deep structural transformation required for net zero.
- Critics also note that markets can suffer from volatility, speculative behaviour, and weak environmental integrity if monitoring and verification systems are inadequate.

Nevertheless, developing **robust carbon market infrastructure is essential to create price signals, ensure environmental integrity and channel private capital** efficiently towards emissions reduction and climate-aligned investment.

This entails building the technical, legal and institutional frameworks needed for countries – especially EMDEs – to:

1. Participate in international carbon credit markets (e.g. under Article 6 of the Paris Agreement)
2. Establish domestic or regional emissions trading systems (ETS) or voluntary offset markets

3. Create registries, monitoring, reporting, verification (MRV) systems and national frameworks to issue, track and retire carbon credits

4. Enable transactions between buyers (often in developed markets) and sellers (typically low-emission or offset projects in developing countries), creating an additional revenue stream for sustainable investment

However, international carbon markets cannot function fairly without strong domestic carbon constraints in developed countries. If caps are lax and carbon prices in AEs remain low, companies will simply buy low-cost offsets instead of reducing emissions, undermining both environmental integrity and price fairness for credits from developing countries.

Reforming carbon markets: towards a fair compromise under Article 6.26

Debates on the future of carbon markets, particularly around Article 6.2 of the Paris Agreement, reveal both technical and political risks. Mechanisms such as international credit trading or carbon capture and storage (CCS) can be effective, but they often shift liability to governments and create fairness concerns. The central challenge remains: how can EMDEs finance climate projects at lower cost, while ensuring that AEs do not offload their abatement responsibilities too cheaply? Some experts argue that EMDE opposition to A6.2 trading is counterproductive, as such agreements can mobilise finance, lower risk premiums and expand investment opportunities. Others caution against offset-only markets, stressing the need to integrate Article 6.2 into compliance frameworks that hold emitters fully liable for abatement, thereby ensuring efficiency and fairness in global decarbonisation.

A practical proposal is developed by Pande et al. (2025) in **"A Credible and Fair International Carbon Market: Core Requirements, Institutions, and Market Design".** The authors argue that achieving global net zero efficiently requires channelling finance towards the lowest-cost emissions reductions, wherever they occur. Existing carbon markets, however, fail to do this effectively.

Centralised compliance systems, such as the EU Emissions Trading System, maintain environmental integrity through strict caps but largely exclude low-cost emissions avoidance, reduction, and removal (EARR) projects in emerging and developing economies (EMDEs). Meanwhile, decentralised voluntary carbon markets mobilise private financing for such projects but suffer from weak standards, inconsistent verification, and limited credibility, preventing them from contributing meaningfully to global emissions caps.

To address these shortcomings, the proposal integrates the strengths of both systems through two new global institutions:

1. A unified international cap-and-trade market including both advanced economies (AEs) and EMDEs; and

2. An autonomous central body—MARVIN—to standardise measurement, verification, accounting, and risk management.

This structure would allow firms in AEs to meet emission targets more cost-effectively by financing verified abatement projects in EMDEs, while MARVIN would ensure transparency, prevent double counting, and manage project and regulatory risks. A "negative permit" mechanism would require AEs to finance a growing share of global mitigation as the cap tightens, ensuring both efficiency and equity.

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[6] Article 6.2 of the Paris Agreement establishes a framework for cooperative approaches whereby Parties can voluntarily transfer internationally transferred mitigation outcomes (ITMOs) across borders to help achieve their nationally determined contributions (NDCs). The provision requires that such transfers promote sustainable development, ensure environmental integrity and apply robust accounting to avoid double counting. It allows bilateral or plurilateral agreements between countries, with oversight through guidance adopted by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA). In practice, Article 6.2 underpins emerging carbon market linkages and international crediting schemes, while leaving flexibility for diverse governance arrangements.

The proposed market would evolve in phases: first establishing MARVIN and a legal framework; then piloting a sandbox market; before scaling up to integrate existing compliance systems and voluntary participants. Ultimately, this framework would unify fragmented markets into a credible, rule-based global carbon trading system – one capable of mobilising large-scale finance for EMDEs, reducing global abatement costs, and maintaining environmental integrity on the path to net zero.

While the ambition of globally integrated carbon markets remains appealing in theory, it is important to acknowledge that the persistent challenges around additionality, permanence, and leakage continue to undermine market credibility, particularly in land-use and offset projects. These risks underline that "scaling with integrity" must be pursued incrementally, with rigorous safeguards and independent verification. In addition to seeking a single global market, other approaches may consider a network of interoperable systems – anchored in strong domestic caps and credible MRV frameworks – that can evolve through bilateral or regional pilots under Article 6. The focus should remain on integrity first, scale second.

A potential compromise mechanism could also reconcile efficiency and fairness by treating the price differential between abatement in EMDEs and AEs as a contingent liability. For example, if an AE pays US$20/tCO$_2$ for reductions abroad instead of US$60/tCO$_2$ at home, the US$40/tCO$_2$ 'gap' would be recorded as a deferred obligation. This liability would accrue into a global fund – anchored, for instance, in the Green Climate Fund or a new Article 6.2 settlement facility – that AEs would eventually need to finance. Funds could be earmarked for adaptation and resilience in EMDEs, or for high-cost abatement technologies in hard-to-abate sectors.

The design could include several key features. An accounting framework would log not only the tons of emissions reduced under each A6.2 trade, but also the cost differential, with digital technologies and smart contracts ensuring transparency and traceability. The triggering of liabilities could occur at predefined checkpoints, such as the 2035 or 2040 Paris stocktakes, or once EMDEs' low-cost mitigation opportunities are exhausted. To strengthen credibility, AEs might provide an upfront downpayment (e.g. 10–20% of the contingent liability), with the unpaid portion accruing an 'interest' penalty until settled. The global fund could also pool other financing sources, including revenues from innovative instruments such as global solidarity levies.

This compromise offers multiple benefits. Politically, it gives AEs the flexibility to pursue cheaper abatement abroad today while assuring EMDEs of future financial transfers. Financially, it turns the abstract notion of 'forgone responsibility' into a measurable, enforceable obligation, backed by transparent accounting and smart contracts. From an equity perspective, it ensures that the efficiency of cheap abatement today is matched by fairness in burden-sharing over time.

A starting example could be the Africa Carbon Markets Initiative (ACMI), launched at COP27 in Egypt – spearheaded by the Global Energy Alliance for People and Planet (GEAPP), Sustainable Energy for All (SEforALL) and the United Nations Economic Commission for Africa (UNECA) with support from the UN Climate Change High-Level Champions – to expand Africa's voluntary and compliance carbon markets, enhancing the continent's contribution to global carbon reduction under the Paris Agreement.

II.3.6. Expand the use of new financial technologies[7]

New financial technologies can play a catalytic role in scaling climate finance to EMDEs. Their main value lies in addressing specific barriers identified earlier in this report, such as high FX and transaction costs, weak data and disclosure, limited bankable pipelines, and underdeveloped risk-sharing mechanisms. By lowering risk premiums, reducing due diligence costs and creating more transparent and verifiable investment structures, digital tools can make EMDE climate projects more investable for global institutional capital.

Concrete applications are already emerging. Tokenised green bonds can broaden the investor base by making assets divisible, tradeable and more accessible, while embedding traceability of use-of-proceeds. DLT-based FX settlement platforms, such as the mBridge project, can shorten payment delays and reduce settlement risk, which is a major barrier to international climate finance flows. AI

[7] This section has benefited greatly from discussions with Robert Townsend at the University of Tokyo.

and big data solutions, including initiatives like Project Gaia, can extract and verify sustainability metrics directly from corporate disclosures, creating harmonised, machine-readable data to enhance disclosure reliability and comparability. Similarly, digital monitoring and verification systems – such as remote sensing combined with smart contracts – can link climate outcomes to financial disbursements, reducing information asymmetries and enhancing trust between investors and host countries.

Together, these technologies have the potential to create a more transparent, efficient and resilient financial ecosystem for climate investment. These can be done through:

1. **AI-powered platforms for generating credible, auditable climate-related project data** (emissions, impact, adaptation metrics)

2. **Distributed ledger technologies (DLT) to support real-time, cross-border transactions and FX settlements using multi-CBDC platforms**

3. **Tokenisation of green finance instruments** (e.g. green bonds, transition credits) to enhance transparency, traceability, secondary market liquidity and fractional ownership

4. **Smart contracts to enable trigger-based disbursement of climate finance** based on performance indicators; escrow arrangements for reducing counterparty risk; and parametric insurance payouts based on climate thresholds (e.g. rainfall, temperature)

Together, these innovations aim to build a trusted, automated and interoperable green finance infrastructure.

There is also an important risk-sharing dimension to the adoption of new digital financial technologies. They can fundamentally restructure how risks are allocated across actors and over time. Traditional risk-sharing arrangements – such as guarantees, insurance, or blended finance – are often limited by opacity, high transaction costs and weak enforceability. By contrast, digital technologies make it possible to design more precise, scalable and enforceable contracts that link financing terms directly to verifiable climate outcomes.

In climate-vulnerable and high-cost investment environments – such as renewable energy projects in small island states or adaptation infrastructure in LICs – digital technologies can dynamically reallocate risks. MDBs and public institutions can assume first-loss or contingent tranches, while private investors retain exposure to higher-return layers, with both sets of commitments governed transparently through digital ledgers and enforceable smart contracts. Over time, this can reduce the cost of capital, build investor confidence and expand the universe of bankable projects in markets that are currently underserved.

Examples of applications include:

- **Project Gaia** (BIS Innovation Hub, see Box II.1) that uses AI for automating ESG and climate disclosure assessments, integrating IoT sensors and satellite data

- **Project mBridge**: A multi-CBDC platform for real-time FX settlement, currently involving Central Bank People's Bank of China (PBoC), the Hong Kong Monetary Authority (HKMA), the Bank of Thailand (BOT), and the Central Bank of the United Arab Emirates (CBUAE)

- **Singapore's Project Guardian**: Pilot for tokenised green bond issuance and smart contract-enabled disbursements

Table II.1 Possible role of new financial technologies	
Goal	**Action required**
Reduce green transaction costs	Deploy DLT and smart contracts for automation, traceability and FX savings
Increase green asset transparency	Use AI (e.g. *Gaia*) and tokenisation for real-time climate impact verification
Unlock new investor access	Enable fractional ownership and liquidity via tokenised green instruments
Secure cross-border green flows	Use multi-CBDC (e.g. *mBridge*) for local currency payment versus payment (PvP) settlement
Expand coverage of climate insurance	Enable parametric payouts via smart contracts linked to real-time weather data

Source: Author

II.3.7. Scale up green bond markets with credit enhancement

Scaling up green bond markets with credit enhancement is a key reform to mobilise larger pools of private capital for climate investment, as guarantees, first-loss tranches and other risk-sharing instruments provided by MDBs and public entities can improve credit quality, lower borrowing costs and attract institutional investors to green assets that would otherwise remain below investment grade.

The reform agenda centres on:

1. Creation of MDB-backed SPVs to issue green bonds that include senior AAA-rated tranches and mezzanine/risk-bearing tranches

2. Use of partial guarantees or first-loss equity from MDBs or donor-funded facilities to upgrade sovereign or sub-sovereign issues from speculative (e.g. BB) to investment grade, enabling broader investor participation

3. Targeting institutional investors and central bank portfolios (e.g. through Glasgow Financial Alliance for Net Zero (GFANZ) members and the BIS's Green Bond Investment Pool) to scale demand

There are already promising examples. The Amundi Planet Emerging Green One (EGO) fund, supported by the International Finance Corporation (IFC), combines MDB capital with institutional investment to scale green bond markets. Similarly, World Bank's MIGA guarantees and the Asian Infrastructure Investment Bank (AIIB) have been deployed to lower risks and crowd in private capital.

MDBs could provide guarantees or take equity stakes in structured finance SPVs, thereby uplifting a sovereign's green bond rating from below investment grade to investment grade. Such a 'rating uplift' can have a significant impact on borrowing conditions – for example, moving from BB to BBB could reduce spreads by around 200 basis points (bps) – making debt servicing more sustainable and facilitating larger, repeat issuances for climate investment. To remain cost-effective and compatible with MDB capital constraints, this support should be structured with diversified exposure and potentially involve committed anchor investors, including central banks. By lowering financing costs and improving market access, this approach would directly enhance the capacity of countries to finance their transition to net zero, while indirectly contributing to stronger overall debt sustainability.

