Underwriting the Future of Resilience

Developing Insurable and Bankable Infrastructure

Global Infrastructure Facility
A G20 INITIATIVE

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AON

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Acknowledgements

We would like to thank the **insurance carriers** who participated in the survey that informed this white paper. All participants and the data collected will remain anonymous.

We further wish to acknowledge our **external reviewers** of the white paper:

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Growing urgency to protect infrastructure investments against escalating climate losses and impacts

As losses from natural catastrophes and extreme weather events continue to rise, ensuring infrastructure resilience emerges as a vital global economic and social priority. This requires proactive action to account for evolving climate hazards — both present and future — across site selection, design, structuring, tendering, construction and operations. This proactive action is especially critical to ensuring that infrastructure investments remain resilient and continue to support inclusive growth, job creation, poverty reduction, and long-term development outcomes in emerging and developing economies (EMDEs). If resilience measures are not considered from the outset, there is a profound risk that assets under development may not function as intended, depreciate in value over time, and **become stranded investments – uninsurable, unbankable and uninvestable**. Yet, in practice, resilience is too often an afterthought — elevated only after major loss events — and the long term benefits of resilient design are rarely captured fully in project preparation, including budgeting, technical design, and lifecycle structuring decisions.

How insurers are redefining their role on climate resilience

Against this backdrop, insurers see a growing opportunity to embed resilience into how infrastructure is underwritten, both during construction and throughout the operational life of an asset. The Insuring Resilient Infrastructure Survey, conducted by Aon in Q1 2026 with 25 leading insurers and reinsurers globally, shows that climate and natural catastrophe risk considerations are moving into the core of underwriting and their influence on coverage and terms is set to increase over the next 3–5 years. The insurance industry is playing an increasingly strategic role in supporting resilience across the infrastructure lifecycle — by providing risk intelligence, advising on loss control and risk mitigation measures, and translating risk into capital allocation decisions.

Persistent structural gaps limit resilient outcomes

At the same time, insurers say they are brought into projects too late — often only after the site selection, design parameters, engineering standards, and contractual risk allocations have already been finalized. By that stage, the most consequential decisions affecting long-term insurability of new infrastructure assets have effectively been locked in. The result is more conservative underwriting, leading to higher premiums and coverage restrictions. Structural gaps further constrain the extent to which resilience measures are built in from the start. These include project preparation and procurement processes that do not systematically embed physical climate risk assessment, a mismatch between short insurance cycles and long-lived infrastructure assets, limited local technical capacity in many EMDEs, and cases where projects are effectively self-insured without adequately budgeting for forward-looking climate impacts.

Executive Summary

Purpose of this white paper and agenda for action

To better align the key stakeholders involved in social infrastructure development (e.g., hospitals, schools, government buildings, etc.) around climate resilience decisions, Aon, the G20 Global Infrastructure Facility (GIF), the International Finance Corporation (IFC) and the Multilateral Investment Guarantee Agency (MIGA), have developed this white paper. It aims to deepen understanding of how insurers assess physical climate risks when underwriting new social infrastructure projects, clarify which resilience measures matter most for underwriting during and after construction, and provide practical suggestions for aligning project preparation upstream practices with underwriting expectations that can drive economic value and stability.

Building on these goals, the white paper set out five enablers and corresponding priority actions to embed climate resilience across infrastructure planning, project preparation, procurement, delivery, operations, and risk transfer — aligning what insurers deem important for underwriting climate risk, with the decisions that shape how projects are structured, designed, financed, and managed over their full lifecycle.

Enablers *(What needs to be in place)*	Priority Actions *(What should stakeholders[1] do)*
1. Early and structured stakeholder engagement	**Lead early and structured stakeholder engagements** Define a standard engagement model between insurers, risk consultants, brokers, architects, engineers, contractors, financiers and asset owners across key project development stages to ensure that risk management conversation moves from ad-hoc consultations to a documented systematic engagement.
2. Current and future physical climate risk assessment *3. Resilient siting, design and construction*	**Approach climate risk systematically – Assess → Map → Embed (AME)** Standardize current and forward-looking climate-risk assessment, map exposure to assess risk, assign applicable resilience measures, and ensure that these measures are embedded in siting, design, construction and operational phases of the project.
4. Underwriting information and documentation	**Embed resilience in project governance, procurement, delivery and operations** Incorporate resilience measures into project procurement requirements, assign clear responsibilities and establish performance monitoring standards for resilience across infrastructure project lifecycle, delineate how climate risk is managed contractually, operationally or via risk transfer. Collect evidence of how climate risk is being managed/reduced and proactively communicate this information to support insurance and loan renewals, and other asset management transactions.
5. Proactive insurance and risk transfer strategy	**Capitalize on proactive insurance and risk transfer strategy** During feasibility and early design, explore with risk consultants, brokers and insurers the feasibility of insurance and solutions that explicitly recognize project's resilience measures and reduced long-term risk profile.

Taken together, these actions are intended to help key public and private stakeholders across the infrastructure lifecycle work in a more coordinated way to ensure that resilience is embedded from the start, so that infrastructure assets remain functional, valuable, insurable and attractive to investors and lenders during full lifecycle.

Building resilient infrastructure from the start helps limit expensive retrofits down the road, and reduces the money required for emergency response and recovery. The shift being advocated in this paper ensures money builds the future rather than repairing the past.

1. The ultimate project owner is the most vested party to take a lead on coordinating the execution of these Priority Actions.

Resilient infrastructure is a vital economic imperative for both developed and Emerging Market and Developing Economies (EMDEs)

As the impacts of natural catastrophes and extreme weather events are increasingly prevalent, the need for resilient infrastructure has never been more pressing.

Annual economic losses from natural disasters globally exceeded **$300 billion for the past 9 out of 10 years**[2]. As population growth and urbanization continue to concentrate in areas that are prone to natural disasters, the losses are projected to rise.

EMDEs are both highly exposed and underinsured. In many EMDEs, insurance penetration remains close to 3% of GDP[3], yet these economies are expected to account for around 98% of global population growth and about 70% of global real GDP growth by 2050[4]. **This creates both heightened vulnerability and a major opportunity: integrating resilience into new infrastructure as these markets build out.**

The return on investment from resilient infrastructure can be immense. Studies estimate the returns from resilience to be in the range of **1:2 to 1:43**[5] reflecting reduced property damage and losses, business interruption expenses, emergency response costs, etc. The returns are higher if resiliency measures are integrated from the onset - as new infrastructure assets are being designed and built.

Conversely, if resiliency measures are not considered from the start, there is a risk that infrastructure assets being built today may not function as well as intended, **depreciate in value** over time, and become difficult to insure and finance.

Resilient infrastructure projects have also proven to be powerful drivers of **job creation**. For instance, every US$1 million invested in resilient construction is estimated to create 650 jobs in India, 200 in China, and more than 150 in both Brazil and Indonesia[6]. These projects stimulate local economies by generating employment across various stages, including construction, technological deployment, and ongoing maintenance.

Lastly, resilient infrastructure can help promote **social equity** and **improved livelihoods** for the most vulnerable populations. The money that would otherwise go to disaster response can be utilized to invest in healthcare, education and other critical services. Intergenerational wealth is maintained as the value of surrounding properties and other assets, which rely on functioning social infrastructure, can be preserved over time.

2. Aon 2026 Climate and Catastrophe Insights; 3. Insurance Development Forum Paper Calls For Comprehensive, Coordinated, Multi-Party Action by Public and Private Sector Actors to Increase Insurability to Close Protection Gaps - Insurance Development Forum; 4. Actions to accelerate emerging market climate transition | World Economic Forum; 5. Building_resilience_through_climate_adaptation; 6. International Labour Organization 2018 “The Employment Impact of Climate Change”

Yet, resilience is often an after-thought, or only becomes a priority post-disaster

Catastrophe and Climate Models:

To date, much of the work carried out to assess physical risks from natural disasters and extreme weather events has been carried out using catastrophe models. Catastrophe models are the stalwart of the insurance and reinsurance industry and provide insights into how natural catastrophe risk is quantified and traded in (re)insurance markets. These models use historical data to simulate thousands of scientifically probable events and use advanced weather modelling to provide a view of hazard at such a high resolution, that the users can differentiate the peril risks between city blocks, community developments, infrastructure assets, and even individual buildings

Climate change science, on the other hand, relies on extremely large scales across space and time, bringing global atmospheric and oceanic observations into future simulations that show how changes to these environmental conditions may influence future weather or climate behavior. To understand climate change, scientists rely on global climate models, such as those developed or updated for use in the Sixth Coupled Model Intercomparison Project (CMIP6). Today, an increasingly popular practice is to bring together global climate data with the high-resolution catastrophe model framework to assess both acute and chronic physical climate risks.

