MSCI Institute

The Hidden Adaptation Economy:

A New View of Corporate Resilience and Opportunity

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Foreword by: GARI

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Foreword

Climate adaptation investment is an unavoidable opportunity – and now a clear and present one.

Adaptation and resilience has always been a complicated topic. Over the years, bringing the investment case for adaptation into focus has been a challenge: The risks are real, the need is urgent, and yet the signal has been difficult for markets to read.

That is changing. The physical evidence is now impossible to ignore. Insured natural catastrophe losses have exceeded USD 100 billion for six consecutive years. The scientific consensus is unambiguous: Some degree of warming and its consequences are, in the words of the Intergovernmental Panel on Climate Change, unavoidable and irreversible. That's not a reason to despair, it's a reason to invest.

The Global Adaptation & Resilience Investment Working Group was founded on a conviction that the private sector has both a role and a self-interest in building resilience, not just as a matter of risk management but as a pragmatic growth opportunity. Since collaborating with the MSCI Institute on "The Unavoidable Opportunity" in 2024, we have argued that the market for adaptation and resilience solutions is larger and more commercially compelling than conventional wisdom assumes. This updated analysis by the Institute vindicates that argument with a rigor we could not bring to bear two years ago.

What this paper shows is striking. The vast majority of listed companies are already taking hazard-specific actions to protect their operations. Half are generating revenues from products and services that help customers, communities and governments build resilience, spanning every sector, every major hazard, and every geography. Adaptation and resilience investments are not confined to a handful of specialist firms. They are hiding in plain sight.

Private equity and venture capital have begun to recognize this, as investors discover that businesses building solutions to an unavoidable problem tend to grow alongside the problem itself. But the opportunity is not confined to private markets. The public equity universe is already populated with companies positioned to benefit from rising demand for resilience. One simply needs to know how to look.

We have more certainty about the trajectory of climate change over the next decade than we have about interest rates, inflation or geopolitics. The case for resilience investing does not rest on speculation. It rests on what we already know. The opportunity is unavoidable. The opportunity is clear and present. The only real question is who acts on it first.

Jay Koh
Founder & Chair
Global Adaptation & Resilience Investment Working Group

Physical climate risks are no longer a future concern. Annual economic losses globally have exceeded USD 300 billion for the past nine out of ten years.[1]

MSCI estimates that the cost of asset damage and business interruption across the global listed equity universe could grow nearly fourfold, to USD 4.6 trillion annually by 2050, under a 3°C (5.4°F) warming scenario. Companies and investors are increasingly aware of this exposure, yet the private sector's response, both in protecting its own operations and in building businesses around rising demand for resilience-enabling solutions, has remained difficult to see clearly from the outside.

This paper sets out to change that. Building on the 2024 Global Adaptation & Resilience Investment (GARI) Working Group report, "The Unavoidable Opportunity : Investing in the Growing Market for Climate Resilience Solutions," we apply a substantially more rigorous analytical methodology to examine how companies across the full MSCI ACWI universe, representing approximately USD 96 trillion in global market capitalization, are responding to physical climate risk.[2] We ask two questions: Which listed companies are investing to build resilience in their own operations? Which are generating revenues from products and services that help customers, communities, and governments adapt to a changing climate?

Executive summary

Our analysis reveals a far broader and deeper engagement with climate adaptation and resilience than is visible through conventional disclosures. **Among the companies analyzed, 89% show evidence of at least one hazard-specific activity to strengthen operational resilience, spanning asset hardening, supply chain adjustments, workforce protections, and emergency-response capabilities. Roughly half are generating revenues from resilience-enabling products and services.** These activities cut across every GICS® sector and every major physical hazard category, from drought, flooding, and extreme heat to wildfires, storms, sea-level rise, and landslides.[3] No sector is absent from the picture.

These findings are consistent with, and extend, conclusions from two other recent MSCI Institute research streams. Our Corporate Resilience Survey found high and growing recognition among companies of the financial risks posed by extreme weather, with respondents in exposed sectors describing concrete investments in operational resilience. Our insurance sector research found insurers actively repricing physical risk in their underwriting and identifying new revenue opportunities in climate advisory and risk consulting. Taken together, the research points to a private sector that is already adapting but doing so in ways that are not yet legible to investors relying on standardized reporting nor easily assessed for effectiveness.

A framework for a complex landscape

One persistent challenge for investors seeking exposure to adaptation and resilience as an investment theme has been the proliferation of frameworks and taxonomies, each developed for different audiences and purposes. This paper offers a consolidating structure. We classify resilience-enabling products along two dimensions: the **systems need** being addressed – spanning natural systems and landscape resilience, food, water and agricultural resilience, built environment and urban resilience, and social systems and human resilience; and the **delivery channel** through which resilience is provided – whether capital and financing, insurance and risk transfer, physical solutions and enabling technologies, or advisory and operational support. This matrix is informed by prior work from the Intergovernmental Panel on Climate Change (IPCC), the Organization for Economic Cooperation and Development (OECD), European Climate-ADAPT, the ASAP Adaptation Solutions Taxonomy, and GARI, and is designed to give investors a **single, coherent map of the product sets** to which they may seek exposure, without requiring fluency in each of the underlying frameworks.

Implications for investors

Three implications for investors follow from our analysis.

1. The opportunity set is larger and more accessible than generally recognized.
Our 2024 analysis identified roughly 10% of the listed universe as having potentially relevant resilience-enhancing product offerings. This updated analysis, drawing on a richer evidence base and a more rigorous methodology, confirms and substantially extends that finding. The opportunity is present across the publicly listed universe today and can be accessed without relying solely on private markets or specialist vehicles.

2. Acting on that opportunity can begin now, even without fully standardized disclosures.
Transition-themed investments have benefited from a decade of regulatory effort to define eligible activities and require consistent reporting, which have improved transparency for investors. It is natural to reach for that same playbook on adaptation, and investors always welcome improved transparency. But our findings suggest that investors need not wait. The information exists in company reports, sustainability disclosures, websites and public communications. What has been lacking is a methodology capable of extracting and interpreting it systematically and at scale.

We used an artificial-intelligence large language model (LLM) to process roughly 900,000 tokens of information per company (compared with roughly 1,000 in our original analysis), demonstrating that the signal is there to be found with the right tools. Standardized disclosures, when they arrive, may add value. But unlike with reporting on emissions and transition exposure, disclosures on adaptation and resilience would either be highly complex, as physical risk is highly localized, intersecting specific assets and operations with dozens of hazards that vary dramatically by precise location; or remain relatively high level on firm-wide governance, which is important but too blunt an instrument for capturing where material risks actually concentrate for investors with highly diversified portfolios.

3. Adaptation complements decarbonization and other investor objectives.
Among companies with identified resilience product offerings, 80% meet the Do No Significant Harm (DNSH) and Minimum Safeguard criteria established by the EU Taxonomy.[4] Among constituents of MSCI's Climate Paris Aligned PAB Index, 42% have identified revenue-generation activities from resilience-enabling products, as of Feb. 28, 2026. Investing in adaptation is not a retreat from decarbonization commitments. It is a complementary and increasingly necessary dimension of responsible stewardship in a world where physical hazards are intensifying now, regardless of the emissions trajectory from here.

The societal-wide adaptation financing gap remains wide, and public budgets alone will not close it. The listed equity universe offers investors meaningful, underappreciated exposure to the companies building and selling resilience. The task for investors is not to wait for adaptation to become a fully defined investment theme. It is to develop the analytical capabilities to see what is already there and allocate capital accordingly in a fast-evolving landscape.

Introduction

Extreme weather events are becoming more frequent, more severe, and more costly, disrupting supply chains, damaging assets, and imposing real financial losses on companies and investors alike.[5]

As a result, climate adaptation and resilience is no longer a peripheral concern for the private sector: it is rising on the agenda of businesses and investors seeking to understand the long-term durability of their assets.

For much of the private sector, **adaptation and resilience has long felt like someone else's problem**, the domain of governments and, at best, of philanthropic capital. That instinct is not without some basis. Many of the most visible adaptation interventions are public goods by nature: Seawalls, coastal restoration, early-warning systems, and flood defenses are built for entire communities, their benefits are widely shared, and they are unlikely to generate the revenue streams that private investors require.[6] Even where the cost-benefit case for adaptation is compelling, returns that take the form of avoided losses rather than earned revenues do not easily translate into an internal rate of return. The result has been a persistent and widening gap between what adaptation requires and what private capital can finance (Appendix 1).[7]

That framing has always captured only part of the picture, and it is becoming less accurate as physical climate impacts intensify. As extreme weather affects more aspects of daily life, economic activity and physical infrastructure, it is becoming clearer that **companies face two distinct imperatives:** to protect their own operations, people, assets and supply chains against growing physical risks; and to meet the rising demand from governments, businesses, and households for products and services that build resilience. **The first is a risk-management imperative. The second is a growth opportunity.**

The idea that investors could find compelling returns not only in decarbonization but also in the growing market for adaptation and resilience solutions was first explored systematically in "The Unavoidable Opportunity: Investing in the Growing Market for Climate Resilience Solutions", a 2024 discussion paper produced by the GARI Working Group, with data and analysis by the MSCI Institute and The Lightsmith Group and supported by the Bezos Earth Fund and ClimateWorks Foundation. That work introduced the CRISP (Climate Resilience Investments in Solutions Principles) framework and applied a large language model to screen the publicly listed universe for companies whose products and services could qualify as adaptation solutions.

