

Climate adaptation, the next challenge

Investors' Response to Physical Risks and Climate Adaptation survey

SOCIETE GENERALE
Securities Services

Climate adaptation, the next challenge

In 2024, Societe Generale Securities Services (SGSS) conducted its *Time to Converge* ESG* survey, exploring how asset owners and asset managers were approaching the convergence of regulatory requirements, investment strategies, organizational structures and ESG solutions. The findings highlighted a market that was progressing rapidly towards greater integration of sustainability considerations across investment processes.

Two years later, the conversation has evolved. While climate mitigation remains a central focus for investors, the growing reality of physical climate impacts has brought adaptation and resilience to the forefront of investment agendas. Extreme heatwaves across Southern Europe, devastating floods in Central and Western Europe, prolonged droughts affecting water availability and agricultural productivity, and increasingly severe storms and wildfires are no longer viewed as distant risks. These events are already disrupting economic activity, damaging assets, and affecting supply chains.

As a result, asset owners are increasingly asking not only how investments contribute to the transition to a low-carbon economy, but also how exposed they are to the physical consequences of climate change and how prepared they are to adapt.

Understanding physical risks, assessing asset resilience and identifying adaptation opportunities have become strategic priorities for long-term investors seeking to protect value and fulfill their fiduciary responsibilities.

Against this backdrop, **SGSS launched its 2026 ESG Survey dedicated exclusively to physical climate risks and adaptation**.

The objective of this study is to understand how asset owners and asset managers are integrating physical climate risks into their investment processes, the methodologies and data they use, the governance frameworks they have established, and the actions they are taking to build resilience and support adaptation.

We would like to thank all our interviewees for their time, availability, and the richness of their insights, which demonstrate the importance they attach to this topic.

In this rapidly evolving landscape, SGSS is committed to accompanying its clients, helping them address not only transition-related challenges but also the growing implications of physical climate risks.

The outputs of this survey are food for thought to collectively find solutions to those challenges.

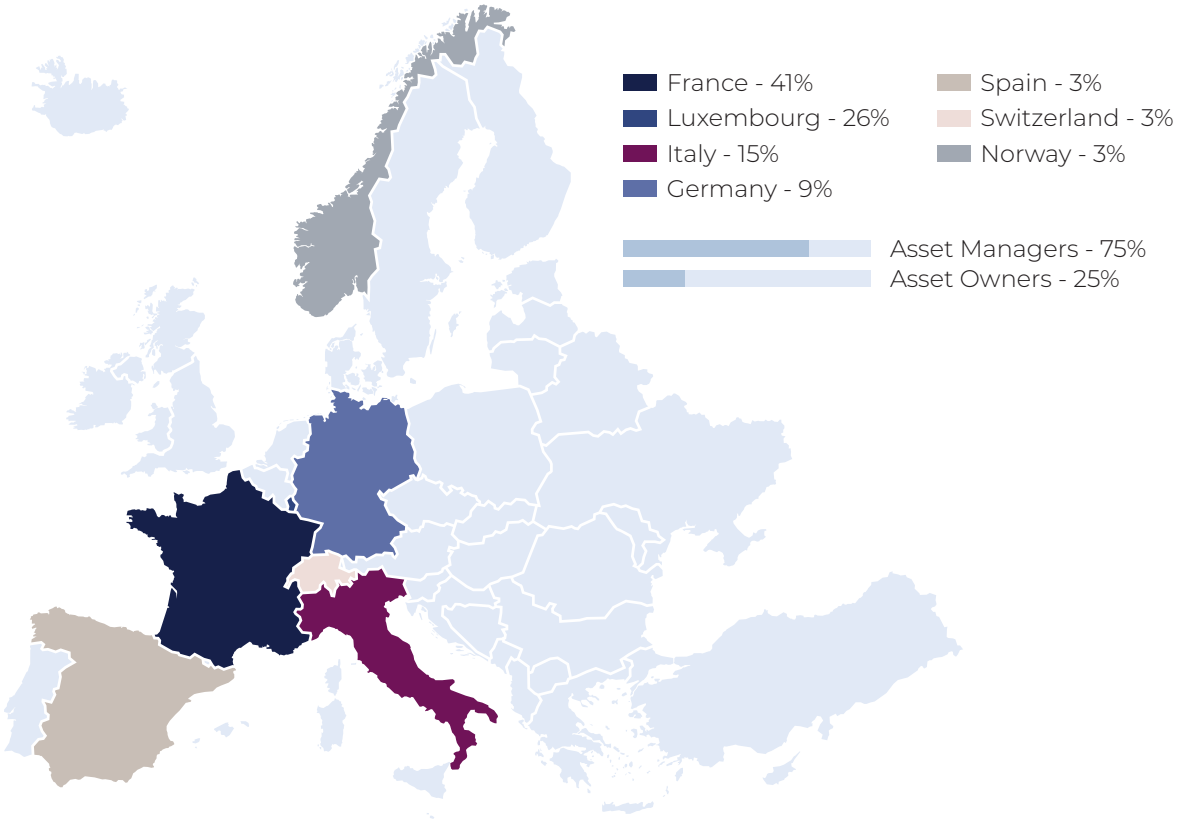
Enjoy the read!

