



ALLIANZ COMMERCIAL

Severe convective storms

Trends, impacts, and pathways to resilience

Global Risk Dialogue Commercial **Insights**

commercial.allianz.com

Severe convective storms: the emerging threat businesses overlook at their peril

- Severe convective storms (SCS) have risen up the risk-management agenda as losses exceed long-term averages and global insured losses from SCS for the last three years have totaled \$208bn in today's dollars.
- Multiple factors are expanding the risk landscape, including urbanization, aging infrastructure and assets, inflationary pressures, outdated building codes, supply chain issues, and the degradation of ecosystems.
- Hailstorms are a major cause of insurance claims from SCS, with damage to aircraft and solar panels among the most expensive drivers in recent years, while the pharmaceuticals / cosmetics and automotive industries are among those which have been impacted by significant damage events, according to **Allianz Commercial** analysis.
- Artificial intelligence is refining natural hazard models and supporting smarter, evidence-based resilience strategies that evolve with changing weather patterns.

Whether it's devastating winds, a tornado, or hailstones that damage manufacturing and production sites, severe convective storms – or SCS – can strike with little warning, causing localized destruction so significant it belies their status as a 'secondary peril'. In recent years, cumulative losses from SCS have exceeded those from hurricanes, a 'primary peril' – a shift businesses must now respond to, bolstering their operational resilience to withstand the destructive power of such events in the future.

While climate change may play a part in higher losses, the exposure landscape has expanded in many other ways around the world. Urbanization, development into hazard-prone regions, and aging infrastructure are all contributing to the impact of SCS, with inflation, supply chain disruption, and skills shortages adding to the financial burden.

Risk analysts and climate experts at **Allianz Commercial** are able to support clients as they build resilience, using the latest modeling technology to generate granular assessments of vulnerability. Our data-driven platform, Climate Adaptation and Resilience Services (CAReS), is one such example, enabling clients to assess their exposure to 12 climate perils over different timeframes, including hail. We hope the insights in this report serve as a valuable resource for businesses as they adapt their storm preparedness strategies to evolve with shifting weather patterns and remain resilient in the future.



Thomas Lillelund
CEO
Allianz Commercial

Risk Q&A

In the first of a new series, **Allianz Commercial** experts take a look at a topical issue of concern, starting with the escalating threat of severe convective storms, which have caused \$200bn+ in insured losses globally in the last three years.

What are severe convective storms?

From thunderclaps and downpours to twisters and hailstones the size of tennis balls, severe convective storms (SCS) can manifest in dramatic and destructive ways.

A complex cocktail of meteorological factors can lead to their formation, including the rapid ascent of warm moist air into cooler air higher up, and shifts in wind speed or direction, with violently unstable weather the potential result.

Unlike regular thunderstorms, SCS must exhibit at least one of the following characteristics: winds exceeding 100kph (58mph), hailstones that are at least 2.5cm/1-in in diameter, or a tornado. SCS can produce a variety of weather patterns including straight-line winds, derechos, microbursts and macrobursts (see panel).



Photo: NOAA Weather in Focus Photo Contest 2015 / Ken Engquist

Why are SCS rising up the risk agenda?

Escalating SCS losses have come to the attention of risk managers at businesses in affected regions. In the annual **Allianz Risk Barometer** survey of 3,338 risk management experts from almost 100 countries, natural catastrophes were ranked number five in the top 10 global risks of concern for 2026.

Over the past three decades, the frequency and intensity of extreme weather events, including SCS, have led to a dramatic increase in insured losses for natural catastrophes, exceeding **\$100bn annually since 2020**¹.

SCS are now a significant annual loss driver for the industry. Global insured losses from SCS comprised nearly half of the total insured natural catastrophe losses in 2025 and **amounted to \$60bn**², according to Gallagher Re. SCS events in 2023, 2024 and 2025 cost global insurers a combined \$208bn in today's dollars, 85% of which has occurred in the US.

Losses from SCS are exceeding long-term averages and in 2025 they were **1.3x times as high as the 10-year average**³. Insured losses from US SCS in 2025 were 1.4x as high as the average for the 10 years from 2015-2024, which is \$36bn. A large central band of the US, comprising states from Texas to South Dakota and Minnesota, is so afflicted by storms it has been nicknamed Tornado Alley.

In Europe, over half of the increase in weather-related insured losses is due to SCS, which are growing at an estimated annual growth **rate of 10%, according to Swiss Re**⁴.

What makes SCS so damaging?

Unlike hurricanes, SCS events can strike with little warning, causing substantial localized

damage and knock-on effects like flash flooding. Between January and September 2025, the US experienced 39 major SCS events, each averaging [more than \\$1bn in insured losses](#)⁵.

