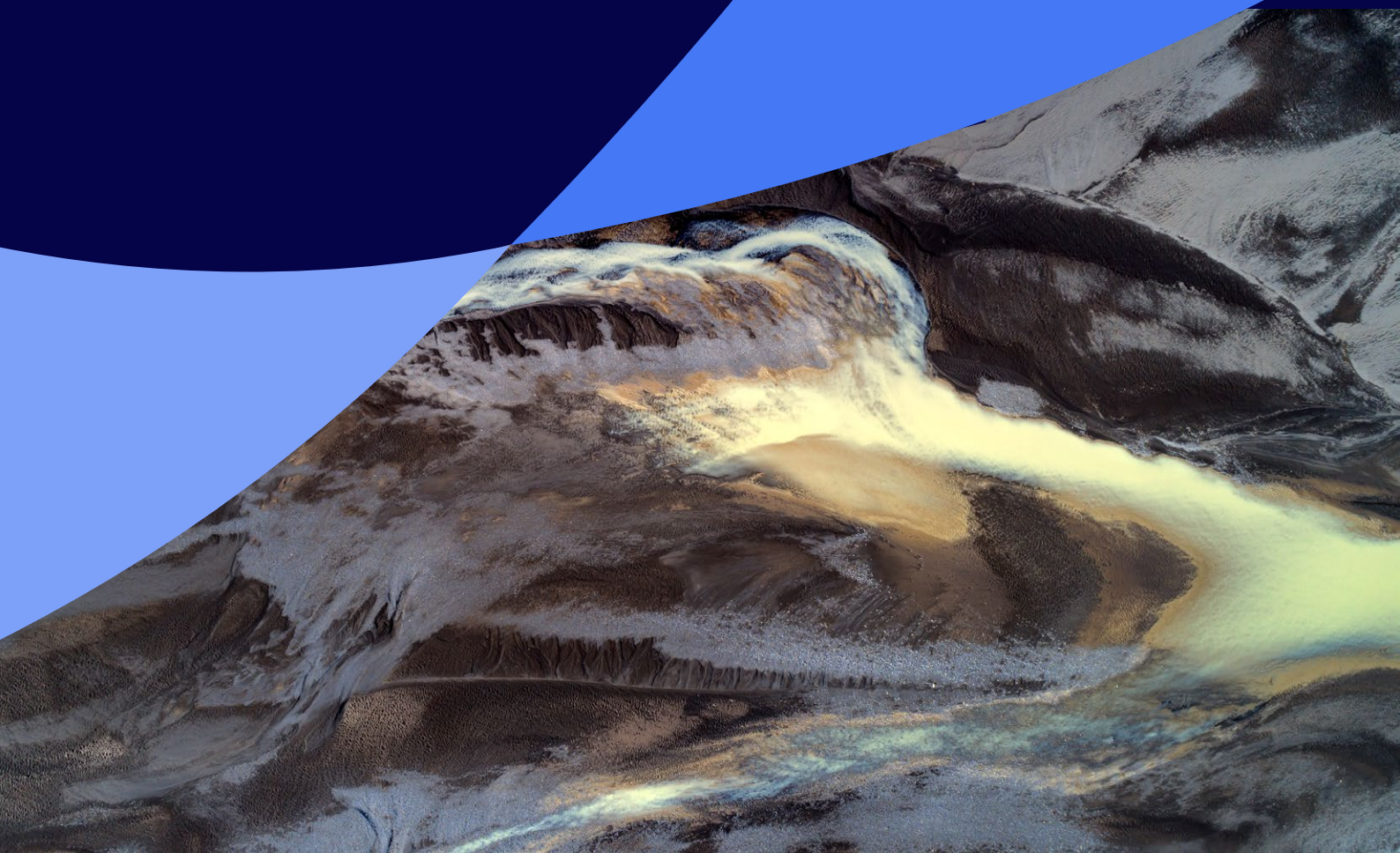
IIGCC

Climate Resilience Investment Framework

February 2025



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Contents

Introduction

IIGCC formally started work on the Climate Resilience Investment Framework (CRIF) in 2021/2022, when an IIGCC working group developed a discussion paper entitled: Working towards a climate resilience investment framework (IIGCC 2022a). This resource is built upon earlier work, including:

- Navigating climate scenario analysis (IIGCC 2019)[1].
- Addressing physical climate risks: key steps for asset owners and asset managers (IIGCC 2020a)[2].
- Understanding physical climate risks and opportunities – a guide for investors (IIGCC 2020b)[3].
- Strengthened physical risk indicators for the Principle Adverse Indicators in SFDR (IIGCC 2020c)[4].
- Investor expectations of companies on physical risks and opportunities (IIGCC 2021)[5].
- Expectations of Policymakers on Corporate Sustainability Disclosures (IIGCC 2022b)[6].

In addition, in 2023 IIGCC agreed to carry on the work of the Physical Climate Risk Assessment Methodology (PCRAM), which was initially developed by the Coalition for Climate Resilient Investment and included engineering consultancies, notably Mott MacDonald, data providers, credit ratings agencies, banks along with institutional investors. This led to the IIGCC publication of "Physical Climate Risk Divergence: PCRAM for investors" (IIGCC 2024a) and "PCRAM in Practice" (IIGCC 2024b), which has also informed this framework's development.

The need for a Climate Resilience Investment Framework

Physical climate risks have always existed and can already be material to investment portfolios. However, increases in atmospheric GHG concentrations associated with human-induced climate change are expected to increase their materiality and significantly affect asset performance and credit worthiness.

This CRIF has been developed for investors that wish to consider how physical climate risks may require enhanced management to accurately assess an asset's financial returns.

Better management of physical climate risks from a financial materiality lens can help investors:

- Improve the financial resilience of both individual assets and portfolios.
- Help investors contribute to building resilience within the real economy, by direct investment, engagement and stewardship.
- Identify investment opportunities associated with adaptation solutions.
- Build the case for strategies managing transition risks (which are needed to mitigate the causes of increasing physical climate risks).

The focus of this framework is to support investors to manage financial risks arising due to physical climate risks to their own individual portfolios. While it is noted that more adaptation investment can provide wider benefits to society (e.g. via less vulnerable public infrastructure that society depends upon) it is not the focus of this framework[7].

Physical climate risks are understood to affect investment portfolios through multiple transmission channels. For example, assets directly or indirectly impacted by climate-related hazards, such as floods or heat stress, may cause a risk to investors through a change in asset valuation, the ability of the asset to pay back loans or provide dividends. Physical climate risks may exacerbate a number of risks to which investors are exposed, including liquidity risk, reputational risk, and credit risk. Given the regionalised nature of many physical risks, concentration risk may also be an important consideration for investors. Physical climate hazards can also lead to macro-economic risks that may affect investment portfolios, such as higher inflation, changes in interest rates and loss in GDP.

This framework adopts a position that investors have some agency and abilities to directly or indirectly contribute towards the management of physical climate risks. Adaptation limits, which act as a boundary to the extent to which physical climate risk can be managed, are recognised as an increasingly documented phenomenon[8].

The transmission channels through which physical climate risks can affect investments has determined the design of this framework. The existence of asset-level risks (such as credit risk) creates the need for asset-level target setting and implementation guidance. The existence of system-level risks (such as macro-economic risks) indicates limits to what investors can individually achieve and creates the need for this framework's 'Policy Advocacy' and 'Stakeholder and Market Engagement' sections.

Consequently, investors are encouraged to pursue resilience at asset, portfolio, and system levels to comprehensively address current and future physical climate risks. It also encourages investors to consider exploring opportunities to direct capital towards adaptation solutions (that is, assets the provide adaptation and resilience benefits to real estate, infrastructure, businesses, communities and nature in their surrounding physical location) as well as investing to improve the resilience of assets in which they are investing.

Finally, investors are still encouraged to continue to maximise contributions to real economy decarbonisation (via NZIF), as a means to mitigate financial risks posed by climate change.

Benefits of using CRIF

This framework aims to support investors to manage material physical climate risks to their individual portfolios. The PCRAM process aims to build the financial case for adaptation and resilience investment.

However, many important adaptations are akin to public goods[9] and require a multi-stakeholder approach. Consequently, investors cannot always be expected to finance and implement adaptation measures entirely themselves due to the inability to sufficiently internalise financial benefits.

Finally, it is also hoped that many investors use this framework, and thus the language used within target setting and implementation guidance, to support a common basis to communicate the state of play regarding their management of physical climate risks within their individual portfolios to regulators, stakeholders, beneficiaries and clients.