Infrastructure assets typically change hands multiple times over their lifecycle as they move from developers to operators, are refinanced, securitized, or acquired by long-term institutional investors.

As a result, early-stage actors, particularly during design and construction, do not always capture the long-term benefits of resilience investments that accrue years or decades later.

This fragmentation across the asset lifecycle weakens the business case for integrating resilience at the point where it is cheapest and most effective – which is at the project preparation stage, when site selection, engineering standards, design parameters, procurement frameworks, and contractual risk allocation are still being determined.

Context and Project Background

While the insurance industry plays a central role in infrastructure resilience, it is often engaged too late in the infrastructure development process or not consistently enough

Unlike ownership structures or financing arrangements, insurance is a constant requirement across the lifecycle of an infrastructure asset. Regardless of who owns or operates a project, affordable and reliable insurance coverage is essential for construction, operations, refinancing, and continued access to capital.

As such, insurance plays an increasingly strategic role in creating demand for resilience across the life cycle of an infrastructure project:

1. **Providing Risk Intelligence**: catastrophe and climate models can inform siting, design, and operational decisions from the planning stage, helping project owners, developers, and contractors understand and manage risk;

2. **Advising on Loss Control and Risk Mitigation Measures**: insights from insurer's risk engineers and loss control specialists can be critical to optimizing the total cost of risk management program and helping strike the right balance between engineered approaches to risk mitigation and financial risk transfer; and

3. **Translating Risk into Capital Allocation Decisions**: quantifying the risk and the impact of resilience measures in terms that resonate with underwriters can help unlock capital for risk mitigation and support better insurance outcomes.

Furthermore, insurance also plays a key role in unlocking capital for infrastructure projects, as having insurance coverage in place in itself boosts investor confidence. If certain risks can be placed with private insurance markets, it also means that public sector, philanthropic and development finance, and other capital sources can be used for other purposes.

Despite this central role, **engagement with the insurance market typically occurs late in the project cycle**, often after site selection and design decisions have been made, and contractual risk allocations agreed on.

This **timing mismatch** creates a structural disconnect between how insurers assess risk and how projects are prepared, particularly during the design and construction phase, when many long-term insurability outcomes are effectively locked in.

In many cases, projects also advance too quickly without meaningful involvement of the asset's risk manager, who can serve as an internal bridge to the insurance market. Strengthening the early engagement and capability of risk managers, effectively positioning them as an extension of the insurance sector within project teams, can help embed resilience considerations sooner and support more sustainable insurance outcomes.

At the same time, financial sponsors of infrastructure projects, developers and public authorities often **lack visibility** into which resilience measures insurers consider truly risk-reducing, as opposed to aspirational. Clear, consistent documentation of design assumptions, resilience measures, and risk mitigation strategies can significantly improve the ability of insurers to assess and price project risks.

Bridging the gap: identifying critical enablers for resilient social infrastructure and key actors best-placed to drive them forward

To better align key stakeholders involved in infrastructure development relative to climate resilience decisions, the white paper aims to:

- Deepen the understanding of how insurance companies assess **physical climate risks** when underwriting new infrastructure projects;
- Clarify what **resiliency measures** matter most to insurers for underwriting projects both **during and post construction**; and
- Provide practical suggestions on how **project preparation practices**, even at early stages of conceptual design, can better **align with underwriting** expectations.

The analysis presented in this paper was informed by a confidential survey of 25 insurers globally, executed by Aon in Q1 2026. The survey focused on how climate resilience is being considered for **social infrastructure projects** (i.e., buildings, such as hospitals, schools, public housing, and other government facilities) in both developed markets and EMDEs. See Appendix A for survey methodology.

Survey findings were corroborated by a series of interviews with insurer representatives, insurance brokers and industry practitioners involved in infrastructure planning processes. This feedback was critical to contextualizing the problem statement, as well as informing the development of priority actions.

There are five (5) core enablers that determine how well climate resilience is integrated into infrastructure projects

1. Early and Structured Stakeholder Engagement
2. Current and Future Physical Climate Risk Assessment
3. Resilient Siting, Design and Construction
4. Underwriting Information and Documentation
5. Proactive Insurance and Risk Transfer Strategy

Five core enablers determine how effectively climate resilience is integrated into infrastructure projects

Early and Structured Stakeholder Engagement

Establish early, structured communication between project developers, owners, risk managers, insurers, brokers, architects, engineers and financiers — starting at feasibility and design stages — to strike the right balance between engineered resilience and financial risk transfer.

Current and Future Physical Climate Risk Assessment

Use site-specific natural catastrophe assessments and forward-looking physical climate analytics to inform risk-based decision-making across the infrastructure lifecycle.

Resilient Siting, Design and Construction

For the most material climate risks identified, demonstrate how resilience measures are embedded into project siting, engineering, construction practices, and operations to reduce losses and strengthen performance across the asset's lifecycle.

Underwriting Information and Documentation

Prepare clear, consistent and transparent climate risk and resilience documentation - aligned with early stakeholder dialogue - to share with underwriters, enabling them to reflect resilience measures in pricing, terms and eligibility for both construction and operational policies.

Proactive Insurance and Risk Transfer Strategy

Proactively explore and, where appropriate, integrate innovative insurance and risk transfer solutions (e.g., parametric covers, build-back-better endorsements, multi-year policies, ILS and resilience-linked warranties) that explicitly recognize resilience investments to help unloc capital.

In addition to integrating these enablers into infrastructure development decisions, several structural gaps exist that may still prevent infrastructure from being built resilient.

Key Findings

Structural gaps that may prevent infrastructure from being built resilient

Physical climate risk assessment and resilience considerations are not yet systematically embedded in infrastructure project preparation and procurement processes across public and private entities, nor are they consistently supported by clear legal and regulatory frameworks that ensure accountability and enforce implementation by all parties.	Not all jurisdictions require consideration of physical climate risks and forward-looking climate data as new infrastructure projects are being designed and built. Often Request for Proposals (RFPs), contracts, and procurement processes lack stipulations that would require project proponents to assess and address these risks from the onset. This is where public sector procurement can be particularly impactful to drive long-term resilience outcomes, by creating stronger demand signals and incentives for climate-resilient infrastructure projects. For private sector entities, embedding resilience also strengthens long-term business sustainability, helping secure supply and sales continuity, reduce exposure to avoidable business interruptions, and reinforce investor confidence.
There is a mismatch of timelines and risk exposures between insurance cycles and long-term nature of infrastructure investments.	For example, some investors and lenders may implicitly assume that insurance will remain affordable and available throughout the entire period spanning their investment/loan. This assumption may not hold true as natural disasters and other stressors impact insurance capacity and pricing the long-term. Therefore, it's critical that long-term investors and lenders integrate forward-looking climate risk assessment into due diligence and understand how those risks are being mitigated over time.
Climate risk is evolving faster than building codes and engineering standards; and models that engineers use differ from models that investors, lenders and insurers use to assess climate risk.	This is why early stakeholder engagement, which brings together these disciplines, is so important to creating transparency and alignment about how climate risk is assessed and managed.
Local expertise may not be available in EMDEs to drive desired resiliency outcomes.	In many EMDEs, regulatory frameworks on physical climate risk management are still evolving; local architects, engineers and contractors may be less familiar and may lack construction experience with regards to the latest climate resilience guidelines, standards and risk management best practices; and facility management companies may lack expertise on both how to design, as well as how to operate and maintain, infrastructure to remain resilient once it is built. In addition, many EDME's face significant gaps in hazard, exposure and vulnerability data, and limited access to high-resolution forward-looking climate models, all of which constrain robust climate risk assessment and pricing.
Where the infrastructure projects are "self-insured", owners may run the risk of inadequately budgeting for potential losses, if forward-looking climate risk is not considered.	Utilizing data-driven approaches to manage these exposures with greater control, consistency, and efficiency is critical. It may also be appropriate to explore reinsurance, catastrophe bonds, and other alternative risk transfer (ART) mechanisms for additional liquidity and protection against major natural catastrophe losses, as asset owners seek to mitigate significant natural catastrophe risks.
Resilience is a shared responsibility and requires a "whole of society" approach to enact.	Unless all actors play their part, resilience outcomes will fall short. Examples of actions are set out in 'Whole of Society' Approach to Resilient Infrastructure chapter, illustrating the range of stakeholders involved and the different roles they can play in advancing resilient infrastructure.