While tornadoes may grab the headlines, the greatest SCS losses are caused by hailstorms, with estimates indicating hail accounts for as much as 50%-80% of all SCS losses. Although the US is a hotspot for these losses, other regions have faced substantial hailstorm damages. A hailstorm in Italy in 2023 incurred \$6.3bn in insured losses (and a record-breaking hailstone measuring 19cm/7.5in), while in 2022 an outbreak of hailstorms in France resulted in [more than \\$4.5bn insured losses](#)⁶. A hailstorm in Calgary, Canada, in August 2024, incurred [insured losses of \\$2.4bn](#)⁷.

“Severe convective storms have traditionally been classed as a ‘secondary peril’, yet this categorization increasingly fails to reflect their true impact,” says **Michael Bruch, Global Head of Risk Consulting Advisory Services at Allianz Commercial**. *“Recent years have shown that cumulative SCS losses can exceed those from*



While tornadoes may grab the headlines, the greatest SCS losses are caused by hailstorms

well-established primary perils such as hurricanes. This shift underlines the need for businesses not only to understand the changing risk landscape but also to strengthen their operational resilience to withstand events that are both frequent and highly localized.

“For businesses, understanding the wider risk landscape is important, but so is recognizing the particular vulnerabilities of their own sites and operations. Building resilience increasingly depends upon combining this local insight with proactive measures that reduce both physical damage and operational disruption.”

The many faces of severe convective storms

Several weather patterns can characterize a severe convective storm (SCS) and all of them are capable of wreaking significant damage or disruption.



Straight-line winds: These powerful winds are not associated with rotation (unlike tornadoes) but they can reach speeds of 160kph (100mph) and produce a damage path that extends for hundreds of miles. They can fell trees, damage buildings, and bring down powerlines. Straight-line winds can be further broken down into short-lived **microbursts**, larger **macrobursts**, and **derechos**, which are widespread, long-lived windstorms.



Tornadoes: A tornado is a violently rotating column of air capable of producing wind speeds exceeding 400kph (250mph) and causing widespread devastation. Tornadoes can cause fatalities and property damage, uproot trees, and propel debris. Characterized by sudden onset and unpredictable paths, strong tornadoes can produce a damage pathway up to 1.6km (1 mile) wide and over 160km (100 miles) long.



Hail: Hailstones vary in size from small pellets to stones the size of grapefruits. Small hailstones (up to 5mm/0.2in) cause little or no damage, while medium-sized hailstones (5mm-2.5cm/0.2in-1in) can harm crops, fruit, and glass. The accumulation of smaller hailstones can cause roof or building collapse if building designs cannot withstand the extra load. Larger hailstones (3cm-5cm/1.2in-2in) can break roofing materials and damage vehicles, and extremely large hail (7.5cm-10cm/3in-4in) can inflict severe structural damage, including to aircraft and buildings. A baseball-sized hailstone can carry the same kinetic energy as a Major League ‘fastball’, reaching speeds of up to 160kph (100mph) or more. Even bigger hailstones, the size of softballs or grapefruits, can smash roofs and cars with the impact force of a sledgehammer.



Additional consequences: Hail and tornadoes are the most destructive elements of SCS, but additional consequences include thunderstorms, lightning strikes, heavy rainfall, and flash flooding.

What is driving the increase in SCS losses?

Inflation, urbanization, aging infrastructure, and unpredictable weather systems are all intensifying losses from SCS events.

Several atmospheric indicators suggest a warming climate may be increasing instability and moisture availability in some regions, according to **Daniel Muller, Emerging Risks and Trends Manager at Allianz Commercial**: *“However, the scientific community still lacks long, homogeneous observational datasets to confirm a robust causal link between climate change and the frequency of severe convective storms. What we can say with confidence is that the exposure landscape has expanded dramatically, and this remains the dominant driver of rising losses.”*

SCS exposures have been intensified by population growth and development into hazard-prone areas. Rapid urbanization, aging infrastructure and assets, building codes out of step with current exposures, and the degradation of natural ecosystems can all heighten the risk of losses.

It is estimated that Oklahoma City, which is located in the center of Tornado Alley, saw building stock increase by 40% and the developed land area of the city by 60% between 1990 and 2025⁸.