Content creation

Content for this framework has been developed by IIGCC member-led working groups. These consist primarily of asset managers and owners, with other stakeholders such as engineering consultants, banks and insurance entities.

This framework is a 'living document', reflecting the dynamic and evolving landscape in which investment decisions are made. It will integrate evolving best practices in future updates, including specific asset class guidance.

Currently, guidance is not provided for all asset classes. Attention has been given first to infrastructure and real estate due to the suitability/design of PCRAM for real assets and because these assets help frame the resilience of the physical system within which corporates operate. For instance, infrastructure was considered an important initial asset class because vulnerabilities in the infrastructure system tend to result in systemwide vulnerability for all that depend on that infrastructure for public services and normal business operations.

Over time it is hoped that all typical asset classes will be covered: listed equities and corporate fixed income, sovereign bonds, real estate, infrastructure, private equity, and private debt. On a best-effort basis, cross-cutting themes will be integrated from the outset (e.g. nature and emerging markets).

This framework attempts to use recognised language and concepts from within financial risk management and climate science with the hope that this allows for better integration into overall risk management governance at both the senior management and distributed levels within an investment organisation, as well as in the finance functions of the assets within which they invest.

How to use this guide

This framework is designed to support investors with practical and best practice ideas that they can use in their own individual management of physical climate risks in the economic interests of their clients and beneficiaries. It is a guide that investors can flexibly adopt. It is not a protocol, standard, or reporting framework[10].

Investors should use it within the context of their own strategies, agendas, starting points, fiduciary duties, client mandates and regulatory considerations, from which - and with which - they make their own unilateral decisions regarding the ways and means they manage physical climate risks and explore associated opportunities.

This framework is designed to be implemented holistically at the organisation level via an 'implement or explain' approach (to relevant stakeholders). Across each section, core action points are those considered particularly important and where expectations are greatest. Advanced action points are considered best practice but may not be possible across all contexts.

The asset class guidance within this framework can be used in isolation from other sections. The multi-criteria maturity scale is not designed to measure financial risk, but instead to convey ongoing efforts to manage physical climate risks.

This framework includes recommended action points by major industry initiatives, seminal resources, and investor-led working groups on a best-effort basis. They are not expected to be equally applicable to all investors. They can support investors to develop and communicate their own contextually relevant actions, strategies and/or plans to manage material physical climate risks (referred to henceforth as 'A&R plan'). Investors should choose and prioritise recommendations most appropriate to their circumstances and the economic interests of their clients and beneficiaries.

Asset owners

Asset owners are encouraged to use the full framework but should note that different teams will find certain sections more relevant than others. Asset owners directly managing the investment process should strive to use this framework across applicable AUM. When external fund managers or investment consultants are used, they should ensure the external parties providing the service are supporting or implementing mandates accordingly.

Asset managers

Asset managers are encouraged to apply this framework across all AUM when applicable and to communicate their progress via the language contained within this framework. Different teams will find certain sections more relevant than others. They are also encouraged, when possible, to develop CRIF aligned products, funds, and strategies; and educate clients on these offerings, including consistent mandates to clients who seek them.

Investment consultants

Investment consultants are encouraged to integrate this framework into solutions and services including asset manager recommendations, and work with clients on CRIF adoption.

Guiding principles

IIGCC anticipates this framework will complement the Net Zero Investment Framework (NZIF), consequently adopting many of its design aspects. It adopts the same broad structure and largely the same guiding principles:

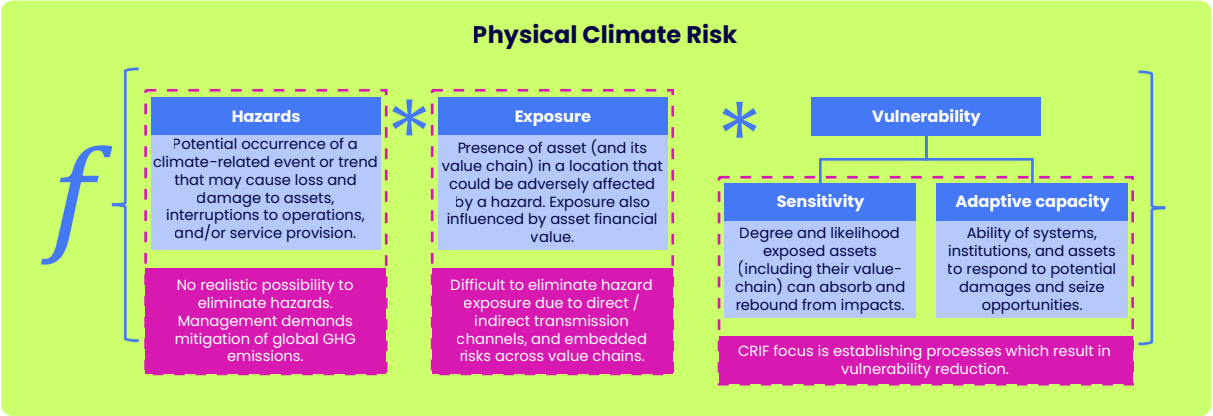
- Impact: The primary objective is to maximise practical efforts to increase adaptation and resilience to physical climate risks in the real economy, through the unilateral and independent decisions of individual investors to drive the process within their own physical, legal and regulatory contexts and the fiduciary duties owed to their clients and beneficiaries.
- Rigour: Alignment based on available (at the time of writing), reasonable, and supportable data and information without undue cost or undue uncertainty.
- Practicality: Feasible for investors to implement, build on existing work, and be compatible with existing processes.
- Accessibility: Definitions, methodologies and strategies should be clear and easily applied.
- Accountability: The framework should allow investors to demonstrate accountability to clients and other stakeholders.

Conceptual underpinnings

Physical climate risk

The general purpose of this document is to support investors with a high-level framework to iteratively plan, implement and modify their individual strategies and plans for managing physical climate risks. Physical climate risk is understood to result from the interaction between hazards, exposure to them, and vulnerability to their impacts in line with general interpretations (see Figure 1)[11].

Figure 1: General understanding of physical climate risk



Vulnerability reduction (i.e. improving adaptive capacity and reducing sensitivity) is considered here to be synonymous with improving resilience and is the focus of this framework. The goal is for assets and portfolios to reduce their vulnerability (by being able to absorb and recover from the impacts of climate related hazards and proactively reconfigure themselves to manage future climate related hazards), with the end goal of being more resilient to current and future physical climate risks.

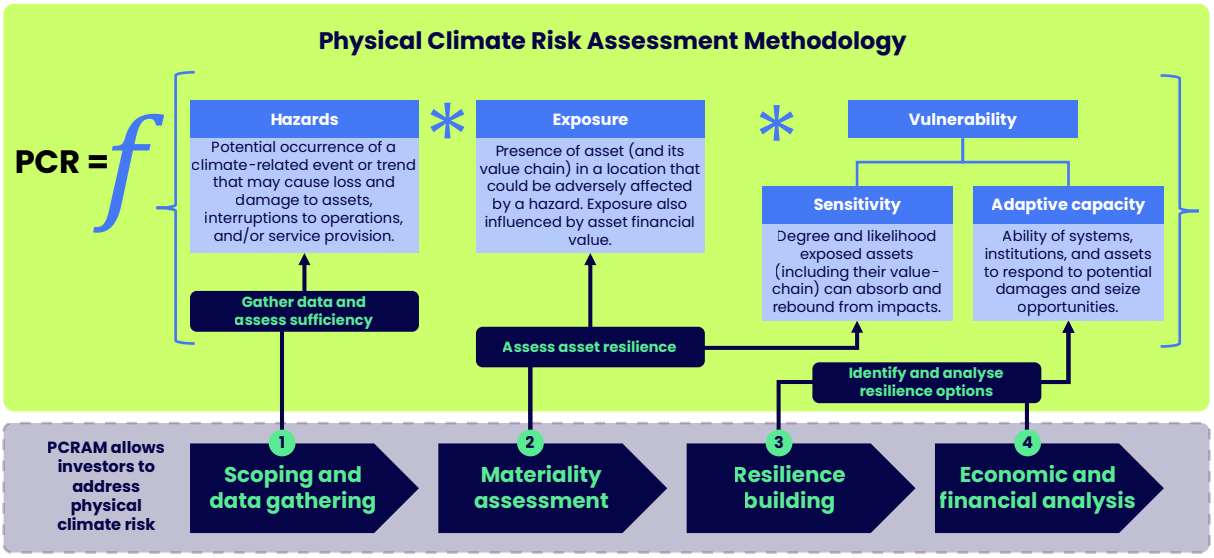
While this framework has a focus on vulnerability reduction, understanding current exposure is still useful for investors. It can help identify the concentration of risk and where it is likely to arise (in relation to residual risk and risk appetite). Also, it is recognised that at the granular level minor adjustments can be meaningful (e.g. location of physical assets).