* Environmental, Social and Governance



Mathieu Maurier
Chief Business Officer - SGSS

The survey gathers insights from 34 investment organizations across Europe. Respondents represent a balanced mix of investment strategies, **with 53% focused on listed-market activities and 47% invested in real assets**, including real estate, infrastructure and private markets.





Introduction: How institutional investors are addressing physical climate risk and adaptation across listed and private markets

The third edition of the SGSS ESG Survey examines how institutional investors and asset managers identify, assess and manage physical climate risk, and how far adaptation has entered governance, investment and engagement practices. The interviews covered physical-risk analysis, integration into valuation and decision-making, and dialogue with portfolio companies. Its central finding is a widening gap between recognition and execution: physical climate risk is now broadly acknowledged, yet systematic investment integration remains constrained by data quality, fragmented methodologies and limited adaptation-specific frameworks.

A disciplined vocabulary is essential. A climate hazard is a potentially damaging acute event, such as a flood or wildfire, or a chronic trend, such as water stress or rising temperatures. Exposure describes the assets, operations, people or value chains exposed to physical climate hazards. Vulnerability captures their sensitivity and capacity to cope. Financial impact is the transmission of these factors into costs, revenues, asset values, insurance, financing conditions or business continuity. Resilience is the ability to withstand and recover, while adaptation comprises the actions taken to reduce vulnerability or exploit resilience-related opportunities.

The interviews point to material differences by asset class. Listed-market investors frequently begin with broad portfolio screening because issuer locations, supply chains and adaptation plans are incomplete. Private equity, real estate and infrastructure investors often have direct access to asset-level information, incorporate requirements into due diligence and contracts, and influence design or operating plans. These differences shape the precision of risk analysis and the investor's ability to act.

The SGSS ESG Survey first finds that client pressure on investment managers is growing rapidly (Chapter 1). In response to this increasing market demand, asset managers have strengthened their physical climate risk assessment practices, although significant methodological and data gaps remain (Chapter 2). As a result, while physical climate risk is increasingly considered, it rarely drives investment decisions outside real assets (Chapter 3). Finally, despite growing recognition of the importance of climate adaptation, it has yet to be systematically integrated into investment strategies (Chapter 4).



Chapter 1.
Client pressure on investment managers is rising rapidly

1.1. Asset owners, lenders and limited partners are increasing pressure on investment managers

Demand is increasingly transmitted through the investment chain. Asset owners place physical risk and adaptation high on their agendas and expect asset managers to improve monitoring. Limited partners have asked general partners how portfolios were affected after severe climate episodes. Banks are also requesting information and KPIs, and some interviewees indicated that stronger performance against lender expectations may influence financing conditions, although lender methodologies are not yet transparent.

Labels and certification schemes can reinforce this pressure by signaling that an investment manager or asset has addressed physical risk.



1.2. But market expectations are rising faster than current capabilities

ESG governance has evolved significantly over the past couple of years. ESG teams have become more closely integrated with investment functions, governance structures have matured, and expertise on sustainability issues, particularly climate mitigation and transition risks, has deepened substantially. These developments have enabled ESG considerations to move beyond reporting requirements and become part of mainstream investment processes.

However, interviewees stressed that growing expectations from asset owners, lenders and other stakeholders are now exposing a new capability gap. Assessing physical climate risks and adaptation requires skills that go beyond traditional ESG expertise, including climate science, hazard modeling, geospatial analysis, adaptation planning and the translation of physical risks into financial impacts. These capabilities remain scarce across the industry, forcing many organizations to build new skills and develop partnerships with external experts.