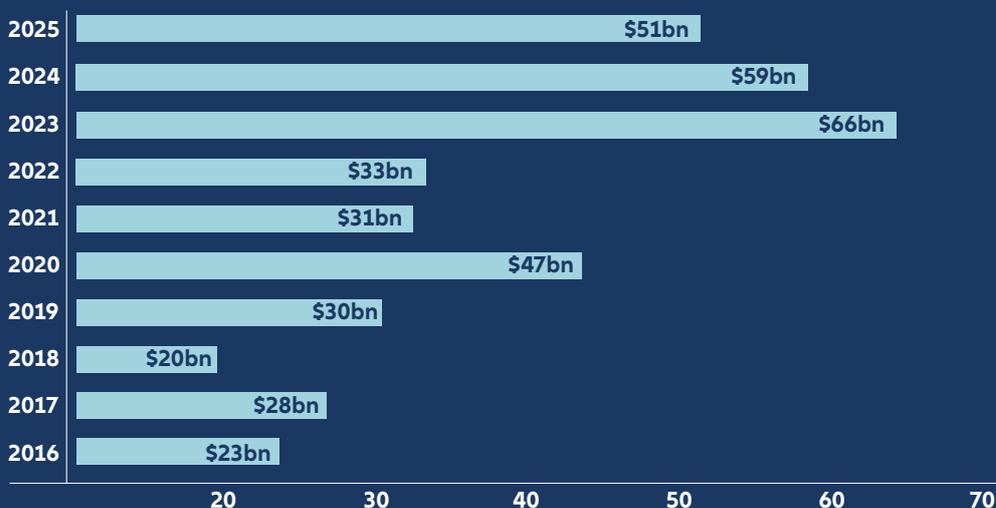
At the same time as built environments have expanded, enhanced detection and reporting systems, including AI-based modeling, have improved the documentation of such events, which has influenced trends in frequency.

Rising inflation and expanding footprints

The financial impact of SCS has intensified due to a cocktail of factors. Inflation has driven up the costs of rebuilding and repairing property, an increase that is compounded by supply chain disruptions such as shortages in skilled labor and materials.

10 years of SCS losses in the US

This chart shows the last 10 years of actual incurred losses adjusted to 2025 US dollars. The loss average for the years 2015-2024 was \$35.5bn.



Source: Gallagher Re⁹



The increasingly sophisticated nature of industrial and commercial buildings makes them highly vulnerable to water damage

These challenges have also increased the expenses related to business interruption. A clear example of inflation's effect can be seen in the case of roof replacements, which are a significant factor in insured losses from SCS. Since the year 2000, the cost of asphalt roof replacements has [reportedly surged by 250%](#), with costs rising 45% in the last five years alone¹⁰.

"In addition, the increasingly sophisticated nature of industrial and commercial buildings, housing costly machinery and equipment, makes them highly vulnerable to water damage," says **Andrew Higgins, Senior Regional Technical and Expertise Manager, Risk Consulting, Allianz Commercial:** *"Water ingress through a damaged roof could lead*

to significant operational disruptions and ultimately business interruption losses. As the digital economy grows, we are also seeing the buildout of data centers at great speed, often in remote areas prone to SCS, as well as a rise in the number of warehouses being constructed in at-risk regions. These facilities can have a vast footprint, housing valuable inventory and equipment."

The growing prevalence of solar farms and rooftop photovoltaic systems is another loss driver – in March 2024, thousands of solar panels at a 350MW facility in Texas were damaged by hailstones, some of them reportedly the size of golf balls.

Roofs and roof-mounted equipment, such as heating, ventilation or air-conditioning (HVAC) units, solar panels, and skylights, are the most commonly damaged parts of a building when hailstorms or high winds strike. The largest losses usually arise from leaks on a roof that result in water damage in premises below, or a power outage that causes business interruption. Roof damage or leaks are often difficult to detect, and if they are not addressed, they can result in further damage.

As climate change influences weather patterns, the frequency and intensity of hailstorms may

increase, leading to more frequent claims and heightened risk exposure for insurers. In the US, for example, scientists have noted that drier conditions in the Great Plains have shifted Tornado Alley eastwards into the south-eastern states, which have seen an increase in the number of days with [conditions favorable to tornadoes](#)¹¹. A warmer

climate with stronger updrafts is expected to produce more of the largest hailstones, with the most damaging projected to increase by anything from [15%-75% in frequency](#)¹², depending on climate scenarios in the US.

Hail damage: sectors most at risk

Hail accounts for as much as 80% of all losses from severe convective storms, and some industries can have greater exposures than others.



Agriculture (crops, greenhouses, nurseries): Even small hailstones can destroy fruit or plants or erode soil, resulting in supply shortages, higher prices and reduced product quality.



Automotive (dealerships, large outdoor car parks at ports, automotive plants): Vehicles are highly susceptible to glass, plastic and body damage.



Aviation (airplanes, airports and aircraft maintenance): Aircraft bodywork is vulnerable to large hail, with high repair costs. Hail and water damage to buildings can cause property losses and business interruption.



Food industry: Roofs and cold storage can be damaged by hail, breaching hygiene regulations and causing production downtime.



Manufacturing (light industrial buildings): Some roof types are particularly prone to hail damage, which can result in water ingress and damage to stock and inventory, with consequent business interruption, repair costs, and worker safety risks.