It is suggested that a sole focus on the management and reduction of exposure (i.e. retreating from physical climate risks) is impractical or could lead to unintended consequences to the detriment of future financial returns. This is due to a myriad of transmission channels through which physical climate risks manifest into financial risks. For instance, widespread climate events negatively affecting macroeconomic conditions, and emerging and developing economies (EMDEs) are interconnected with developed economies via supply chains.

'Adaptation' refers to actions undertaken to improve resilience. Knowledge is considered vital to adaptive capacity. This framework's asset-level guidance promotes knowledge production to enable investors to better evaluate options to manage physical climate risk. The quality of knowledge investors can produce depends on the quality of underlying data and information which they cannot control. Consequently, this is a key component of this framework's 'Policy Advocacy' and 'Stakeholder and Market Engagement' sections.

Figure 2 below maps these concepts onto the PCRAM process upon which the asset class methodology within this framework is based (see Figure 2).

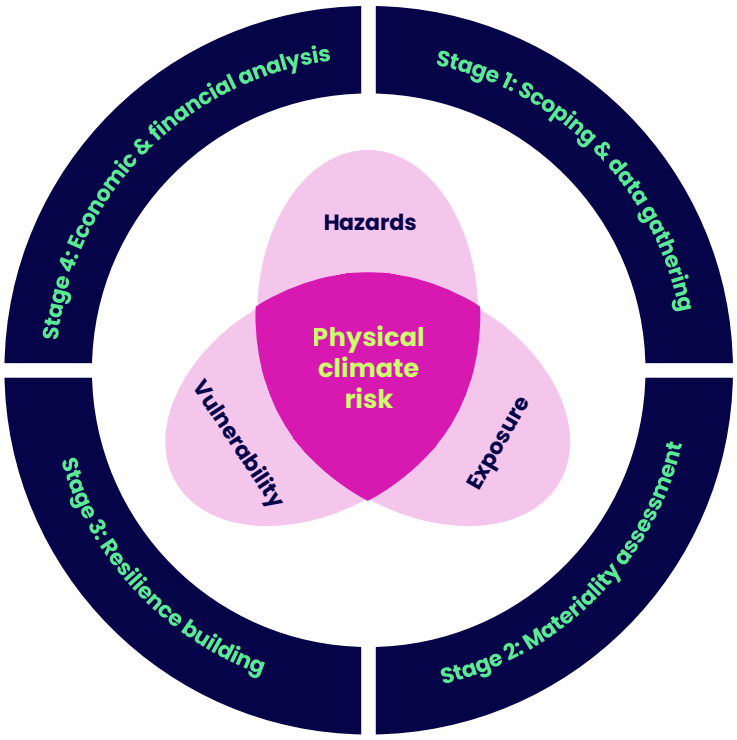
Figure 2: Mapping PCRAM to physical climate risk



This framework addresses the materiality that physical climate risks pose directly and indirectly to investor financial returns and recognises this materiality is dynamic, whereby its relevance changes over time.

This has influenced this framework's design. Explicit attention is given to physical climate risk within supply chains and the need for a systemic approach to resilience. The principal focus within target setting is to address how physical climate risks affect future asset performance and creditworthiness. Finally, there is no "achieving" category within its maturity scale[12] recognising that dynamic materiality and PCRAM is promoted as a continuous process, see Figure 3.

Figure 3: PCRAM as a continuous process to manage physical climate risks



Adaptation solutions

Financial risk management will tend to focus investor attention on efforts that improve the resilience of investments specific to themselves and their clients, under a risk management or climate-proofing paradigm.

However, investors can also explore opportunities that enable external stakeholders (e.g. corporates or governments) to improve their resilience while generating financial returns. Further, Increased investments in adaptation solutions are likely necessary as part of efforts to address physical climate risk across socioeconomic systems[13].

Consequently, this framework encourages investors to set a portfolio level objective to increase their allocation to adaptation solutions as well as set an objective to improve their portfolio resilience. This could include increasing allocations to public adaptations – noting that this will only be logical to investors when sufficient financial returns are apparent.

This framework does not determine and categorise specific activities as being 'adaptation'. Investors are encouraged to disclose their own approach or taxonomy used to relevant stakeholders and in relevant documentation when appropriate.

Adaptation pathways

The alignment-centric target setting methodology within this framework is based on 'adaptation pathways' – understood here as the actions to be undertaken and the dynamic choices to be made over time to manage physical climate risks[14]. Physical climate risks are dynamic and probabilistic[15]; and understanding them is inhibited by practical issues causing uncertainty.

Consequently, the term alignment refers always to adaptation pathways. These pathways are fundamentally different to 'net zero pathways' used within NZIF, which are outcome performance benchmarks. In contrast, adaptation pathways are less objective and vary depending on the investor's circumstances.

This framework's target setting methodology is 'process based', and not outcome based, unlike the NZIF methodology. It is centred around the PCRAM process (IIGCC 2024a). This recognises that the management of physical climate risk is an iterative and ongoing process, and thus the alignment scale purposefully excludes an 'achieving alignment' category.

The selection of climate scenarios is central to the concept of adaptation pathways. This framework deliberately does not instruct nor require the use of certain scenarios. Investors should choose their own scenario(s), based on many factors – including regulation, risk appetite, and future warming assumptions - and justify this decision to relevant stakeholders. The intention is that future implementation support explores this topic to further assist investors.

Asset-level and value-chain risks

References to the assessment and management of physical climate risks within this framework should be understood to refer to both direct (e.g. asset values) and indirect (e.g. supply or value chain) impacts on the asset in question[16].

Physical Climate Risk Assessment Methodology (PCRAM)

This is a process-centric framework based on the PCRAM four-step process methodology (see Figure 4). This showcases the potential benefits of investing in resilience across the lifespan of an asset by assessing sensitivities to future cashflows based on projected material climate events affecting the KPIs specific to the asset.

Figure 4: The PCRAM process

Steps	1 Scoping and data gathering	2 Materiality assessment	3 Resilience building	4 Economic and financial analysis
Objective	Determine data sufficiency	Assessing asset vulnerability	Identifying resilience options	De-risk asset exposure to PCRs
Sub-tasks	→ Project initiation → Project definition → Data gathering and sufficiency	→ Hazard scenarios → Impact identification → Impact severity → Risk quantification	Resilience options: → Hard (Structural/Capex) → Soft (Operational/ Systems)	→ Cost/benefit analysis → IRR comparison
Outputs	→ Initial climate study → Critical components → KPI selection (the "Base Case cashflow forecast")	→ Detailed climate study → List of impacts and severity by component → The "Climate Case cashflow forecast"	→ Repeat materiality assessment → Revised climate study for new elements → The "Resilience Case cashflow forecast"	→ Recommendations → Value implications
Decision gates	**Gate A** Is data good and sufficient?	**Gate B** Are PCRs material to this asset?	**Gate C** What resilience options are available for this asset?	

Integration of nature

This framework focuses on physical climate risks. While this places an importance on climate phenomena, it also necessitates a look at broader nature-related phenomena. Many of the events and trends commonly understood to be climate hazards are better understood to be the confluence of numerous systems. For instance, flooding is not only caused by rainfall but also by the state of the natural environment and socioeconomic development.

The latest thinking suggests that integrating nature should consider how nature can affect all elements of physical climate risk. This means understanding the role of nature in affecting the:

- Likelihood of potential occurrence of climate-related events or trends,
- Exposure of assets to climate-related events or trends,
- Resilience of exposed assets,
- Adaptive capacity of investments to respond to climate-related events or trends.