Enabler 1: Early and Structured Stakeholder Engagement | Survey Results

Key Findings

Insurers recognize the **importance of early, structured engagement** between project developers, owners, risk managers, insurers, brokers, architects, engineers and financiers. Shifting from ad hoc and late stage conversations to **early dialogue on climate risk management approaches is essential** to strengthening long term insurability of infrastructure assets.

Stakeholder engagement is currently focused on a narrow set of counterparties

Survey results indicate that underwriters prioritize **project developers and owners** as the most **important early stakeholders for climate risk and resilience engagement,** followed by contractors, financial sponsors, and engineers.

Exhibit 1: *Top five most important stakeholders to engage early on climate risk and resilience*

In other words, insurers know whom they would like to engage with early on climate risk mitigation

Engagement is concentrated on complex and/or larger projects

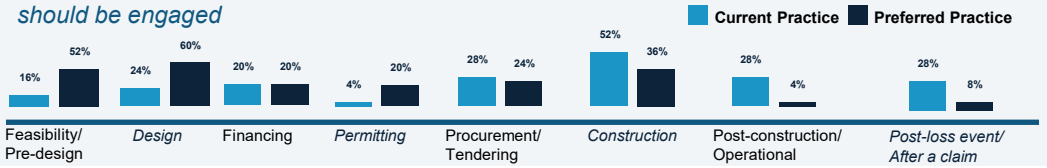
Among insurers, who do engage early with the stakeholders on climate risk and resilience for new construction, **nearly half of respondents** say this engagement happens "**only on a few projects, as an exception**". Discussions on resilience are therefore often reserved for complex, higher-value or particularly exposed projects, rather than being embedded as a normal part of project preparation for infrastructure projects.

Engagement with insurers can extend beyond only large and complex projects to become a routine practice across a broader range of infrastructure being built.

Engagement tends to occur late in the project lifecycle – after the biggest opportunities to shape resilience have passed

When asked at which stages they **currently engage stakeholders on climate risk** and resilience for new property construction, insurers point **primarily to later phases**. However, when asked which stages they consider **most important for engagement**, the answers shift **decisively upstream**.

Exhibit 2: *When insurers are engaged on climate risk and resilience vs. when they think they should be engaged*



This reveals a structural misalignment: insurers believe they add the most value early, when site selection and design decisions can still be changed to improve resilience outcomes.

More structured engagement is one of the single most important changes needed

Many survey participants explicitly describe **more structured engagement as a top priority** for enabling better management of physical climate risk.

- Several insurers expressed interest in **earlier and more structured conversations about optimizing the cost of engineered versus financial risk transfer solutions** to mitigate climate risk – but these need to occur **early in the project preparation stages.**
- Others highlighted the **need for industry-wide dialogue between regulators, insurers, engineers, architects and infrastructure owners** to arrive at optimal risk sharing structures and new approaches to mitigating climate risk.

Taken together, this suggests a strong appetite among insurers for a more deliberate engagement model – one that starts earlier, spans multiple disciplines and is anchored in a shared view of current and future physical climate risk.

Enabler 2: Current and Future Physical Climate Risk Assessment | Survey Results

Key Findings

Insurers have already made **site-specific natural catastrophe assessments a standard practice** for many large projects, providing a strong base to build from. The opportunity now is to **integrate forward-looking climate analytics** so that long-term climate risk considerations become a routine **part of underwriting**.

Strong reliance on site-specific hazard data

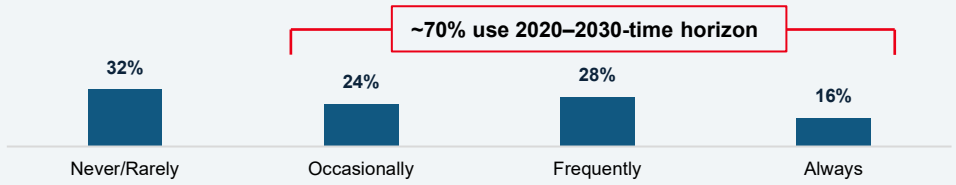
Survey results show that **insurers rely heavily on site-specific natural catastrophe assessments** for new assets being built. When asked how often they use site-specific physical climate risk data (e.g., flood, wind, wildfire hazard at the project location), all **respondents reported using location-specific hazard exposure data**, and more than two thirds (**84%**) said they do so **consistently**.

This confirms that detailed hazard assessments are already a core part of property and construction underwriting today.

Growing but still uneven use of forward-looking climate data

By contrast, the **use of forward-looking climate risk data** (e.g., climate-adjusted hazard projections, scenario-based views of risk over future decades) is **far less consistent**.

Exhibit 3: *Frequency of use of forward-looking physical climate risk data for underwriting*



In other words, most underwriters are anchored in today's view of climate hazards, with only a subset assessing how this risk may evolve over coming decades.

Underwriters rely on a variety of sources for climate data and focus on large and complex projects for more in-depth analysis

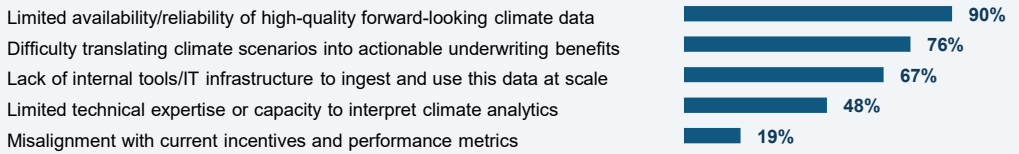
- The most frequently cited sources of forward-looking climate data for underwriting **included third-party vendor catastrophe and climate models (74%), internal risk-engineering or loss-control assessments with forward-looking components (61%)**, and **public-sector or academic datasets (57%).**
- Many respondents (**65%**) also use **client-commissioned studies** — engineering reports and bespoke climate risk assessments — as a **regular source of decision-grade information for underwriting** complex or large infrastructure projects.

This suggests that a broad range of data sources is already in play for assessing climate risk, but their use is concentrated on larger or more complex risks, rather than embedded systematically into underwriting for all infrastructure projects.

Data quality and difficulty translating climate scenarios into underwriting decisions are common barriers to wider adoption

Around **84% of survey respondents point to a familiar set of barriers** when it comes to leveraging forward-looking climate risk data for underwriting infrastructure projects.

Exhibit 4: *Top barriers to integrating forward-looking climate risk data into underwriting*



Taken together, these findings clarify where progress is most needed, creating a roadmap for turning climate scenarios into practical, resilience-aligned underwriting decisions.

Enabler 3: Resilient Siting, Design and Construction | Survey Results

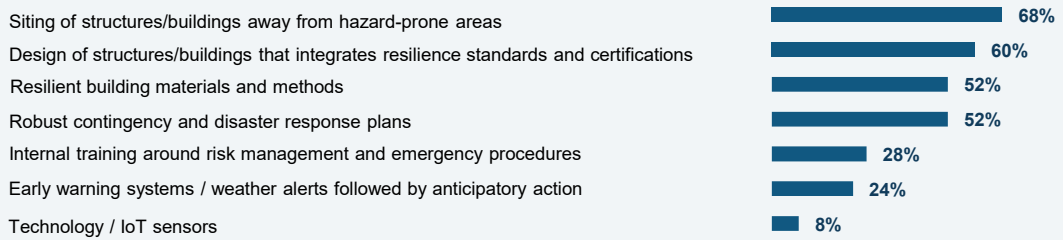
Key Findings

Insurers share a **clear view of the resiliency measures that need to be defined during concept and design phase and implemented** during construction and operational-phases **to limit physical climate losses** for infrastructure projects. The **next step is to consistently link these measures to underwriting and coverage expectations**, so that infrastructure projects can be designed for resilience with greater clarity and confidence.

Clear agreement on which resilience features materially reduce losses

Insurers have a **strong and shared view of the site-specific and operational measures** that are the **most material in reducing losses** across construction and operational phases.

Exhibit 5: *Resilience measure viewed as most material in reducing losses*



This points to a strong technical consensus on what effective climate-resilient practice looks like for infrastructure projects.

Voluntary resilience standards and labels are rarely used

When asked whether they consider specific **climate-resilience standards and labels**, **majority** of the respondents (84%) indicated that they **do not use** these in a systematic way for underwriting purposes.

There is an opportunity to better articulate the value that resilience standards and labels provide for loss mitigation and improved underwriting.

Construction and operational-phase resilience measures are recognized, but assessed inconsistently

Insurers commonly highlighted the **importance of resilience measures during the construction and post-construction/operational phases**. However, these controls are often **checked qualitatively**, based on individual underwriter or risk-engineering judgement; and only **24%** indicated that resilience **measures are embedded in formal underwriting guidelines/manuals** as standard practice.