Retail and other non-manufacturing sites (shopping centers with skylights, hotels, schools): Glass facades and skylights are vulnerable to breakage and water ingress, which can damage high-value interiors and cooling systems, leading to customer safety risks, product loss, revenue decline, and liability claims.



Solar installations: Severe hail is the greater contributor to insured losses on solar photovoltaic systems worldwide.



Technology and data centers: Hail can cause roof leaks, leading to cooling system failure, IT outages, data loss, and reputational damage.



Warehousing and logistics: Large roofs with metal or plastic sheeting are prone to denting or collapse, and vehicles and fleets can also be damaged by hail, resulting in supply chain disruption, delivery delays, and high repair costs.

Mapping the losses

The devastating impacts of SCS have been felt in destinations around the world, from the plains of Tornado Alley in the US to the mountains of northern Italy.

Surprisingly, the UK has the highest number of tornadoes annually per land size (33 reported annually on average), but the US experiences the highest number overall, with over 1,000 tornadoes reported each year since 1990. Canada reports the second highest number, at around 80-100 each year, and Australia experiences around 20 tornadoes annually, though the true number is likely considerably higher.

The central US, known as Hail Alley, especially the region extending from Texas through Oklahoma, Kansas, and into Nebraska and Colorado, is known for frequent and severe hailstorms. In Canada, southern Alberta is particularly susceptible.

The frequency of severe hailstorms is rising more rapidly in Europe than anywhere else, according to a [recent study](#)¹³, a trend the researchers believe is linked to climate change. Hotspots occur close to mountain ranges, particularly in north-eastern Spain, south-western France, and northern Italy.



The frequency of severe hailstorms is rising more rapidly in Europe than anywhere else

In Asia, significant hailstorms are experienced in northern India and Bangladesh, particularly during the pre-monsoon season, while Japan – traditionally associated with perils such as typhoons and earthquakes – suffered substantial hail losses from 2022-2024. Eastern Australia, such as Sydney and the surrounding area, also experiences hailstorms.

Latin American centers of hail activity include Paraguay, north-eastern Argentina, and southern Brazil. South Africa's Gaunteng Province is known for frequent hailstorms in the spring and summer.



Photo: Ben R / Adobe Stock

SCS events around the world

The map shows some of the notable storms from the last 15 years, with insured losses from just 11 events totalling in excess of \$50bn.

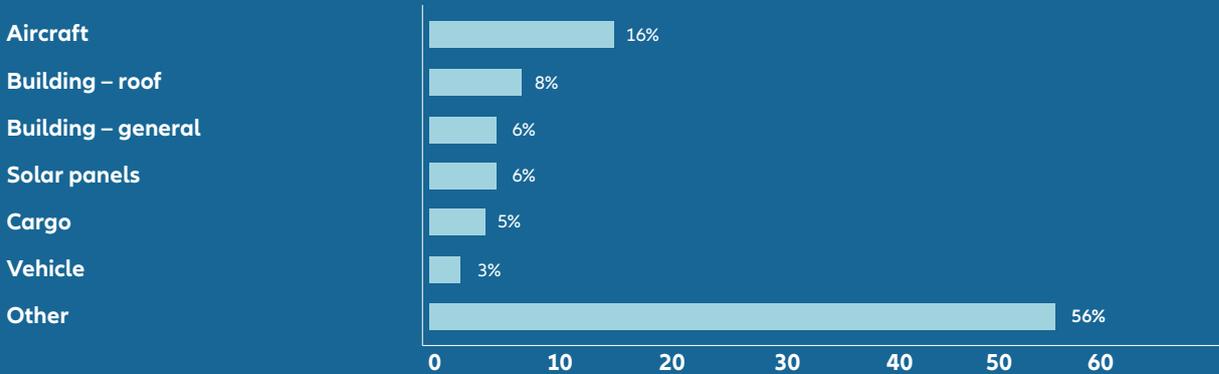


Sources: Aon, Atmospheric Research, Catastrophe Indices and Quantification Inc., Gallagher Re, Guy Carpenter, Insurance Information Institute, PERILS

Hailstorm insurance claims analysis

Top 6 damaged assets / property according to value of claims, expressed as % (2016-2025)