The findings were striking: Far more listed companies than conventional wisdom would suggest are already operating in businesses that stand to benefit from rising demand for resilience-enabling products, spanning sectors from industrials and materials to information technology, healthcare and financial services. That initial universe of over 800 companies, representing approximately 11% of the MSCI ACWI IMI Index by number of issuers, signaled a potentially investable theme hiding in plain sight.

Much has changed since our 2024 report. On three fronts in particular, the landscape has shifted in ways that warrant an updated and expanded analysis:

Awareness and experience.

Realized losses from extreme weather events have mounted, with insured natural catastrophe losses exceeding USD 100 billion for six consecutive years and occurring in 2023, 2024, and 2025.[8] At the same time, advances in physical risk modeling and climate data have given companies and investors better tools to measure their exposure at the asset level, quantify potential financial impacts, and evaluate the economic case for protective action. These improvements mean that companies are increasingly able to act on physical risk as an operational and financial concern, independent of government action to shore up community-wide resilience.

Stronger institutional and analytical foundations.

A number of organizations have developed and refined frameworks, taxonomies, and market research to help guide private sector capital toward adaptation and resilience solutions, including supranational and multilateral development banks (EU and the World Bank), investors, consultants and non-profits (GIC and Bain & Company, Temasek and BCG, Tailwind Futures, McKinsey Global Institute, and Climate Bonds Initiative), and investor groups such as GARI, the Institutional Investors Group on Climate Change (IIGCC), and the Asia Investor Group on Climate Change (AIGCC).[9] See Appendix 1 for details.

Better analytical techniques.

The proof-of-concept methodology employed in the original analysis relied on short company descriptions and a relatively constrained data set. We had noted the limitations of that approach in depth, precision, and consistency. We have since developed a substantially more rigorous methodology, applying an agentic retrieval-augmented generation (RAG) pipeline that draws on a much broader range of company information and processes far more information per company.

How this research extends our prior work:

We address two questions of growing urgency for investors across the public equity universe, representing USD 96 trillion and over 85% of global market capitalization, as of January 30, 2026: which listed **companies are investing to build resilience** in their own operations against physical climate threats, and which are **offering products and services** positioned to benefit from rising demand for resilience solutions?

We situate those findings within a structured framework that draws on the emerging landscape of adaptation taxonomies and standards, offering investors a **simple, coherent map of the solution sets** to which they may seek exposure.

We describe an improved AI-driven methodology for identifying this universe in detail, a methodology we believe can be **generalized beyond climate adaptation to support thematic investment analysis** more broadly.

Background

Drivers of demand for adaptation & resilience

The need to adapt and build resilience is growing as physical climate risks intensify across regions and sectors. Globally, natural disasters have caused economic losses exceeding USD 300 billion nine out of the past 10 years.[10] In the U.S. alone, there were 23 climate disaster events with losses exceeding USD 1 billion each in 2025.[11]

Estimates of uninsured losses range from USD 116 billion[12] to USD 167 billion[13] in 2025 with costs of disaster recovery estimated at USD 260 billion.[14] Human capital losses are substantial. Europe alone recorded approximately 110,000 heat-related deaths in 2022 and 2023, versus only 13,000 across the prior eight years (2014–2021).[15] And in 2024 alone, extreme heat caused the loss of 640 billion potential labor hours, representing a productivity hit equivalent to just over USD 1 trillion.[16]

These trends point to rising exposure of physical assets, supply chains and populations, driving governments at local and national levels to consider ways to protect their communities, from shoring up infrastructure to regulations that reduce future vulnerabilities. Businesses and households, too, are seeking measures to reduce potential damage to property and health, as the costs become more tangible through recent events.

To size this emerging demand, Singapore's GIC has estimated that annual global revenues from a subset of climate adaptation solutions could increase from approximately USD 1 trillion today to around USD 4 trillion by 2050, with roughly USD 2 trillion of that growth attributable to rising climate-related risks.[17]

We outline the macro forces driving the need for adaptation and resilience solutions, and some key levers that increasingly translate the need into market demand for products and services.

Exhibit 1. Macro forces driving need for adaptation and resilience

Forces	Description (what it is)	Example
Rising physical hazards	Weather events such as storms, floods, wildfires, extreme heat and cold are increasing in frequency and intensity	"Hot extremes" (heatwaves) that previously occurred once every 10 years in a climate without human influence are now 2.8 times more frequent and 1.2°C hotter.[18] In the U.S., the number of billion-dollar severe convective storm events has nearly doubled in the last decade compared to the previous one.[19]
More people and assets exposed	Migration and economic growth have increased the concentration of people, physical and health infrastructure, economic assets and activities in urban and coastal centers that are exposed to physical hazards	Approximately 1.6 billion people were directly affected by extreme weather events between 2014 and 2023.[20] ~900 million people globally live in the low-elevation coastal zone (≤10 m above sea level), areas especially exposed to sea-level rise and coastal flooding. This number is expected to increase to 1.2 billion by 2050.[21]
Escalating costs of damage and recovery	Damage and recovery from rising physical risks and exposure are better quantified for sizing the potential financial risks	Across the 9,409 global public companies across the MSCI Climate Change Metrics universe, average annual losses reach USD 88 billion in asset damage and over USD 1.1 trillion in business interruption.[22] Comparative assessments show that avoided losses and co-benefits typically outweigh the upfront costs of adaptation measures by a factor of as much as 10, measured over a ten year time period across 12 countries.[23]

Exhibit 2: Levers translating need to demand for adaptation and resilience products and services

Levers	What it does	Illustrative examples	Limitations
Regulations	Reduces exposure through mandated zoning laws, health & safety standards that prevent high-risk behavior; improves resilience through appropriate building codes and standards; improves risk management through diligence and disclosure requirements.	• Florida and Gulf Coast regions saw wind-rated window and door sales rise 20% after local hurricane code updates.[24] • In California, new Wildland Urban Interface (WUI) codes have contributed to a 25% increase in demand for fire-rated siding and roofing.	Limited geographic coverage; updated building codes remain absent in many jurisdictions.
Insurance terms and pricing	Incentivize self-protection and loss mitigation by policyholders as a response to premiums, coverage terms, and underwriting requirements that more accurately reflect potential costs of repair and recovery	• Alabama's IBHS FORTIFIED Home program, which mandates enhanced construction standards through a state-backed certification and discount regime, reduced hurricane wind claim frequency by 55–73% and insurer losses by up to 75% during Hurricane Sally (2020), relative to conventionally built homes.[25] • Certified fire-hardened neighborhood in California offered insurance premium discounts ranging from 3.8% to 50%.[26]	Effectiveness depends on insurance market functionality; limited reach in developing countries with underinsured or uninsured markets.
Public funding programs	Provides direct government spending on projects, or financing to help de-risk private capital through grants, subsidies, and public procurement.	• Vietnam is investing >USD 6 billion in flood adaptation infrastructure through 2030 and anticipates USD 55–92 billion in total adaptation spending this decade.[27] • The UK has spent cumulatively over GBP 5 billion on flood resilience infrastructure in the past decade, and the government has committed GBP 2.4 billion over 2024-2026 for additional expenditure on flood defenses.[28]	Subject to political priorities, fiscal constraints, and budget cycles.
Rising household incomes	Higher protection for personal health and property from greater willingness and ability to pay	• India is poised for a rapid surge in space cooling demand, driven by rising incomes, urbanization, and intensifying heat. Between 2025 and 2035, the country is expected to add 130–150 million new room air conditioners (ACs).[29]	Concentrated in specific product categories (e.g., cooling), countries and demographics; dependent on sustained economic growth.

Investor responses and challenges

Institutional investors have begun to ask questions beyond the emissions trajectory and the readiness of portfolio companies for the energy transition. While decarbonization remains the foundation of climate investments, the market consensus, as reflected in a study by our Institute has been for a nearly 3°C (5.4°F) temperature rise above preindustrial levels this century, which would prompt a reallocation of capital to reflect the financial risks and opportunities in an adapting world.

Risk Management: How well prepared are companies for rising physical risks?
Investors with diverse global portfolios traditionally view risk through the lens of sectors, countries and market factors. That lens can obscure the risks from a wide range of physical hazards that emanate from an asset and location level. Improvements in hazards modeling and geospatial asset location data have allowed investors to better estimate potential financial impacts from both direct and indirect effects of rising physical risks under different climate scenarios. For example, MSCI's physical risk data has estimated that the cost of asset damage and business interruption to the 9,000+ companies in the global equity universe could grow nearly fourfold, to USD 4.6 trillion, by 2050, if average global temperatures were to rise 3°C.

Companies are addressing physical risk, although the extent is unclear. On the one hand, in a 2025 survey of 550 public and private companies globally, the MSCI Institute found a high degree of recognition by respondents that extreme weather increasingly pose operational and financial risk. In sectors with high exposure to extreme weather, companies increasingly treat physical resilience as a central risk management priority, with respondents indicating they have invested in a mix of engineering, digital and nature-based solutions to strengthen their resilience.

On the other hand, a number of industry studies, including by the World Economic Forum[30], Marsh[31] and MSCI have found that the majority of companies have not taken actions to mitigate their physical risk exposure.[32] Investors have also highlighted data gaps in measuring how companies are integrating adaptation into their operational and supply chain planning[33], prompting industry groups such as IIGCC[34] and AIGCC[35 36], to develop frameworks that guide investors seeking data and action on adaptation planning.