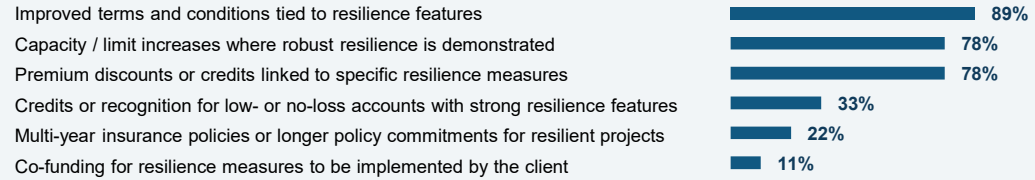
See Appendix D for additional details on resilience measures insurers look for in submissions during construction and operational property phases

As a result, infrastructure projects can face varying expectations from different markets or underwriters, even when exposure profiles are broadly similar.

The link between resilience measures being implemented and insurance incentives can be strengthened

Today, **forward-looking climate information** is already being **used to set or adjust pricing and rates (74%), determine policy terms and conditions** such as exclusions, deductibles and limits **(78%), guide risk-mitigation or loss-control requirements (70%),** and **inform risk selection** and **reinsurance decisions**.
Yet **only 36% of insurers provide explicit incentives for resilience measures** and loss mitigation—and even then, in a partial and unsystematic way.

Exhibit 6: *Types of incentives insurers offer for resilience and loss mitigation*



Taken together, resilience is already influencing coverage, and to a growing extent price, creating a clear opportunity to make these links more consistent.

Enabler 4: Underwriting Information and Documentation | Survey Results

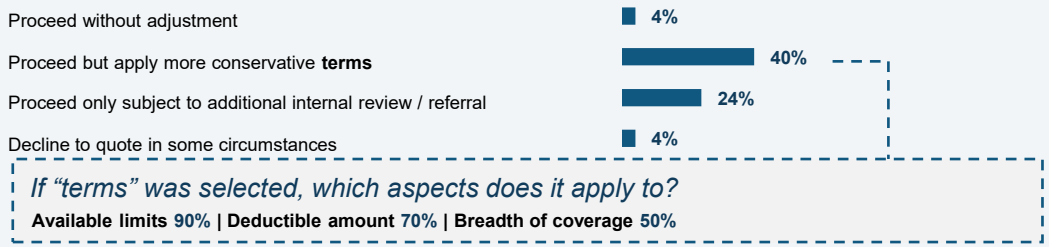
Key Findings

The provision of **clear and consistent documentation on how climate risk is assessed and mitigated** is still the **exception rather than the norm** in underwriting processes. When **clients do not provide this information** upfront, underwriters often proceed with more conservative assumptions, tighter terms, or additional internal review – **outcomes** that **can weaken project economics** and, in some cases, **limit insurability**. Robust, **transparent documentation** is therefore **critical**.

Climate risk information provided to insurers is often incomplete – and underwriters respond by tightening terms

Survey results show that **when climate risk management documentation is not provided**, most underwriters do not simply "proceed as usual". Instead, they typically **apply more conservative terms (40%)** or **require additional internal review (24%)**.

Exhibit 7: *Typical underwriting actions when climate resilience documentation is missing*



This dynamic underscores a missed opportunity: better information at submission could support more accurate risk selection and pricing, rather than default conservatism. In practice, this can result in a lose-lose outcome, where asset owners absorb higher insurance costs driven by uncertainty instead of directing capital toward resilience improvements that would strengthen asset performance and long-term insurability.

Climate and resilience considerations are increasingly present in underwriting guidelines and workflows, but are not yet fully standardized

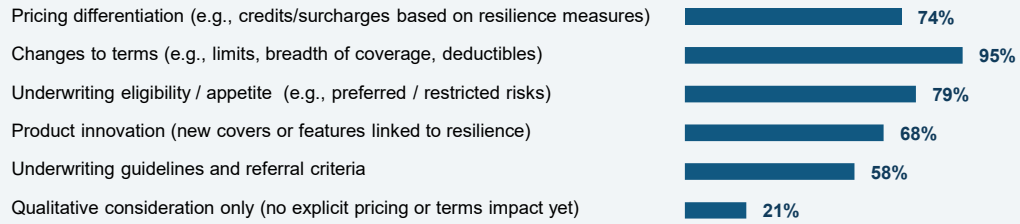
Survey responses show that **climate risk and resilience are now increasingly considered in construction (44%) and operational property (36%) underwriting workflows** and are beginning to be built into mandatory fields (36%), automatic flags, referral triggers and binding conditions, although, many insurers still rely primarily on individual underwriter judgement rather than fully systematized processes.

As a result, the quality and impact of resilience information depend heavily on how it is presented in individual submissions.

Quality documentation can unlock more risk sensitive pricing and terms

A large majority of respondents (**76%**) expect **resilience measures to play a bigger role in underwriting decisions** over the next 3–5 years.

Exhibit 8: *Expected ways climate resilience measures will be reflected in underwriting decisions*



This suggests that projects able to evidence robust climate-risk assessment and risk mitigation approaches will be better positioned to benefit from improved terms and sustained insurability.

Enabler 5: Proactive Insurance and Risk Transfer Strategy | Survey Results

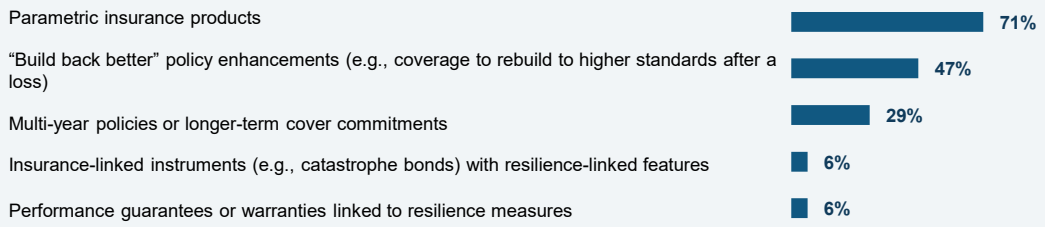
Key Findings

Insurers are already experimenting with **new products and features that explicitly recognize climate resilience** – from parametric solutions to "build back better" endorsements and multi-year policies. However, **these remain relatively niche**. A more **proactive and strategic approach to insurance and risk transfer**, informed by the project's resilience profile, can **help unlock these innovations** and align capital with better-protected assets.

Product innovation on resilience is emerging

Many respondents (**68%**) indicate that they are **beginning to develop or enhance products and features that support climate resilience**.

Exhibit 9: *Product types insurers are developing to support climate-resilient construction and property*



The results suggest that resilience-oriented product innovation is at an early stage, even as most insurers expect resilience to play a growing role in their underwriting decisions.

Embedding resilience into future underwriting priorities

Survey results show that insurers are already positioning for this shift: **79% are prioritizing investment in better climate data**, models and analytics, and **an equally large share are investing in underwriting tools and decision support**, with **over half** also **focusing on risk-engineering and client advisory capabilities**.

Together, these efforts signal a market that is gearing up to reflect resilience more explicitly in day-to-day underwriting – creating an opportunity for more resilient projects to be differentiated in terms of coverage, pricing and terms.

Pathway Forward

Grounded in the survey results and informed by practitioner feedback, the following **Priority Actions** have been developed.

These Priority Actions provide a **practical path to operationalize the five enablers** and cater to protecting the interests of long-term financiers and infrastructure project owners.

The **Priority Actions** directly link to where **positive insurance market signals** have been established:

- There is a growing interest in earlier engagement on climate risk and resilience;
- Site-specific hazard assessments are a routine practice;
- There is a strong, shared view of the resilience measures that can materially reduce losses;
- The value of clearer documentation on how climate risks are assessed and mitigated is widely recognized; and
- The work is underway to develop resilience-linked insurance products and risk-transfer solutions.

Priority Actions

1. Lead early and structured stakeholder engagement
2. Approach climate risk systematically: Assess → Map → Embed
3. Embed resilience in project governance, procurement, delivery and operations
4. Capitalize on a proactive insurance and risk transfer strategy

The ultimate project owner is the most vested party to take a lead on coordinating the execution of these Priority Actions.

Pathway Forward | Priority Actions

1. Lead early and structured stakeholder engagement

1.1 Define a standard engagement model with key stakeholders across the project lifecycle

Move from ad-hoc consultations on climate risk mitigation to a ***systematic engagement approach, spanning each key phase*** of project development cycle and each key stakeholder group:

- **Feasibility/pre-design**: high-level natural catastrophe and forward-looking climate risk assessment communicated to insurance brokers, insurance carriers and financiers to negotiate better terms and conditions.
- **Concept and detailed design**: engagement with architects, engineers and contractors to delineate responsibility and oversight with respect to the proposed resilience measures.
- **Financing / insurance placement**: engagement with insurance carriers and brokers to align on coverage structures, pricing, and any conditions precedent linked to resilience features.
- **Operations**: annual feedback loop between asset owners and managers, insurance carriers and brokers on risk performance and any required adjustments to the risk management plan.