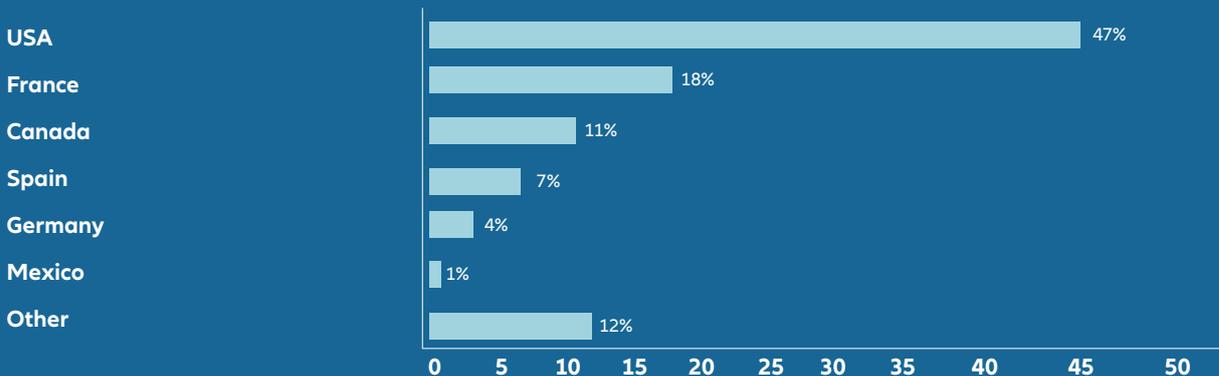
Damage to aircraft is the most expensive cause of hailstorm claims, accounting for 16% of the value of claims analyzed. Solar panel damage drives costly claims, while vehicle damage is a leader in claims frequency.



Based on analysis of 3,013 claims with a total value of approximately €2.2bn (based on the 100% loss event total, including the shares of other insurers in addition to Allianz Commercial).

Top 6 loss locations according to value of claims, expressed in % (2016-2025)

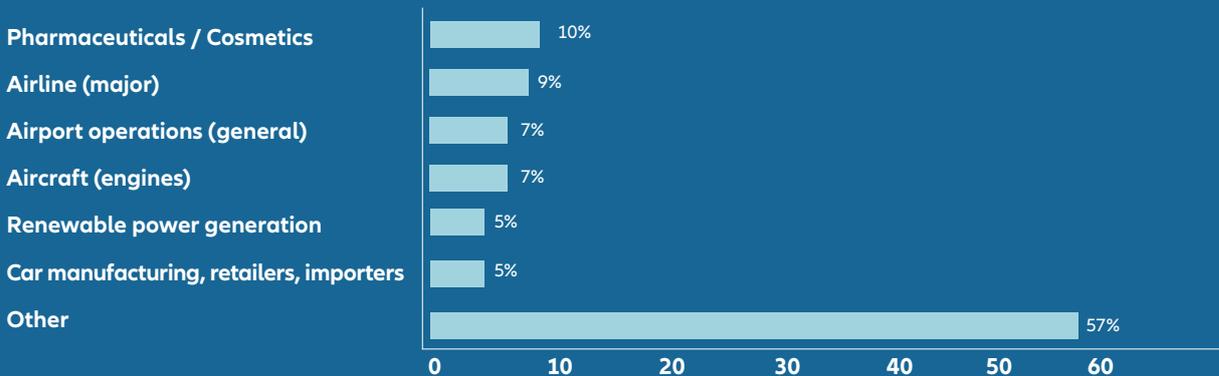
The USA accounts for almost half of the value of hailstorm claims analyzed. Collectively, the top six loss locations account for close to 90% of the hailstorm claims analyzed in the dataset.



Based on analysis of 3,013 claims with a total value of approximately €2.2bn (based on the 100% loss event total, including the shares of other insurers in addition to Allianz Commercial).

Top 6 industries impacted by hail damage according to value of claims, expressed in % (2016-2025)

Accounting for almost a quarter of the value of claims analyzed, a number of different areas of the aviation sector have suffered hail damage.



Based on analysis of 3,013 claims with a total value of approximately €2.2bn (based on the 100% loss event total, including the shares of other insurers in addition to Allianz Commercial). Analyzed claims in the dataset are from January 1, 2016 to December 31, 2025.

Source: Allianz Commercial

*“Our claims data tells a clear story: hail-related losses are not only growing in frequency but also shifting in character,” says **Nikolaus Breitenberger**, Global Head of Claims Intelligence and Core Business Solutions, Risk Consulting, Allianz Commercial. “What was once considered routine property damage now increasingly involves high-value assets, from aircraft fleets to solar installations, driving claim severity to levels that demand a fundamentally different response. At **Allianz Commercial**, we are leveraging advanced claims intelligence and AI-driven analytics to identify emerging loss patterns earlier, enabling our clients and underwriters to move from reactive loss management to proactive, evidence-based resilience strategies that keep pace with a rapidly evolving risk landscape.”*

Economic impact: the rising cost of small-scale extremes

The cumulative effect of individual SCS events can have significant economic consequences, in particular from the localized destruction they often leave in their wake.

The limited spatial footprint and brief duration of SCS belie their capacity for concentrated destruction, particularly in densely populated regions, making them an increasingly important driver of economic and insured losses.