Leverage the 'greenium'

There is mounting evidence of a 'greenium': green bonds tend to yield less than equivalent non-green bonds, due to investor preference and ESG mandates. The size of a greenium varies by issuer type and

region (typically 5–20 bps for sovereigns), but is growing with increased demand for green assets. This creates an opportunity for governments to finance climate-related expenditures at lower cost by:

- Clearly labelling and verifying green expenditures (aligned with robust taxonomies)
- Enhancing transparency and governance around green budgeting
- Participating in voluntary or regulated green bond markets (e.g. EU Green Bond Standard, ICMA)

Debt-for-climate and green debt swap mechanisms

Beyond green bond issuance, debt-for-climate swaps are gaining traction. Existing high-cost or short-duration debt can be exchanged for long-term concessional or guaranteed green instruments. This was pioneered in for example, Belize in 2021) and Seychelles in 2016, where sovereign debt was restructured in exchange for marine or forest conservation commitments, with support from non-governmental organisations (NGOs) and development finance institutions. Swaps reduce debt service pressure and create fiscal space for verified green investment. MDBs and bilateral donors can catalyse these operations via partial guarantees, credit enhancements and green performance-linked instruments.

Box II.5. Multilateral development bank-backed special purpose vehicles to open green markets for sub-investment-grade sovereigns

Goal: Enable BB/B sovereigns to issue affordable green bonds at scale by using MDB credit enhancement inside a bankruptcy-remote SPV, lifting issues to investment grade and crowding in long-term investors.

How it works:

- Structured SPVs: Pools diversified sovereign (and eligible quasi-sovereign) green assets; transparent rules for tranche seniority, cash flows; reporting aligned with ICMA Green Bond Principles
- MDB credit enhancement: First-loss/equity or partial guarantees to deliver rating uplift (e.g. BB→BBB), cutting funding costs by roughly ~200 bps and supporting repeat issuance
- Design for official-sector eligibility: Target investment-grade ratings, high-quality collateral, simple structure and strong disclosure so the vehicle meets central bank reserve-management criteria (liquidity, safety, transparency)
- Anchor official buyers: Possibly tap the ~US$12 trillion pool of central bank FX reserves (including via reserve-friendly green bond funds and BIS-type platforms such as BISIPs) as cornerstone investors, alongside pensions/insurers/asset managers. BISIPs are open-ended, Swiss-law pooled funds run by BIS Asset Management for the official sector. They are designed for central bank reserve managers, with conservative mandates and clear eligibility rules. BIS has used the BISIP format for multiple fixed-income strategies – including the green bond funds central banks already use
- Scalable pipeline: Standardised documentation, country diversification and periodic taps build a durable, revolving channel for climate finance

Why it matters:

- Lower spreads, stronger access: Rating uplift reduces coupons and extends tenors for climate investment

- Debt sustainability: Cheaper financing improves rollover risk and interest burdens for EMDE sovereigns
- Private capital at scale: Mobilises institutional demand for high-grade green assets while leveraging limited MDB capital efficiently

Governance and safeguards:

Independent verification of use-of-proceeds, impact reporting and climate alignment; clear fiduciary roles for arranger, trustee and verification agents; periodic performance reviews tied to MDB support.

II.3.8. Leverage of global climate funds and/or low-income country collateral (nature, tropical forests, etc.) to enhance climate finance

Leveraging global climate funds and LIC collateral – such as natural capital, tropical forests, or other environmental assets – offers a promising avenue to enhance climate finance. **By transforming global public goods into credible forms of security, countries can attract private investment, lower risk premiums and unlock larger, more stable flows of capital for sustainable development and climate resilience.**

This reform involves strategically deploying concessional resources from global climate funds, such as the GCF and CIFs, and/or monetising natural capital-based collateral from LICs to:

- Backstop or de-risk private or MDB co-financed green investments, particularly in countries with limited sovereign creditworthiness
- Monetise nature-based assets (e.g. standing tropical forests, biodiversity hotspots, carbon sinks) through structured finance or guarantees
- Enable first-loss layers, reserve cushions, or subordinated tranches in blended finance vehicles or project-specific facilities
- Enhance credit ratings of LIC borrowers or green projects to facilitate issuance of green bonds or access to MDB pipelines

A promising innovation in global fiscal architecture would be the expansion – or significant scaling – of a global green fund, building on institutions such as the GCF. Such a fund would be financed through a diversified mix of sovereign contributions, global solidarity levies (such as taxes on international aviation, maritime transport, or financial transactions; see Box II.6 and Pereira da Silva et al., 2025), voluntary private donations and, over time, global wealth or global carbon taxes. Beyond financing national climate transitions, the fund would act as a global macro-fiscal buffer, capable of providing countercyclical support in the face of climate shocks and natural disasters. For LICs with limited fiscal space and acute climate exposure, access to predictable, concessional and rules-based financing is essential – not only for fairness and climate justice, but also for ensuring global financial and ecological stability. Institutionalising such a fund with broad political legitimacy and strong governance standards would represent a vital step towards a globally coordinated fiscal response to the climate crisis.

Using a climate fund for the decarbonisation of EMDE power sectors

An example of such an approach is proposed by Bolton and Kleinnijenhuis (2025), who outline how large-scale decarbonisation of EMDE power sectors could be implemented through an International Climate Fund (ICF) operating as a global public–private financing platform. The ICF would coordinate contributions from advanced economies (AEs), multilateral development banks (MDBs), and private investors, channelling them into country-specific transition programmes. Much like the IMF during financial crises, the ICF would sign conditional "programme agreements" with EMDE governments,

detailing phased pipelines of fossil-fuel plant retirements and renewable energy investments. Disbursements would be tied to verifiable decarbonisation milestones and managed under transparent governance, monitoring, and accountability standards.

Under this structure, the ICF's financing would take the form of blended capital: public funds from AEs would provide grants or first-loss equity tranches to de-risk private participation, while private investors would supply senior capital through market instruments. At the project level, Special Purpose Vehicles (SPVs) or national project funds could issue green or transition bonds backed by the ICF's concessional layer and by stable revenue streams such as long-term power purchase agreements. This design would enable projects in EMDEs to achieve an investment-grade risk profile, thereby lowering financing costs and attracting institutional investors at scale.

Such a mechanism illustrates how a global climate fund can transform international commitments into actionable investment flows. By combining fiscal support, financial innovation, and performance-based conditionality, it can align efficiency and equity – enabling AEs to finance low-cost abatement abroad while EMDEs gain predictable access to capital for clean power. The ICF model thus bridges the gap between global climate objectives and the realities of project-level financing, turning collective ambition into bankable climate action.

Box II.6. The role of global solidarity levies in financing climate action in emerging and developing economies

EMDEs face an external climate finance gap of roughly US$1.3 trillion annually by 2035, far beyond what current ODA or private capital flows provide. **Global solidarity levies represent a pragmatic and politically feasible instrument to mobilise stable and predictable additional resources to close this gap. (Global Solidarity Levies Task Force (2025))**

These levies apply modest contributions to highly international activities – such as air travel and maritime shipping – sectors with large carbon footprints and limited domestic political visibility. Building on successful precedents like the French air ticket levy that finances UNITAID, they can generate significant new revenue while maintaining economic efficiency and minimising distortion. This report's simulator shows that aviation and shipping levies alone could raise US$150–350bn per year, a substantial contribution towards EMDE financing needs.

Importantly, **solidarity levies should not be confused with carbon pricing.** Whereas carbon taxes or emissions trading schemes aim primarily to change behaviour by internalising the cost of carbon emissions, solidarity levies are designed to generate predictable revenues for redistribution. They are complementary instruments: carbon pricing provides incentives for decarbonisation, while solidarity levies mobilise international resources that can be earmarked transparently for mitigation, adaptation and just transition programmes in the EMDEs.

Unlike traditional transfers, **solidarity levies mobilise untapped tax bases that are less vulnerable to domestic fiscal constraints or political cycles.** They can be implemented by coalitions of the willing or climate clubs, without waiting for universal consensus, and embody a form of 'enlightened self-interest': they allow AEs to contribute equitably to global public goods while giving EMDEs access to affordable climate finance.

This initiative has been conducted by the Global Solidarity Levies Task Force (GSLTF), an international expert initiative created to design and promote innovative global taxation mechanisms—or solidarity levies—to mobilise predictable, additional financing for global public goods, particularly climate action, pandemic preparedness, and sustainable development. Established in 2023 by a coalition of governments (including Barbados, Kenya, France), international organisations, and philanthropic partners, the Task Force is supported by the European Climate Foundation (ECF), which plays a central role in hosting the Secretariat, coordinating technical research, and facilitating high-level policy dialogue among participating countries, experts, and institutions. The ECF ensures that the Task Force's proposals are technically sound, politically feasible, and aligned with international climate-finance goals, including those under the Paris Agreement and COP30 process.

Global solidarity levies (aviation/shipping/transactions) are predictable, additional, cross-border revenues that underwrite first-loss/guarantee tranches, adaptation windows and just transition spending. They complement other reforms and markets' efforts to mobilise resources, and can contribute to de-risking of projects and enhancing of the climate fund while ensuring fairness, see Pereira da Silva et al. (2025).

Using a climate fund to create an EMDEs permanent revenue flow: The Tropical Forest Forever Facility (TFFF): proposed by Assunção and Scheinkman (2023), is a nature conservation multilateral fund spearheaded by Brazil and supported by 11 additional countries. It is designed to mobilise around US$125 billion through sovereign deposits, institutional investors, and philanthropy (see Appendix Box 2). Backed by the G20 Environment Ministers, the Facility will launch at COP30 in Belém (2025), leveraging satellite monitoring, digital platforms, and smart contracts to ensure credibility and performance. It represents an innovative financing mechanism that provides permanent, predictable incentives for conserving tropical forests.

Rather than relying on short-term donor programmes or carbon credit markets, the TFFF would establish a large endowment fund, capitalised by contributions from advanced economies, multilateral development banks, and private investors. The capital would be invested in diversified financial assets, while the annual returns – not the principal – would finance regular payments to participating tropical forest countries in proportion to their verified conservation performance. Returns from investments in high-grade bonds would be paid to tropical forest nations maintaining deforestation rates below 0.5 per cent, with penalties for violations. If deforestation occurs, payments would be reduced accordingly. A fixed share (for example, 20 per cent) would go directly to Indigenous Peoples and Local Communities (IPLCs), recognising their central role in forest stewardship.

The Facility's design transforms forest conservation into a global public good investment, rather than a charity or offset scheme. By ensuring that countries receive stable, rules-based, performance-linked income, the TFFF aims to overcome the volatility and fragmentation of existing Reducing Emissions from Deforestation and Forest Degradation (REDD+) mechanisms and voluntary carbon markets. Its structure parallels the logic of an international endowment: a perpetual financial engine whose returns sustain environmental integrity, biodiversity, and climate stability.

Operationally, the TFFF can be understood as a system of Special Purpose Vehicles (SPVs) managing national or regional forest accounts under a global fund. Each SPV investment would be backed by the TFFF's concessional capital. This structure mirrors the blended finance logic behind global climate facilities and International Climate Fund (ICF) proposals: public capital provides the endowment and/or a first-loss or concessional layer that de-risks private participation, while SPVs act as transparent vehicles linking global endowment returns to national investment pipelines.

In essence, the TFFF and the SPV model share a common goal – transforming climate protection and natural capital into investable, long-term assets that attract both public and private finance while preserving global commons.

II.3.9. Channel international taxation proceeds as regular proceeds of a global climate fund

Channelling the proceeds of international taxation – such as solidarity levies on aviation, shipping, or financial transactions – **into the regular resources of a global climate fund is a critical reform**, ensuring that these revenues provide a predictable and stable additional source of finance for mitigation, adaptation and just transition programmes in EMDEs.

In a context of severe fiscal constraints in developed countries, including high debt levels, fiscal consolidation and competition with other spending priorities such as defence, **this measure involves allocating proceeds from new international taxes** (such as aviation, maritime, carbon border adjustment, or future financial transaction taxes; see Box II.6) **to a global climate fund** (the Green Climate Fund or equivalent). This can be combined with private donations from high-net-worth individuals and firms, and from the revival of proposals of additional issuance of (green) SDRs to be primarily allocated to LICs' central banks. These stable and predictable revenue streams would be particularly valuable for de-risking functions that unlock private capital flows. They could be deployed to:

- Subsidise FX hedging or provide liquidity backstops
- Provide first-loss capital in disaster insurance and guarantee structures for green bond issuance
- Provide risk-sharing for LICs, where private capital is deterred by macro or climate vulnerability

To be effective, the mechanism requires formal earmarking and stable transfer arrangements to ensure regular annual flows, making it a reliable instrument to anchor blended finance and MDB-supported investment structures.