Growth prospects: Are companies positioned for market demand for resilience products?
A key challenge that motivated the 2024 analysis for "The Unavoidable Opportunity" was that many companies, especially large and complex ones, that are already in the business of selling products to support community, corporate or individual household adaptation and resilience do not identify these revenue streams as such. Since then, pure-play companies with products that address specific hazards – such as wildfire prediction (addressed by products like AI powered wildfire risk models[37] and heat sensor networks[38]) – have emerged and become more readily identifiable through venture and private equity investments.[39] It remains an analytical challenge, however, to identify the relevant growth revenue streams that target demand for adaptation and resilience among listed companies. Identifying exposure to those revenues and companies is far more complex than seeking exposure to climate mitigation or energy-transition opportunities, both themes with well-defined products and activities.

Our approach

Our analysis focuses on large- and mid-cap companies globally as represented by the MSCI ACWI Index.[40]

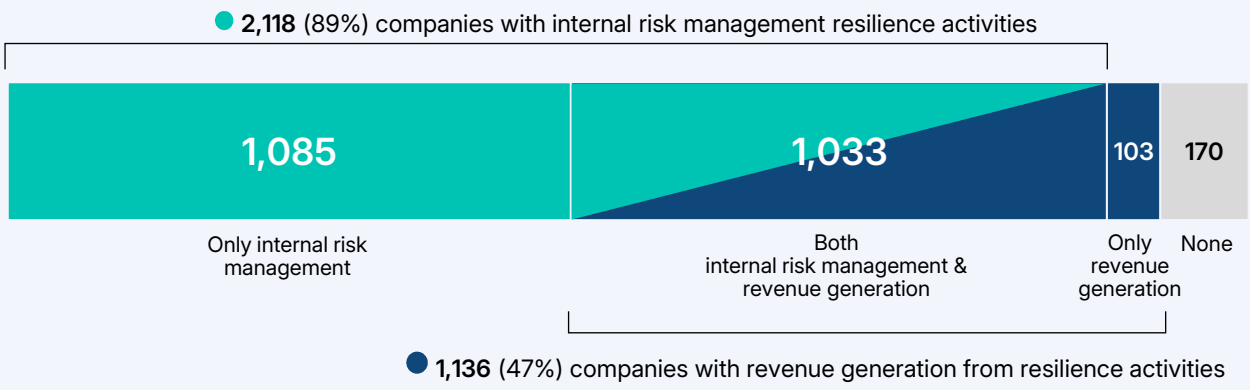
We first comprehensively captured company activities that pertain to adaptation and resilience activities from a wide range of publicly available company sources. We classified each activity by physical hazards relevant to those activities, including a cross-sectional category for activities that cut across multiple hazards. We then sorted each activity by whether it targets management of corporate operations and supply-chain risk or aims at revenue generation. Building on our 2024 analysis, we used an AI LLM while expanding the evidence base, narrowing large text sets to hazard-relevant content, and validating conclusions. We discuss the details of the methodology in a later section.

Findings

We find that a large majority of listed companies have identifiable activities related to adaptation and resilience, with activities aimed at risk management of corporate operations and supply chain outweighing activities for revenue generation.

Among the peer set analyzed, 89% showed evidence of at least one physical hazard-specific activity that enhances adaptability and resilience of their corporate operations. By contrast, just under half (47%) demonstrated activities tied to product offerings sold to customers to enable their resilience.

Exhibit 3. Corporate resilience activities: Risk management vs. Revenue generation



Source: MSCI Institute analysis of company data. Research universe comprised of the constituents of the MSCI ACWI Index, as of January 2026.

Corporate risk-management activities

Our analysis identified significant corporate activities such as asset hardening, operational adjustments, supply-chain changes and contingency planning that aim to reduce vulnerabilities to physical risks. Company-level risk-management revealed drought, flood and extreme heat as the hazards most companies are actively preparing for, with 65%, 57% and 43% of companies, respectively, documenting activities to strengthen resilience against these hazards.

- **Drought risk management centers on water efficiency.** Most measures focus on reducing water use, recycling process water, or installing efficient irrigation. Less common are drought-tolerant crop varieties, alternative sourcing for water-dependent inputs, and contingency planning for water scarcity.
- **Physical hardening is concentrated on floods and storms.** Companies that retrofit or reinforce facilities typically do so in response to flood or cyclone risk. Investments in flood defenses, such as walls, levees, seawalls and gates, are far more common than physical protections against other hazards, which tend to rely on operational responses instead.
- **Extreme-heat preparedness focuses on cooling infrastructure.** The dominant response is facility-level cooling, including HVAC upgrades, expanded cooling capacity and data center thermal management. Measures aimed at worker health and safety, such as limiting outdoor work, heat action plans and heat stress monitoring, appear far less frequently, despite the direct human risk.

Five activity types appear across nearly all hazards:

- **Climate risk assessments** are the most common response overall.
- **Business continuity planning** is the standard response to acute weather disruptions but is less developed for slow-onset hazards such as drought and extreme heat.
- **Supply chain adaptation** — including supplier diversification, alternative sourcing and buffer stock — appears consistently in response to drought, flood and storm risk.
- **Early warning systems** are concentrated on sudden-onset hazards, particularly cyclones and floods.
- **Scenario analysis and modelling** are applied most often to flood risk and are notably underrepresented for extreme heat.

We classify the identified risk-management activities along the two dimensions of the ***target hazard*** *and* ***operations area.*** We identified activities that target reducing risks from the following hazards: drought, flooding, extreme heat, storms (hurricanes, cyclones), wildfire, sea-level rise, landslides and hailstorms. Droughts, floods and extreme heat are the three hazards most often identified for risk management activities.

Operationally, companies' risk management activities aimed to build resilience in six distinct operations areas: physical asset integrity; utility and resource continuity; supply chain and logistics continuity; workforce health and productivity; information, monitoring and control; emergency response and recovery management.

Note that these activities are not concentrated by industry (Exhibit 5). For most (89%) companies, we identified at least one activity aimed at shoring up resilience of an operations area to a physical risk hazard. Companies are exposed to very different hazards depending on the nature and location of their physical assets, supply chains, employees and customers. We estimate that 42% of MSCI ACWI constituents are exposed to high risks of drought, 11% to extreme heat, and 5% to cyclones and hurricanes (Exhibit 4).[41] The peer set is least exposed to risks from landslide, hail and sea level rise. Estimated annual loss from direct asset damage and business interruption can range from USD 19 billion to USD 155 billion, with the industrials sector facing the highest average annual loss rate.[42]

Exhibit 4: MSCI ACWI constituents' exposure to physical hazards

	Drought	Extreme heat	Cyclone/ hurricane
# of exposed companies	**1026**	**261**	**119**
% of exposed companies	**42%**	**11%**	**5%**

Note: Peer set are the constituents of the MSCI ACWI Index as of Jan 26, 2026. The number of companies is based on local hazard intensity values of 8 or higher, on a scale of 0 to 10. To form a company-level view, asset-level exposures are aggregated.

Our classification framework for hazards-based corporate risk management offers a systematic view of what companies are doing on the ground to build resilience in their key operations areas. Companies appear to be doing more than can be discerned from structured disclosures, offering some transparency to global investors on the resilience of their portfolios to physical risks.

The extensive set of activities identified by our methodology and classified by our framework can help bridge investor-company dialog on how prepared companies are (or need to become) to specific physical risk impacts. The questions that our approach do not yet answer, however, are how much companies are spending for different resilience-building activities, whether that is sufficient or effective to withstand projected changes in hazard frequency and intensity, and how companies approach cost-benefit analysis for future hazards protection as an integrated part of overall corporate risk management.

Exhibit 5: Companies' resilience activities in risk management, by sector and hazard

		Drought	Extreme heat	Wildfire	Cyclone/ hurricane	Hail	Flood	Landslide	Sea level rise	Cross sectional
Hazard intensities →		**7.3**	**5.1**	**4.6**	**3.3**	**2.3**	**2.2**	**1.6**	**1.1**	
Sector	**↓ % of companies with at least one risk management activity**									
Utilities	*97%*	76%	52%	50%	79%	2%	85%	48%	32%	74%
Energy	*96%*	88%	43%	26%	52%	0%	71%	45%	21%	62%
Materials	*95%*	90%	45%	22%	45%	0%	67%	48%	10%	58%
Consumer Staples	*94%*	89%	56%	13%	35%	3%	65%	27%	9%	60%
Health Care	*93%*	75%	49%	14%	42%	1%	55%	3%	10%	49%
Real Estate	*91%*	83%	68%	47%	55%	1%	78%	23%	32%	63%
Consumer Discretionary	*91%*	76%	51%	10%	33%	0%	55%	5%	10%	55%
Industrials	*87%*	60%	40%	12%	38%	0%	52%	13%	11%	44%
Financials	*84%*	32%	25%	14%	36%	5%	52%	2%	10%	49%
Communication Services	*81%*	45%	54%	18%	48%	0%	48%	4%	19%	43%
Information Technology	*80%*	64%	35%	7%	31%	1%	40%	5%	7%	35%
Total	*88%*	65%	42%	17%	41%	2%	57%	15%	13%	50%

Source: MSCI Institute analysis of company data and MSCI Sustainability & Climate Research. Research universe comprises constituents of the MSCI ACWI Index, as of Jan. 26, 2026. The percentages denote companies in a sector that have instituted hazard-specific risk management activities. The columns are ordered by average hazard intensity values for the constituents of the MSCI ACWI Index.