Note that ensuring alignment among stakeholders is equally important as asset owners, developers, contractors, investors, lenders, insurers and regulators often operate under different incentives and risk tolerances. There is a need not only to convene stakeholders early, but also to actively coordinate expectations, risk allocation, and project objectives.

1.2 Use insurers' risk-engineering and advisory capabilities more systematically

Invite **brokers/insurers' risk engineering teams during site selection**, concept and design stages of infrastructure projects, not only at insurance placement. Where feasible, **align these interactions with engineering and feasibility studies**, allowing for solution co-development.

For EMDE projects where **local expertise is scarce**, leverage partnerships with **global insurance providers, architecture, engineering and construction firms that have mandates to service local markets** and expressed interest to support knowledge transfer.

Note that regulations often lag behind evolving environmental and operational conditions. As a result, engaging stakeholders, who are directly involved in local project execution - such as local communities, contractors, design consultants, and architects, can provide valuable insights into emerging climate risks, supply chain constraints, and practical design considerations that may not yet be fully reflected in regulatory guidance.

2. Approach climate risk systematically: Assess → Map → Embed

2.1 Assess: Require a standardized climate risk assessment to be performed during project preparation process

Require a ***standardized climate risk assessment*** to be performed during project preparation process ***as the minimum requirement for every infrastructure project***. This assessment needs to include:

- A ***current view of acute physical climate hazard*** (e.g., through site-specific hazard mapping and catastrophe modeling); and
- A ***forward-looking view of physical climate risk*** spanning the useful life of the infrastructure asset; and
- A ***vulnerability assessment of the asset as well as the surrounding infrastructure*** to the identified hazards, as well as community disaster preparedness assessment.

2.2 Map: Link climate risk assessment to prioritized resilience actions

Include a ***clear mapping of identified climate risks to the specific resilience measures required to mitigate the risks***, prioritized based on materiality and financial exposure, so that long-term asset performance and reliability impacts are mitigated, and it is ***clear how the proposed resilience investments are addressing the most material exposures***. Where feasible, incorporate cost-benefit analysis or financial impact assessment to demonstrate the economic rationale for recommended resilience measures, supporting more informed underwriting and investment decisions.

2.3 Embed: Implement resilience best practices in the siting, design, construction and operational decisions

During project preparation phase, document how measures that will be implemented to address material climate risks, actors in charge of implementation, across every stage of the project, including:

- Siting and land-use decisions
- Above-code design standards
- Resilient materials and methods
- Contingency / functional-recovery planning
- Key construction-phase controls
- Training, technology and emergency response

Track implementation of risk mitigation actions throughout project life cycle – to communicate progress with key stakeholders. **Consider the use of adaptive design to mitigate climate uncertainty and evolving nature of risk.**

Share this information proactively with insurance brokers, insurance carriers and financiers to negotiate better terms and conditions.

Pathway Forward | Priority Actions

3. Embed resilience in project governance, procurement, delivery, and operations

3.1 Embed key resilience controls into contracts, operations, and monitoring

Build ***specific resilience requirements, audit steps, and monitoring procedures into construction and operations contracts*** so that the responsibility for climate risk management throughout the life cycle of the project is clearly articulated and communicated.

Collect and ***retain evidence of resilience measure being implemented*** (e.g., signed checklists, dated photos, inspection reports, contractor certifications) ***as part of routine project documentation***, including benefit-cost ratios and use this evidence to demonstrate robust risk management approaches to insurers as coverage and terms are negotiated.

3.2 Strengthen functional capacity for resilient construction and operations

Ensure architects, construction companies, ***risk managers, site workers, supervisors, and facility managers receive guidance, tools, and oversight needed to implement and maintain resilience measures*** consistently on-site during construction phase, and throughout the asset's life. See Appendix C for examples of guidelines and standards that may be applicable.

3.3 Align climate-risk management with core project-preparation milestones

Make ***climate risk management a formal part of project preparation governance***. This includes:

- ***Climate-risk management milestones*** (i.e., completion of the Assess → Map → Embed process outlined above) and as part of project-preparation KPIs, so these steps are treated as mandatory elements of project development rather than optional add-ons;
- Treating ***documented engagement with insurers, brokers and technical stakeholders as a "gate condition"*** for advancing through key project-preparation stages;
- Where possible, ***linking incentives*** — such as preferred financing terms — ***to projects that can demonstrate robust climate risk management processes and long-term benefits***.

4. Capitalize on a proactive insurance and risk transfer strategy

4.1 Explore resilience linked insurance options early in project structuring

During project preparation stages and early design, ***work with brokers and insurers to test the feasibility of insurance and risk-transfer solutions that explicitly recognize the project's resilience measures*** and long-term risk profile. Use AME outputs and the underwriting pack to demonstrate why the project is a strong candidate for such resilience-linked approaches.

4.2 Integrate insurance strategy into financing and contracts

Require that ***financing term sheets and key project agreements reference the agreed risk-transfer plan and resilience-linked coverage features***, clarify who is responsible for maintaining resilience conditions tied to coverage, and show financiers how ***engineered resilience approaches and risk transfer solutions together protect cash flows and debt service***.

*The white paper consultation process underscored that **resilience is a shared responsibility: many different actors influence risk management decisions throughout the project lifecycle**. See **"Whole of Society" Approach to Climate Risk Mitigation** and Resilience that illustrates the **most common feedback received on these roles and responsibilities**. It is not intended to be exhaustive but rather highlights the most immediate opportunities for enhanced collaboration between key stakeholders involved in infrastructure financing, build out and operations.*

“Whole of Society” Approach to Resilient Infrastructure

Stakeholder	Action
Multilateral Development Banks, Development Finance Institutions and Export Credit Agencies	• Integrate forward-looking physical climate risk assessments and consideration of long-term resilience measures into project preparation and investment due diligence • Add resilience requirements to procurement standards for all investments • Keep playing the key role in harmonizing methodologies and standards for resilience with public and private sectors • Strengthen institutional capacity of developers and investors to embed climate resilience criteria systematically at corporate level, and provide technical assistance on how to integrate climate resilience into asset lifecycle • Develop a common set of KPIs to track how physical climate risk is managed across the asset lifecycle
Institutional Investors / Asset Managers	• Embed forward-looking physical climate risk assessments and consideration of long-term resilience measures into deal due diligence for infrastructure investments • Require relevant documents and disclosures of how physical climate risk is mitigated during and post construction • Report to Limited Partners on how resilience investments are protecting long-term asset value and cash flows
Lenders	• Embed forward-looking physical climate risk assessments and consideration of long-term resilience measures into loan due diligence for infrastructure investments • Do not assume that insurance will be affordable/available throughout the entire long-term loan duration – ensure that forward-looking risks have been assessed and factored into loan consideration as it is typically renewed on an annual basis
Asset Owners	• Require forward-looking physical climate risk assessments and discussion of how material risks are being mitigated in all new RFPs for infrastructure assets • Require engineers and architects to provide siting and design proposals that clearly articulate how physical climate risk is mitigated throughout the lifecycle of the project • Involve insurance carriers early in risk management decisions • Where relevant, engage lessees/tenants in operational resilience planning and business continuity measures aligned with the asset’s climate risk profile
Architects and Engineers	• Play an active role in articulating the value of forward-looking physical climate risk assessments and resilient designs to clients • Disclose cost-benefit analysis for conventional vs resilient designs to clients
Developers and Contractors	• Assess physical climate risk and articulate measures in place to limit property loss and damage, schedule delays and worker safety issues • Continually train employees on resilient construction methods and materials • Inquire about resilient materials available through suppliers
Technical Advisors for Construction Projects	• Provide expertise and technical assistance to develop capacity among public authorities, technical experts and communities to ensure long-term infrastructure resilience • Assist in identifying climate risks and advise on adaptation strategies and measures for infrastructure projects • Advise on resilient construction methods and support to the implementation of climate-resilient standards and materials. • Coordinate between diverse stakeholders and sectors, and facilitate dialogue and public awareness
Facility Managers	• Implement operational resilience measures • Integrate climate resilience KPIs into maintenance, inspections, and performance reporting • Continually train employees on resiliency measures and emergency response procedures