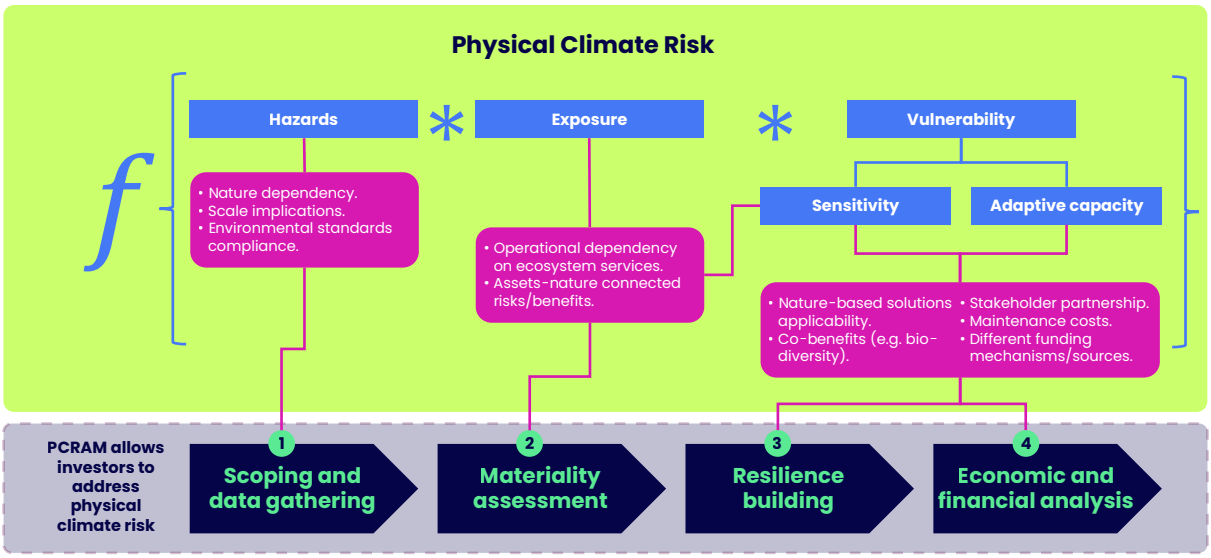
Additionally, the view has been adopted that integrating nature should encompass every step within the PCRAM methodology (see Figure 5), in a manner which conforms to the LEAP approach within the Task Force on Nature-related Financial Disclosures[17].

Within step 1 (scoping and data collection), integrating nature could mean considering nature in dependency analysis (location/topography), implications of scale (e.g. catchment area data for flooding), or data required for environmental standards (e.g. biodiversity net gain).

Within step 2 (materiality assessment), integrating nature could include the integration of environment into scenario analysis, something already considered best practice. For instance, considering an asset's operational dependency on ecosystem goods and services, or considering the interconnected risks/benefits between assets and nature.

Within step 3 and 4 (resilience building and economic/financial analysis). Integrating nature could consider nature-based options as substitutes and complementary solutions to grey solutions (along with biodiversity co-benefits)[18]. It could also mean considering potential risks/benefits to working at different scales and stakeholder types. Finally, it could mean the consideration of implications for ongoing maintenance costs and different funding mechanisms/sources to finance costs of nature-based solutions.

Figure 5: Integrating nature into physical climate risk assessment and PCRAM



Emerging markets and developing economies (EMDEs)

As with financing net zero, the resilience needs of assets in and related to EMDEs are often more urgent, and can be more prevalent than mitigation in their climate financing needs. There are also important nuances and considerations that investors should take into account when investing for resilience in EMDEs, such as:

- Care should be taken in understanding resilience needs for assets in EMDEs. Approaches to measuring physical climate risk that focus solely on loss metrics, such as Climate Value at Risk which often rely on proprietary or 'black box' methodologies, may have an unintended consequence in pre-empting capital flight, due to lack of data and/or insufficient analysis undertaken in EMDEs have highlighted through stakeholder engagement and a focus on exploring the cost/ benefit of investing in additional resilience measures can help overcome data and analytical challenges, and can include multiple co-benefits along with the reduction of financial risks specific to the asset (see, IIGCC 2024b).
- An overemphasis of the exposure function within the physical climate risk equation can lead to insufficient or maladaptation, if vulnerability is not well understood[19].
- The need to engage with local governments and communities to understand the systemic dependencies and impacts (both positive and negative) that investing in resilience may have both directly and indirectly related to specific assets.

- Noting that in many EMDEs, vernacular architecture and indigenous practices may often point to elegant and cost-effective resilience options which are often nature-based[20].

There are many resilience investing opportunities for impact and financial performance that are more prevalent in EMDEs, especially when centred in sustainable development:

- The opportunities for investment in adaptation and resilience solutions in EMDEs are broader. Providing access to energy, communications, water, healthcare and other critical infrastructure can make communities in EMDE more resilient to climate impacts, to a greater degree than incremental improvements to these services in developed economies.
- Co-benefits with mitigation solutions (e.g., renewable energy infrastructure, energy-efficient housing, low carbon heating and cooling) are easier to realise when working on greenfield projects, which can be value accretive through being low carbon and resilient in a transitioning world.
- International and development finance institutions can provide credit enhancement and other blended solutions that can optimise risk vs. return calculations with appropriate structuring, making these investments potentially more attractive with appropriate due diligence.

While physical climate risks materialise locally, efforts to address them should account for the transboundary nature of risk, such as those caused by complex international value chains. Consequently, even if investments and thus direct physical climate risk exposure is concentrated in developed markets, this risk is highly interconnected with physical climate risk in EMDE via value chains.

Figure 6: Integration of emerging markets across CRIF

Mapping identified EMDE investment barriers to CRIF recommended actions	
Identified barriers	**Potential solutions catalysing investment opportunities**
1. Investors constraints and biases	**Conceptual underpinnings** section Even if investments and thus direct physical climate risk exposure is concentrated in developed markets, these are highly interconnected with emerging markets via value chains. **Objectives** section Where possible seek to increase allocation to emerging markets when adaptation solutions investment exist, being mindful of co-benefits (e.g. environment or social & mitigation co-benefits) for the overall investment case.
2. Actual and perceived risk profile	**Conceptual underpinnings** section Ensuring that a focus on financial materiality, alongside a potential scarcity of data in EMDE does not lead to an unintended bias away from investing in these markets. Being cognisant that an overemphasis of the exposure can lead to insufficient or maladaptation, if vulnerability is not well understood. **Policy Advocacy** section Advocate for sovereigns to incorporate future scenarios of physical climate risks and adaptation within current and forward-looking fiscal risk assessments as a stress test, and consequently what this could mean for their debt and cost of capital. Particularly in nations that may be perceived as climate risk hotspots such as EMDE.
3. Lack of investable opportunities (product match)	**Conceptual underpinnings** & **Stakeholder and Market Engagement** sections Engage with, and support, MDBs and DFIs to provide credit enhancement and other blended solutions that can right size risk return metrics with appropriate structuring, making these investments potentially more attractive with appropriate due diligence. Work with stock markets to promote greater disclosure of necessary data related to physical climate risks, including in emerging markets.
4. Regulation and standards	**Policy Advocacy** section Engage local governments and communities to understand the systemic dependencies and impacts (both positive and negative) that investing in resilience may have both directly and indirectly related to specific assets. Need to integrate the management of physical climate risk across government development planning processes.

Note: identified barriers sourced from ODI (2024)

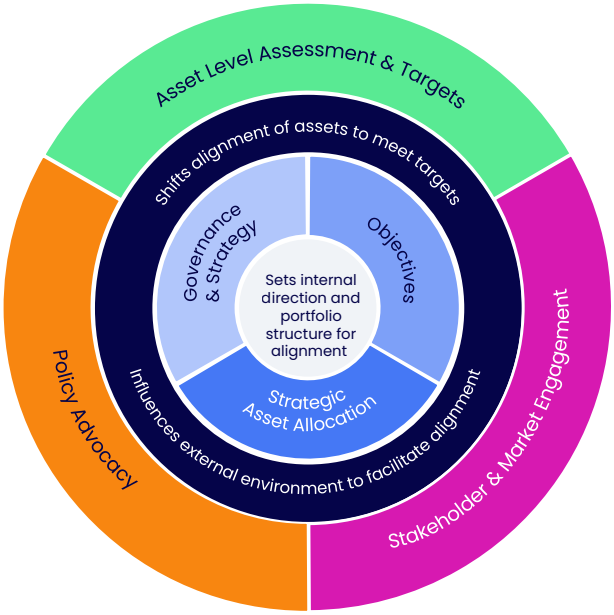
Reducing physical climate risks across value-chains and encouraging investment in adaptation solutions is part of this framework promotion of systemic resilience as part of the overall objective of climate resilience goals. See Figure 6 for how the topic of EMDEs has been integrated across CRIF.

The topic of EMDEs will be a significant focus of future framework guidance, particularly for asset class guidance covering sovereign bonds and corporate assets. Future supplementary implementation guidance will support with incorporating EMDE into resilience investment strategies, addressing the challenges and complexities involved[21].