Examples already exist. The UNITAID model uses airline ticket levies to fund global health programmes. The International Maritime Fund proposal under discussion at the International Maritime Organisation (IMO) and a portion of the EU Carbon Border Adjustment Mechanism (CBAM) revenues could serve as comparable purposes. The International Finance Facility for Immunisation (IFFIm) also provides a precedent, pooling donor commitments to issue bonds.

Duflo et al. (2025) advance an important proposal linking global solidarity levies (see Box II.6) with incentives for carbon-pricing adoption in the Banerjee–Duflo–Greenstone Proposal: "A Grand Bargain for Climate Mitigation, Adaptation and Compensation". The idea is to connect compensation for climate damages suffered by low- and middle-income countries (LMICs) with their adoption of carbon-pricing policies, creating a self-reinforcing system that aligns fairness with mitigation.

At its core lies a transparent and conservative calculation of the mortality-driven social cost of carbon (SCC). The authors estimate that OECD countries' 2022 emissions impose roughly US$1.7 trillion per year in present and future mortality damages on non-OECD countries – equivalent to about 37 per cent of Africa's GDP. Applying the polluter-pays principle, this figure defines the notional "loss-and-damage budget" owed by high-income emitters to the developing world. The damages are overwhelmingly externalised: for each tonne of CO_2 emitted, about 97 per cent of mortality costs occur outside the OECD, mostly in Africa and South Asia.

To allocate and disburse these funds efficiently and equitably, the authors propose a FAIR mechanism – Foreseeable, Automatic, Immediate, and Regular – organised around individual transfers, community block grants, and government disaster insurance. Participation in the FAIR system would be conditional on a carbon-pricing commitment: each eligible LMIC agreeing to implement a carbon tax or emissions-trading system, graduated by income levels and consistent with the principle of common but differentiated responsibilities. In return, participants would receive predictable compensation flows directly benefiting citizens, communities, and governments. This "damage-money-for-mitigation bargain" would thus combine equity (compensation) with efficiency (global price signals), while strengthening trust between advanced economies (AEs) and emerging and developing economies (EMDEs).

The proposal identifies realistic funding sources through global solidarity levies – distinct from those of the existing task force – including:
(i) a reformed OECD Pillar 2 global minimum corporate tax, raised to 21 per cent, which could generate about US$300 billion annually; and
(ii) a 3 per cent wealth tax on the 3,000 richest billionaires, raising roughly US$400 billion per year.
Together, these measures would finance the FAIR scheme's initial needs, while additional levies (for example, on aviation, shipping, or financial transactions) could expand resources over time.

The Banerjee–Duflo–Greenstone proposal is therefore complementary to – but beyond the scope of – financing the US$1.3 trillion transition needs of EMDEs discussed above. In essence, it reframes climate finance as a rule-based global compensation and cooperation system: advanced economies pay for the measurable harms their current emissions cause, while developing countries commit to carbon pricing and use the proceeds to protect citizens and accelerate adaptation.

Vertical climate and environment funds (VCEFs) and their effectiveness

The VCEF Review Conceptual Framework, developed under the G20 Independent High-Level Expert Group on Climate Finance (IHLEG), provides a structured approach to assess and strengthen the performance of Vertical Climate and Environment Funds (VCEFs)—including the Green Climate Fund (GCF), Global Environment Facility (GEF), Climate Investment Funds (CIFs), and Adaptation Fund. These funds play a critical role in channelling concessional finance for climate and environmental goals, but their effectiveness depends on how well they are designed, governed, and integrated into the broader climate finance architecture.

The framework identifies five interconnected levels of analysis and reform, ranging from global mandates to catalytic impacts:

1. Strategic mandate and global alignment: how clearly each fund's objectives, capitalisation, and governance correspond to international climate goals and complement other instruments.

2. Institutional design and operational efficiency: including governance, accreditation, risk management, and transparency.

3. Interface with MDBs and national systems: coordination with multilateral and national development banks, ensuring country ownership and harmonisation to reduce duplication and transaction costs.

4. Programme and project design: how funds deploy resources at the operational level, ensuring alignment with national strategies, results frameworks, and adaptive management.

5. Catalytic impact: how effectively funds leverage additional public and private capital, lower financing costs, and generate systemic change beyond direct disbursements.

This multi-level framework moves beyond narrow financial accounting to evaluate how VCEFs act as catalysts within the global climate finance ecosystem. It highlights that improving performance is not only a matter of mobilising more finance, but also of enhancing coordination, efficiency, and leverage. The framework thus serves as both a diagnostic tool and a roadmap for reform, supporting the G20 agenda to make vertical funds more coherent, country-driven, and effective in scaling up investment for climate and development.

II.3.10. Climate-consistent macroeconomic policies

The effectiveness of the regulatory and policy reforms discussed in the previous sections in unlocking climate capital for EMDEs will ultimately depend on their consistency with a broader macroeconomic policy framework aligned with climate objectives. As highlighted in The Case for Adaptive Inflation Targeting (Barmes et al., 2024; Pereira da Silva, 2025), monetary and fiscal frameworks designed for the "Great Moderation" era are not necessarily suited to a Green Swan world of persistent, systemic shocks induced by climate change.

Central banks and finance ministries must therefore evolve from traditional inflation-targeting and debt-anchored fiscal regimes towards adaptive frameworks that preserve credibility while allowing flexibility to accommodate green investment and climate-related supply shocks. Adaptive inflation targeting would enable central banks to tolerate temporary inflationary pressures arising from transition costs or physical disruptions, thereby avoiding pro-cyclical tightening that could undermine growth and climate finance.

Similarly, adaptive fiscal policy should treat green investment as a critical long-term, risk-mitigating and growth-enhancing factor – one that supports both the stability of public finances and the necessary consolidation of legacy debt. Fiscal authorities could therefore adopt climate-adjusted debt-sustainability analyses and integrate redistribution and international risk-sharing mechanisms to maintain social and market trust.

Within such a macro-financial setting, tax policy must also evolve. Fiscal systems should explicitly account for the differentiated financing capacities of advanced economies (AEs) and the global

concentration of wealth, reflecting both fairness and effectiveness in burden sharing. Given that richer countries and wealthier households have historically generated far higher carbon footprints than poorer ones, progressive and internationally coordinated taxation – including solidarity levies and global wealth-based contributions – will be essential to mobilise predictable resources for the transition and to anchor legitimacy in a just and sustainable global framework.

Part III. Mechanisms for implementation, institutional implications and coordination

For the reforms outlined in Part II to move from proposals to practice, it is essential to clarify how they can be implemented, by whom and under what governance structures. The effectiveness of any reform depends not only on its design but also on whether the right institutions adopt it, the appropriate legal or regulatory frameworks are adapted, and the necessary coalitions are mobilised. We will therefore detail here the forum in which the proposal should be discussed and agreed; the regulatory or legislative change to put the reform into effect; and the set of actors and stakeholders to be involved in the discussion.

III.1. Using coalitions of the willing for implementation

Many proposals in this report, such as concessional finance expansion, MDB capital reforms and new international levies, require shareholder or donor action that can be blocked by one or two large G20 economies. **Without a fallback strategy, reforms risk being aspirational 'best practices' rather than actionable plans.**

One practical solution is to consider the discussion and potential implementation through a 'coalition of the willing' set of countries. Recognising that not all recommendations will receive immediate universal endorsement, this report supports the principle of 'variable geometry' in climate finance reform, enabling coalitions of willing countries, MDBs and development partners to proceed with implementation where political alignment exists. Precedents from climate clubs, trade agreements and the Bridgetown Initiative show that coalitions can create demonstration effects and pave the way for later adoption at scale.

Such coalitions can:

- Pool resources and commitments into joint facilities or platforms hosted by MDBs, climate funds, or alliances such as FiCS
- Pilot CAF reforms, capital optimisation tools, or guarantee platforms within a subset of MDBs whose shareholders agree, allowing demonstration effects to inform later adoption
- Launch blended finance SPVs and structured instruments open to any contributing sovereign or institution, without requiring all G20 members to participate
- Use existing multi-actor clubs – for example, V20, Bridgetown Initiative, Coalition of Finance Ministers for Climate Action – to operationalise specific recommendations and report progress back to the broader Circle
- Maintain interoperability of reforms with global standards, allowing eventual integration if and when consensus broadens

III.2. Applying the coalitions of the willing model for financial regulation

It should be recognised that central bank/financial stability bodies (BIS, BCBS, NGFS, FSB, IOSCO, IAIS) have different mandates, risk tolerances and timelines, meaning that **coordination will require deliberate, structured engagement to avoid fragmentation and delays**. Sequencing is also critical: climate risk integration could face pushback from some prudential authorities concerned about mandate creep, or from jurisdictions wary of ad hoc use of regulation for goals that are outside price

and financial stability. If reforms to integrate climate risk into prudential frameworks, disclosures, or taxonomies proceed without early buy-in from these bodies, MDBs and EMDE regulators risk ending up with non-aligned rules, duplicated compliance, or even regulatory arbitrage. For example, BIS/BCBS endorsement is often a prerequisite for banks to treat climate-related exposures differently in capital requirements; NGFS scenarios are voluntary and non-binding – making their integration into supervision uneven without explicit agreements.

Accounting for climate risks is in fact compatible with the principles that guide Basel III, meant to strengthen financial resilience after the GFC, as it is intended to ensure that proper risk management and liquidity contribute to the overall stability of the financial sector. Therefore, **integrating climate risks should not to be seen as a departure from these original principles, but as a recalibration in the face of the increased threat of extreme climate events, and the scientific evidence that links financial volatility and those climate shocks.**

That said, the political economy of prudential reform cannot be ignored. In the US, the Basel III Endgame capital rule has been the subject of intense debate, with industry lobbying against stricter capital requirements. This creates a degree of uncertainty that could weaken global consistency and, in a worst-case scenario, encourage regulatory divergence. This underlines the importance of sequencing reforms carefully and embedding them within cooperative frameworks.

With those caveats, we now detail the major forums of discussion for the implementation of each direction of reform (see Appendix 2 for more details and Table III.1).

III.3. Implementation strategy and actors

Turning reform proposals into practice requires clarity on where they should be discussed, what rules or legislation must change and who the key actors are. Each reform outlined in Part II maps onto existing institutional frameworks.

Regulatory adaptation, stress testing and supervision must be advanced through the BCBS, the primary global standard-setter for capital, liquidity and disclosure rules. The NGFS plays a complementary role by developing technical groundwork and piloting climate scenarios that can inform Basel revisions. The main frameworks concerned are Basel III Pillars 1, 2 and 3, alongside national legislation such as the EU's CRR/CRD. Implementation requires the involvement of central banks, supervisors, NGFS members and private sector stakeholders such as the IIF and GFANZ.

Climate data, taxonomies and disclosure hinge on convergence via the IFRS International Sustainability Standards Board (ISSB), the NGFS and the G20 Sustainable Finance Working Group (SFWG). Key changes include adoption and national implementation of ISSB standards (IFRS S1 and S2), alignment of green taxonomy regulations and strengthened securities disclosure rules. Implementation requires coordination between ISSB, central banks and supervisors, securities regulators, and national statistical and environmental agencies.

Central bank operations, asset purchases and reserve policies should be piloted within the NGFS, the BIS and the IMF. Reforms include revising collateral eligibility, integrating green instruments into quantitative easing (QE) and reserve management and, where necessary, updating central bank mandates. Implementation requires central banks, Ministries of Finance and, in many if not all jurisdictions, parliamentary or legal approval.

CRA reform falls within IOSCO, supported by pressure from the IMF and G20. Changes would involve updating the IOSCO Code of Conduct, national CRA licensing rules and the IMF–World Bank Debt Sustainability Frameworks. Key actors include securities regulators, Ministries of Finance, IOSCO, CRA supervisors and private financial coalitions.

FX risk mitigation should be addressed in the G20 Finance Track, the IMF and among MDB shareholders. Required reforms include revising MDB CAF to leverage callable capital for FX guarantees, clarifying IFRS treatment of contingent liabilities and enabling donor budget rules to recognise callable capital as commitments. Implementation requires G20 finance ministries, MDB boards, accounting standard-setters, recipient country authorities and private hedging providers.

Carbon market infrastructure requires coordination across the World Bank's Partnership for Market Implementation (PMI), the UNFCCC Article 6 Supervisory Body and voluntary standards such as the ICVCM and VCMI. Reforms include enacting national carbon market legislation, operationalising Article 6 and regulating carbon credits as tradable assets. Key actors include environment and finance ministries, central banks, MDBs, the UNFCCC, voluntary market standards and trading platforms.