As a result, while ESG governance has successfully adapted to address mitigation and transition challenges, many institutions are still developing the capabilities needed to respond to the growing demand for robust physical risk and adaptation analysis.





Chapter 2. Physical climate risk assessment is progressing, but significant gaps remain

Physical climate risk assessment is expanding, but non-harmonized methodologies and data gaps still prevent consistent and decision-ready analysis.

2.1. Market methodologies are emerging although implementation differs sharply between listed and private markets

Two approaches dominate:

- Top-down analysis applies sector, macroeconomic and policy assumptions, regional climate hazards modeled across portfolios and is useful for rapid screening, prioritization and comparison.
- Bottom-up analysis maps individual assets, locations and operating characteristics to relevant hazards and adaptation measures.

Respondents increasingly regard a combination as best practice: top-down screening identifies concentrations and potential hotspots, while bottom-up work tests whether those signals remain material once company- or asset-specific evidence is considered.

Asset class determines feasibility. Listed-market investors rarely undertake systematic bottom-up analysis across every issuer because reliable site data, comparable KPIs and detailed issuer-level information are limited. Data-provider tools can estimate locations and climate value at risk, but their results often depend on external datasets, sector proxies and modeled assumptions rather than verified adaptation plans. The analysis can guide attention, but it is not equivalent to a complete asset-level assessment.

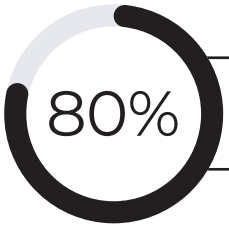
Private markets offer a different information environment. Real estate and infrastructure portfolios contain fewer, larger and more identifiable assets, making physical mapping more feasible, although still labor-intensive. Private equity investors may obtain operational information through due diligence and ownership rights. Stress-testing capabilities were described as more advanced in private markets, where investors can connect scenarios to asset design, maintenance plans, insurance and contractual commitments.

Most interviewees consider both acute and chronic hazards, and Intergovernmental Panel on Climate Change (IPCC) scenarios are frequently used for prospective assessment and stress testing. Water stress was among the hazards most often mentioned. Yet hazard coverage alone is not sufficient. Decision-ready analysis must connect hazard intensity to exposure, vulnerability, adaptation capacity and a credible financial transmission channel.

2.2. In addition, limited data availability and quality make it difficult to draw firm conclusions

Dependence on a concentrated data-provider market, incomplete location data and limited value-chain transparency make risk estimates directional rather than precise.

The assessment ecosystem relies heavily on external providers. More than 80% of respondents use providers for assessments, stress testing or prospective scenarios. The direction is clear: external tools are central, especially in listed markets. Only the most advanced institutions have developed proprietary solutions using a combination of government, NGO, public data and data providers.



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But the provider landscape remains relatively concentrated. Despite the growth of geospatial start-ups covering physical risks, a small group of established providers is repeatedly selected. Newer tools can be effective for real assets, but mapping a corporate portfolio from registered addresses remains labor-intensive and may miss production sites, warehouses or suppliers. Concentration can also create methodological convergence around similar datasets without creating genuine transparency or comparability.

Nevertheless, value-chain coverage is the largest blind spot. The vast majority assess investee companies rather than their suppliers, even though physical disruption can affect inputs, logistics and revenues far beyond directly owned sites. Mapping providers is particularly difficult in countries with limited transparency. Less than 5% of respondents assess physical risks across their entire suppliers value chain.