Structure and levers

This framework outlines key components of an investor specific A&R plan that broadly integrates physical climate risk management into internal structures and processes, investment, and wider macro-stewardship activities.

Figure 7: CRIF Wheel

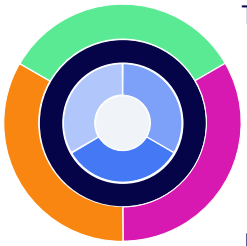


The NZIF structure has been adopted as the basis of the 'CRIF wheel' to facilitate dual use of the frameworks (see Figure 7). It also recognises that Investors can broadly manage physical climate risks the same way as they would transition risks. Many of the recommended action points within CRIF have their origin within NZIF.

This framework recognises that a range of levers may exist for investors to manage physical climate risks which are material to their individual portfolios. These levers will have various levels of appropriateness and efficacy depending on the context.

Levers have been identified across asset selection, (direct asset) management, and engagement. Macro-stewardship levers relating to market stakeholders and policy makers are also identified[22]. It is noted that efforts to address systemic risk and demonstrating systems benefits are difficult to attribute to the specific actions of a single investor. In the future, guidance for the use of using external fund managers will be incorporated.

Governance and strategy



This section covers what internal structures, policies, and processes an investor might need to establish the basis, legitimacy, and actions that can facilitate investor efforts to address physical climate risk. Together with the sections on 'Objectives and Targets' and 'Strategic Asset Allocation', it forms part of this framework's lever of 'Setting internal direction and portfolio structure for alignment'. Core action points are those considered particularly important and where expectations are greatest. Advanced action points are considered best practice but may not be possible across all contexts.

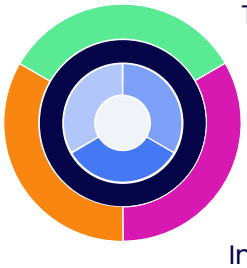
Core action points

- Assess and disclose physical climate risk assessments and practices in line with legal obligations, fiduciary duties, and industry best practice (e.g. TCFD, TNFD, and ISSB).
- Assign appropriate implementation responsibility for A&R plan to the investment committee and implementation oversight to the board integrating these to an appropriate extent with other strategic goals.
- Ensure senior leadership have sufficient knowledge to effectively oversee implementation of the A&R plan, including the interconnections between developed and EMDE.
- Develop, disclose, and periodically review A&R plan; explaining significant deviations to major industry frameworks.
- Incorporate the A&R plan into mandates and objectives for staff (including investment and portfolio managers), and review progress over time.
- Develop investment products and funds aligned with A&R plan; and educate clients accordingly.
- Integrate A&R plan into asset manager selection, appointment, and monitoring processes.

Advanced action points

- Establish an internal system to periodically monitor implementation and effectiveness of the A&R plan.
- Establish a plan to ensure the appropriate resources, skills, competencies, and knowledge exist across the organisation to effectively implement A&R plans[23].
- Integrate A&R plan into remuneration incentives as appropriate and when relevant, with care to avoid unintended consequences.
- Establish progress reporting for A&R plan, strategy, and targets to the board, senior management, and external stakeholders such as current and potential clients.
- Obtain independent review or third-party assurance or verification of A&R plans and PCRAM assessments (this could be in the form of an audit or by another entity, such as a consultancy or a research/policy think tank).
- Disclose the current internal and external constraints relating to A&R goals and how these will be managed.
- Define expectations on how climate scenario analysis is expected to inform investments (e.g. investment and portfolio managers).
- Integrate adaptation solutions into investment strategy to capture climate resilience opportunities.
- Prioritise the achievement of real economy resilience improvements within the markets, sectors, and companies associated with the investor[24].
- Review policies with an eye on emerging threats like extreme weather patterns and associated insurance claim trends.

Objectives



This section establishes A&R objectives for the portfolio. It translates qualitative goals into quantitative metrics to underpin internal accountability. It establishes climate objectives which are designed to be achieved via approaches to climate-proof assets, investment in adaptation solutions, policy advocacy, as well as stakeholder and market engagement. Together with 'Governance and Strategy' and 'Strategic Asset Allocation', it forms part of this framework's lever of 'Setting internal direction and portfolio structure for alignment'.

Investors are encouraged to set objectives both to recognise the need to make assets resilient but also invest in adaptation solutions to unlock a broader investment universe and create value.

Core action points are those considered particularly important and where expectations are greatest. Advanced action points are considered best practice but may not be possible across all contexts.

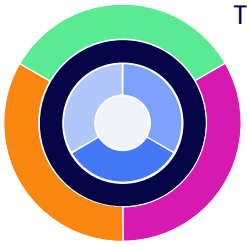
Core action points

- Monitor and disclose baseline proportion of portfolio managed in alignment with A&R plan
- Disclose the AUM committed to be managed in line with A&R plan, explaining reasons if this cannot be 100% of AUM.
- Set objectives for increasing portfolio resilience and investment in adaptation (e.g. proportion of portfolio managed in line with A&R plan,
  - Proportion of portfolio managed for physical climate risks (% or $ AUM);
  - Allocation to adaptation investments (% or $ AUM).
- Define the influence of portfolio level objectives over investment decision-making and communicate to investment managers, including interplay with mitigation related objectives.

Advanced action points

- Assess and disclose the relative strengths and weaknesses of the methodology, metrics, and data used to set portfolio level objectives.
- Disclose reasons for any assets not covered by A&R plan, including the process, progress, and timeline for inclusion.
- Where possible, seek to increase allocation to EMDEs when adaptation solutions investment exist, being mindful of co-benefits (e.g. environment or social) for the overall investment case.

Strategic asset allocation



This section integrates A&R objectives into the asset allocation process, complementing traditional risk/return objectives. This is to address any potential divergence between the time horizons typically associated with investment and climate risk.

Together with 'Governance and Strategy' and 'Objectives and Targets', it forms part of this framework's lever of 'Setting internal direction and portfolio structure for alignment'.

Core action points are those considered particularly important and where expectations are greatest. Advanced action points are considered best practice but may not be possible across all contexts. Some recommended actions will be less relevant for asset managers not undertaking asset allocation for clients; but relevance can still exist for those involved in similar activities (e.g., portfolio optimisation).

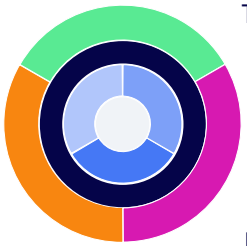
Core action points

- Ensure any asset allocation process is sufficiently informed by quantitative physical climate risk assessments of supply chain exposure, dependencies, and asset vulnerability.
- Undertake PCRAM and climate scenario assessments including stress-testing as appropriate to update capital market assumptions, asset-level, and risk/return expectations.

Advanced action points

- Consider different asset classes and investments when constructing portfolios, as well as the importance of primary issuances of bonds, given the role these have in driving risk management within the real economy.
- Monitor potential for increased climate resilience investment, especially in vulnerable sectors.
- Disclose use of proxy data when used to address data availability/quality issues, including assumptions made and methodological compromises.
- Explore insurance solutions including parametric insurance and reinsurance pools available to cover areas with current and future high exposure to specific climate risks, transferring residual risk away from the portfolio, once resilience investment is optimised through PCRAM assessments.

Asset Level assessment and targets



This aims to help investors shift the alignment of underlying holdings (assets) as part of a continuous process to climate-proof assets. Target setting and implementation guidance are specific for each asset class, although the overall target structure remains the same and aggregation across asset classes remains possible. Core action points are those considered particularly important and where expectations are greatest. Advanced action points are considered best practice but may not be possible across all contexts.

Core action points

- Set the scope to confirm which assets should be considered within scope of target setting.
- Assess the alignment of existing and new assets using this framework's alignment criteria.
- Set and disclose short-term targets and implement approaches to address physical climate risks to assets within each asset class.
  - Asset alignment target: A 5-year target for increasing the % of AUM that are 'aligned' to an adaptation pathway.
  - Engagement threshold target: A minimum proportion of assets (based on %AUM) that are assessed as at least 'aligning' to an adaptation pathway, or are subject to engagement, increasing gradually over time.
- Monitor and disclose alignment of assets to relevant stakeholders, including any material implications of physical climate risk on projected asset cash flows and values over time.
- Establish a policy to determine the extensiveness of PCRAM assessment relative to different investment holdings[25].