Hail drives most losses from SCS, with damaging winds the second major loss driver, mainly tornadoes and derechos. Tornadoes cause highly localized but intense destruction, while derechos produce broader damage through sustained, powerful straight-line winds.

Severe hailstorms primarily affect buildings and vehicles, which account for the bulk of insured losses. In Switzerland, for example, building claims alone reached around €1.6bn over two decades, with 90% of damages concentrated in just a few extreme events. Meanwhile, a single event in June 2021 caused around [€420mn of damage in one canton](#)¹⁴. Losses are often highly localized, as hail typically falls in narrow swaths only a few kilometres wide, creating sharp spatial spikes in damages.

A recent study in the US over the period 1969–2023 suggests that both tornadoes and severe wind events exert measurable economic effects at the local level. On average, a damaging wind event reduced country-level income growth by around 0.16–0.23%, while tornadoes were associated with slightly larger declines of approximately 0.21–0.23%. In monetary terms, this corresponds to one-off income losses of approximately \$5.6mn for damaging winds and [\\$6.3mn for tornadoes](#)¹⁵.

Tornadoes generate about 20% higher economic losses than non-rotating severe wind events. These impacts are primarily driven by the destruction of physical capital and infrastructure, which disrupts production and local labor markets, alongside indirect effects such as business interruption,



Tornadoes generate about 20% higher economic losses than non-rotating severe wind events

transport disruptions and household financial strain, especially where insurance coverage is limited.

*“The economic significance of severe convective storms lies not only in the scale of individual events, but in their cumulative effect,” says **Hazem Krichene, Senior Climate Economist at Allianz Research**. “Frequent, localized shocks to capital stock and income growth can weigh on regional productivity, strain insurance systems and gradually reshape risk pricing and investment decisions. This calls for a stronger focus on risk-informed investment – from resilient building standards to better insurance penetration and forward-looking climate adaptation policies – to contain long-term economic drag.”*

Adaptation to SCS largely hinges on reducing structural vulnerability, especially to hail. Roofs and facades are highly exposed, and more stringent building codes can materially reduce losses – by 12–28% for hail and over 30% for tornadoes.

In addition, the rapid expansion of solar infrastructure introduces new vulnerabilities. Solar panels are vulnerable to large hail, including damage that may not be immediately visible but can result in substantial insurance claims from single events. As solar capacity expands, strengthening resilience standards and installation quality will be increasingly important.

Ride the storm: effective mitigation strategies

SCS can be unpredictable, but if businesses secure their facilities and take preventive measures, they can mitigate the impact on their operations and assets if a storm strikes.



Mitigation measures for withstanding SCS with minimal damage will vary depending on the nature of a business's activities and the local weather systems it is subject to.

"A data center in Tornado Alley will need different resilience strategies than an automotive dealership

*in hail-prone northern Spain," says **Andrea Albertini, Senior Risk Consultant at Allianz Commercial.** "Yet both types of business face a heightening risk of severe weather events that are becoming increasingly volatile. These events can strike quickly and be highly localized, with knock-on effects like flash flooding, or afflict a wider*



Photo: by-studio / Adobe Stock

Seven steps to build resilience

While each business will require unique strategies, here are seven essential steps to enhance storm resilience.

- 1 Start by identifying your facilities' vulnerabilities to storm damage as well as the vulnerabilities across your assets, operations and supply chains. This will depend on what is most exposed – e.g. an automotive manufacturing business might require specialist hail nets for vehicle storage yards.
- 2 Develop a written SCS emergency response plan, assign roles and responsibilities and provide training annually. Designate someone to monitor the weather using a reliable source so they can keep key personnel updated.
- 3 Gather emergency supplies and equipment for salvage and clean-up operations; keep a list of vendors, contractors, and emergency services to expedite resuming operations after a storm.
- 4 Draw up a business continuity plan and review it annually.
- 5 Protect the building 'envelope' (the physical boundaries between the interior and exterior, such as the roof, windows, and doors) using measures such as impact-resistant doors and glass, installing shields on skylights, providing additional securement of rooftop equipment or repairing the roof covering (see panel).
- 6 Assess the reliability of your electricity supply and critical utilities and put in place backup systems or alternative power sources in case of outages.
- 7 Identify trees or branches that could fall or damage buildings, equipment or powerlines in the event of a SCS.



As weather patterns become more volatile, strengthening resilience is no longer optional – it is a fundamental part of ensuring long-term business stability

area, producing wind damage that extends for hundreds of miles, undermining the broader economy and community resilience."