Stakeholder	Action
Insurance Brokers	• Leverage advanced hazard mapping, data and analytics, to advise on physical climate risk and risk mitigation measures that clients can implement to be more resilient • Clearly document and communicate client’s risk assessment and mitigation actions to insurers in a way that aligns with underwriting requirements, so these measures can be recognized in pricing, terms and overall insurance outcomes
Insurance Carriers	• Proactively engage with infrastructure project financiers, owners and developers to help assess physical climate risk, develop risk mitigation strategies and balance engineered approaches with financial risk management • Articulate the benefits of physical climate risk mitigation to policyholders and internally, including how resilience measures may lead to risk differentiation, impact premium decisions, limits, deductibles, and other terms • Explore financial instruments that could be used to incentivize and deliver greater investment in resilience
Climate Risk Data and Modelling Providers	• Translate the benefit of implementing climate resiliency criteria into business metrics (e.g., reduction in average annual / probable maximum losses, downtime, business interruption and revenue loss) • Provide hazard and risk metrics that are transparent, explain uncertainty, and are usable both in project preparation and underwriting
Credit Rating Agencies	• Provide investors and capital providers with clarity on how long term threats from physical climate risk are being reflected in valuation and investment decisions, and how investments in resiliency influence credit ratings
Financial and Insurance Regulators	• Set expectations and guidance for how banks, insurers, and asset managers assess and disclose physical climate risk in their portfolios • Clarify how resilience investments can positively influence capital requirements and supervisory assessments
Governments / Public Authorities	• Integrate a resiliency lens into new building codes, zoning bylaws, and master planning decisions, recognizing that most existing building codes focus primarily on “life safety” and rarely address resilience or post-disaster performance Provide fiscal and non-fiscal incentives for above-code resilient infrastructure to encourage better practices and skills development • Include clear climate risk management requirements in government procurement, as well as concession agreements, specifying how this risk is to be addressed through construction, operation, and maintenance of infrastructure assets being built
Industry Associations	• Educate members on the need to conduct physical climate risk assessments and benefits of risk mitigation actions
International Voluntary Standards Organizations	• Continue to integrate climate risk into international codes, guidelines and standards • Participate in forums on climate risk and resilience, alongside investors, lenders, insurers and engineers
Legal Professionals	• Embed climate resilience criteria into RFPs, contracts, and insurance clauses • Clarify allocation of climate-related risks between owners, contractors, and operators • Ensure documentation of climate risk analyses and decisions to manage future liability risk • Identify regulatory constraints, contractual risk allocation issues, and compliance considerations that may affect both resilience planning and insurance structuring
Traditional Knowledge Providers and Civil Society	• Add local and traditional knowledge about adaptive and protective measures by sharing local practices, traditional coping strategies and community-based solutions • Support maintenance and early warning systems by organizing public awareness and acting as first responders in crisis situations

For a detailed discourse of the various actors involved in the process of creating insurable market conditions for residents specifically, please see “Safeguarding Home Insurance: Reducing exposure and vulnerability to extreme weather” report by Geneva Association[7].

7.Safeguarding Home Insurance: Reducing exposure and vulnerability to extreme weather

Recommendations for Further Research and Development

As this white paper underwent external stakeholder review, there were several areas noted that would benefit from further research and development:

- An outline of the early and structured stakeholder engagement process, with key milestones and decisions flows articulated
- A standard checklist of climate risk information that would be valuable to include as part of insurer submissions
- A discussion of approaches to limit physical climate risk for existing assets, including optimal timing and ideas of the most cost-effective retrofits
- Alignment on the use of climate data and models between engineers, investors, lenders and insurers
- Identification of neutral, trusted partnerships that can be instrumental in executing technical work, capacity building and translating risk models across stakeholders
- An exploration of how public–private collaboration can support resilient infrastructure outcomes, including effective incentives and financing structures
- An articulation of how regulatory and policy frameworks can enable greater private capital participation and risk mitigation in infrastructure projects
- Educational content targeting Asset Owners to better understand costs and benefits of addressing building's vulnerability to extreme weather and chronic climate change impacts over its lifecycle

Conclusion

Extreme climate losses are on the rise.

Global infrastructure spending is accelerating, driven by the profound economic and demographic shifts.

Ensuring that new assets are designed, built and operated to be resilient is therefore critical – especially in EMDEs, which are often the most exposed, least protected and growing the fastest.

Resilience is not a "nice to have", it is a precondition to both unlocking capital today and ensuring that infrastructure assets are functional, insurable and investable in the long run.

As this paper demonstrates, there are already clear, practical approaches for integrating climate resilience into project preparation, investment decisions and asset management.

At large, natural catastrophe and forward-looking climate data exist to assess risk, robust loss control and risk engineering expertise is available to develop strategies to manage it, and technical guidance to corroborate actions taken is continually being developed.

Many actors are already collaborating as part of a broader, "whole of society" approach to risk mitigation, but many more will need to join and deepen this collaboration if we are to achieve the level of resilience required for future infrastructure assets.

The gap is not a lack of ideas, but the lack of systematic integration: applying a climate-resilience lens to all new infrastructure projects and bringing insurance expertise as well as technical assistance and support to the table early enough to shape design, documentation and risk transfer strategy.

Rather than playing "musical chairs" with risk, the time is now to align stakeholder incentives and using the key enablers identified in this paper, to build the infrastructure of the future instead of perpetuating shortcomings of the past.

Appendix A | Survey Methodology

To better understand how physical climate risk and resilience are reflected in day-to-day underwriting, the ***Insuring Resilient Infrastructure Survey*** was conducted with a global sample of property construction and operational underwriters and related specialists.

25 insurers participated

- Respondents represented a ***mix of (re)insurers and brokers*** across regions, including, but not limited to ***East Asia and Pacific, Europe and Central Asia, South Asia, Latin America, Middle East and North Africa, and Sub-Saharan Africa***
- Respondents ***underwrite a broad range of infrastructure assets***, from social infrastructure and residential to transport, energy and utilities, ***reflecting the sectoral diversity of global portfolios and a meaningful mix of both construction and operational property risks***
- Total insurance premium placed in the identified regions is estimated at ***$308b for property insurance*** and ***$108b for insurance for the construction*** industry
- Typical respondent roles included ***construction and property underwriters, risk engineers and loss-control specialists, and climate experts***

The survey was structured into six sections

Section 1 examined the *extent to which carriers use forward-looking climate risk data and modeling for underwriting decisions*, and what the main barriers are

Section 2 explored which *resilience measures insurers look for in submissions, how these are factored into the underwriting decisions* (terms, limits, etc.), what *happens when documentation of these resilience measures is missing*, and *which guidelines and/or standards are seen as material* in reducing losses

Section 3 identified *which stakeholders insurers prefer to engage with on physical climate risk mitigation* (e.g., financial sponsors, developers, contractors, etc.) and when, as well as what *forms of support and incentives they provide to guide resilience outcomes* for their insureds

Section 4 focused on *internal governance: where responsibility for climate risk and resilience sits within organizations*, and priorities for building additional capabilities over the next 3–5 years

Section 5 covered *insurance product innovation* (e.g., parametric, build-back-better, multi-year policies) being developed to support resilience investments

Section 6 was an *open-ended question on the single most important change that would help insurers and clients better manage physical climate risk* and resilience

The findings from this survey provide a practitioner's view of where the market is today and where it expects to go - forming the empirical backbone of the five enablers set out in the white paper.