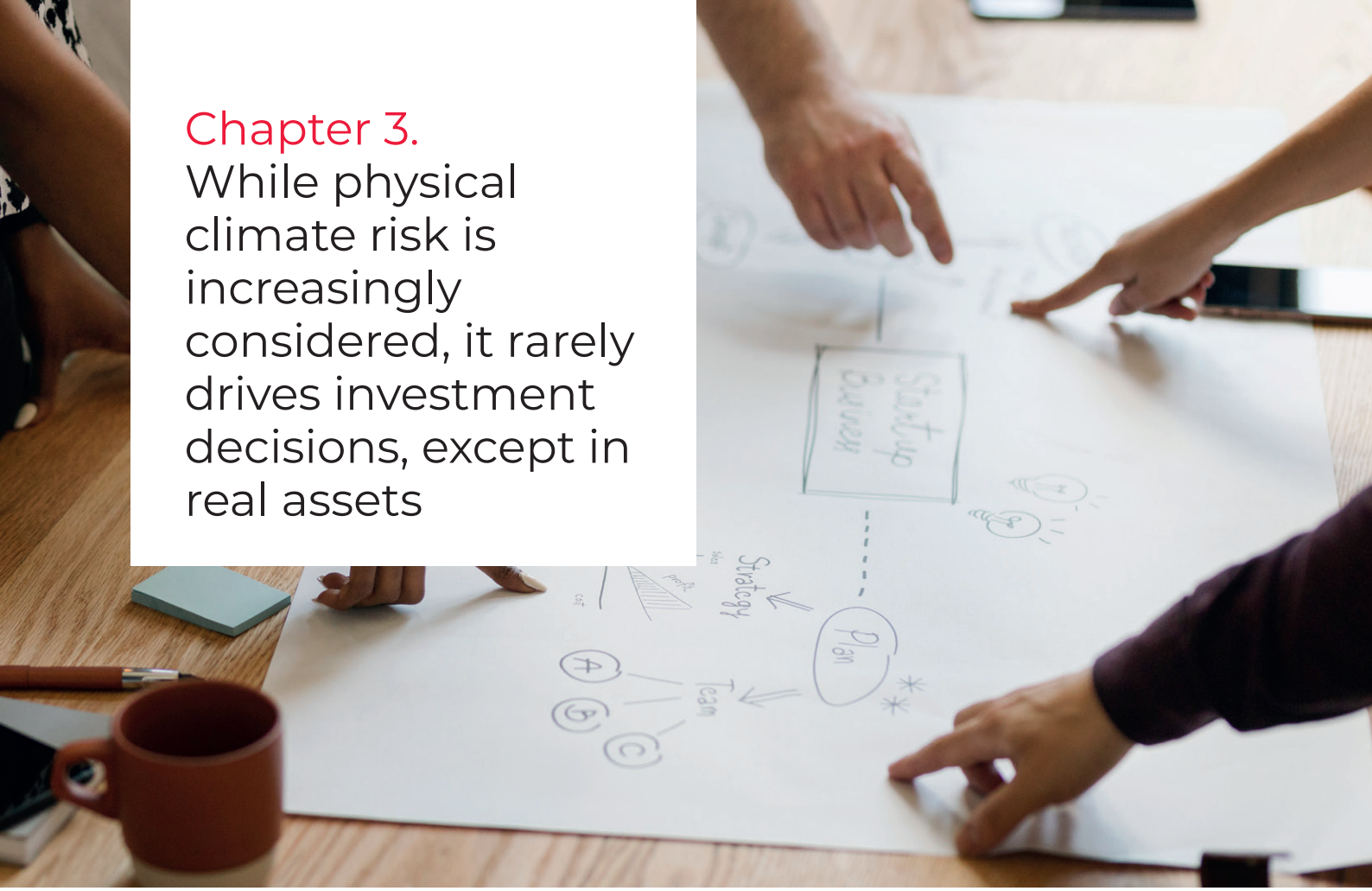


of respondents cover the full value chain.

These limitations explain why model outputs are generally treated as directional indicators, not precise measures of financial risk. Current datasets and methods are evolving, common standards are absent, and assumptions multiply when results are translated into financial metrics. Investors should therefore use model outputs to prioritize investigation, engagement and scenario analysis, while explicitly documenting uncertainty and avoiding false precision.



Chapter 3.
While physical climate risk is increasingly considered, it rarely drives investment decisions, except in real assets



3.1. Engagement, stress testing, insurance and valuation practices are progressing, but financial impacts are usually integrated only when risks are high

Physical risk increasingly appears in engagement, but not yet systematically through dedicated questions. Some portfolio companies are proactive, while many remain focused on transition and mitigation. Responses range from skepticism to acknowledgment without investment. Management willingness to discuss physical risk can itself inform an investor's view of preparedness and, in some cases, prompt a reassessment of the investment.

Influence differs by asset class:

- Private equity owners can place the issue on board and management agendas. Private debt investors can monitor but have more limited intervention rights.
- Listed-market investors use dialogue and voting, but are constrained by incomplete data and the difficulty of tracing asset-level exposure.

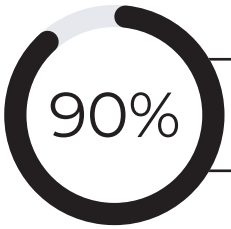
Engagement should therefore be tailored: listed issuers may first be asked for location and value-chain transparency, while real asset operators can be challenged on engineering standards, residual risk and delivery milestones.