Exhibit 6: Hazards-based risk management activities by operations area

Operations areas	Target hazards: Drought	Extreme heat	Wildfire	Hailstorm	Cyclone / hurricane / storm
Physical asset integrity (Buildings, plants, equipment, sites)	• Water conservation infrastructure (recycled water pipelines, reclamation systems)	• Cooling system upgrades (HVAC, evaporative cooling) at plants and data centres • Heat-resistant building materials and roof insulation	• Fireproof infrastructure • Fire-resistant building materials	• Anti-hail nets at storage yards and orchards • Vehicle canopies at processing centres	• Storm-hardened construction (steel/concrete poles, underground cabling) • Grid hardening and infrastructure reinforcement
Utility & resource continuity (Water, energy, cooling, fuel)	• Wastewater reuse • Rainwater harvesting • Water-efficient irrigation;	• Increased cooling capacity to maintain power/water operations during heat • Smart HVAC with temperature sensors	• Backup power systems to maintain operations during grid outages caused by wildfire	• Business interruption insurance for hail-related utility losses	• Backup generation for key facilities
Supply chain & logistics continuity (Inputs, transport, storage)	• Drought monitoring in supplier regions • Supplier assessment in high water-stress areas	• Supply chain diversification away from heat-stressed agricultural regions • Climate-resilient crop varieties (palm oil, coffee)	• Supplier fire-risk assessments • Alternative sourcing plans for wildfire-prone input regions	• Supply diversification to reduce dependence on hail-exposed agricultural inputs	• Business continuity planning for hurricane disruptions • Backup logistics routes
Workforce health & productivity (Heat stress, safety, shelter)	•	• Limiting outdoor work during extreme heat • Heatstroke prevention campaigns • HVAC upgrades for workers	• Fire safety training and drills • PPE provision • Fire-extinguisher use training	• Worker shelter provisions during severe hail events	• Storm shelter designations • Worker communication systems during storms
Information, monitoring & control (Data, sensing, forecasting)	• WRI Aqueduct water-stress monitoring • Water usage tracking across operation • Drought risk dashboards	• Smart HVAC temperature sensor networks • Heat-risk modelling for field operations •	• Drone infrared cameras for early wildfire detection	• Severe convective storm research and hail climatology monitoring • Operational hail anticipation systems	• Weather forecast integration with operations • Storm-track monitoring and early warnings
Emergency response & recovery capacity (Shelters, response equipment, continuity planning)	• Drought-resilience continuity planning • Water shortage response procedures • Alternative water sourcing protocols	• Cooling station establishment • Emergency medical response for heat-related illness	• Fire emergency response plans • Coordination with local fire brigades and first responders • Post-wildfire remediation procedures	• Hail damage insurance claims procedures • Rapid vehicle and inventory inspection protocols	• Liaison with local emergency planning committees

	Flooding	Landslide	Sea-level rise	Cross- sectional
Physical asset integrity (Buildings, plants, equipment, sites)	• Flood-protection engineering (culverts, wetland buffers • Facility site elevation and waterproofing • Erosion & sediment control structures	• Slope stabilisation and benching at quarries/mines • Re-vegetation after operations	• Coastal flood-resilient infrastructure • Site elevation assessments	• Climate risk assessments of locations • Facility design reviews
Utility & resource continuity (Water, energy, cooling, fuel)	• Drainage systems to prevent utility disruption • Backup water supply infrastructure	• Backup utility routes around landslide-prone corridors	• Sea-level risk assessment of utility asset • Coastal infrastructure protection	• Multi-hazard energy storage deployment • Cross-site utility redundancy planning
Supply chain & logistics continuity (Inputs, transport, storage)	• Supplier flood-risk screening • Alternative transport routes • Increased inventory buffers	• Supplier landslide risk monitoring • Alternative transport routes	• Coastal supplier risk assessments • Structural integrity programmes for supplier factories in flood-prone coastal zones (Bangladesh, China)	• Business continuity protocols across supplier network • Supply-chain mapping and climate stress testing
Workforce health & productivity (Heat stress, safety, shelter)	• Employee emergency assistance programmes (temporary housing, emergency supplies post-flood)	• Restricted access protocols during high-risk periods	• Worker relocation and safety protocols for coastal facility personnel • Evacuation plans for low-lying site staff	• Multi-hazard workforce training • Evacuation drills • Employee awareness campaigns
Information, monitoring & control (Data, sensing, forecasting)	• Real-time flood-risk monitoring • Drone/UAV topographic mapping • Flood early-warning systems	• Drone-based topographic mapping	• Coastal Risk Index (CRI) mapping tools • Sea-level rise scenario analysis • Maritime digital warning systems for coastal construction	• Climate scenario modelling (NZE/STEPS, IPCC SSP scenarios) • Third-party live weather monitoring platforms
Emergency response & recovery capacity (Shelters, response equipment, continuity planning)	• Flooding business continuity plans and disaster recovery plans	• Landslide emergency response protocols • Mine/quarry evacuation procedures	• Coastal flooding emergency response plans • Facility evacuation and personnel safety protocols for sea-level surge events	• Cross-hazard scenario planning for resource allocation • Continuity policies covering all major hazards

Source: MSCI Institute analysis of company data. Cross-sectional refers to enabling services and technologies that cut across multiple climate hazards rather than addressing a single risk. They include services such as climate consulting, geospatial hazard mapping, scenario modeling, early warning systems, post-disaster recovery, and climate-responsive land-use planning.

Revenue-generation activities

We identified all corporate activities related to adaptation and resilience that are aimed at generating revenues, as distinct from internal corporate risk management.

While only about half as many companies are selling products, services and solutions for adaptation and resilience, compared with the number undertaking risk management activities for operational resilience, that is still a far higher proportion than what we identified in our 2024 analysis. This could reflect the much larger body of corporate information that we draw on for this updated analysis. Or it stems from companies describing their existing product opportunities in ways that are more readily linked to addressing specific physical hazards. Or it may reflect more companies becoming involved in tapping the growth opportunities in the market for resilience-enhancing products.

Here, for example, is an overview of adaptation and resilience products and solutions in the industrials, financial and information-technology sectors – the three sectors with the most companies generating resilience-related revenue.

Industrials

We found that companies in the industrials sector are the most active providers of resilience-enhancing products and services, with 64% offering at least one product across hazards. Their offerings fall into three broad categories.

- *Physical infrastructure and hardware*, including flood monitoring devices, meteorological radars, satellites, HVAC and cooling systems, water treatment equipment, and engineered coastal or slope protection systems.
- *Digital platforms and models*, such as risk analytics tools, catastrophe models, flood prediction SaaS, and climate scenario platforms that help quantify and plan for physical risk.
- *Engineering and consulting services*, including integrated water management, nature-based design, post-disaster recovery, and climate adaptation planning, often delivered through large project engagements.

Financials

In the financials sector, 63% of companies offer at least one product across hazards, reflecting the sector's role as a capital intermediary and risk underwriter. Financial firms enable adaptation across sectors and in sovereign finance through the products they underwrite and the capital they deploy. Their resilience-enhancing products are concentrated in insurance, reinsurance, structured finance and risk advisory. Insurance is the most prevalent product type, ranging from traditional property and crop coverage to parametric and index-based solutions. More than a third (37%) of banks distribute some form of weather-related insurance.

Information technology

The IT sector's offerings can be grouped into four themes.

- *AI and data platforms*, with AI embedded in early warning systems, climate forecasting models, and scenario planning tools to anticipate and model hazard impacts.
- *Internet of things and real-time monitoring*, integrating sensor networks, smart meters, water gauges, and satellite imagery into operational platforms that provide visibility into rivers, reservoirs, soil conditions, and urban infrastructure.
- *Virtual models and simulation tools*, including stormwater hydraulics and full flood-damage scenarios that allow planners to test resilience interventions digitally.
- *Thermal management and cooling*, where semiconductor and hardware companies address the challenge of cooling energy-intensive infrastructure through liquid immersion cooling, evaporative systems, and AI-controlled HVAC.

Exhibit 7: Comparison of version 1.0 vs. version 2.0 results – Industrials sector in focus

We illustrate the differences in the results between version 1.0 and version 2.0 of our analysis by comparing the results from four companies in the industrials sector which were identified as offering resilience-enabling products in both versions. Version 2.0 yielded a broader set of company products, and more detailed product descriptions, along with providing context for their usage.

Product Category	Company	Version 1.0 result (earlier analysis)	Version 2.0 result (current analysis)
Insulation products	Rockwool A/S	Insulation products, rock wool fire insulation systems, building insulation materials (listed as building products)	Non-combustible stone wool insulation for fire-resistant construction in wildfire-prone Wildland-Urban Interface (WUI) zones; HVAC insulation for district cooling systems to address extreme heat; Rockflow underground stone wool rainwater systems for urban flood and sea level rise management.
Pumps & water management equipment	Ebara Corporation	Submersible pumps, pump systems, dewatering systems, pumps and valves (listed as industrial machinery)	High-capacity pumps and drainage systems for flood control and disaster prevention; custom agricultural irrigation pumps for stable water supply under drought; large spot air conditioners and cold storage agents for heatstroke prevention under extreme heat at construction sites
Sealing & waterproofing	Compagnie de Saint-Gobain SA	Waterproofing materials, coatings, sealants, environmental protection coating systems (listed as building products)	Waterproofing membranes and resins for roofs and weather barriers to protect buildings from storms and flooding; waterproofing mortars for basements to flood-proof buildings; Crystar® ceramic membranes for potable water production under drought conditions
Drainage & pipe systems	Astral Limited	PE/PPR/PVC pipes and fittings, drainage solutions, sustainable drainage systems (listed as building materials)	UPVC pipes for urban drainage and sewage systems explicitly cited as contributing to urban flood management; Silencio dual-layer impact-resistant drainage pipes engineered to withstand extreme conditions during cyclone/storm events; CPVC pipes for plumbing systems designed for extreme heat resistance

In addition to identifying many more examples of revenue generation from companies addressing market demand for adaptation and resilience, we categorized the wide range of product offerings. We simplified emerging industry frameworks to reduce the complexity of defining this nascent market and to consolidate a shared understanding of what companies are selling today.