Advanced action points

- Disclose the science-based scenario(s) or pathway(s) used when applying PCRAM, including how scenarios meet key parameters, any critical assumptions used, and whether proxy data is used.
- Disclose why any assets are not in scope under asset-level targets, including any process, progress, and timeline for inclusion.
- Disclose metrics, targets and methodologies used to assess and track alignment of assets according to each asset class, and the extent to which these are consistent with this framework's methodology.
- Disclose approaches to achieve targets and key outcomes achieved.
- Disclose policy determining when PCRAM assessment is repeated[26].

Proportionality

This framework encourages investors to climate-inform their investment decisions to the maximum practical extent possible, recognising that in some contexts data quality may undermine insights produced by physical climate risk assessments. It is hoped that increased usage of data by the investment industry will stimulate data improvements. Macro-stewardship connections with data have been outlined within this framework's 'Policy Advocacy' and 'Stakeholder and Market Engagement' sections.

Criteria underpinning CRIF asset alignment

This framework uses a set of six backwards, current, and/or forward-looking criteria to help determine asset alignment on a maturity scale.

- Ambition: Statement of intent exists to ensure that physical climate risks across operations and value chains are managed.
- Governance: Appropriate senior leadership structures, oversight, and processes exist to facilitate management of physical climate risk.
- Business continuity plans: Resilience options exist to manage current vulnerability to physical climate risks.
- A&R plans: Specific adaptation options identified and appropriately analysed to manage future vulnerability to physical climate risks.
- Disclosure: public statement of intent to disclose physical climate risks in line with industry best practice (e.g. TCFD, TNFD, and ISSB).
- Capital allocation alignment: Appropriate levels of resources are being directed to implement adaptation options to manage current and future physical climate risks.

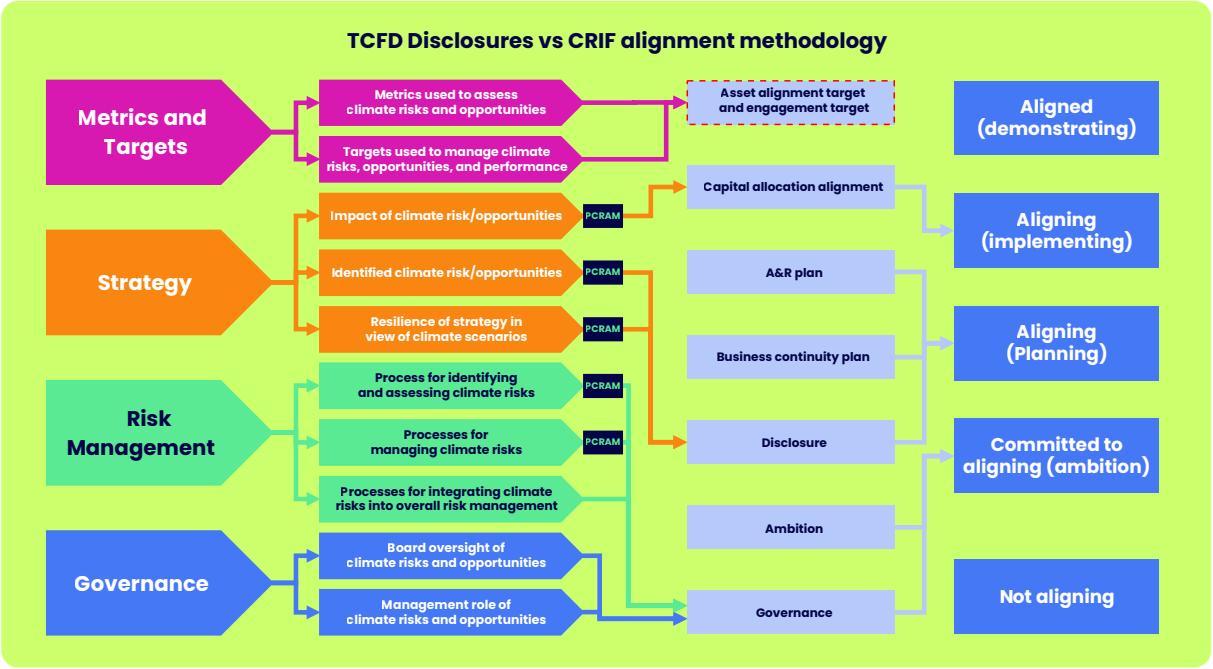
Outside of the determinant criteria above, investors may wish to incorporate other considerations into the assessment of underlying assets such as mitigation efforts, climate policy advocacy, and the just transition.

As stated previously, this framework deliberately does not instruct or require the use of certain scenarios. Investors should choose a context-relevant scenario(s) and justify this decision, and any assumptions made, to relevant stakeholders.

TCFD/ISSB disclosures

The CRIF alignment methodology has been produced with the acknowledgement that disclosures consistent with the TCFD (being integrated into ISSB) framework will contribute towards, but not fully provide, all of the information required by investors in the management of physical climate risks (see Figure 8). The aim is to complement and not replace the information provided via this disclosure framework.

Figure 8: TCFD disclosures relative to CRIF alignment methodology



Real estate

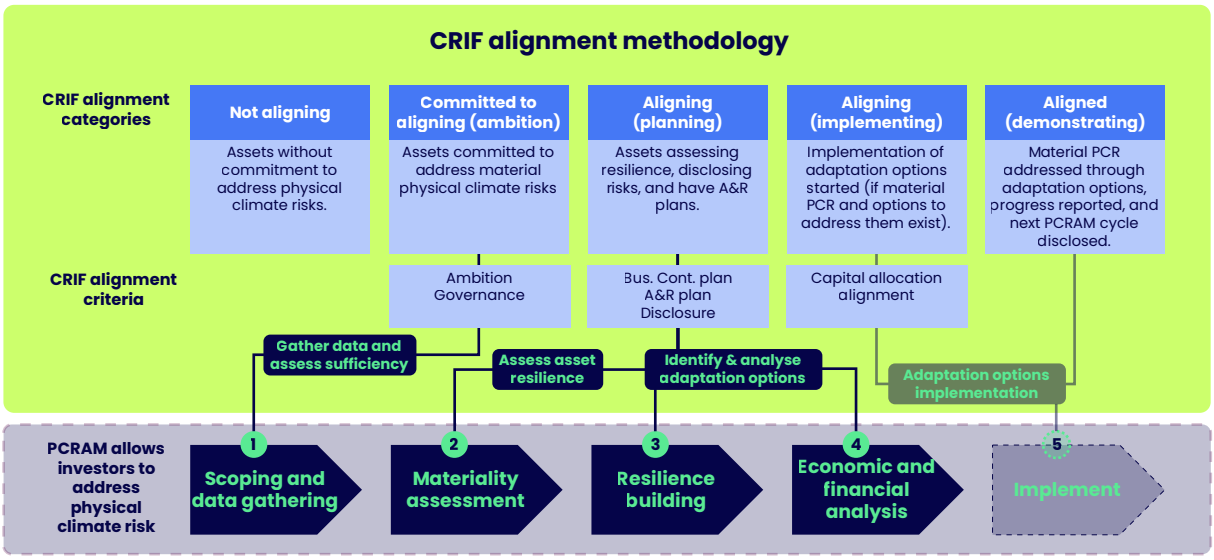
Alignment targets

- Asset alignment target: A 5-year target for increasing the % of AUM that are 'aligned' to an adaptation pathway (see Figure 9).
- Engagement threshold target: A minimum proportion of assets (based on %AUM) that are assessed as 'aligned' to an adaptation pathway, or are subject to engagement, increasing gradually over time.

Scope

- Include individual direct investments, investments in assets pooled through a fund or trust structure, investments in listed real estate companies, and real estate debt.
- Include all types of real estate: retail, office, industrial, residential, hotel, lodging, leisure & recreation, education, and technology/science.
- Include existing real estate assets and those in development.

Figure 9: Alignment criteria and categories



Approaches to achieve asset level targets

The approaches below can be used to achieve asset alignment targets. They are presented agnostically, as efficacy will depend on the individual investor context.

Asset selection

- Due diligence: Assess prospective investments to understand the extent to which physical climate risks may affect asset values and income flows, and whether adaptation options have been explored/implemented.

- Due diligence: For debt investments, given influence levels associated with the holding period, the screening test could be higher and include an approach where material risks require external due diligence to be conducted in line with PCRAM. As part of this process, the investor would have a reasonable expectation that they can engage the borrower/issuer to achieve this.
- Positive screening: increase exposure to assets that have already started climate-proofing efforts, following approaches consistent with the PCRAM approach.