Stress testing is progressing, often using IPCC scenarios, but translating model outputs into valuation remains selective. For some interviewees, assessment results are informational and would prevent an investment only where risk is very high. In certain cases, high physical risk is reflected in asset or company valuation, including through risk premiums. Such integration is more credible when supported by asset-level evidence, a plausible financial channel and an understanding of existing adaptation measures.

Insurance is both a risk-transfer mechanism and a pricing signal. In some jurisdictions it is mandatory; elsewhere investors conduct cost-benefit analysis or include insurance in due diligence. Yet insurance does not remove physical risk, and availability, exclusions and pricing may evolve. Investment analysis should consider residual risk after insurance and adaptation, rather than treating coverage as a substitute for resilience.

3.2. Private market investors can translate physical risk assessments into contractual action plans, more easily than listed-market investors

For real assets, more than 90% of respondents confirm that physical-risk assessments are embedded in due diligence questionnaires. Respondents also indicated that identified actions can be written into contractual documents, creating a direct link between risk identification and implementation. Investors can require further studies, resilience measures, monitoring or remediation, and can revisit these actions during ownership. This is a more actionable model than portfolio screening alone.



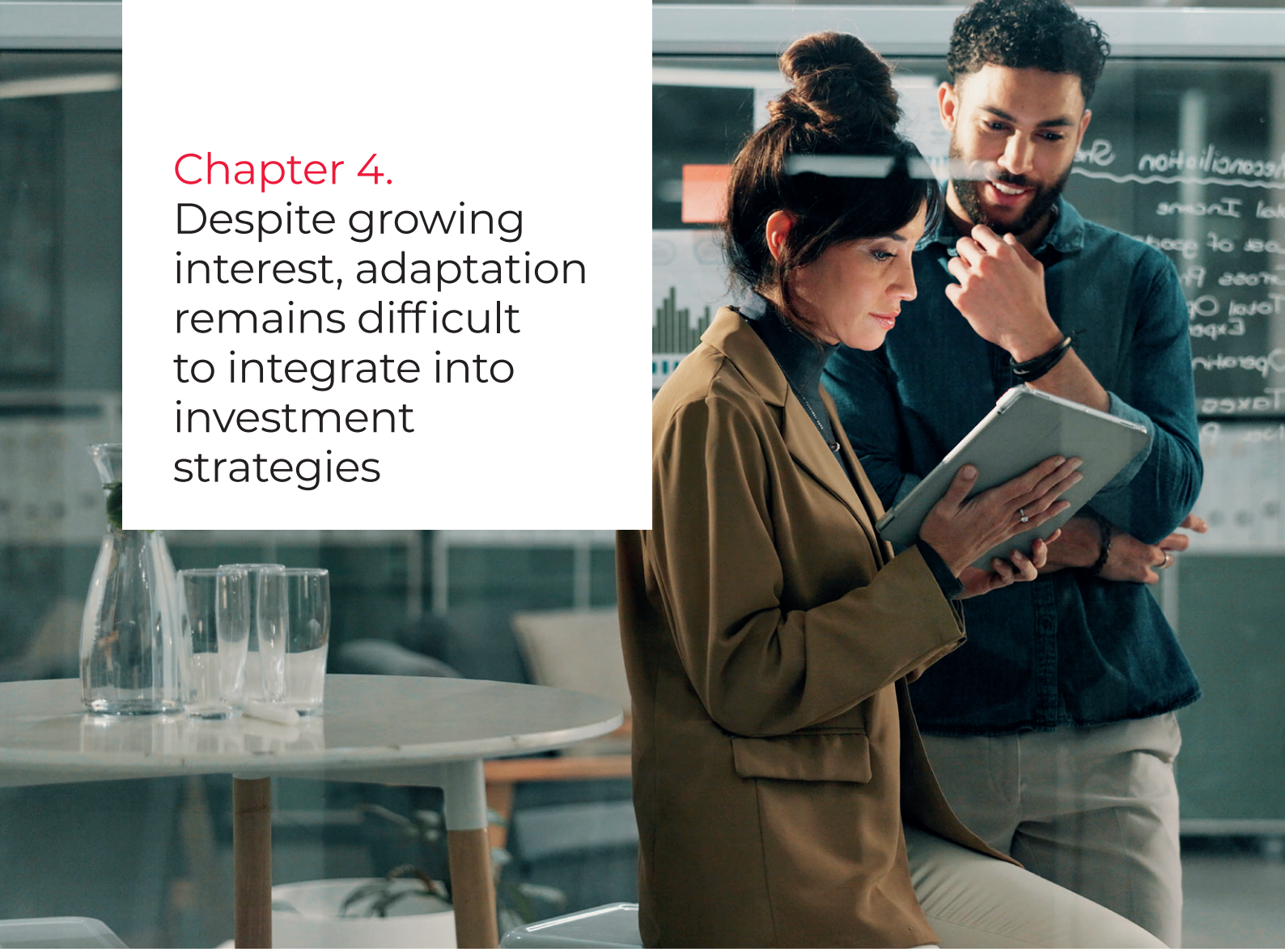
Of respondents confirm that physical-risk assessments are embedded in due diligence questionnaires.