Our adaptation and resilience product-set matrix is informed by prior relevant work by IPCC, OECD, European Climate-ADAPT, the ASAP adaptation solutions taxonomy and GARI (Appendix 2). Each of the existing frameworks has a different goal and intended audience. Drawing on the relevance and strength of each, we classify the identified revenue-generating activities into two dimensions that help to situate each "resilience product" in terms of the ***systems needs*** it targets and the ***delivery channel*** it uses.

Systems needs span four macro areas requiring resilience-building:

A. Natural systems and landscape
B. Food, water and agricultural systems
C. Built environment, infrastructure and urban
D. Social systems and human health

Delivery channels through which companies offer their resilience-enabling product:

1. Capital and financing
2. Insurance and risk transfer
3. Physical solutions and enabling technologies
4. Advisory, planning and operational support

Our framework integrates scientific, policy, investor, and asset-based taxonomies in two dimensions. This consolidation provides a clear structure, showing how vulnerabilities from climate risks connect to the commercial products and services developed to address them.

Laying out the products in this matrix clarifies the nature and range of resilience-enhancing products in the marketplace today. Some products have long histories but require adjustments in product features to incorporate changing physical risks (e.g., crop insurance, battery storage, and backup power). Others are innovations that leverage new technologies to specifically meet the emerging market needs for adaptation and resilience (e.g., wearable cooling devices, urban flood, and storm-modeling analytics).

The matrix of resilience-enabling products also helps underpin the product sets we identified from companies in each sector, as detailed in Exhibit Y. Every sector comprises companies that currently sell resilience-enhancing products that address needs detailed in each of the four macro areas, with the exception of the materials sector, which does not currently include companies with identified activities tied to selling resilience-enhancing products to address the needs of social systems and human health.

Exhibit 8: Adaptation & resilience product set matrix

Delivery channels → / System needs ↓	1.Capital & financing *Deploying capital to enable adaptation assets and services*	2. Insurance & risk transfer *Pooling, transferring, or pricing physical climate risk*	3. Physical solutions & enabling technologies *Tangible assets, systems, and technologies that directly reduce risk*	4. Advisory, planning & operational support *Information, coordination, and response that support adaptation outcomes*
A.Natural systems & landscape Ecosystems that reduce physical climate risk	Financing for ecosystem restoration (wetlands, mangroves, watersheds); nature-based flood and erosion control projects	Parametric and catastrophe insurance linked to natural hazards	Nature-based flood buffers; erosion control materials; landscape-scale water retention solutions	Ecosystem risk mapping; land-use and watershed planning; nature-based solution assessment
B. Food, water & agricultural systems Water availability, food production, and supply chains	Financing for irrigation, water supply, desalination, wastewater treatment, and climate-smart agriculture	Crop and weather-linked insurance products	Precision irrigation systems; industrial and agricultural cooling; water treatment and reuse technologies; climate-resilient inputs	Drought monitoring; agricultural early-warning systems; water-resource analytics; farm-level decision support
C. Built environment, infrastructure & urban Buildings, energy, transport, and cities	Financing for resilient buildings, energy systems, transport, and urban infrastructure	Property, catastrophe, and hazard insurance; reinsurance	Industrial and data-center cooling systems; HVAC and thermal management; flood protection and drainage infrastructure; monitoring hardware	Climate risk analytics for assets; infrastructure stress testing; urban planning and resilience advisory; emergency response coordination
D. Social systems & human health People, safety, access, and social capacity	Financing for social protection, emergency liquidity, and access to essential services	Micro-insurance and disaster protection for households and communities	Micro-scale adaptation solutions (e.g., personal cooling, portable protection, air filtration); health-related resilience technologies	Disaster preparedness and response planning; public health monitoring; risk communication and early-warning services

Exhibit 9: Companies with revenues from resilience-enabling products, by sector and hazard

Sector	↓ % of companies with resilience-enabling products	Drought	Extreme heat	Flood	Wildfire	Cyclone/ hurricane	Sea level rise	Hailstorm	Landslide	Cross sectional
Industrials	*64%*	33%	38%	26%	23%	19%	12%	4%	8%	19%
Financials	*63%*	37%	13%	37%	21%	21%	11%	15%	7%	29%
Information Technology	*58%*	20%	34%	17%	12%	11%	5%	2%	2%	17%
Utilities	*48%*	22%	30%	11%	1%	6%	4%	0%	1%	11%
Materials	*47%*	19%	29%	14%	20%	12%	6%	2%	5%	6%
Communication Services	*47%*	29%	13%	22%	13%	18%	4%	0%	1%	22%
Consumer Discretionary	*36%*	14%	25%	9%	4%	7%	2%	1%	1%	5%
Energy	*31%*	11%	18%	1%	4%	2%	2%	0%	3%	4%
Real Estate	*28%*	17%	18%	15%	10%	9%	9%	0%	5%	16%
Consumer Staples	*23%*	13%	7%	2%	2%	1%	0%	0%	1%	1%
Health Care	*14%*	5%	8%	3%	1%	1%	0%	1%	1%	3%
Total	**47%**	**23%**	**23%**	**18%**	**13%**	**12%**	**6%**	**4%**	**4%**	**15%**

Source: MSCI Institute analysis of company data and MSCI Sustainability & Climate Research. Research universe comprises MSCI ACWI Index constituents, as of Jan 2026. The percentages denote companies in a sector that offer resilience-enabling products specific to a hazard.

Methodology for identifying climate adaptation & resilience activities

Version 1.0: Baseline approach

The 2024 version of our Institute's analysis was designed as a proof of concept to explore how large language models could support the identification of companies selling products and services that can protect against physical climate risks, without companies themselves self-identifying as such. That approach relied primarily on short business descriptions and summary disclosures to assess whether a company's products or services could support adaptation or resilience outcomes. Using these summaries, a structured set of questions was derived from established adaptation framework – most notably the GARI working group's CRISP framework – to evaluate potential resilience involvement. While this methodology demonstrated feasibility, it was constrained by the limited scope of input data and by differences in how comprehensively companies describe their activities in abridged disclosures.

Introducing Version 2.0

We developed Version 2.0 to address the limitations of the original approach and to support a more comprehensive and robust assessment at scale. The updated methodology incorporates a much broader range of company disclosures and publicly available information from listed companies' annual reports, sustainability reports, company websites, investor presentations and news media coverage. This expansion vastly increased the amount of data analyzed per company.

Version 2.0 retrieved company activities related to adaptation and resilience and classified them according to physical hazards relevant to those activities. Version 2.0 retrieved and classified company-level activities aimed at enhancing operational resilience as well as product- and service-level activities.

Exhibit 10: Comparing our approaches

	Version 1.0	Version 2.0
Goal	Find companies that provide products and services with potential to help customers enhance their resilience	1. Find companies that are undertaking activities to improve their own internal operational resilience 2. Find companies that have activities associated with revenue generation from products and services that can help customers enhance their resilience
Dataset	Abridged company business descriptions sourced from annual reports.	Company websites, regulatory filings, including annual reports, and corporate sustainability reports.
Prompt Framework	List of questions covering potential impacts and responses based on GARI's CRISP framework.	LLM asked to look through examples of products/services that would allow for customers/company to adapt to changing climate across a list of hazards based on GARI's CRISP framework.
Measure of Certainty	Relevancy, specificity, and clarity of each answer evaluated. Affirmative/negative/indirect – indicates yes, no or uncertain if company has a resilience-enabling product offering. Explanation behind answers given.	Confidence (low, medium or high) of each answer evaluated. Rationale, evidence and source given behind answer to limit hallucination and help with manual evaluation.
Classification of companies	Affirmative/negative/indirect – binary classification of companies, without further detail on the target stakeholder of potential product/service.	Internal/external/unknown scope for distinguishing the stakeholder that the identified company activity targets: companies' own risk management or revenue generation from customers. Company classification conducted at the physical hazard-level, with target stakeholders listed explicitly: communities, customers, own operations, supply chain, workforce.
Validation Process	Research analysts reviewed output to identify issues for correction.	The LLM is employed to identify hallucination and judge relevance of outputs based on rubric. This is supplemented by research analysts also reviewing output.
Token Intensity	The question-answer LLM chaining methodology from V1.0 used ~1,000 tokens per company	The agentic retrieval-augmented generation (RAG) workflow designed for Version 2.0 uses ~900,000 tokens per company

Core design principles of Version 2.0

The redesigned methodology is built around three core principles. First, it emphasizes breadth of evidence, ensuring that classifications reflect the full range of available company-level information. Second, it prioritizes analytical focus by systematically narrowing large volumes of text to information that is directly relevant to climate adaptation and resilience outcomes. Third, it emphasizes grounding and validation, requiring that conclusions about a company's actions be supported by verifiable evidence drawn from identified sources. These principles reflect established best practices in retrieval-augmented analysis, which has been shown to improve accuracy and reliability when working with large and diverse text corpora.[49]

Hazard-based, retrieval-first analysis pipeline

Central to the Version 2.0 methodology is a hazard-based analytical structure aligned with the CRISP framework. Climate adaptation and resilience activities are assessed by first decomposing the taxonomy into distinct climate hazard themes, such as flooding, extreme heat, drought, or wildfire. Each hazard is analyzed independently, allowing the methodology to focus on the specific types of solutions relevant to that risk. This design reflects the fact that adaptation activities for different hazards are semantically distinct and benefit from targeted evaluation.