New financial technologies should be guided by the BIS Innovation Hub, the G20 Finance Track and IOSCO. Regulatory changes include recognising tokenised green bonds and carbon credits as legal instruments, enabling DLT-based settlement and authorising multi-CBDC platforms for green cross-border payments. Implementation involves central banks, finance ministries, securities regulators, MDBs and private consortia.

Green bond scaling with credit enhancement is primarily for MDBs, the G20 SFWG and IOSCO. Necessary reforms include updating MDB CAF, revising national debt issuance rules to allow structured green bonds and adapting securities regulations for hybrid structures. Implementation requires finance ministries, national development banks, MDBs, CRAs, institutional investors and securities regulators.

Leveraging climate funds and natural capital should be anchored in the GCF and CIFs, together with the UNFCCC, the G20 and MDBs. Governance changes include updating global fund rules, clarifying national legal frameworks on natural capital and carbon rights and ensuring fair revenue-sharing. Implementation involves finance and environment ministries, climate funds, MDBs, UN agencies, private investors and civil society, including Indigenous communities.

Table III.1. Implementation dashboard: regulatory reforms for climate finance in emerging markets and developing economies

Reform area	Forum(s)/institutions	Accord/regulation to change	Key actors	Timeline
Prudential regulation and stress testing	Basel Committee on Banking Supervision (BCBS); Network for Greening the Financial System (NGFS)	Basel III (Pillars 1–3); national prudential rules (e.g. EU CRR/CRD)	Central banks; financial supervisors; NGFS members; private sector (IIF, GFANZ)	6–24 months (NGFS pilots → BCBS recognition)
Climate data, taxonomies and disclosure	IFRS/ISSB; NGFS; G20 Sustainable Finance Working Group (SFWG)	ISSB S1 and S2 adoption; EU/ASEAN/national taxonomies; securities disclosure laws	IFRS/ISSB; central banks; securities regulators; national statistics offices	6–18 months (national adoption + convergence)
Central bank operations and reserves	NGFS; BIS Committees; IMF, national Parliaments	Central bank collateral frameworks; QE eligibility; reserve management guidelines; central bank mandates	Central banks; Ministries of Finance; parliaments (where mandates are restrictive)	12–24 months (pilot eligibility → mandate alignment)
Credit rating agency reform	IOSCO; IMF; G20 SFWG	IOSCO CRA Code; national licensing rules; IMF–WB Debt Sustainability Frameworks	Securities regulators; Ministries of Finance; IOSCO; CRA supervisors; private coalitions (GFANZ)	12–24 months (IOSCO guidance → CRA methodology updates)

FX risk mitigation facilities	G20 Finance Track; IMF; MDB Boards	MDB CAF; IFRS treatment of callable capital; donor budget rules	G20 finance ministries; MDB boards; IFRS Foundation; recipient ministries/CBs; private hedging providers (TCX)	12–36 months (CAF reform → FX facility scaling)
Carbon market infrastructure	UNFCCC (Article 6 Supervisory Body); World Bank PMI; ICVCM/VCMI	UNFCCC A6 Rulebook; national carbon laws; financial regulation of credits	Environment and finance ministries; central banks; MDBs; UNFCCC; voluntary market standards (Verra, GS)	6–24 months (registry pilots → A6 operationalisation)
New financial technologies	BIS Innovation Hub; G20 Finance Track; IOSCO	National securities law; digital asset regulation; central bank rules (CBDC platforms)	Central banks; finance ministries; securities regulators; MDBs; private tech consortia	6–24 months (pilots → regulated deployment)
Green bond scaling with credit enhancement	MDBs; G20 SFWG; IOSCO	MDB CAF; national debt issuance laws; securities listing rules	Finance ministries; NDBs; MDBs (IFC, AfDB, ADB, IDB); CRAs; institutional investors	12–24 months (pilot SPVs → scaling enhanced tranches)
Leveraging climate funds and natural capital	GCF; CIFs; UNFCCC; G20; MDBs	Climate fund governance; national laws on carbon/natural capital rights	Finance and environment ministries; climate funds; MDBs/UN agencies; private investors; civil society and Indigenous groups	12–36 months (legal frameworks → fund-backed issuance)
Global solidarity levies	G20 clubs/coalitions; UNFCCC; Global Climate Fund	International levy frameworks; fund governance rules	G20 finance ministries; coalition of willing Aes; global climate funds	24–36 months (club pilots → fund integration)

Taken together, the reforms require coordination across prudential, fiscal and climate institutions. The strategy proposed is not to wait for universal consensus, but to proceed through coalitions of the willing, supported by MDB pilots and technical networks such as NGFS or BIS Innovation Hub. Demonstration effects can then feed into formal standard-setting bodies (e.g. BCBS, IOSCO, UNFCCC), ensuring global coherence over time. Relevant precedents, such as the Vienna Initiative, which coordinated public and private stakeholders to stabilise Europe's emerging banking sector after 2009, illustrate how multi-actor cooperation can accelerate implementation while preserving financial stability. This sequential, layered approach helps overcome veto points and accelerates implementation while keeping reforms anchored in legitimate global frameworks.

To strengthen accountability and sustain political attention, an institutional mechanism for periodic public reviews could be established. These reviews, regularly conducted under the auspices of an existing international platform such as the NGFS or G20 Sustainable Finance Working Group, would provide updates on progress across reforms, identify bottlenecks, and encourage timely follow-up. While respecting national sovereignty, such a transparent approach can help refresh public memory, maintain pressure for delivery, and reinforce collective momentum towards implementation.

Conclusion: Unlocking climate capital for emerging markets and developing economies: from diagnosis to delivery

The transition to net zero cannot be won without a massive redirection of global capital towards EMDEs – encompassing both mitigation and adaptation finance. These countries face annual external financing needs on the order of US$1.3 trillion by 2035, yet international flows remain a fraction of that. This report has set out a comprehensive, sequenced and politically ambitious agenda of regulatory, policy and institutional reforms to help close that gap. It has outlined a set of reforms to overcome the impediments limiting the flow of climate finance into developing countries.

The key messages that emerge are:

1. There is no silver bullet – only a coherent package of reforms – prudential, market-based, technological and concessional – can shift risk perceptions and reduce the high cost of capital in EMDEs

2. Prudential regulation must evolve to reflect climate risk more explicitly while preserving the integrity of Basel III

3. Mobilisation of institutional investors is key for scaling up financing – the centre of gravity for scale sits with non-bank institutional capital (sovereign wealth funds (SWFs), pension funds, insurers). Prudential reforms unlock banks and improve warehousing/aggregation into vehicles that institutional investors will buy

4. Credit rating methodologies must stop amplifying EMDE risk premiums and start recognising MDB guarantees, risk-sharing and climate resilience measures

5. Reform of CRAs' role and methodologies is needed to reduce the procyclicality of their ratings and their underlying biases against EMDEs' investment in the net zero transition, and to favour the use of new technologies related to AI and ML

6. FX risk solutions through callable capital-backed facilities and structured hedging platforms are indispensable to attract long-tenor investment

7. Carbon market infrastructure and robust taxonomies can unlock new flows and ensure integrity in climate finance

8. New financial technologies – tokenisation, CBDC platforms, smart contracts – can reduce transaction costs, enhance transparency and crowd in private capital

9. Green bond markets need scaled credit enhancement from MDBs and NDBs to deliver investment-grade paper at scale

10. Global climate funds and solidarity levies must provide predictable concessional anchors, channelling international taxation proceeds into stable revenues for de-risking, adaptation and just transition

11. Coalitions of the willing and variable-geometry approaches are essential to advance reforms even in the absence of universal consensus

12. Implementation sequencing – starting with what is feasible under existing mandates while preparing for more ambitious reforms will build credibility and momentum

Towards effective implementation

Effective delivery requires aligning each reform with the right forum and actors: prudential adjustments with the BCBS and NGFS; rating reform through IOSCO and the G20; MDB capital reforms with shareholders and CAF processes; FX facilities with IMF/MDB boards; carbon markets with UNFCCC Article 6 and voluntary standards; and digital finance pilots through BIS and G20 initiatives. Political traction must come from Ministries of Finance and Heads of Government, while credibility relies on central banks, regulators, MDB boards and private standard-setters.

Country platforms will be essential to link global reforms with pipelines of investable projects. Coalitions of MDBs, NDBs, ministries and civil society can demonstrate proof of concept and crowd in institutional investors, creating a virtuous cycle of credibility, liquidity and scale. Monitoring, feedback and transparency – anchored in international platforms like the NGFS, ISSB, or the World Bank's Partnership for Market Implementation (PMI) – will be critical to sustain momentum and avoid fragmentation.

In parallel, **strong national policy and fiscal frameworks are indispensable to translate these global reforms into concrete results**. Credible and well-articulated Nationally Determined Contributions (NDCs), aligned with medium-term fiscal and structural reform plans, provide the foundation for investment strategies that attract both domestic and international capital. As highlighted in recent MDB reform discussions, strategies for domestic resource mobilisation – through tax reform, subsidy realignment, and more efficient public financial management – are essential complements to external financing. Without credible domestic frameworks, even scaled-up multilateral and private flows risk remaining under-utilised or misaligned with national transition priorities.

The MDB reform agenda has rightly focused on expanding multilateral balance sheets and scaling external finance, but domestic policy frameworks for climate action have so far received less attention. **Going forward, both MDBs and the IMF could play a stronger role by integrating climate-related fiscal and structural reforms into their core country engagement.** In particular, IMF surveillance could go beyond traditional Article IV consultations to explicitly include domestic resource mobilisation as a central component of climate policy, identifying fiscal measures – such as carbon taxation, subsidy reform, or green public investment frameworks – that can enhance countries' capacity to finance their own transitions.

Beyond diagnosis and policy proposals, success will depend on a well-defined implementation strategy. Such a strategy should:

- Match reforms to the appropriate institutional forum, balancing technical credibility (e.g. Basel Committee, IOSCO) with political traction (e.g. G20, the Boards of the IMF, World Bank and other MDBs)
- Design a coherent sequencing of reforms by connecting the global to the local: regulatory and financial changes at the international level should ultimately be channelled through country platforms, ensuring that mobilised capital is anchored in nationally defined strategies and investable pipelines
- Identify and coordinate the right set of actors, from central banks and securities regulators to MDBs, Ministries of Finance and private standard-setters
- Sequence reforms pragmatically, starting with what is institutionally feasible and politically viable, while preparing the ground for broader changes
- Incorporate monitoring and feedback mechanisms, using international platforms (e.g. NGFS, ISSB, World Bank PMI) to track progress, adapt measures and ensure transparency

Mapping gaps to reforms

We now construct a mapping between the external financing gaps (by actor, from Figure I.1) **and the major reforms** (from Table III.1) **that can help close them.** We remain realistic: not all proposals will materialise, nor will they do so with the estimated yields or at the same time. However, the numerical illustrations presented here show that, in theory, there is reason for cautious optimism. External financing gaps (by 2035, EMDEs excluding China) on an annual basis are:

- Private finance gap: US$650bn
- MDB finance gap: US$300bn
- Bilateral finance gap: US$100bn
- South–South cooperation gap: US$50bn
- Other concessional/innovative finance gap: US$200bn

Conclusions: Mapping gaps to reforms

Financing gap (actor)	Amount (US$bn/year)	Relevant reforms (Table III.1)	Rationale
International private finance	650	- Prudential regulation & stress testing - Climate data/disclosure (ISSB, Gaia) - CRA reform - FX risk mitigation facilities - Green bond scaling with credit enhancement - New financial technologies	Institutional investors (SWFs, pensions, insurers) need bankable, investment-grade assets; reforms reduce risk premiums, improve data and standardise benchmarks
MDBs	300	- MDB capital and guarantee reforms (within 'prudential regulation' + MDB-specific) - CRA reform (recognition of callable capital, guarantees) - Green bond scaling	Reforms expand MDB balance sheet capacity, unlock callable capital, reduce internal capital charges on guarantees and improve external recognition
Bilateral finance	100	- Leveraging climate funds and natural capital - Global solidarity levies - Carbon market infrastructure	Bilateral donors can channel funds via GCF, CIFs, or levy proceeds, while Article 6 markets create flows from Aes to EMDEs
South–South cooperation	50	- Carbon market infrastructure (Article 6, voluntary standards) - New financial technologies (multi-	Facilitates cross-country project co-financing and settlement, especially

		CBDC, DLT) - Country platforms	among large MICs (Brazil, India, GCC funds)
Other concessional/innovative finance	200	- Global solidarity levies (airline levy, FTT, crypto, shipping) - Leveraging climate funds and natural capital - Carbon market infrastructure	Predictable concessional anchors de-risk adaptation; innovative taxes and funds expand available concessional pools

We now express the reforms in terms of how much of each financing gap they could realistically cover, see Appendix 3 for details on the calculations.