Real estate illustrates the value of early intervention. Some respondents integrate physical risk at the design stage, when resilience measures may be less costly than retrofitting. Measures that reduce residual risk can strengthen the commercial proposition of an asset and may lower insurance costs. Infrastructure strategies can use similar logic, connecting design specifications, maintenance and contingency planning to long-term asset performance.

Private equity can also exert influence through ownership and governance rights. Majority positions allow investors to elevate physical risk on management agendas and agree operational plans. Private debt investors generally have less control, although due-diligence questions, covenants and monitoring may still create leverage. Listed investors rely more heavily on engagement and voting, with limited ability to require asset-specific action.

The critical distinction is between assessment and adaptation. A hazard score does not demonstrate that an asset is vulnerable, nor does a resilience measure create value unless it reduces expected disruption, cost or loss. The strongest private market practices therefore combine location analysis with engineering evidence, business-continuity planning, insurance analysis and clear responsibility for delivery.





Chapter 4.
Despite growing interest, adaptation remains difficult to integrate into investment strategies

Adaptation is becoming a strategic priority for investors, but the lack of scalable opportunities and direct revenue models continues to constrain capital allocation.

4.1. Most investors do not yet have a dedicated adaptation strategy

Adaptation is becoming strategically important, but dedicated investment strategies remain exceptional. More than 99% of respondents do not have a standalone adaptation strategy and approach the theme opportunistically. More than 95% incorporate physical risk and adaptation within their overall risk assessment rather than a specific framework.

The main constraint is investability. Interviewees see a much larger and more mature pipeline in decarbonization, renewable energy and the broader energy transition than in adaptation.

Mitigation is generally easier to measure and finance because its benefits can be linked to clear performance metrics. Adaptation is more difficult to identify, as it is often embedded in asset upgrades, maintenance plans, and operational decisions. Its value is typically reflected in lower losses, reduced downtime, and more resilient assets.

This creates a visibility problem as well as a pipeline problem. An adaptation measure may be embedded in infrastructure design, water management, cooling systems, flood protection, supply-chain diversification or business-continuity planning without being classified as adaptation. Investors need practical taxonomies and indicators that identify the resilience outcome without forcing every measure into a narrow thematic product.

The absence of a dedicated strategy should therefore not be read as absence of activity. The survey indicates that adaptation is already present in due diligence, asset design, insurance analysis and engagement. The strategic task is to connect these practices into a coherent framework with objectives, governance, indicators and capital-allocation criteria.

4.2. Scaling adaptation investment will require stronger business cases

Adaptation faces a distinctive business-model challenge: benefits are frequently indirect and materialize as avoided losses rather than new revenue. Investors can therefore struggle to attribute cash flows to resilience, particularly when benefits appear over long horizons.

Building a stronger business case starts by linking adaptation measures to financial outcomes. Investors can evaluate how a climate adaptation measure affects costs, revenues, financing conditions, and asset value. The goal is not to produce exact forecasts, but to clearly show how adaptation measures reduce residual risk compared with assets that remain unadapted.

Design-stage interventions in real estate are especially relevant because implementation costs may be lower and commercial or insurance benefits may be clearer.

Blended finance was identified as a potential scaling mechanism. Public capital can absorb risks, support demonstration projects or value benefits that are not fully captured by private cash flows. Such structures may be particularly relevant where adaptation generates broad social benefits or where project pipelines are immature. However, blended finance should support additionality and viable long-term models rather than compensate indefinitely for weak project economics.