Asset management

- Develop a clear timebound management and investment strategy to climate-proof assets to the extent possible using an approach consistent with the PCRAM methodology.
- Integrate management and investment strategies into agreements with relevant parties involved in the management of real estate including, where relevant property managers, surveyors and other professional service providers.
- Where relevant, engage with tenants on adaptive capacity of buildings considering their occupancy.
- Develop adequate governance systems to ensure appropriate delivery of management and investment strategy to address material physical climate risks for which adaptation options exist.
- Disclose results of PCRAM asset-level assessments on physical climate risks through TCFD-compliant reporting and incorporate such risks into financial accounts.
- Using the PCRAM approach, quantify potential business disruption of current physical climate risks and integrate this into business continuity plans.
- Disclose residual physical climate risk and where any adaptation limits have been reached, including where action by other stakeholders is deemed necessary.
- Integrate investment requirements of adaptation options into capital and operating expenditure.
- On a best-effort basis, integrate nature considerations into PCRAM assessment.

Asset engagement

- Ensure governance and management responsibilities for addressing physical climate risk are defined for each asset/operator, including establishing remuneration linkages.
- Undertake engagement with escalation strategy based on achievement of alignment indicators.
- Advocate for consistency between efforts to manage physical climate risks and climate policy engagement.
- Advocate for the engagement of employees, suppliers, regulators, and the community to ensure a just and effective A&R process:
- Incorporate supply chain resilience into engagement and stewardship efforts.
- Engagement with greenfield developers to advocate for long-term physical climate risks to be addressed during asset development.
- Engage on the integration of nature into PCRAM assessments.

Infrastructure

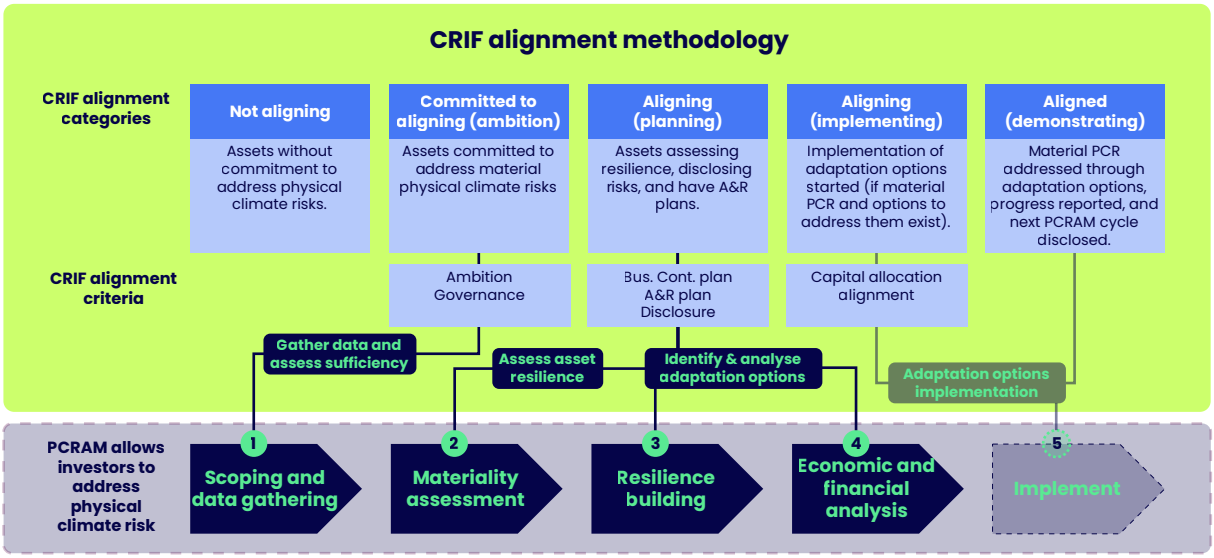
Alignment targets

- Asset alignment target: A 5-year target for increasing the % of AUM that are 'aligned' to an adaptation pathway (see Figure 10).
- Engagement threshold target: A minimum proportion of assets (based on %AUM) that are assessed as 'aligned' to an adaptation pathway, or are subject to engagement, increasing gradually over time.

Scope

- Infrastructure as an asset class should be broadly defined to incorporate equity and debt exposure held through direct or co-investments, listed and unlisted infrastructure funds, project finance or passive investments. It includes greenfield and brownfield investments in economic, social, and environmental infrastructure.
- Potential crossover with other asset classes is high, which is why investors will need to assess which guidance methodology is most appropriate to their individual circumstances.

Figure 10: Alignment criteria and categories



Approaches to achieve asset level targets

Asset selection

- Due diligence: Assess current and future physical climate risks affecting the asset. For greenfield assets that cannot be aligned, new investment should be reconsidered.
- Due diligence: For debt investments, given influence levels associated with the holding period, the screening test could be higher and include an approach where material risks require external due diligence to be conducted in line with PCRAM. As part of this process, the investor would have a reasonable expectation that they can engage the borrower/issuer to achieve this.

- Positive screening: increase exposure to adaptation solutions, when relevant and appropriate[27].
- Positive screening: increase exposure to assets that have already started climate-proofing efforts, following approaches consistent with the PCRAM approach.
- Insurance loss control report: May be beneficial at the due diligence stage and could offer an opportunity to identify adequate resilience measures for the asset, as insurance would have access to average reinstatement costs. Furthermore, as resilience measures are monetised, it could lead to easier justification of upfront CAPEX allocation internally.

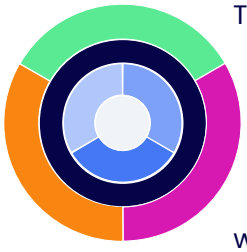
Asset management

- Develop a clear timebound management and investment strategy to climate-proof assets to the extent possible using an approach consistent with the PCRAM approach.
- Integrate management and investment strategies into agreements with relevant parties involved in the management of physical assets.
- Develop adequate governance systems to ensure appropriate delivery of management and investment strategy to address material physical climate risks for which adaptation options exist.
- Disclose results of PCRAM asset-level assessments on physical climate risks through TCFD-compliant reporting and incorporate such risks into financial accounts.
- Using the PCRAM approach, quantify potential business disruption of current physical climate risks and integrate this into business continuity plans.
- Disclose residual physical climate risk and where any adaptation limits have been reached, including where action by other stakeholders is deemed necessary.
- Integrate investment requirements of adaptation options into capital and operating expenditure.
- On a best effort basis, integrate nature considerations into PCRAM assessment.
- During refinancing, engage borrowers, project developers and operators to implement adaptation options to address long-term physical climate risks.

Asset engagement

- Ensure governance and management responsibilities for addressing physical climate risk are defined for each asset/operator, including establishing remuneration linkages.
- Undertake engagement with escalation strategy based on achievement of alignment indicators.
- Advocate for consistency between efforts to manage physical climate risks and climate policy engagement.
- Advocate for engagement of employees, suppliers, regulators, and community to ensure a just and effective A&R process:
- Incorporate supply chain resilience into engagement and stewardship efforts.
- Engagement with greenfield developers to advocate for long-term physical climate risks to be addressed during asset development.
- Engage on the integration of nature into PCRAM assessments.

Policy advocacy



This section addresses barriers to, and captures opportunities for, A&R alignment created by the wider policy and regulatory environment. Policy engagement is expected to be a critical component of A&R plans. Engaging with governments to advocate for the development and implementation of coherent and well-designed policies has the potential to address key barriers to reducing vulnerability across entire economies and unlock investment in adaptation solutions. Investors may also benefit from engaging with assets to advocate with national and sub-national governments to understand adaptation barriers, opportunities, and priorities. Core action points are those considered particularly important and where expectations are greatest. Advanced action points are considered best practice but may not be possible across all contexts.

Core action points

- Create procedures for robust internal oversight of policy advocacy efforts, including monitoring, review, and transparency through disclosure.
- Engage with investment managers or clients on the need for A&R aligned policy advocacy to achieve A&R objectives.
- Engage with supranational, national and/or regional authorities in improving the enabling environment for investment aligned with climate resilience goals.

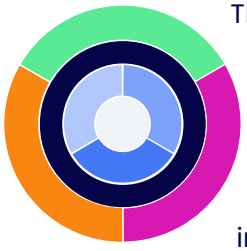
Advanced action points

- Disclose within A&R plan the interdependencies between A&R targets and the wider policy environment.
- Collaborate with financial institutions such as insurers[28] to build a case for adaptation policies.
- Collaborate with financial institutions such as insurers to support mandatory climate risk disclosure.
- Where resources allow, work with local EMDEs partners to enhance the in-country policy, regulatory, governance and data environment.