For each hazard theme, the analysis systematically retrieves and reviews the most relevant information from a company's full set of disclosures, rather than evaluating all materials simultaneously. This targeted approach improves analytical focus and helps mitigate known performance limitations associated with large context windows in language models, where relevant information may otherwise be diluted or overlooked.[50] Evidence identified across individual hazards is then consolidated and evaluated holistically to assess the scope, impact and financial relevance of a company's adaptation and resilience, promoting consistency across sectors and business models.

Key improvements from Version 1.0 to Version 2.0

Compared with the initial version, the Version 2.0 methodology represents a significant advance in both depth and reliability. The expanded evidence base reduces reliance on how companies summarize their businesses and improves coverage of specialized or emerging activities. The hazard-based structure enables more precise and consistent identification of relevant activities across sectors and regions. Most importantly, the redesigned process strengthens confidence in the results by ensuring that classifications are grounded in documented company disclosures. Together, these enhancements support a more credible and scalable framework for identifying companies selling climate adaptation and resilience products and services for further investment analysis.

Lessons learned from misclassifications

While the model was able to identify nuanced adaptation and resilience activities across sectors by drawing from large text corpora, areas for improvement remain. Several elements of the methodology presented challenges, including the scale and heterogeneity of unstructured text sources and the need for multi-dimensional classification of outputs.

A key hurdle was semantic ambiguity between activities aimed at internal risk management and external revenue generation that both relate to climate adaptation and resilience but serve different purposes. Misclassifications in initial model runs included:

- **Conflating philanthropic or impact-driven initiatives** aimed toward building climate resilience with commercial product offerings designed to enable customer resilience (Appendix 3).
- **Misclassified internal risk management measures,** such as investments in site-specific flood protection, as commercial products;
- **Misinterpreting consumer-marketed language** (for example, labeling a "cooling" toothpaste as an extreme-heat resilience solution);
- Classifying companies providing products or services to hospitals or healthcare facilities as contributing to **health-related adaptation and resilience**, even when the offering was not explicitly designed to address climate-related health risks.

These limitations highlight the importance of human validation and iterative prompt refinement. Initial classification runs were deliberately conducted on smaller company sets to identify areas for improvement. Subsequent model iterations and feature enhancements are outlined in Appendix 4.

In addition, expanding the scope of data sources and applying the model to roughly 85% of the investable universe by market capitalization (MSCI ACWI) required **balancing comprehensiveness with precision**. Addressing these challenges required an iterative process incorporating explicit taxonomies, decision rules in prompt engineering and multiple quality checkpoints. These included use of a rubric to assess data-source relevance, deploying an LLM as a judge to detect hallucinations and incorporating analyst feedback to refine classification schema and prompts. This multi-layered approach, combining human-in-the-loop validation alongside automated decision rules, proved essential to achieving reliable outputs at scale without relying solely on model judgment.

Relevance beyond climate-themed investments

The key innovation in Version 2.0 of applying post-processing after an initial filtering based on provided framework and taxonomy – essentially asking the LLM to further sort into categories and to ground its choices to the source data - is a technique we believe is generalizable and can significantly improve future thematic approaches.

This step yields far greater granularity of information and **opens the possibility to add additional layers of information to the identified activities or topics, such as supplementing with geospatial location data** to further refine the classifications. It also means that thematic identification of an investment universe need not be as fully descriptive or prescriptive at the outset, with a full semantic taxonomy. **The ability to relax the specification criteria to search widely across a large corpus in an initial filter also lends the technique to identifying other themes that are ambiguous, nuanced and emerging.**

These additional iterative steps are now possible compared with Version 1.0 due largely to significant improvements in LLM capabilities, which are available at a fraction of the cost compared to two years ago. In Version 2.0, we vastly expanded the information analyzed — increasing from roughly 1,000 tokens per company based on abridged business descriptions to about 900,000 tokens per company drawn from disclosure documents and company websites. **Despite this substantial expansion in data and the addition of post-processing steps, the total time and cost of the analysis remain significantly lower** (if applied to the same universe of companies).

Limitations and additional considerations

While our analysis identifies revenue-generating activities across sectors and companies, it does not quantify how much revenue is associated with each resilience-enabling product.

For many listed companies, revenue from any one resilience-enabling product remains modest, reflecting both the early stage of the markets and the diversified revenue bases of large firms. This does not, however, diminish their relevance or future growth opportunities relative to more mature markets. By linking products to specific hazards and systems needs, investors can more systematically project the future needs and size the trajectory of market demand for relevant resilience-enabling products.

Spillover effects

For climate-focused investors, especially large, global universal owners, an important consideration when seeking exposure to adaptation and resilience as a growth theme is the system-wide implications of a company's resilience-enabling product.

Maladaptation refers to adaptation actions that unintentionally increase vulnerability to climate risks or create new risks, rather than reducing overall exposure. The IPCC notes that such outcomes can arise when adaptation measures shift risk to other populations or systems, reinforce existing inequalities, or lead to higher long-term impacts.[43] Examples include infrastructure that transfers risk elsewhere (e.g., seawalls that deflect floodwaters onto neighboring communities), or adopting solutions that increase greenhouse gas emissions (such as air-conditioning) or exacerbate social inequities (e.g., flood-resilient upgrades that raise property values and price out low income residents).

At the same time, resilience-enhancing products can generate positive externalities when using them produces wider benefits beyond addressing the intended need. To date, positive spillovers have been noted for public investments but less so for private actions to improve resilience.[44]

Yet many resilience-enhancing commercial products, if adopted at scale, could contribute to community-wide resilience.

- For example, heat insulation and cool-roof coatings reduce air conditioning costs and lower energy bills for the property owner. When adopted at scale across an urban area, they can contribute to lowering ambient temperatures in the surrounding neighborhood which benefit pedestrians, outdoor workers, and residents in nearby buildings, reducing urban heat island effects. In addition, the reduced energy usage has the co-benefit of contributing to climate mitigation.
- Similarly, urban drainage systems like bioswales and permeable surfaces installed in housing developments aim primarily to manage flood risk within the site boundary. The reduced surface water runoff, however, can benefit the whole drainage system and downstream communities.

Sustainability profile

Depending on the objective of investors, insight into the sustainability profile of companies offering resilience-enabling products may be one important consideration. To support investors aiming to align with EU Sustainable Finance Disclosure Regulation or the EU Taxonomy, for example, we applied MSCI's do-no-significant harm (DNSH) screen and found that 80% of the companies offering resilience-enabling products align with the EU Taxonomy's DNSH and Minimum Social Safeguards criteria.[45] A quarter of companies generating revenues from resilience-enabling products, 283 companies in our analysis, meet the criteria for inclusion in MSCI's Climate Paris Aligned PAB Index, based on data as of Feb. 28, 2026 (Appendix 5).

Conclusion

The analysis makes a straightforward case: Climate adaptation and resilience is no longer a marginal theme in the universe of listed equities. It is a factor in how companies manage their operations and how they generate revenue, even where that is not yet visible in conventional financial analysis.

Our finding that 89% of companies show evidence of at least one hazard-specific resilience activity in their risk management is consistent with what we found in the MSCI Institute's Corporate Resilience Survey, in which companies across exposed sectors reported investing in a mix of engineering, digital, and nature-based measures to strengthen their resilience to extreme weather. The gap we observe between the share of companies investing in their own operational resilience and the smaller share generating revenues from resilience-enabling products also echoes a pattern surfaced in that study: companies are more engaged in protecting their own operations than in explicitly framing their product lines as resilience-enhancing for their customers.

Our Institute's study on the insurance sector's response to physical risks adds a further dimension, with insurers describing efforts to price physical risk in their underwriting, and identifying new revenue opportunities through climate advisory and risk consulting services. Across these research streams, a consistent picture emerges of companies recognizing and responding to physical climate risk, but doing so in ways that are not yet fully legible to investors relying on standardized disclosures nor easily assessed for effectiveness.

Adaptation and the transition investment playbook

Investments in advancing the energy transition have dominated climate finance. That primacy is appropriate. Decarbonization remains fundamental to limiting the physical risks that adaptation seeks to manage**. Investing in adaptation and resilience is not a concession that mitigation has failed.** It is both a pragmatic recognition of already-locked-in warming and a **responsibility of capital stewardship** in an era of intensifying physical hazards, regardless of the emissions trajectory from here.

That said, adaptation presents investors with a genuinely different analytical challenge than transition finance. The transition has benefited from a decade of regulatory and standard-setting efforts to define what counts as green, to calculate emissions, and to project decarbonization grounded in science-based transition pathways. Those definitions, while imperfect and ever improving, have yielded far greater transparency for investors. According to our Institute's Transition Finance Tracker, 79% of listed companies now disclose their emissions, 60% have decarbonization targets and many are developing transition plans giving investors a workable map that has catalyzed increased flows to climate-themed investments. It is natural to reach for that same playbook for adaptation: define eligible activities, mandate or encourage standardized disclosure, and let capital flow accordingly.

Our findings suggest that the picture is more nuanced. On one reading, the gap between what companies are doing and what appears in structured disclosures can be an argument for better, more standardized reporting. If most listed companies already have identifiable resilience activities, the disclosure burden of reporting them should not be prohibitive, and standardized disclosure would give investors a more accessible signal. On another reading, the analysis implies that **investors are already benefitting from improved disclosures** on climate and broader sustainability issues. The information on adaptation and resilience reside in pockets of that public disclosure. The analytical challenge is to extract and interpret it to reflect the complexity of the physical risk challenges.