As well as taking into account a business's specific vulnerabilities, **Albertini** adds that any mitigation strategy needs to be responsive to changes in weather patterns and future risks: *"It is vital for businesses to understand their local weather patterns, or consult with risk consultants familiar with the local geography, to assess their areas of weakness and develop an up-to-date emergency response plan."*

Scenario analysis is essential for assessing risk exposure and building resilience to climate perils because it helps organizations understand how different climate futures could affect their assets, operations, and long-term performance. By examining a range of hazard conditions instead of relying only on past patterns, scenario analysis reveals hidden vulnerabilities, identifies possible tipping points, and shows how risks may change over time. This forward-looking approach strengthens decision making by allowing organizations to test adaptation options, focus investments, and design strategies that remain effective under multiple future conditions. Tools such as **Allianz Commercial's** CARES (see page 15) help map how exposure to climate perils evolves across various time horizons and climate scenarios.

Vigilance remains vital

In the **Allianz Risk Barometer 2026**, respondents identified business interruption as the most concerning impact of climate change on their companies, with 63% of the votes. This was closely

followed by concerns about acute physical impacts, which garnered 57% of the votes.

*“Many businesses are already aware of the growing threat posed by SCS. With cumulative losses increasingly blurring the lines between so-called primary and secondary perils, it is essential that these risks are fully reflected in mitigation and continuity planning,” says **Michael Bruch, Global Head of Risk Consulting Advisory Services at Allianz Commercial.** “As weather patterns become more volatile, strengthening resilience is no longer optional – it is a fundamental part of safeguarding operations and ensuring long-term business stability.”*



A data center in Tornado Alley will need different resilience strategies than an automotive dealership in hail-prone northern Spain

Tough at the top: why roof hardening pays off

Roofs are the most vulnerable part of a building if a SCS hits, and roof hardening measures can help to safeguard businesses against extreme wind and hail events.

*“Incorporating enhanced roofing materials, fastening systems and comprehensive protection can significantly reduce a building’s vulnerability to hail, wind and water intrusion,” says **Lena Fuldauer, Head of Resilience & Business Development, Risk Consulting, Allianz Commercial.** “Allianz loss history indicates that roofs with strengthened uplift resistance at their corners and perimeters, for example, fare significantly better in strong winds compared to those without these improvements.”*

Roof hardening measures can include upgrading to steel gutters and downspouts, reinforcing edges and adding impact-resistant underlay to help ensure durability against hail impacts. Installing protection screens over HVAC units can prevent business interruption, especially for businesses dependent on cooling.

Advanced sealed roof deck systems can prevent catastrophic water damage during roof cover loss, with research from the Insurance Institute for Business & Home Safety (IBHS) showing 65% of water hitting exposed roof



Photo: Four888 / Adobe Stock

decks will enter the building. Sealing roof deck systems and improving roof deck attachment can reduce potential [water intrusion by up to 97%¹⁶](#).

*“Roof hardening can have added benefits that go beyond storm protection,” **Fuldauer** adds. “Impact-resistant materials and enhanced attachment methods can extend the lifespan of roof systems, reducing the need for maintenance, and modern roof hardening materials often incorporate reflective technologies and improved insulation, so they are energy-efficient too.”*

For more information, see [Adapt Now: Roof Hardening and Beyond](#).

AI redraws the mitigation map

Artificial intelligence is rapidly reshaping how insurers and businesses understand, anticipate, and mitigate the impacts of SCS.

Traditional catastrophe models have long struggled to capture property-specific risk factors or the cumulative effects of hazards like hail on building envelopes, according to **Michael Bruch, Global Head of Risk Consulting Advisory Services at Allianz Commercial**. *“However, recent industry analysis shows AI-driven models can now process vast amounts of unstructured data, including satellite imagery, roof geometry, material aging patterns, vegetative exposure and local climatology, to generate far more granular assessments of physical vulnerability than was previously possible.”*

Catastrophe modeling specialists also note AI is increasingly used to validate or refine existing natural hazard models, helping to reduce inconsistencies and improve reliability in areas where traditional flood, wildfire or storm datasets have produced conflicting results. This shift enables a more proactive mitigation mindset: instead of reacting to losses after a major storm, organizations can use AI-supported insights to identify weak points in roofs, facades or critical equipment and prioritize upgrades that minimize future damage.

Across the insurance industry, adoption of AI for risk assessment is accelerating quickly. A 2024 survey shows that one in four insurers already use AI to assess severe convective storm exposures, with a [strong majority \(73%\) believing AI¹⁷](#) will play a crucial role in managing climate-related losses going forward. These tools also help bridge the gap between strategic risk planning and operational resilience by translating localized hazard signals – such as expected hailstone size, wind intensities or the likelihood of rooftop equipment uplift – into actionable mitigation measures.

“As AI becomes embedded in core risk processes, its most meaningful benefit for customers is its ability to support smarter, evidence-based resilience strategies that evolve with changing weather patterns, rather than relying on historical norms,” **Bruch** concludes.