Below is a non-exhaustive list of examples of important policy topics that investors may wish to consider when encouraging enhanced policy action to facilitate their A&R efforts.

- Advocate for more open data sources, especially of public infrastructure assets to harmonise hazard information and location data.
- Advocate for policy approaches that support more systemic adaptation actions to address physical climate risks, including through macro-fiscal policy.
- Advocate for regulations that require climate risk disclosures and resilience planning in investment portfolios.
- Support policies, platforms, and mechanisms to provide incentives and support risk-sharing mechanisms to provide stability and facilitate A&R investments.
- Advocate for 'investment-ready' National Adaptation Plans looking at synergies for NDCs.
- Advocate for sovereigns to incorporate future scenarios of physical climate risks and adaptation within current and forward-looking fiscal risk assessments as a stress test, and consequently what this could mean for their debt and cost of capital. Particularly in nations that may be perceived as climate risk hotspots such as EMDEs.[29]
- The need to integrate the management of physical climate risk across government development planning processes.

Stakeholder and market engagement



This section is dedicated to facilitating the availability of data, mandates, and investment advice necessary to achieve A&R objectives. Stakeholder and market engagement is deemed a critical component of A&R plans. This framework's concepts, such as the PCRAM methodology are yet to permeate across the wider body of actors serving the investment community. It is also recognised that physical climate risk can aggregate and cascade throughout economies, therefore investors may find value in stewardship activities beyond immediate investments. Core action points are those considered particularly important and where expectations are greatest. Advanced action points are considered best practice but may not be possible across all contexts.

Core action points

- Undertake stewardship with market actors - such as physical climate analytic service providers and certification bodies - to ensure that their assessments, data, and products are based on alignment criteria, robust methodologies, and are consistent with A&R goals.
- Undertake stewardship with industry peers to share expertise, experience, and address common challenges in support of the achievement of A&R objectives.
- Advocate to the investment industry on the need to manage funds in alignment with A&R objectives.
- Promote investor expectations of enhanced corporate disclosures regarding physical climate risks, such as those established in IIGCC (2021).

Advanced action points

- Participate in regulator and/or industry initiatives to develop voluntary and mandatory standards of A&R plans and other disclosures, such as Paris-aligned accounts[30].
- Encourage credit rating agencies, sell side analysts, and fund managers to incorporate climate-related risk factors into financial analysis and price resilience investment.
- Work with standard setters on developing the range of climate resilience-related metrics that can inform investment decisions and financing instruments[31].
- Partner with insurance industry forums focused on resilience to access insights on climate risk and adaptive solutions.
- Collaborate with insurers to establish guidelines that reflect actuarial climate risk data and resilience standards[32].
- Engage insurers for insights on loss trends, including Average Annual Loss (AAL)[33], Probable Maximum Loss (PML)[34] and reinstatement costs under various scenarios to better understand potential risks and opportunities.
- Engage with, and support, MDBs and DFIs to promote dialogue and enhance the quantity and quality of blended finance products and opportunities that efficiently mobilise private capital to invest in adaptation solutions in EMDEs.
- Work with stock markets to promote greater disclosure of necessary data related to physical climate risks, including in EMDEs.

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Endnotes

1 This resource sets out a five-step framework to help asset owners and managers use scenario analysis, in understand how climate changes drives financial impact across their portfolios. Source: IIGCC. 2019. Navigating climate scenario analysis - a guide for institutional investors. https://www.iigcc.org/resources/navigating-climate-scenario-analysis-a-guide-for-intuitional-investors.

2 This resource covers five steps for investors to take in starting to identify, assess, monitoring and manage physical climate risk. Source: IIGCC. 2020a. Addressing physical climate risks: key steps for asset owners and asset managers. https://www.iigcc.org/resources/addressing-physical-climate-risks-key-steps-for-asset-owners-and-asset-managers.

3 The detailed guidance is intended as a useful tool for investors which brings together useful case studies, frameworks and resources for investors who are making a start on assessing physical risk, see: IIGCC, 2020b.

4 This resource supports advocacy for physical climate risk disclosures and resilience strategies within policy and regulation: emphasising that corporates and investors should address both transition and physical risks separately rather than on a basis of aggregated climate risk, see: IIGCC. 2020.

5 This resource aims to inform corporate engagement to drive physical climate risk management and disclosures, with 50 companies globally identified that are highly exposed. More than 50 IIGCC members ($10t AUM), signed an open letter to these companies asking them to adopt the expectations, see: IIGCC. 2021.

6 This resource supports advocacy for physical climate risk disclosures and resilience strategies within policy and regulation: emphasising that corporates and investors should address both transition and physical risks separately rather than on a basis of aggregated climate risk, see: IIGCC. 2022.

7 That said, more resilient socioeconomic systems are expected to have less macro-economic or systemic risks to which investors are exposed (e.g. sovereign risk). Klusakab et al., (2021) and Volz et al., (2021) find climate change have or will continue to affect sovereign risk ratings.

8 See IPCC (2023).

9 In that they are non-rivalrous and non-exclusionary.

10 It is recognised that investors are already subject to a range of voluntary and mandatory disclosure requirements. It should not create a separate reporting standard but drive best practice disclosure through key frameworks such as TCFD, whilst advancing industry standards.

11 See IPCC 2023.

12 In contrast NZIF has an achieving net zero alignment category, representing an asset whose emissions performance is at least equal to what is required by its sector/regional pathway for the year 2050, and their operational model will maintain this performance.

13 This is akin to mitigation discussions which focus on the reduction of financed emissions rather than investment in climate solutions.

14 It would be somewhat analogous to a decision-making tree which changes over time as uncertainty is managed.

15 They are considered dynamic as over time climate related hazards will change (whether it be in frequency or intensity) due changes in atmospheric concentrations of GHGs. Also, the implications of these hazards will change as socioeconomic and natural ecosystems change. They are considered probabilistic in that while hazards can be identified and generally understood, the occurrence of physical climate-related hazards is somewhat stochastic and chaotic.

16 A comprehensive approach to resilience has shown to be beneficial in three ways: reduce sensitivity, faster and fuller recovery (see BCG 2025).

17 The examples of potential considerations cited here conform to the LEAP approach set out as part of the work of the TNFD (see TNFD 2022).

18 Any use of nature-based solutions would also likely entail the need to measure and monitor complementary nature-related metrics (and potentially targets).

19 See Kling et al (2021)

20 See Piesik (2023)

21 It is expected that future engagement work by IIGCC on the topic of physical climate risk within EMDEs will also pay particular attention to risk transfer mechanisms (including need for reinsurance pools and blended finance).

22 This would equate to the approach outlined by UNDRR (2022) Principles for Resilient Infrastructure which aims to "I. Assist in raising awareness and setting a common basic understanding of what "resilient infrastructure" constitutes; II. Form the basis for planning and implementation of infrastructure projects that take resilience as a core value; III.Raise engineering designs based on available and reliable data so parameters of safety and disaster risk mitigation are in place on new and retrofitting projects; IV. Set out the desired outcomes of national infrastructure systems to establish resilience of critical services; and, V. Assist the public and private sectors in making risk-informed policy and investment decisions" (page 13).

23 This should consider specific thematic training, such as on integrating nature into processes.

24 This could be done by undertaking an assessment of supply chain exposure and dependencies, and asset adaptive capacity relative to that supply chain.

25 For instance, investors may wish to consider a lighter assessment for assets under a certain size or those held for only a short holding period.

26 Examples of reasons to repeat the PCRAM assessment could include: occurrence of major climate related events; substantial changes to data coverage, availability, or quality; significant shifts in sectoral or industry exposure; or during key stages in investment cycle (e.g. refinancing).

27 For a framework to evaluate the impact of adaptation solutions at asset level see CISL (2025).

28 Insurers in particular can offer data on insured losses and reinstatement costs due to extreme events.

29 See, Bernhofen et al., 2024.

30 This resource contains investor expectations for companies when preparing 'Paris-aligned' company accounts, see IIGCC. 2020d.

31 A framework to evaluate the quality of metrics by CISL (2025) proposes that metrics should be context-specific, compatibility with relevant timescales, account for uncertainties, and consider the challenges in determining project boundaries.

32 The recent publication by IoFA (2024) highlighted the need for realistic climate modelling techniques accommodating the increasing likelihood of historic tail risks becoming more probable.

33 For more information on AAL, see https://www.verisk.com/blog/modeling-fundamentals--what-is-aal-/

34 For more information on PML see, marsh.com/en/services/risk-advisory/insights/how-loss-estimate-studies-can-create-awareness-on-exposure.html

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