In an era of faster and more volatile market cycles, **applying new analytical techniques to surface relevant information helps address the inherent time lag in disclosures that are by definition backward-looking**, bringing greater timeliness to investment signals. For adaptation and resilience specifically, this forward-looking capability is especially valuable given the highly localized nature of physical risk. The intersection of a company's specific assets, operations, and supply chains with dozens of physical hazards whose frequency and intensity vary dramatically by precise location means that enterprise-level disclosure, though critical to evidencing strong risk governance, captures only part of the picture. A methodology designed to extract and interpret the more granular, asset- and hazard-specific information embedded in public disclosures can equip investors to identify where material risks actually concentrate and where the most relevant resilience-enhancing investments are being made or still need to be made.

What this means for investors

Three implications follow.

1. The opportunity is larger and more accessible than conventional frameworks suggest. It is present across the publicly listed universe, in every sector, against every major hazard.

2.Seeing the opportunity requires better tools. Our agentic retrieval-augmented generation pipeline methodology, processing roughly 900,000 tokens of information per company, demonstrates that the signal is there to be found, but only with an approach capable of extracting it systematically and with the rigor required for investment-grade analysis.

3. Adaptation exposure is broadly compatible with other investor objectives: 80% of companies with identified resilience product offerings meet EU Taxonomy DNSH criteria; 42% of the constituents of MSCI's Climate Paris Aligned PAB Index had identifiable resilience revenue activities, as of Feb. 28, 2026.

As physical risks escalate, companies are being prompted to act, investing to protect their people, assets, and supply chains. **They are playing catch-up, working to close the gap between growing exposures and the resilience measures already warranted.**

Where companies are investing, and where they still need to, often traces the contours of broader societal vulnerabilities, pointing to intersections of private and public interest that matter for the society-wide adaptation gap. But there is no avoiding the underlying imperative. **The need to build resilience is accelerating, creating real and growing market opportunity that may not be welcomed but is, in every sense, unavoidable.**

Appendices

Appendix 1: Could market mechanisms fill the adaptation gap?

Multiple assessments have highlighted a persistent and widening adaptation gap, defined as the difference between what is needed to build resilience and what is currently financed and implemented.

The UN's periodic assessment of adaptation needs finds that adaptation planning and implementation are progressing too slowly relative to the scale of climate impacts, and the financing falls far short of what is required.[46] While adaptation measures are increasingly seen as economically justified on a cost-benefit basis, investment levels remain well below what is needed to close existing protection gaps.[47]

A range of structural barriers contribute to the persistent shortfall in adaptation finance. Many adaptation activities, such as flood protection, coastal defenses and early-warning systems, are public goods or community-level systems. These account for roughly three-quarters of global adaptation efforts and have historically relied heavily on increasingly constrained government budgets.[48]

Debt burdens in vulnerable developing countries further reduce fiscal space for resilience investments and raise the hurdle for bond structures that governments in those countries fear could increase the burden. In addition, the benefits of investing in resilience, such as avoided damages or improved resilience, are often public, long-term and difficult to monetize, weakening the case for private-sector capital. Investors under a fiduciary obligation to seek market returns to meet future liabilities typically require a clearer path to profitability than most adaptation projects can provide.

In this context, companies' activities to protect their own assets, people and operations can be an important contribution to avoid exacerbating the widening gap and rising burden on government budgets. With improved knowledge and analytics, companies' awareness of how community-wide vulnerabilities impact their operations and supply chains could catalyze engagement with community-level investments to protect against rising hazards.

Appendix 2: Organizations that have sized the commercial market for adaptation and resilience products and services

- **GIC and Bain & Company** have analyzed the emerging investment potential in climate adaptation by estimating the total addressable market and investment value of select adaptation solutions. Their report, "Sizing the Climate Adaptation Opportunity," highlights the private sector's role in scaling adaptation solutions across established and emerging technologies, finding robust opportunity across different climate scenarios.
- In "Advancing adaptation mapping costs from cooling to coastal defenses," the **McKinsey Global Institute** uses geospatial analysis to examine the potential costs of climate adaptation through 2050. Its report evaluates 20 measures addressing heat, wildfires, drought and flooding, offering insight into the costs and benefits of building long-term resilience.
- In "The Private Equity Opportunity in Climate Adaptation and Resilience," **Temasek and BCG** map the emerging investment landscape in climate adaptation and resilience for private-market investors. Their map clarifies the market's size, competitive dynamics and commercial potential across six key solution areas: climate intelligence, resilient building materials, flood defenses, adapted agriculture, water efficiency, and emergency medical products.

Appendix 3: Frameworks referenced when classifying companies' revenue from resilience-enabling products

Our classification of resilience-enabling products and services draws on several established frameworks.

UN Intergovernmental Panel on Climate Change (IPCC)

The IPCC provides the foundational scientific framework for climate risk and adaptation. Its fifth and sixth assessment reports (AR5 and AR6) cover categories and examples of adaptation options. These include engineering and the built environment, ecosystem-based and social systems; categories that we reference in system needs.

Organization for Economic Cooperation and Development (OECD)

The OECD's Climate Adaptation Investment Framework is designed to help mobilize investment for climate adaptation and strengthening resilience to the impacts of climate change. The framework's policy recommendations reference insurance as a building block to promote the adoption of solutions for managing climate-related risks that we reference as delivery channels for building resilience.

The European Union Climate-ADAPT platform

A knowledge base for adaptation options, tools, case studies and sector frameworks. Climate-ADAPT adaptation options are classified under a framework that countries in the European Economic Area use to report climate adaptation actions. Sectoral categorization of adaptation options are bucketed by nature-based solutions, urban resilience, and health and social vulnerability, which are consolidated under categories we reference for system needs.

The Adaptation SME Accelerator Program (ASAP) Taxonomy

Developed by the Global Adaptation and Resilience Investment Working Group (GARI) in partnership with the Inter-American Development Bank, IDB Lab and the Global Environment Facility, the taxonomy provides criteria to determine whether a small or medium-sized enterprise (SME) qualifies as an "Adaptation SME" based on its technologies, products and services, while also identifying areas where targeted support is needed to prevent maladaptation and strengthen environmental and social risk management practices. The ASAP taxonomy solution categories include analytics and physical solutions, which we reference as delivery channels for targeting system needs.

We also referenced the GARI Climate Resilience Investments in Solutions Principles (CRISP) framework, the Tailwind Futures adaptation and resilience taxonomy, and the Climate Bonds Initiative's (CBI) resilience taxonomy to validate the alignment of identified adaptation and resilience corporate activities.

Appendix 4: Adaptation-focused corporate philanthropy

In classifying corporate activities into internal risk management or revenue generation, we surfaced a third category of note: adaptation-focused corporate social responsibility or community-directed climate adaptation initiatives.

We found activities like reforestation and afforestation, post-disaster relief, improving water access for communities, disaster shelters and healthcare-access programs among the activities companies are undertaking in the communities and ecosystems where they operate.

Nature-based solutions aimed at building climate resilience in local communities, such as watershed management, afforestation and mangrove restoration, featured most frequently across companies. Post-disaster relief and recovery and disaster preparedness that address multiple physical hazards also featured heavily.

Theme	Types of activities	Relevant hazards	Description
Nature-based solutions	Mangrove & coastal ecosystem restoration	Flood, sea-level rise, cyclone, landslide	Companies plant mangroves to serve as natural barriers against flooding, storm surges, coastal erosion, and sea level rise. Highly cross-functional across multiple hazards. *Company examples: BSE Limited, SDIC power holdings*
	Afforestation & reforestation	Landslide, wildfire, drought, flood	Large-scale tree planting for soil stabilization, erosion control, water retention, and post-fire recovery. Often combined with biodiversity goals. *Company examples: Interglobe Aviation, Norsk Hydro*
Community capacity building	Post-disaster relief & recovery	Cross-sectional	Financial aid, emergency supplies, temporary shelter, and community rebuilding programs. Many companies provide matching donations and partner with NGOs. *Company examples: CITIC Securities Company, Otsuka Holdings Co.*
	Community disaster preparedness	Cross-sectional	Early warning systems, emergency response training, disaster drills, and community-based disaster management. *Company examples: LEG Immobilien SE, PT Sumber Alfaria Trijaya Tbk*
	Emergency response teams & equipment	Cross-sectional	Company-sponsored fire brigades, medical response teams, emergency rescue operations, and equipment donations to local emergency services. *Company examples: Medtronic Public limited, BSE Limited*
Agriculture, water and sanitation-related infrastructure	Water infrastructure & conservation, watershed management and restoration	Cross-sectional	Building wells, reservoirs, water treatment plants, and rainwater harvesting systems. Critical for communities facing water scarcity. Often includes WASH (Water, Sanitation & Hygiene) components. *Company examples: Arca Continental, Kering*
	Climate-resilient agriculture	Drought, heat	Water-efficient irrigation, agrivoltaics, drought-resistant crops, and regenerative farming. Addresses food and water security under changing climate conditions. *Company examples: The Hershey Company, CP Axtra Public Company*
	Healthcare & disease prevention	Cross-sectional	Disease surveillance, vaccine programs, healthcare infrastructure in vulnerable communities. Addresses climate-sensitive health threats like vector-borne diseases and waterborne illness. *Company examples: Dell Technologies, GSK, Microsoft*