Appendix B | Insurance Products and Terms Definitions

Insurance Products and Terms	Definitions
Alternative Risk Transfer (ART)	Alternative techniques to hedge and transfer risk that differ from traditional, indemnity-based insurance and reinsurance instruments. This can include multi-year insurance policies, insurance linked securities and parametric insurance.
Build Back Better	An insurance scheme that provides access to additional claim funds after an event occurs, allowing participants to reinstate their assets to a higher level of resilience. More broadly, the term “Build Back Better” is also used in public policy, disaster recovery regulations, and financing frameworks to describe approaches that permit or incentivize reconstruction to a higher resilience standard, rather than simply restoring assets to their pre-disaster condition.
Catastrophe Bonds	Also known as cat bonds, an alternative source of capacity to traditional reinsurance programs that pays the issuer when a pre-defined event occurs. Cat bonds are a type of insurance linked security.
Construction Insurance	Coverage that protects against losses that may occur during the course of construction. While construction insurance may also include coverage against third-party claims, or damages caused by negligent acts, omissions or professional errors, this paper is focused on damage to property and materials. Also known as Builders Risk, Course of Construction or Construction All Risks.
Emerging Markets and Developing Economies (EMDEs)	Economies that are in a transitional stage of development, based on factors such as per capita income, participation in global trade of goods and services and level of integration into the global financial system,
Infrastructure	Physical assets that serve an area or community. Infrastructure may include social, residential, transport, energy, water and wastewater, digital, industrial/logistics and community/leisure assets.
Insurance Linked Securities (ILS)	A mechanism for managing risk by issuing coupon-paying securities that can be drawn upon to cover potential liabilities. The global ILS market consists of private securities and catastrophe bonds.
Infrastructure Lifecyle	The series of stages that an infrastructure project goes through, from early-stage project planning, identification, preparation, structuring, bidding and negotiation, mid-stage commissioning and delivery through to late-stage operations, maintenance, repurposing and end-of-life decommissioning.
Multi-Year Insurance	An insurance approach that incorporates policy terms that span two or more years, locking in pricing and coverage terms over several years. This differs from traditional insurance approaches that typically provide one-year terms that must be renewed on an annual basis.
Parametric Insurance	An if-then coverage solution where a specific, pre-defined event, as determined by independent, third-party data sources, triggers the payment of claim funds.
Property Insurance	Coverage that protects against accidental damage to buildings, contents or other physical assets during operations. Depending on the policy, this may also include revenue loss during business interruption. Also known as Property All Risks.
Resilience	The ability of a system to anticipate, reduce, accommodate and recover from disruptions in a timely, efficient, and fair manner. (IPCC)
Risk Engineering	Development, implementation and ongoing evaluation of risk management programs.
Self-Insurance	A risk management method in which an organization retains risk on its own balance sheet and sets aside dedicated reserves or capital to cover potential losses, rather than fully transferring that risk to a third-party insurer.

Appendix C | Resiliency Resources (1 of 2)

Stakeholder	Relevant Resources
Multilateral Development Banks, Development Finance Institutions and Export Credit Agencies	Equator Principles. (2023). *Guidance Note on Climate Change Risk Assessment*.
	Global Center on Adaptation. (2022). *Climate-Resilient Infrastructure Officer Handbook*.
	Global Center on Adaptation (2019). *Adapt Now: A Global Call for Leadership on Climate Resilience*. (Global Commission on Adaptation flagship report)
	Sustainable Markets Initiative, Insurance Task Force. (2026). *Disaster resilience framework for climate-vulnerable countries.*
	UN Office for Disaster Risk Reduction. (2022) *Principles for Resilient Infrastructure*.
	OECD, (2024). *Compendium of Good Practices on Quality Infrastructure.*
	World Bank. (Retrieved 2026). *Climate and Disaster Risk Screening Tool*, https://climatescreeningtools.worldbank.org/
Institutional Investors / Asset Managers / Lenders	Adaptation & Resilience Investors Collaborative, United Nations Environment Programme Finance Initiative. (2024). *Physical Climate Risk Assessment and Management: An investor playbook*. Authors: Chiara Trabacchi, Gary Power.
	Adaptation & Resilience Investors Collaborative. (2024). *Assessing Adaptation & Resilience Impact in Private Investments: A measurement framework for investors*
	British International Investment. *Taskforce on Climate-related Financial Disclosures (TCFD) Toolkit*.
	Boston Consulting Group. (2024). *Framework for Resilience and Adaptation Investment Measurement and Evaluation (FRAIME)*. Authors: Qahir Dhanani, Stefano Niavas, Greg Fischer, Charlotte Saint-Bonnet, Emily Weeks
	Climate Bonds Initiative, United Nations Office for Disaster Risk Reduction (UNDRR). (2023). *Designing a climate resilience classification framework to facilitate investment in climate resilience through capital markets*. Climate Bonds Resilience Taxonomy
	Global Adaptation and Resilience Investment Working Group (GARI). (2024). *Climate Resilience Investments in Solutions Principles (CRISP)*.
	Green Finance Institute. (2024). *Framework to develop a UK Green Taxonomy for adaptation and resilience*.
	Institutional Investors Group on Climate Change (IIGCC). (2025). *Physical Climate Risk Appraisal Methodology (PCRAM) 2.0*. Author: Anne Chataigné
	Institutional Investors Group on Climate Change (IIGCC). (2025). *Climate Resilience Investment Framework (CRIF)*.
	Intact Centre on Climate Adaptation, University of Waterloo. (2023). *Transitioning From Rhetoric to Action: Integrating Physical Climate Change and Extreme Weather Risk Into Institutional Investing. Authors: Kathryn Bakos, Blair Feltmate.*
	Organization for Economic Co-operation and Development (OECD). (2024). *Climate Adaptation Investment Framework*. Green Finance and Investment
	RAND. (2017). *Resilience Dividend Valuation Model*. Authors: Craig A. Bond, Aaron Strong, Nicholas E. Burger, Sarah Weilant, Uzaib Saya, Anita Chandra
Architects, Engineers, Developers and Contractors	Associated General Contractors of America (AGC). (2024). *Climate Change and Resilience Resources for Contractors.*
	American Institute of Architects. (2023). *Resilience Design Toolkit*.
	American Institute of Architects. (2024). *Hazard and Climate Risk: a user's guide and form for acknowledging risk*.
	American Society of Civil Engineers. (2025). *Standard Practice for Sustainable Infrastructure, ASCE/COS 73-23*.
	American Society of Civil Engineers. (2018). *Climate-Resilient Infrastructure: Adaptive Design and Risk Management.*
	Arup & Saint-Gobain. (2026). *Adapting Buildings to Climate Change: Insights into the contribution of building construction solutions to the climate adaptation agenda.*
	Construction Industry Council (CIC). (2024). *Guidance on Resilient Construction Practices*.
	Institute for Sustainable Infrastructure. (retrieved 2026). *Envision Sustainable Infrastructure Framework*.
	International Coalition for Sustainable Infrastructure. (2026). *Infrastructure Pathways*.
	International Federation of Consulting Engineers (FIDIC). (2021). *Climate Change Charter*.
	Japan Bosai Platform. (2023). Disaster Risk Reduction Technologies and Industry Collaboration Framework.
	The Resiliency Company, Ryan Companies, ULI, JLL. (2026). *From Vulnerability to Value: A Risk Mitigation Playbook*. Authors: Janika McFeely, Shaler Campbell, Monica Contreras, Jasmine Wong, Sarah Delph.

Appendix C | Resiliency Resources (2 of 2)

Stakeholder	Relevant Resources
Asset Owners and Facility Managers	International Standards Organization. (2019). *ISO 22301:2019 Security and resilience – Business continuity management systems – Requirements*.
	International Standards Organization. (2018). *ISO 31000:2018 Risk management – Guidelines.*
	Urban Land Institute. (2023). *ULI Developing Resilience Toolkit: Protecting Buildings and Sites*.
	Urban Land Institute. (2025). *CRE Guide to Natural Hazards and Property Insurance Underwriting*. Author: Lindsay Brugger
Governments / Public Authorities	Alliance for National and Community Resilience. (2019). *Community Resilience Benchmarks (CRB)*.
	American Society of Civil Engineers. (2025). *Pathways to Resilient Communities: Infrastructure Designed for the Environmental Hazards in Your Region*.
	Arup, The Rockefeller Foundation. (2019). *City Resilience Framework*.
	C40 Cities and Climate Solutions International, Inc. (2025). *Mainstreaming Climate Adaptation in City Financial Planning and Budgeting.* Authors: Jan Whittington, Elizabeth Bauch, Barbara Barros, Katya Guryeva, Adrienne Greve, Brian McCartan.
	CapaCITIES. (2022). *Designing 'bankable' climate resilient infrastructure projects.*
	The Geneva Association. (2026). *Addressing Growing Protection Gaps through Better Public-Private Insurance Programmes*. Author: Hélène Schernberg
	Intergovernmental Panel on Climate Change. (2014). *Adaptation planning and implementation*. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Authors: Nobuo Nimura, Roger S. Pulwarty, Do Minh Duc, Ibrahim Elshinnawy, Margaret Hiza Redsteer, He-Qing Huang, Johnson Ndi Nkem, Roberto A. Sanchez Rodriguez.
	Lloyd's. (2018). *Innovative finance for resilient infrastructure.*
	National Institute of Standards and Technology (NIST). *Community Resilience Resources*. https://www.nist.gov/community-resilience
	Smart Mature Resilience Project. (2017). *European Resilience Management Guideline*.
	United Nations Office for Disaster Risk Reduction (UNDRR). (2017). *Disaster Resilience Scorecard for Cities*.
	U.S. Chamber of Commerce, Allstate, U.S. Chamber of Commerce Foundation. (2025). *Beyond the Payoff: How Investments in Resilience and Disaster Preparedness Protect Communities.*
	World Bank. (2025). *The Handbook for Livable and Resilient Cities. Integrating Hazard and Risk Information into Urban Planning. Washington, DC: World Bank.*
	World Bank. (2019). *Lifelines: The Resilient Infrastructure Opportunity. Sustainable Infrastructure Series*. Authors: Stephane Hallegatte, Jun Rentschler, Julie Rozenberg.
Risk Managers	GARP. (2025). *A Risk Professional's Guide to Physical Risk Assessments: A GARP Benchmarking Study of 13 Vendors*
	Institute and Faculty of Actuaries. (2022). *A practical guide to climate change for risk management actuaries*.
	International Actuarial Association. (2023). *The Climate Change Adaptation Gap: An Actuarial Perspective.*
	International Standards Organization. (2021). *Adaptation to climate change – Guidelines on vulnerability, impacts and risk assessment*
	Urban Land Institute. (2024). *Physical Climate Risks and Underwriting Practices in Assets and Portfolios*.
Legal Professionals	Columbia Law School, Sabin Center for Climate Change Law. (retrieved 2026). *Adaptation Resources*. https://climate.law.columbia.edu/content/adaptation-resources
	Conservation Law Foundation, Boston Green Ribbon Commission. (2018). *Climate Adaptation and Liability: A Legal Primer and Workshop Summary Report.*
	The Geneva Association. (2021). *Climate Change Litigation – Insights into the evolving global landscape.* Authors: Maryam Golnaraghi, Joana Setzer, Nigel Brooke, Wynne Lawrence and Lucia Williams.
	Georgetown Climate Center. (2020) *Equitable Adaptation Legal & Policy Toolkit*.
Labels, Certifications, etc.	ASTM International. (2024). *Standard Guide for Property Resilience Assessments*.
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	International Finance Corporation (IFC). (2025). *Building Resilience Index (BRI)*
	Institute for Catastrophic Loss Reduction. (2024). *Public Infrastructure Engineering Vulnerability Committee (PIEVC) Engineering Protocol for Assessing Public Infrastructure Vulnerability to Climate Change Impacts.*
	Institute for Market Transformation to Sustainability. (2021). *RELi Rating Guidelines for Resilient Design and Construction*
	LEED v5. (2025). *Climate Resilience Assessment*.
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	U.S. Resiliency Council (USRC). (2024). USRC Building Rating System.