1. **International private finance gap – US$650bn/year:**

- Institutional investor pools (US$180 trillion AUM) → capacity far exceeds the gap; even 0.5% allocation = US$900bn (enough to cover 100% of the gap)
- MDB-backed SPVs/guarantees reducing EMDE costs by ~200 bps → could crowd in US$100–200bn annually (≈15–30% of the gap)
- Blended finance scaled 5× (US$50bn annually) → ≈8% of the gap

Coverage potential: Together, reforms could meet or exceed the US$650bn gap if institutional investors are mobilised at scale.

2. **MDB gap – US$300bn/year:**

- Recognition of 25–35% of callable capital → estimated to unlock US$100–150bn/year (≈33–50% of the gap)
- GCI → could add another US$100–150bn/year, covering the remainder

Coverage potential: Callable capital + GCI could close ≈100% of the MDB gap

3. **Bilateral finance gap – US$100bn/year:**

- Scaling of GCF/CIFs and bilateral channels → currently ≈US$30–40bn/year; could be doubled/trebled to ≈US$60–90bn/year (≈60–90% of the gap)
- Debt-for-nature swaps → examples show billions mobilised; realistically could add ≈US$10–20bn/year (covering the rest)

Coverage potential: Combined measures can plausibly close the gap fully

4. **South–South cooperation gap – US$50bn/year:**

- Article 6 carbon markets with a US$40/$tCO_2$ differential → could generate ≈US$20–30bn/year (≈40–60% of the gap)
- Multi-CBDC/DLT settlement efficiencies + country platforms → could enable another ≈US$20–30bn/year of mobilised flows

Coverage potential: Together could close ≈100% of the gap

5. **Concessional/innovative finance gap – US$200bn/year:**

- Global solidarity levies (aviation/shipping) → US$150–350bn/year (≈75–175% of the gap)
- TFFF → US$125bn target (≈60% of the gap)
- Global Green Fund (levies + taxes) → additional predictable revenues on top of levies

Coverage potential: Solidarity levies alone can fully finance the gap; with TFFF and funds, potential exceeds 200%

6. **Cross-cutting reserves (not a gap, but a source):**

- Global CB reserves (US$12 trillion); 1–2% reallocation → US$120–240bn/year
- This could cover ≈18–37% of the private finance gap, or ≈100% of the MDB gap if targeted

Final outlook

The proposed regulatory and policy reforms are both feasible and effective. They build on existing institutions, frameworks and precedents, but recalibrate them as needed for the urgency of climate action. They do not require rewriting the global financial order, but rather adjusting its rules and incentives to mobilise trillions where they are most needed. Above all, they are timely: with climate finance set to dominate the international agenda, the forthcoming forums – **COP30 in Belém**, the **Circle of Ministers of Finance, the G20, the meetings of the BIS and NGFS,** and the **IMF–World Bank Annual Meetings** – **offer concrete opportunities to advance and embed this agenda.**

Complementary work by expert and policy groups – including the Independent High-Level Expert Group on Climate Finance (IHLEG), the expert group convened by the COP30 Presidency, the 4P Eminent Persons Group (EPG), the Global Solidarity Levies Task Force, the VCEF Review Taskforce, and initiatives under the OECD, UNDP, and NGFS – **is already converging around similar principles.** In parallel, non-governmental and philanthropic coalitions such as the European Climate Foundation (ECF), the Climate Policy Initiative (CPI), and GFANZ (the Glasgow Financial Alliance for Net Zero) are supporting analytical, advocacy, and implementation efforts to make these reforms operational.

Dialogue with **civil society and advocacy organisations –** including networks such as Climate Action Network International (CAN), Climate Finance Access Network (CFAN), The Nature Conservancy, 350.org, Greenpeace International, and WWF, as well as youth movements such as YOUNGO and the Loss and Damage Youth Coalition, together with many others at local level in each region and country – is indispensable. These actors bring new ideas, public accountability, transparency, and social legitimacy to the reform process, while representing the younger generations most exposed to the consequences of climate inaction. Their inclusion ensures that climate finance reforms advance not only economic efficiency but also **equity, intergenerational justice, and democratic legitimacy**.

Together, these forums, institutions, and civic movements represent a rare alignment of political, institutional, and societal momentum – a moment when pragmatic reform of the global financial architecture can translate into tangible progress towards climate and development goals.

The report obviously does not claim that there are no obstacles; it acknowledges that some proposals lack consensus and require political will. Indeed, full feasibility is dependent on political decisions – recognising callable capital or imposing levies requires strong G20 consensus and beyond that global agreement, which is not guaranteed.

Nevertheless, it is worth showing that there is a path and that choice is now political: either we allow risk perceptions, institutional inertia, and fragmented governance to perpetuate underinvestment in the EMDEs – or we adopt pragmatic, sequenced reforms that make climate finance both scalable and just. **The pathway is clear and the time to act is now.**

References

Asia Society Policy Institute (2023) *Battle for the foot bill: how will China's contributions be captured in the new climate finance goal?* Blog post. https://asiasociety.org/policy-institute/battle-foot-bill-how-will-chinas-contributions-be-captured-new-climate-finance-goal

Assunção, J. and Scheinkman, J.A. (2023) *Carbon and the fate of the Amazon*. Report. Climate Policy Initiative. https://www.climatepolicyinitiative.org/publication/carbon-and-the-fate-of-the-amazon/

Bank for International Settlements – Basel Committee on Banking Supervision [BCBS] (2002) *Frequently asked questions on climate-related financial risks*. Report. Basel: BIS. https ://www.bis.org/bcbs/publ/d543.pdf

Bank for International Settlements – Basel Committee on Banking Supervision [BCBS] (2025) *A framework for the voluntary disclosure of climate-related financial risks*. Report. Basel: BIS. https ://www.bis.org/bcbs/publ/d597.pdf

Bank for International Settlements [BIS] (2021) BIS launches second green bond fund for central banks. Press release, 25 January. Basel: BIS. https://www.bis.org/press/p210125.htm

Bank for International Settlements [BIS] (2022). Project mBridge: Connecting economies through CBDC. (BIS Innovation Hub Other Publication No. 59). https://www.bis.org/publ/othp59.pdf

Bank for International Settlements [BIS] (2023). Project Gaia: Exploring climate-related data and financial disclosures. BIS Innovation Hub. https://www.bis.org/about/bisih/topics/suptech_regtech/gaia.htm

Bank for International Settlements [BIS] (2024) *Project Nexus: connecting payment systems across borders*. Brochure. Basel: BIS. https://www.bis.org/innovation_hub/projects/nexus_brochure.pdf

Banque de France (2023) *Are credit ratings procyclical? A study of French banks' capital requirements during the COVID crisis*. Working paper. Paris: Banque de France. https://www.banque-france.fr/en/publications-and-statistics/publications/are-credit-ratings-procyclical-study-french-banks-capital-requirements-during-covid-crisis

Barmes, D., Claeys, I., Dikau, S. and Pereira da Silva, L. A. (2024). The Case for Adaptive Inflation Targeting. Monetary Policy in a Hot and Volatile World, London: Grantham Institute Publication. https://cetex.org/wp-content/uploads/2024/12/The-case-for-adaptive-inflation-targeting.pdf

Bhattacharya A, Songwe V, Soubeyran E and Stern N (2024) Raising Ambition and Accelerating Delivery of Climate Finance. London: Grantham Research Institute on Climate Change and the Environment, London School of Economics and Political Science. https://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2024/11/Raising-ambition-and-accelerating-delivery-of-climate-finance_Third-IHLEG-report.pdf

BloombergNEF (2025) *New energy outlook 2025*. Report. https://about.bnef.com/insights/clean-energy/new-energy-outlook/

Boissinot, Jean. (2022), La finance verte : Climat, secteur financier et transition net zéro. Paris: Dunod. https://shs.cairn.info/la-finance-verte--9782100836499?lang=fr

Bolton, P., & Kleinnijenhuis, A. (2025). Funding the climate transition of EMDEs: How to decarbonise their power sectors. Remarks at COP30 Advisory Committee, April 25, 2025.

Bolton, P., Després, M., Pereira da Silva, L. A., Samama, F., & Svartzman, R. (2020). The Green Swan: Central Banking and Financial Stability in the Age of Climate Change. Bank of International Settlements. https://www.bis.org/publ/othp31.htm

Bolton, P., Kacperczyk, M., & Samama, F. (2022). Net-Zero Carbon Portfolio Alignment. Financial Analysts Journal. Advance online publication. https://doi.org/10.1080/0015198X.2022.2033105

Boston University Global Development Policy Center (2024). Global China Initiative. Policy brief. Boston: BU GDP. https://www.bu.edu/gdp/files/2024/11/GCI-PB-24-CGEF-2024-FIN.pdf

Cantor R, Packer F (1996) Determinants and impact of sovereign credit ratings. *FRBNY Economic Policy Review*. Federal Reserve Bank of New York. https://www.newyorkfed.org/research/epr/96v02n2/9610cant.html

Carbon Brief (2024) *Analysis: UK climate aid reaches record £1.8bn in 2023 after loosening rules*. Blog post, 7 June. https://www.carbonbrief.org/analysis-uk-climate-aid-reaches-record-1-8bn-in-2023-after-loosening-rules/

Climate Action Network Europe [CAN Europe] (2021) *The EU's climate finance: world's largest contributor needs to set the direction of travel*. Blog post. https://caneurope.org/the-eus-climate-finance-worlds-largest-contributor-needs-to-set-the-direction-of-travel/

Climate Policy Initiative [CPI] (2025) *Global landscape of climate finance 2025*. Report. San Francisco: CPI. https://www.climatepolicyinitiative.org/publication/global-landscape-of-climate-finance-2025/

Council of the European Union (2023) *Climate finance: Council approves 2022 international climate finance figures*. Press release, 23 November. Brussels: Council of the EU. https://www.consilium.europa.eu/en/press/press-releases/2023/11/23/climate-finance-council-approves-2022-international-climate-finance-figures/

Dialogue Earth (2024) *Will China assume more responsibility for global climate finance?* Blog post, 19 November. https://dialogue.earth/en/climate/will-china-assume-more-responsibility-for-global-climate-finance/

Duflo, E., Banerjee, A., & Greenstone, M. (2025). A climate damages agreement that would benefit (almost) everyone. Remarks presented at COP30 Advisory Committee, April 25, 2025.