Appendix 5: Model iterations and enhancements

	Iteration 1 ACWI Universe subset (100 companies)	Iteration 2 ACWI Universe subset (200 companies)	Iteration 3 ACWI Universe (2312 companies)	Iteration 4 ACWI Universe (2391 companies)
What data sources were used?	Model incorporates publicly disclosed corporate filings such as annual reports and sustainability reports as evidence	Included TavilyAI web scraped sources to supplement official data sources like annual reports and sustainability reports	TavilyAI retrieved sources from unrelated entities that share similar names with target companies	Implemented source exclusion rules for editorial content, podcasts, generic news commentary, and unrelated entities with similar names Enhanced validation to ensure activities are attributed only to target issuer
How do we define our climate hazard taxonomy?	Granular 11 hazard themes occasionally resulted in artificial boundaries between related climate risks Multi-hazard activities (e.g. coastal infrastructure serving multiple purposes) required assignment to single categories	Consolidated to 10 specific hazard categories based on GARI's hazard classification, including the addition of cross-sectional hazard classification for broader activities (e.g. - business continuity planning)	Cross-sectional category coverage does not extend to activities addressing multiple hazards simultaneously Hazard theme of health is not specific to climate related risks	Health as a hazard theme is removed Implemented routing protocol for multi-hazard enabling activities to cross-sectional category
How do we categorize outputs?	Limited ability to distinguish between internal resilience measures and external products/services No categorization of who benefits from the identified activity	Introduced beneficiary classification (customers, communities, own operations, supply chain, workforce) Added scope classification (internal/external) Implemented scope taxonomy (internal/external activities) Some overlap between beneficiary and scope categories required refinement	Refined beneficiary categories for clearer distinctions (own operations, communities, supply chain, workforce) Enhanced scope classification with community and unknown designations (community, external, internal, unknown) Confidence scoring enables effective filtering and prioritization of identified activities Implemented materiality classification (core business/significant/medium/minor) Materiality classifications are unreliable without revenue data, leaving it to the judgement of the LLM	Established categorization framework maintained for consistency Confidence and materiality metrics maintained for activity assessment
How do we ensure correct categorization?	Model successfully identifies adaptation-relevant products and services from corporate disclosures	No changes	Classification criteria for consumer products requires refinement to ensure adaptation focus Enhanced distinction needed between climate mitigation and adaptation activities Comprehensive adaptation relevance explanations for all identified activities	Applied exclusion criteria for generic consumer goods unless explicitly positioned as climate adaptation solutions Implemented adaptation-mitigation decision rule: primary benefit must be physical hazard resilience, not emissions reduction Detailed adaptation relevance descriptions maintained
How do we ensure output richness and clarity?	Product and service descriptions lacked detail and context, making it difficult to assess adaptation relevance Output format contained redundant evidence fields	Enhanced product descriptions with clear explanation of adaptation and resilience relevance Streamlined JSON output structure by removing duplicated evidence Introduced confidence scoring (low/medium/high) to assess classification reliability	Evidence snippets occasionally contained fragmented text requiring manual review	Implemented minimum evidence quality standards Confidence and materiality metrics maintained for activity assessment

Enhancement · New feature · Maintained feature · Development area

Portfolio-building considerations

We assessed the alignment of our set of resilience companies with the EU Taxonomy's DNSH and Minimum Social Safeguards criteria alongside the Paris Agreement Benchmarks.

Appendix 6. Alignment of resilience with Do No Significant Harm, Minimum Social Safeguards criteria and Paris Agreement Benchmarks

	% of companies in each category aligned with EU Taxonomy's DNSH and Minimum Social Safeguards criteria	% of the MSCI Climate Paris PAB Index (673 companies)* aligned with each category
Companies with resilience revenue generating activities	**97%**	**42%**
(1136 companies)	1098 companies	283 companies
Companies with resilience activities in internal risk management	**96%**	**84%**
(2118 companies)	2043 companies	562 companies
Companies with both revenue generating and risk management resilience activities	**97%**	**37%**
(1,033 companies)	999 companies	247 companies
Companies with neither revenue generating or risk management resilience activities	**98%**	**9%**
(170 companies)	166 companies	62 companies

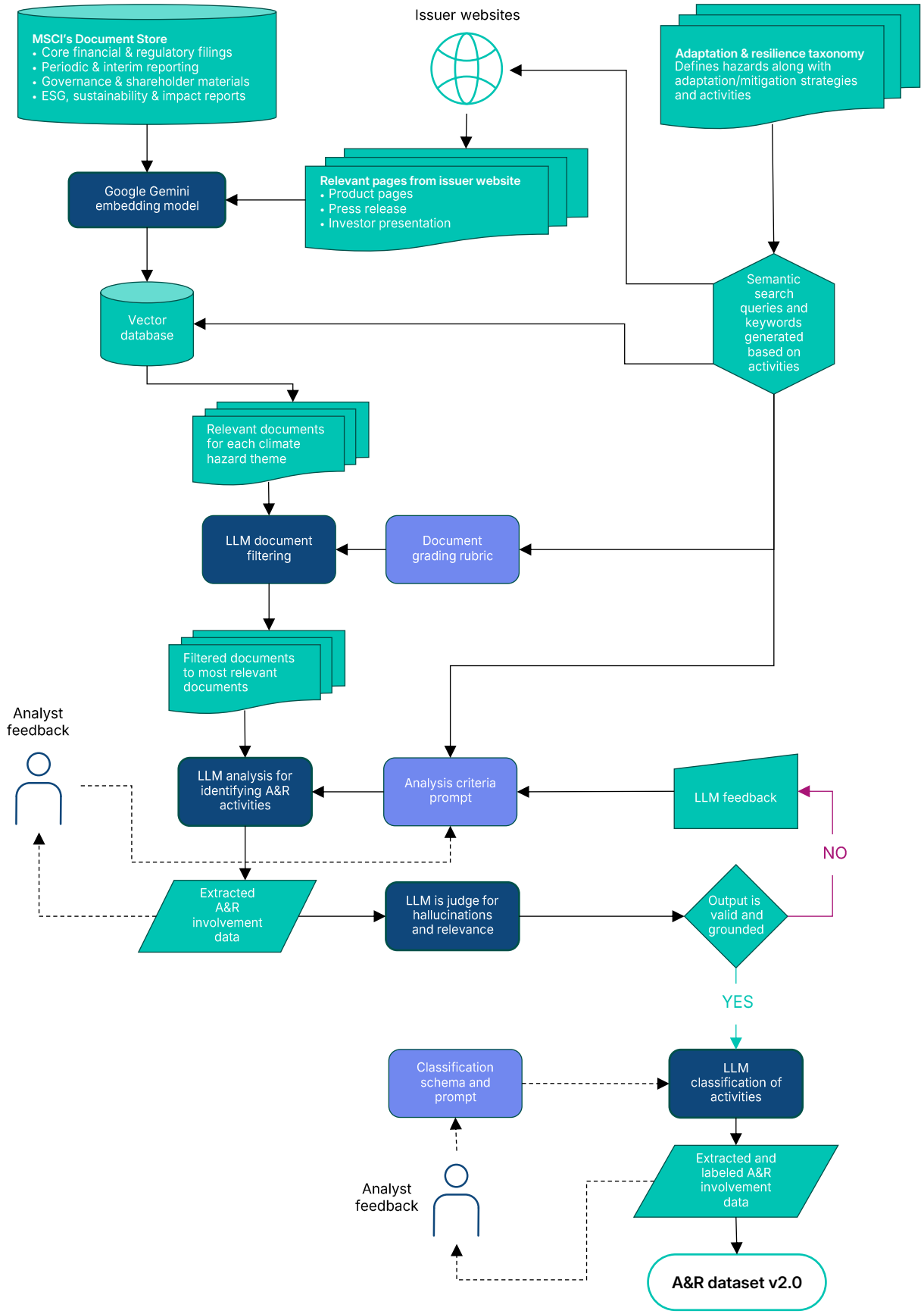
Source: MSCI Sustainability & Climate Research, as of February 2026.
* 1 Alignment with the MSCI Climate Paris Aligned PAB Index (673 constituents, as of Feb. 28, 2026) based on the MSCI ACWI. For more information see MSCI ACWI Climate Paris Aligned PAB Index. We used MSCI's EU Taxonomy DNSH Overall and Minimum Safeguard factors which flag companies for not passing either the DNSH criteria or Minimum Social Safeguards as defined in the MSCI EU Taxonomy Estimated Data Methodology or are flagged for certain MSCI Controversies. Detailed definitions of red and orange controversy flags can be found in the MSCI ESG Controversies Methodology Document.

Appendix 7. GICS sector average Scope 1 and 2 emissions intensity across companies (CO2e tons per USD million sales)

		Companies with external resilience-enabling offerings	Companies with internal resilience-building actions	Companies with both internal actions and external offerings	Companies with neither internal actions or external offerings
	MSCI ACWI	**1136 companies**	**2118 companies**	**1,033 companies**	**170 companies**
Utilities	2365	2099	2331	2099	3789
Energy	659	563	665	558	491
Materials	590	751	600	751	390
Industrials	142	97	152	103	112
Consumer Staples	69	84	70	85	54
Information Technology	58	55	62	58	48
Real Estate	53	55	52	51	39
Consumer Discretionary	51	41	51	41	62
Health Care	41	37	42	38	31
Communication Services	34	47	36	47	20
Financials	5	4	5	4	6

Source: MSCI Institute analysis of company data. Research universe comprises MSCI ACWI Index constituents, as of Jan. 31, 2026.

Appendix 8: Process flows outlining the methodology used in Version 2.0



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