Appendix D | Resilience Measures

Exhibit 10: *Resilience measures insurers look for in **construction-phase** submissions*[8]

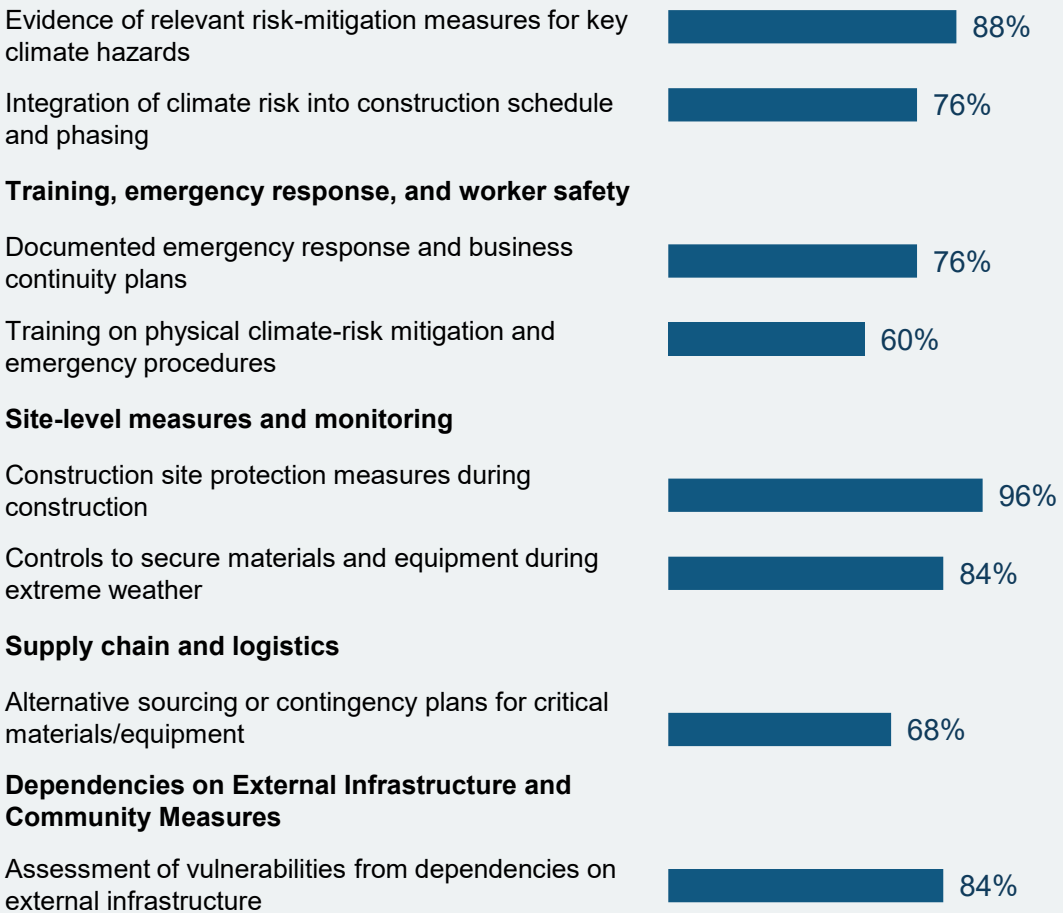
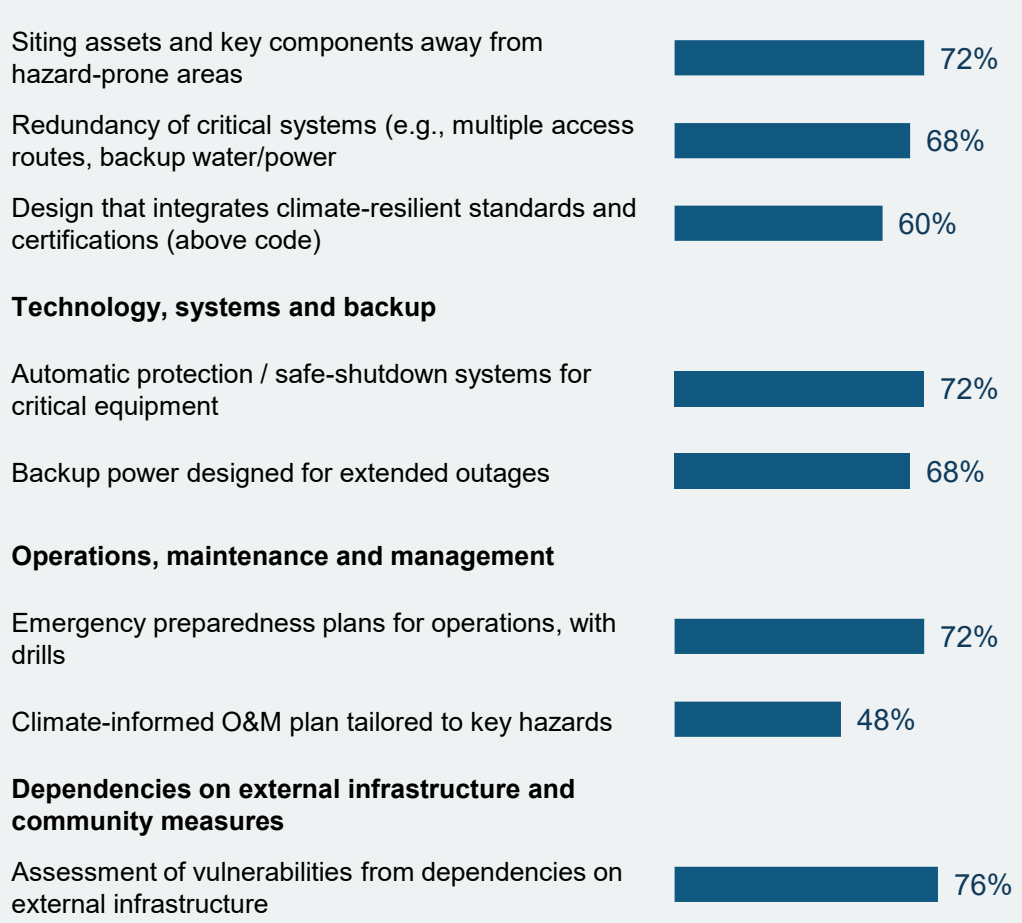


Exhibit 11: *Resilience measures insurers look for in **operational property-phase** submissions*[6]



8. The items listed represent a selection of the most frequently mentioned responses.