Energy Transitions Commission and McKinsey & Company (2023) *Raising ambition and accelerating delivery of climate finance*. Report. https://www.energy-transitions.org/publications/financing-the-transition-etc/#download-form

European Centre for Development Policy Management [ECDPM] (2025) *European support for adaptation in times of shifting politics and tight budgets*. Blog post. https://ecdpm.org/work/european-support-adaptation-times-shifting-politics-and-tight-budgets

European Commission (2023) *How the EU is helping partner countries fight climate change*. Web page. https ://climate.ec.europa.eu/news-other-reads/stories/how-eu-helping-partner-countries-fight-climate-change_en#

European Commission (2024) *International climate finance*. Web page. https ://climate.ec.europa.eu/eu-action/international-action-climate-change/international-climate-finance_en

Executive Office of the President of the United States (2023) *Fact sheet: Biden–Harris Administration leverages historic US climate leadership at home and abroad to urge countries to accelerate global climate action at UN Climate Conference COP28*. Press release, 2 December. Washington DC: White House. https://bidenwhitehouse.archives.gov/briefing-room/statements-releases/2023/12/02/fact-sheet-biden-harris-administration-leverages-historic-u-s-climate-leadership-at-home-and-abroad-to-urge-countries-to-accelerate-global-climate-action-at-u-n-climate-conference-cop28/

Feldstein, M., & Horioka, C. (1980). Domestic saving and international capital flows. The Economic Journal, 90(358), 314–329. https://doi.org/10.2307/2231790

Ferri G, Liu L, Stiglitz JE (2003) The procyclical role of rating agencies: evidence from the East Asian crisis. *Economic Notes*. https://onlinelibrary.wiley.com/doi/10.1111/1468-0300.00016

Financial Markets Law Committee (FMLC). (2024). Pension Fund Trustees and Fiduciary Duties: Decision-Making in the Context of Sustainability and the Subject of Climate Change. London: FMLC. https://fmlc.org/wp-content/uploads/2024/02/Paper-Pension-Fund-Trustees-and-Fiduciary-Duties-Decision-making-in-the-context-of-Sustainability-and-the-subject-of-Climate-Change-6-February-2024.pdf

FinDevLab, International Monetary Fund and World Bank (2024) *Lifting the hood of the LIC-DSF to revamp its accuracy and transparency*. Policy note. Washington, DC: IMF/World Bank. https://findevlab.org/wp-content/uploads/2024/10/FDL-_Policy-Note-18_The-Debt-Sustainability-Framework-for-Low-Income-Countries_Oct24.pdf

Fouliard J, Howell M, Rey H (2021) Answering the Queen: machine learning and financial crises. *BIS Working Paper No. 926*. Basel: Bank for International Settlements. https://www.bis.org/publ/work926.htm

FTSE Russell (2022) *Decarbonisation equity benchmarks*. Research paper. London: FTSE Russell. https://www.lseg.com/content/dam/ftse-russell/en_us/documents/research/decarbonisation-equity-benchmarks.pdf

Fuchs A, Gehring K (2017) The home bias in sovereign ratings. *Journal of the European Economic Association*. Oxford University Press. https://academic.oup.com/jeea/article-abstract/15/6/1386/3091078

G20 (2022) *Boosting MDBs' investing capacity: an independent review of multilateral development banks' capital adequacy frameworks*. Report. Washington, DC: G20. https://www.gihub.org/resources/publications/boosting-mdbs-investing-capacity-an-independent-review-of-multilateral-development-banks-capital-adequacy-frameworks/

Global Emerging Markets Risk Database Consortium (2024) *Default and recovery statistics: private and public lending 1994–2023*. Luxembourg: European Investment Bank. https://www.gemsriskdatabase.org

Global Solidarity Levies Task Force (2025) Scaling Solidarity: Progress on Global Solidarity Levies Global Solidarity Levies Task Force: For People and the Planet, https://solidaritylevies.org/app/uploads/2024/11/GSLTF-Scaling-Solidarity-Progress-on-Global-Solidarity-Levies-report.pdf

Heldmann, J., Dang, H.D. and Brückner, T. (2025) *Investing in a low-carbon transition: carbon footprint savings with green MSCI indices*. *Journal of Environmental Management*, 393, 126022. https://www.sciencedirect.com/science/article/pii/S030147972501998X?utm

Imperial College Business School and SOAS University of London (2018) *Climate change and the cost of capital in developing countries*. Report commissioned by UN Environment, with financial support from the MAVA Foundation. London: Imperial College Business School and SOAS University of London. https://www.soas.ac.uk/sites/default/files/2023-02/Climate%20Change%20and%20the%20Cost%20of%20Capital%20in%20Developing%20Countries%20-%20English.pdf

Independent High-Level Expert Group [IHLEG] (2024) *Accelerating sustainable finance for emerging markets and developing economies – Independent High-Level Expert Group review of the vertical climate and environmental funds*. Report. https://www.climatepolicyinitiative.org/wp-content/uploads/2000/10/G20-IHLEG-VCEF-Review.pdf

Intergovernmental Panel on Climate Change [IPCC] (2023) *AR6 synthesis report: climate change 2023*. Geneva: IPCC. https://www.ipcc.ch/report/ar6/syr/

International Energy Agency [IEA] (2023) *Net zero roadmap: a global pathway to keep the 1.5°C goal in reach*. Paris : IEA. https ://www.iea.org/reports/net-zero-roadmap-a-global-pathway-to-keep-the-15-c-goal-in-reach

International Monetary Fund [IMF] (2022) *Sovereign debt sustainability and central bank credibility*. IMF Working Paper. Washington, DC: IMF. https://www.imf.org/en/Publications/WP/Issues/2022/01/28/Sovereign-Debt-Sustainability-and-Central-Bank-Credibility-512335

International Monetary Fund [IMF] (2023) *Resilience and Sustainability Trust: operational update*. Report. Washington, DC: IMF. https://www.imf.org/en/Topics/Resilience-and-Sustainability-Trust

Jondeau, E., Mojon, B., & Pereira da Silva, L. A. (2021). Building benchmark portfolios with decreasing carbon footprints (BIS Working Paper No. 985). Bank for International Settlements https://www.bis.org/publ/work985.pdf

Mazzucato, M., & Heher, U. (2025). Powering the Green Transformation: Mission-Oriented Country Platforms to Accelerate Climate Action. Remarks presented at COP30 Advisory Committee, April 25, 2025.

Ministry of Finance, Brazil. (2025). Report of the COP30 Circle of Finance Ministers on the Baku to Belém Roadmap to 1.3 Trillion. [PDF]. COP30 Brasil. https://cop30.br/pt-br/noticias-da-cop30/cop30-circle-of-finance-ministers-report_final.pdf

Network for Greening the Financial System [NGFS] (2022) *NGFS climate scenarios for central banks and supervisors*. Paris : NGFS. https ://www.ngfs.net/en/publications-and-statistics/publications/ngfs-climate-scenarios-central-banks-and-supervisors

Oehmke, M. and Opp, M. (2025). *Green Capital Requirements.* CEPR Discussion Paper No. DP1865, Centre for Economic Policy Research (CEPR), London. https://www.fmg.ac.uk/sites/default/files/2025-06/DP865-revised-updated.pdf

Organisation for Economic Co-operation and Development [OECD] (2025a) *International aid falls in 2024 for first time in six years*. Press release. Paris: OECD. https://www.oecd.org/en/about/news/press-releases/2025/04/official-development-assistance-2024-figures.html

Organisation for Economic Co-operation and Development [OECD] (2025b) Development Finance Statistics. Web page. https://public.flourish.studio/story/2786612/

Organisation for Economic Co-operation and Development [OECD] (2023) *Long-term investing of large pension funds and public reserve funds*. Report. Paris: OECD. https://www.oecd.org/en/publications/long-term-investing-of-large-pension-funds-and-public-pension-reserve-funds-2023_c690ccc3-en.html

Organisation for Economic Co-operation and Development [OECD] (2025c) *Pension markets in focus 2025 (preliminary edition)*. Report. Paris: OECD. https://www.oecd.org/content/dam/oecd/en/topics/policy-sub-issues/asset-backed-pensions/PMF%202025%20-%20Preliminary%202024.pdf

Pande, R., Burgess, R., Farboodi, M., & Page, L. (2025). A credible and fair international carbon market: Core requirements, institutions, and market design. Remarks presented at COP30 Advisory Committee, April 25, 2025.

Pereira da Silva Luiz Awazu, Proctor JC, Salin M, Svartzman R, Després M, Saint-Amans P (2025) Global solidarity levies: a negotiation framework for the just transition. Report. Brussels: European Climate Foundation (forthcoming).

Pereira da Silva, Luiz Awazu (2025), The Macroeconomics of Climate Change: Progress amid geopolitical turbulence, Remarks at the LSE- CETEx PLP event, 27 October 2025

Pisani, J. and Mahfouz, S. (2023) *Les incidences économiques de l'action pour le climat: rapport à la Première ministre*. Report. Paris: France Stratégie. https://www.strategie-plan.gouv.fr/publications/incidences-economiques-de-laction-climat

Rojas-Suarez, L. (2025) *Aligning international banking regulation with the SDGs*. CGD Policy Paper 351. Washington, DC: Center for Global Development. https://www.cgdev.org/sites/default/files/aligning-international-banking-regulation-sdgs.pdf

Saffar M (forthcoming) *Private capital mobilisation for climate action in developing countries*. London: Grantham Research Institute on Climate Change and the Environment, London School of Economics and Political Science (CETEX).

State Street Global Advisors (2023) *EU climate benchmarks: a guide*. Report. Boston: SSGA. https://www.ssga.com/library-content/pdfs/insights/eu-climate-benchmarks-a-guide.pdf

Tennant J (2020) Sovereign credit rating: evidence of bias against poor countries. *International Review of Financial Analysis*. Elsevier/ScienceDirect. https://www.sciencedirect.com/science/article/abs/pii/S1062940818302158

Tubiana, L and Guérin, E (2025), *Le Climat est un sport de combat*, Albin Michel, 29 Octobre 2025

U.S. Securities and Exchange Commission – COVID-19 Market Monitoring Group (2020) *Credit ratings, procyclicality and related financial stability issues*. Speech. Washington, DC: SEC. https://www.sec.gov/newsroom/speeches-statements/covid-19-monitoring-group-2020-07-15?utm

UK Government (2024) *UK international climate finance results 2024*. Report. London: Department for Energy Security and Net Zero. https://www.gov.uk/government/publications/uk-international-climate-finance-results-2024/uk-international-climate-finance-results-2024

United Nations Conference on Trade and Development [UNCTAD] (2022) *A European financial transaction tax for climate and development*. Geneva: UNCTAD. https://unctad.org/system/files/official-document/tdr2022_en.pdf

United Nations Conference on Trade and Development [UNCTAD] (2025) *Policy review: credit rating agencies, developing countries and bias*. Geneva: UNCTAD. https://unctad.org/publication/credit-rating-agencies-developing-countries-and-bias

United Nations Department of Economic and Social Affairs (2023) *Credit rating agencies and sovereign debt: challenges and reform options*. Report. New York: UN DESA. https://financing.desa.un.org/sites/default/files/2023-03/Credit%20Rating%20Agencies_paper_1.pdf

US Securities and Exchange Commission – COVID-19 Market Monitoring Group (2020) *Credit ratings, procyclicality and related financial stability issues*. Speech. Washington, DC: SEC. https://www.sec.gov/news/speech/credit-ratings-procyclicality-and-related-financial-stability-issues

Wan, S. and Becker, T. (2025) *A risky safe asset: the vulnerabilities of US Treasuries*. Insight report. New York: BlackRock. https://www.blackrock.com/institutions/en-us/insights/us-treasury-risks

Wolf, M. (2025) *The Wolf–Krugman exchange — the crisis of trust*. *Financial Times*, 6 June. London: Financial Times. https://www.ft.com/content/dd41cb0c-5fbb-4ba3-b485-f84a933db993

World Bank (2025) Foreign Direct Investment in Retreat: Policies to Turn the Tide. Report. Washington: World Bank. https://openknowledge.worldbank.org/server/api/core/bitstreams/7c3cf4fc-7fea-4e17-9d52-0aa7ed15fd15/content

World Economic Forum [WEF] (2023) *Sovereign wealth funds are playing an increasingly important role in economies everywhere*. Blog post. Geneva: WEF. https://www.weforum.org/stories/2023/11/sovereign-wealth-funds-are-playing-an-increasingly-important-role-in-economies-everywhere/

World Economic Forum [WEF] (2024) *Net zero industry tracker 2024*. Report. Geneva: WEF. https://www.weforum.org/publications/net-zero-industry-tracker-2024/

Appendices

Appendix 1. Possible policy actions to favour cross-border climate finance capital flows to developing countries

		Regulatory reforms within CB mandates					CB Policies requiring more coordination and reaching consensus in adequate forums (NGFS, BIS)				Policies requiring coordination with Governments and Global Community in adequate forum (Bretton-Woods IFIs, G20, G7+)						
		Data, Taxonomies, and Transparency	*Convergence around international disclosure standards*	*Stress-testing*	*Guarantees, Credit Enhancement and Risk-Sharing Tools*	*Risk-weights and other prudential regulation*	*Monetary Policy collateral*	*Asset purchase programs*	*FX Reserves to hold Sovereign Green Bonds*	*Direct Credit to specific sectors and firms*	*Credit Ratings*	*Improve settlement and conversion to reduce FX risk*	*Advancing Carbon Market Structures*	*New Financial Technologies (DLT, smart contracts, etc)*	*Debt swaps and investment funds against collateral*	*Global Funds & Official Development Assistance*	*Global Funds & Private assistance donations*
Middle Income Countries	*Investment Grade*																
	Sub Investment Grade																
Low Income Countries	*With potential collateral*																
	Without collateral																

Level of importance
High
Medium
Low

Appendix 2. Details on implementation of the reforms: where, how, with whom?