Most respondents see increasing capital flows towards adaptation as a priority while continuing mitigation. The two goals should not be framed as substitutes. Mitigation limits future hazard escalation; adaptation reduces vulnerability to impacts already occurring or locked in. A credible investment strategy needs both, with distinct objectives, indicators and decision pathways.



Conclusion: From directional risk awareness to actionable investment frameworks

Physical climate risk has moved into mainstream investor attention, but it has not yet achieved consistent, decision-ready integration. Governance is strengthening as ESG expertise moves into investment teams and risk functions, scientists, consultancies and academic institutions contribute specialist knowledge. Assessment is spreading across asset classes, yet the quality of action remains determined by access to granular location data, the ability to analyze vulnerability and the strength of the financial transmission case.

The central divide is between directional screening and actionable evidence. Listed investors can identify potential hotspots, prioritize engagement and test portfolio exposure, but often lack the verified locations, value-chain data and company adaptation plans required for precision. Private market and real-asset investors can more readily connect analysis to due diligence, contracts, design, insurance and operating plans. Even there, however, models remain assumption-heavy and financial integration is selective.

Consequently, progress should focus on four priorities:

- First, investors need better asset-level and value-chain information.
- Second, methodologies should combine top-down screening with targeted bottom-up analysis.
- Third, engagement should ask not only whether a company is exposed, but how vulnerability is governed and reduced.
- Fourth, adaptation needs investable business cases that value avoided losses, residual-risk reduction and long-term resilience.

The transition required is therefore not from no analysis to perfect measurement. It is from increasingly sophisticated signals to proportionate action: screening where data are incomplete, deeper investigation where exposure is material, contractual or engagement measures where influence exists, and valuation adjustments where evidence supports a credible financial impact.

A shared ambition that calls for collective action across the investment ecosystem, and in which SGSS is fully committed to playing its part.

Survey conducted by **Fouad Massabni, Head of ESG Commercial offer**.

SGSS, your partner for sustainable investment

Sustainable and responsible investment standards are playing an increasingly important role for investors.

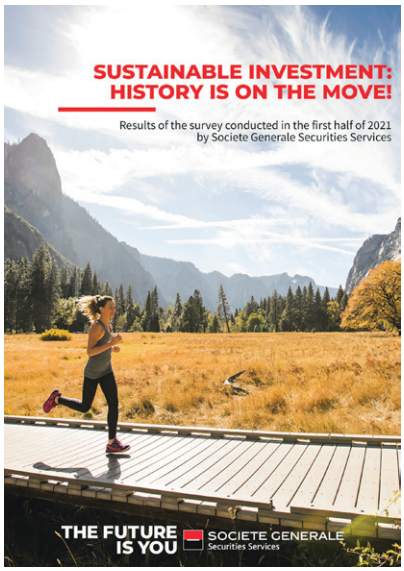
SGSS offers a suite of solutions to address your operational needs, embedding ESG criteria throughout the investment and operational value chain:

- A pre-trade compliance solution, enabling ESG controls before orders are executed on the portfolio management platform, together with indicators and reporting capabilities to ensure alignment with the defined ESG strategy.
- A data collection, management, and reporting solution for private market participants, to measure and monitor the ESG impact of investments across private asset classes.
- An integrated ESG data reporting solution for listed-market investors, accessible through the SGSS digital portal.
- Proxy voting instruction transmission and processing services, facilitating shareholder voting in line with investors' ESG commitments and stewardship policies.
- A Pass-Through Voting solution, enabling asset owners and end investors to express their own voting preferences and directly influence voting outcomes while benefiting from a robust operational framework.
- An ESG ratings consensus solution, providing a consolidated and transparent view of ESG assessments based on ESG ratings collected from more than 40 asset managers, helping investors benchmark perspectives, address rating divergence, and support more informed investment decisions.

In addition, clients can access a broad range of ESG products and sustainable investment advisory services through the synergies created with the other businesses of Societe Generale Group, which places Corporate Social Responsibility (CSR) at the heart of its commitments.

For more information on our ESG offering, visit the ESG section of the SGSS website.

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SGSS ranks among the top ten global custodians and among the top three European custodians with EUR 5,901 billion of assets under custody*. SGSS provides custody and trustee services for 3,445 funds* and the valuation of 2,477 funds*, representing assets under administration of EUR 744 billion*. SGSS ranks among the European leaders in stock option management.

*Sources: SGSS internal report and Competitor Annual Reports Greensted. Data as of 30.06.2026.

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