1. Implement regulatory adaptations, climate risk stress testing and supervision:

- Right forum to discuss the reform:
    - (a) Basel Committee on Banking Supervision (BCBS): Primary standard-setter for global prudential rules. Any adaptation of Basel III must be initiated or endorsed here, particularly for capital, liquidity, or disclosure frameworks.
    - (b) Network for Greening the Financial System (NGFS): incubator for climate-related regulatory and supervisory innovation. It produces technical groundwork and pilots climate risk scenarios to feed into Basel revisions.
- Accord, legislation, or regulatory norm to be changed:
    - (a) Basel III Framework, specifically: Pillar 1 (Minimum Capital Requirements), Pillar 2 (Supervisory Review Process), Pillar 3 (Disclosure Requirements).
    - (b) Optional national-level legislation or regulatory alignment like the CRR/CRD (Capital Requirements Regulation/Directive) in the EU; and/or national prudential standards.
- Set of actors to involve in the change:
    - (a) Central banks and financial sector supervisors.
    - (b) NGFS members and observers.
    - (c) Private sector stakeholders (e.g. IIF, GFANZ).

2. Operationalise climate data, taxonomies, and disclosure:

- Right forum to discuss the reform:
    - (a) International Financial Reporting Standards (IFRS), International Sustainability Standards Board (ISSB).
    - (b) Network for Greening the Financial System (NGFS).
    - (c) G20 Sustainable Finance Working Group (SFWG) to push for global convergence of taxonomies and coordinate work across jurisdictions.
- Accord, legislation, or regulatory norm to be changed:
    - (a) Adoption and national implementation of ISSB standards (e.g. IFRS S1 and S2).
    - (b) National sustainable finance taxonomy regulations: EU Taxonomy, ASEAN Taxonomy, or national green taxonomies.
    - (c) Disclosure rules under securities law and supervisory mandates.
- Set of actors to involve in the change:
    - (a) IFRS/ISSB.
    - (b) Central Banks and Financial Supervisors.
    - (c) Securities Market Regulators.

- (d) National Statistics Offices/Environmental Agencies.

3. **Apply Central bank monetary operations, asset purchase programmes (QE) and reserve policies for climate finance:**

- Right forum to discuss the reform:
  - (a) Network for Greening the Financial System (NGFS).
  - (b) Bank for International Settlements (BIS), specifically its BIS committees (Markets Committee, Committee on the Global Financial System).
  - (c) The International Monetary Fund (IMF) for policy advice and surveillance and to assess the macroeconomic, monetary and fiscal implications of green asset purchases, QE and FX reserve management.
- Accord, legislation, or regulatory norm to be changed:
  - (a) Central bank operational frameworks and guidelines (domestic) to adjust collateral/asset purchase eligibility criteria to include green bonds and climate-linked instruments.
  - (b) Monetary policy mandates (if restrictive); in some countries, enabling laws or mandates may need revision.
  - (c) Reserve management investment guidelines.
- Set of actors to involve in the change:
  - (a) Central banks.
  - (b) Ministries of Finance: may be required to approve changes to central bank statutes.
  - (c) National Parliaments/legal Authorities, if statutory changes to central bank mandates are needed.

4. **Reform credit rating agency (CRA) methodologies**

- Right forum to discuss the reform:
  - (a) International Organization of Securities Commissions (IOSCO). IOSCO oversees the Code of Conduct for CRAs, and its guidance is adopted by national regulators worldwide. Central to any systemic reform of rating practices and methodologies.
  - (b) the IMF can incentivise CRAs through its country reports, and push for inclusion of climate-related risks.
  - (c) G20 (Sustainable Finance Working Group/Finance Track) can exert pressure on CRAs to alter methodologies and recognise risk-mitigating instruments (e.g. MDB guarantees, climate resilience frameworks), particularly when developing country voices are strong.
- Accord, legislation, or regulatory norm to be changed:
  - (a) IOSCO Code of Conduct for CRAs.
  - (b) National securities legislation/CRA licensing rules.
  - (c) Debt Sustainability Frameworks (DSA) and IMF–WB joint analysis tools.

- Set of actors to involve in the change:
    - (a) Securities market regulators (national level).
    - (b) Ministries of Finance.
    - © IOSCO and national CRA supervisors.
    - (d) Private sector coalitions (e.g. GFANZ, IIF).

5. Mitigate FX risk through structured facilities:

- Right forum to discuss the reform:
    - (a) G20 Finance Track/International Financial Architecture Working Group.
    - (b) International Monetary Fund (IMF).
    - (c) World Bank/MDB Heads and Shareholders Platform (e.g. Global Emerging Markets Risk Database Consortium, GEMs). MDB boards and technical units must adapt capital adequacy frameworks and internal policies to scale use of callable capital and off-balance sheet guarantees to support FX hedging.
- Accord, legislation, or regulatory norm to be changed:
    - (a) MDB Capital Adequacy Frameworks (CAF), reform methodologies (e.g. based on the G20-commissioned CAF Review) to better reflect the credit quality and risk-bearing capacity of callable capital. Increase capital of MDBs and allow MDBs to leverage callable capital for contingent FX risk instruments, guarantees and hybrid structures, without eroding lending headroom.
    - (b) IFRS/MDB Accounting Standards, clarify how callable capital and contingent liabilities (e.g. FX guarantees) should be reported and provisioned for.
    - (c) National budget rules (donor countries) enable recognition of callable capital contributions as valuable commitments that do not trigger budgetary scoring as upfront fiscal liabilities.
- Set of actors to involve in the change:
    - (a) G20 Shareholder Ministries of Finance: key decision-makers in recapitalisation rounds and CAF reform.
    - (b) MDB Executive Boards and Treasuries: implement new capital accounting standards and deploy scalable FX hedging instruments backed by callable or hybrid capital layers.
    - (c) Accounting standard-setters (IFRS Foundation): define treatment of callable capital and MDB guarantees in a way that facilitates their operational use.
    - (d) Recipient country Ministries of Finance and central banks: coordinate with MDBs on deployment of FX facilities, accept associated contingent structures and ensure alignment with macro-prudential frameworks.
    - (e) Private sector hedging providers and funds (e.g. TCX): collaborate with MDBs on co-risk-sharing mechanisms and product delivery.

6. Develop carbon market infrastructure:

- Right forum to discuss the reform:

- (a) World Bank/Partnership for Market Implementation (PMI) helps countries develop MRV systems, national registries and market linkages, in coordination with existing carbon platforms.
- (b) UNFCCC (Article 6 Supervisory Body) sets global rules for transferring mitigation outcomes (ITMOs) and defines transparency, MRV and registry requirements.
- (c) Integrity Council for the Voluntary Carbon Market (ICVCM) and Voluntary Carbon Market Integrity Initiative (VCMI) define quality standards (Core Carbon Principles), verification protocols and buyer-side rules. These bodies help ensure that national systems in developing countries can interface credibly with voluntary markets.

- Accord, legislation, or regulatory norm to be changed:
  - (a) National carbon market legislation.
  - (b) UNFCCC Article 6 Rulebook (operationalisation).
  - (c) Financial and environmental regulation to recognise carbon credits as tradable financial or environmental assets, and clarify tax and ownership rules.
- Set of actors to involve in the change:
  - (a) Ministries of Environment/Climate Change.
  - (b) Ministries of Finance.
  - (c) Central banks/financial market regulators.
  - (d) World Bank (PMI) and other MDBs.
  - (e) UNFCCC and Article 6 Supervisory Body.
  - (f) Existing voluntary market standards and platforms (e.g. Verra, Gold Standard, Xpansiv, CBL) that work with national systems to harmonise methodologies, ensure project-level quality and enable dual eligibility for projects (both voluntary and Article 6 markets).
  - (g) ICVCM and VCMI ensure interoperability of national markets with the voluntary carbon market by certifying credit quality and use standards.

7. **Expand the use of new financial technologies:**

- Right forum to discuss the reform:
  - (a) Bank for International Settlements (BIS) – Innovation Hub, the core technical forum for cross-border financial infrastructure modernisation, leads pioneering pilots (e.g. Project mBridge, Project Gaia).
  - (b) G20 – Finance Track/TechSprint/SFWG.
  - (c) International Organization of Securities Commissions (IOSCO).
- Accord, legislation, or regulatory norm to be changed:
  - (a) National Financial Market and Securities Regulations, define tokenised green bonds, carbon credits and smart contract-based finance as legal, regulated instruments, enable DLT-based settlement systems and define digital asset custody rules.

- (b) Central bank and monetary regulations, permit use of multi-CBDC platforms (e.g. mBridge) for cross-border green payments and FX settlement.

- Set of actors to involve in the change:
  - (a) Central Banks.
  - (b) Ministries of Finance/financial regulators.
  - (c) Securities commissions and financial infrastructure authorities.
  - (d) MDBs and international financial institutions.
  - (e) Private sector platforms and consortia, Climate Impact X, Polygon, Ethereum-based pilots.

8. **Scale up green bond markets with credit enhancement:**

- Right forum to discuss the reform:
  - (a) MDBs (e.g. World Bank, IFC, AfDB, IDB).
  - (b) G20 Finance Track/Sustainable Finance Working Group (SFWG).
  - (c) International Organization of Securities Commissions (IOSCO).
- Accord, legislation, or regulatory norm to be changed:
  - (a) MDB Capital Adequacy Frameworks (CAF).
  - (b) National Public Finance and Debt Issuance Regulations to allow Ministries of Finance or public development banks to issue or participate in structured green bonds, backed by credit enhancements (e.g. through SPVs).
  - (c) Securities and listing rules to permit green bonds with tiered tranching
- Set of actors to involve in the change:
  - (a) Ministries of Finance/debt offices.
  - (b) National development banks (NDBs) serve as issuers or co-issuers of green bonds, intermediating between MDBs and markets.
  - (c) MDBs (IFC, AfDB, ADB, IADB) provide guarantees, first-loss capital and technical assistance for structuring deals.
  - (d) CRAs recognise MDB enhancement explicitly in ratings to uplift green bond tranches.
  - (e) Institutional investors purchase enhanced senior tranches; offer market feedback to ensure instrument liquidity.
  - (f) Securities regulators/IOSCO, standardise treatment of hybrid structures and enforce green bond integrity standards.

9. **Leverage global climate funds and/or LIC collateral (nature, tropical forests, etc.) to enhance climate finance:**

- Right forum to discuss the reform:

    - (a) Green Climate Fund (GCF) and Climate Investment Funds (CIFs).
    - (b) UNFCCC/Article 6 Supervisory Body.
    - (c) G20.
    - (d) World Bank (for debt-for-nature swaps), IMF (to integrate into DSAs) and biodiversity-focused actors like the Nature Conservancy or the Global Biodiversity Framework Fund.
- Accord, legislation, or regulatory norm to be changed:
    - (a) Global Fund Governance and Capital Deployment Rules.
    - (b) National Legal Frameworks for Natural Capital and Carbon Rights, establish legal ownership and transferability of carbon credits, biodiversity credits, or conservation outcomes and set rules for revenue-sharing, land tenure and Indigenous rights, ensuring fairness in nature-backed financing deals.
- Set of actors to involve in the change:
    - (a) Ministries of Finance.
    - (b) Ministries of Environment/Forestry, certify assets (e.g. tropical forests), manage MRV systems and ensure policy coherence.
    - (c) Climate funds (GCF, CIFs) provide guarantees, blended capital and results-based finance to LIC-led programmes.
    - (d) MDBs and UN agencies (UNDP, UNEP) design and co-finance risk-sharing vehicles; support capacity building and registry systems.
    - (e) Private investors/credit platforms.
    - (f) Civil society organisations and Indigenous groups ensure equitable governance, participation and benefit-sharing in nature-backed finance.

Appendix 3. Mapping external financing gaps to reforms – detailed calculations

1. International Private Finance Gap – US$650 billion/year

Component	Data/Assumption	Calculation/Result
Institutional investor reallocation	Global institutional investors (pension funds, insurers, SWFs) manage ≈ US$180 trillion in AUM. A modest 0.5% reallocation to EMDE climate assets is consistent with diversification and ESG mandates.	0.5% × US$180 trillion = US$900 billion potentially available for EMDE green investment.
Reduction of risk premium through MDB-backed vehicles	Average EMDE borrowing costs are ≈200 bps higher than AEs due to FX, political, and credit risk. MDB guarantees and blended-finance SPVs can reduce this premium.	A 200bps reduction could make many projects investment-grade. If this shifts 0.1–0.2% of institutional portfolios, that equals US$100–200 billion/year.
Scaling blended finance	Current blended-finance mobilisation ≈US$10 billion/year. MDBs and DFIs can scale this fivefold under better risk-sharing and standardised pipelines.	5 × US$10 billion = US$50 billion/year additional mobilised capital.

2. MDB Finance Gap – US$300 billion/year

Component	Data/Assumption	Calculation/Result
Callable capital recognition	MDBs hold ≈US$1.5–2 trillion in callable capital, largely unrecognised for capital adequacy. Recognising 25–35% would expand usable capital with 4× lending leverage.	0.25–0.35 × (1.5–2 trn) = US$375–700 billion usable capital → US$100–150 billion/year lending headroom.
General Capital Increase (GCI)	A 30–50% increase in paid-in capital across MDBs could double current lending headroom.	Adds roughly US$100–150 billion/year of new lending capacity.

3. Bilateral Finance Gap – US$100 billion/year

Component	Data/Assumption	Calculation/Result
Expansion of GCF/CIFs and bilateral channels	Current concessional ODA ≈US$30–40 billion/year. Doubling/tripling through replenishments and co-financing can reach US$60–90 billion.	2× = US$60–80 billion; 3× = US$90–120 billion of concessional flows.
Debt-for-nature swaps	Recent swaps (Ecuador, Belize, Gabon) mobilised US$1–3 billion each. Scaling 5–10 such deals annually could add significantly.	5–10 swaps × ~US$2bn = US$10–20 billion/year.

4. South–South Cooperation Gap – US$50 billion/year

Component	Data/Assumption	Calculation/Result
Article 6 carbon markets	If 0.5–0.75 Gt CO_2 are traded at US$40/t, consistent with typical AE–EMDE differentials, Article 6 could create sizable South–South flows.	0.5–0.75 Gt × US$40/t = US$20–30 billion/year.
Digital and financial integration (multi-CBDC, DLT, country platforms)	CBDC/DLT systems can reduce settlement and FX friction among MICs, facilitating joint investments.	Could enable additional US$20–30 billion/year in mobilised flows.

5. Concessional/Innovative Finance Gap – US$200 billion/year

Component	Data/Assumption	Calculation/Result
Global solidarity levies (aviation and shipping)	A levy of US$10–20 per airline ticket and US$25–50/t of shipping fuel yields US$150–350 billion/year globally if phased in by 2035.	Modelled yield = US$150–350 billion/year.
Tropical Forests Forever Facility (TFFF)	Target endowment US$125 billion generating ≈5% returns (US$6 billion/year) leveraged 20× via co-financing and sovereign issuance.	≈US$120–130 billion leveraged investment capacity.
Global Green Fund pooling new taxes	Combining solidarity levies with small transaction or wealth taxes can generate stable concessional pools.	Adds additional predictable revenues (no specific estimate).

6. Cross-Cutting Global Reserves (Source, not a gap)

Component	Data/Assumption	Calculation/Result
Central-bank reserve reallocation	Global FX reserves ≈US$12 trillion. A 1–2% reallocation into green BISIP-type funds would provide systemic liquidity.	1% = US$120 billion; 2% = US$240 billion per year reallocated to transition financing.

Appendix Box 1. The Feldstein–Horioka puzzle and investing in the transition

The Feldstein–Horioka puzzle (1980) refers to the empirical finding that domestic saving and domestic investment are highly correlated across countries, even in an era of rising financial globalisation. In theory, under perfect capital mobility, a country's investment should not depend heavily on its domestic saving – it should tap into global capital markets. But the data shows a surprisingly strong correlation between saving and investment ratios, particularly in OECD countries.

Macroeconomic implications

- Limited international capital mobility in practice, despite open capital accounts
- Persistent home bias in capital flows, with domestic capital largely funding domestic investment
- Challenges theoretical models of global capital allocation based on comparative returns
- Suggests that cross-border risk perception, frictions, or policy distortions are significant
- Has implications for the efficiency of global savings in financing productive investment across borders

Main proposed explanations

- Imperfect capital mobility due to capital controls, transaction costs, or regulatory differences
- Risk aversion and information asymmetry, especially about foreign macroeconomic or political risk
- Institutional quality, rule of law and enforcement affect investor confidence in capital outflows
- Exchange rate volatility and lack of hedging instruments can deter cross-border investment
- Home bias in investor behaviour (e.g. preference for domestic assets)

Main policy responses

- Capital market deepening and institutional reform to increase attractiveness of domestic investment destinations
- Risk mitigation instruments (guarantees, hedging facilities, political risk insurance) to reduce cross-border barriers
- Transparency, rule of law and regulatory alignment to reduce home bias and attract international capital
- Regional financial integration to reduce the cost and perceived risk of cross-border flows
- Macroeconomic policy coordination to reduce currency, inflation and regulatory volatility

Application to green investment in EMDEs

The puzzle is relevant to the climate finance debate:

- Despite the global need for capital to finance mitigation and adaptation in EMDEs, most climate finance remains domestically funded – mirroring the Feldstein–Horioka pattern

- Cross-border green investment is limited by perceived or real risks in EMDEs: credit, currency, policy, or execution
- As with the original puzzle, this indicates that global capital is not flowing efficiently to where it is most needed or most productive for the climate transition
- Solutions include the following. De-risking tools: FX hedging facilities, blended finance, MDB guarantees. Institutional reform: better project pipelines, taxonomy alignment and enforceable standards. Technology deployment: digital finance (e.g. tokenisation, traceability) to reduce monitoring and governance costs. Global coordination: using climate funds and coalitions (e.g. GFANZ, MDBs, G20) to lower the cost of capital into EMDEs

Appendix Box 2. Tropical Forest Forever Facility, a special purpose vehicle-based conservation fund

1. Capital base formation

- The Tropical Forests Forever Facility (TFFF) is designed as a permanent endowment fund, with a target capital base of around US $125 billion, making it one of the most ambitious conservation finance mechanisms ever conceived. The goal is to generate stable, perpetual returns to finance forest conservation and restoration without relying on unpredictable donor cycles or annual appropriations.

- Composition of contributions: Sovereign deposits from both advanced and emerging economies constitute the foundation of the capital base. These are structured as long-term, low-liquidity contributions, akin to callable or reserve assets, rather than conventional budgetary transfers. Developed countries contribute as part of their international climate and biodiversity commitments, while large forest economies (e.g., Brazil, Indonesia, the DRC) participate symbolically to reinforce ownership and governance legitimacy.

- Philanthropic foundations (such as the Bezos Earth Fund, Bloomberg Philanthropies, CIFF, and others) provide first-loss or catalytic capital, de-risking the facility and improving its credit profile to attract private co-investors. Institutional investors (pension funds, insurers, sovereign wealth funds) are invited to participate through green or blended investment tranches, backed by MDB guarantees and aligned with Article 9 of the EU taxonomy and other sustainability frameworks.

2. Investment strategy

- **Financial structure.** The fund operates as an **endowment or "perpetual capital vehicle"**, investing its assets in high-quality, climate-aligned financial instruments – sovereign and MDB green bonds, blended portfolios, or ESG index funds. Assuming a conservative annual return of **4–5 per cent**, the **US$125 billion** endowment could generate **US$5–6 billion** annually in stable, predictable income. These returns would then be channelled as performance-based payments to tropical forest countries that demonstrate verified protection, restoration, or reforestation outcomes (for example, through **MRV systems** consistent with **Article 6** or **REDD+** frameworks).

- **Governance and durability.** The capital base would be managed by a **multilateral trustee structure** – possibly hosted by a coalition of development banks or under **UNFCCC** oversight – to ensure transparency, fiduciary standards, and insulation from political cycles.

- **Long-term sustainability.** The endowment model ensures that the principal capital remains intact in perpetuity, creating a **"sovereign wealth fund for the planet's forests"**, whose returns finance global public goods over decades rather than within single budget periods. The fund does not disburse principal. Instead, it invests the pooled capital in low-risk, high-grade global assets (for example, sovereign or AAA-rated bonds). The annual investment income (yield) is used to make performance-based payments to eligible forest countries.

3. Performance criteria

- Countries receive annual payments (~US$4 per hectare) if they maintain tropical forest cover and limit deforestation (to <0.5% of annual forest area)

- If deforestation exceeds the agreed threshold, payments are partially or entirely suspended – creating a strong incentive for preservation

4. **Monitoring and verification**

- Satellite-based forest monitoring systems (e.g. MapBiomas, Global Forest Watch) are used to verify forest cover and deforestation rates, ensuring transparency and accountability
- New financial technologies and smart contracts can be an important component of the mechanism

5. **Disbursement flexibility**

Recipient countries can choose to:

- Withdraw the annual return immediately as budget support for forest-preserving activities
- Reinvest their share in the facility to compound future earnings

6. **Governance and launch**

- The facility is expected to be hosted by the World Bank (or a similar multilateral institution)
- It will be officially launched at COP30 in Belém, Brazil (November 2025), with support from Brazil, Colombia, DRC, Ghana, Indonesia, Malaysia and several donor countries

This model is designed to provide predictable long-term finance for forest conservation while protecting the integrity of the fund's capital base. It introduces an innovative way to reward forest protection with financial stability – linking sovereign income to environmental performance without relying on volatile carbon markets.

Appendix Box 3. Emerging markets and developing economies versus advanced economies: vulnerabilities, term premiums and a shifting safe haven

In EMDEs, the mapping from macro-financial vulnerabilities – large fiscal deficits, high public debt, exchange rate (ER) volatility, policy uncertainty, weak contract enforcement or political risk – to sovereign risk premiums is tight and immediate. When ERs depreciate or policy uncertainty rises, local currency term premiums typically widen and the long end of the curve sells off; the mechanism is reinforced by shallower markets, foreign investor retrenchment and the sovereign bank nexus. Many IMF reports explain how expected fiscal loosening in EMDEs pushes up 10-year local yields, with effects amplified where banks hold more government paper; IMF and World Bank analyses, alongside BIS reseach and monitoring, document how EM currency swings and global financial cycle shocks transmit quickly into higher term premiums.

AEs – especially the US – long benefited from the opposite pattern. In risk-off episodes, capital flowed into Treasuries, the dollar appreciated, and term premiums compressed (the 'safe-haven' and 'convenience yield' effects). That view still holds at times, but 2025 has brought signs of erosion: abrupt tariff announcements, trade war and policy reversals have injected US policy uncertainty, at points weakening the dollar's reflexive haven bid and lifting the long end. BIS and media coverage note episodes in April and over the summer when flows rotated towards gold and other assets rather than the dollar, and several outlets argue the Treasury convenience yield has thinned as debt and deficits climb.

The yield curve tells the story. Around the 2 April 2025 tariff announcement, the 10-year Treasury at one point jumped more than 20 bps intraday; by mid-May, the 10- and 30-year had risen roughly 40 bps from early April troughs before partially retracing. Into early September, the 30-year hovered near 5% as long-dated bonds sold off globally, while the 10-year traded in the mid-4s. These are moves that, until recently, investors more readily associated with EMDE sensitivity to policy shocks.

Another useful example is the UK's 2022 'Truss experiment'. The mini-budget detonated a gilt sell-off in which the 10-year trough-to-peak move reached roughly 300 bps, amplified by forced LDI deleveraging and a perceived challenge to macro-institutional credibility – dynamics familiar from emerging market (EM) crises. Many commentators suggested that higher projected borrowing explained only a fraction of the move; institutional signals and market-structure feedbacks did the rest.

The traditional dichotomy – EMDE long ends punish macro slippage while AEs (notably the US) enjoy haven inflows – is blurring at the margin. If policy unpredictability, fiscal drift and trade shocks persist, the US term premium can behave more 'EM-like', with ER moves and uncertainty feeding into the long end rather than cushioning it. For EMDEs, this only sharpens the existing prescription: bolster credibility (fiscal anchors adapted to investment needs), deepen local markets, reduce FX mismatches and deploy pre-emptive macro-prudential and capital-flow tools to dampen the pass-through from ER stress to term premiums. For AEs, it is a reminder that macro-institutional credibility and predictable policy are themselves key determinants of the convenience yield that keeps long-term funding costs in check.

An important corollary of this shift is its potential to narrow the relative risk perception gap between EMDEs and AEs, with positive implications for climate finance. If long-term US Treasuries begin to exhibit EM-like sensitivity to fiscal drift, policy unpredictability, or trade shocks, the traditional safe haven premium that depressed EMDEs' relative attractiveness may erode. In such a world, investors could reassess the relative risk–return trade-off, making high-yielding, climate-aligned assets in EMDEs more attractive. By reducing the structural wedge in risk premiums, this convergence may help unlock larger flows of private capital into EMDE climate projects – provided that complementary reforms (credible fiscal anchors, transparent green investment pipelines, stronger institutions) are in place to reassure markets. In other words, the diminishing US convenience yield could inadvertently create an opening for EMDEs to attract more financing for the transition.