AI and climate science combine to redefine European hail risk

An AI-driven project in Germany aims to build a next-generation understanding of hail formation, severity, and regional variability across Europe.

The Managing European Hail Risk under Climate Change (HAR-CC) is a joint project between the Karlsruhe Institute of Technology and **Allianz Re**, which is home to the Allianz Group’s Center of Competence for Natural Perils.

The project combines radar data showing hail paths, satellite detections of ‘overshooting tops’ (bulbous protrusions on top of a thunderstorm), high-resolution weather reanalysis, and the data from millions of Allianz claims to recreate past hail events and identify future trends. Using this unique pool of data and machine learning, HAR-CC analyzes which atmospheric factors best predict large hail. In so doing, it strengthens the scientific basis for assessing hail risks and helps to create advanced hail hazard maps and exposure models.

“By applying the methodology across key European markets, HAR-CC provides the analytical bridge between climate science and catastrophe modeling,” says **Simon Siedersleben, Nat Cat Analyst at Allianz Re**. *“This enables Allianz to integrate future-focused hail risk insights into underwriting, pricing, and reinsurance, supporting a climate-resilient strategy that evolves with emerging atmospheric realities.”*

Managing climate risks with CAREs

Allianz Commercial’s Climate Adaptation and Resilience Services (CAREs) is a data-driven platform that enables clients to assess their exposure to 12 climate perils, including hail and windstorm. The platform models the change in risk exposure over different time horizons and climate scenarios aligned to the [United Nations IPCC](#). Consulting services are included to support organizations on their journey to climate resilience. Find out more at [Climate Adaptation and Resilience Services](#).

References

- 1 WTW, Natural Catastrophe Review January 2026, January 28, 2026
- 2 Gallagher Re, Natural Catastrophe and Climate Report 2025, January 21, 2026
- 3 Gallagher Re, Natural Catastrophe and Climate Report 2025, January 21, 2026
- 4 Swiss Re, Wildfires, storms, floods contribute to record 92% of global insured losses in 2025, says Swiss Re Institute, March 19, 2026
- 5 Reinsurance News, US SCS losses reach \$42bn, establishing a "new normal": Moody's, November 21, 2025
- 6 Gallagher Re, Natural Catastrophe and Climate Report 2025, January 21, 2026
- 7 Business Insurance, Insured hailstorm losses pegged at \$2.4 billion, August 7, 2025
- 8 Moody's, Smarter models powering insurance innovation against growing SCS threat, Insurance Insider webcast, January 22, 2026
- 9 Gallagher Re, Natural Catastrophe and Climate Report 2025, January 21, 2026
- 10 Global [Re]Insurance, Cat models under pressure after a year of global shocks, December 10, 2025
- 11 National Geographic, Where is tornado alley? How the deadliest storm zone in the U.S. is shifting east, July 15, 2025
- 12 NPJ Climate and Atmospheric Science, Hailstone size dichotomy in a warming climate, August 21, 2024
- 13 Munich Re, Severe hailstorms increasing most rapidly in Europe, January 21, 2026
- 14 European Geosciences Union, An open-source radar-based hail damage model for buildings and cars, March 11, 2024
- 15 International Journal of Disaster Risk Science, The impact of tornadoes and damaging winds on county-level income growth in the United States, December 9, 2024
- 16 Insurance Institute for Business & Home Safety, Alabama FORTIFIED Roof™ Endorsement
- 17 ZestyAI, State of the Industry, November 2024

About Allianz Commercial

Allianz Commercial is the center of expertise and global line of Allianz Group for insuring mid-sized businesses, large enterprises and specialist risks. Among our customers are the world's largest consumer brands, financial institutions and industry players, the global aviation and shipping industry as well as family-owned and medium enterprises which are the backbone of the economy. We also cover unique risks such as offshore wind parks, infrastructure projects or film productions.

Powered by the employees, financial strength, and network of the world's #1 insurance brand, as ranked by Interbrand, we work together to help our customers prepare for what's ahead: They trust us to provide a wide range of traditional and alternative risk transfer solutions, outstanding risk consulting and multinational services as well as seamless claims handling.

The trade name Allianz Commercial brings together the large corporate insurance business of Allianz Global Corporate & Specialty (AGCS) and the commercial insurance business of national Allianz Property & Casualty entities serving mid-sized companies. We are present in over 200 countries and territories either through our own teams or the Allianz Group network and partners. In 2025, the integrated business of Allianz Commercial generated around €17.3 billion in gross premium globally.

For more information contact az.commercial.communications@allianz.com

Follow Allianz Commercial on  LinkedIn

commercial.allianz.com

Download our checklists

- [Windstorm Checklist](#)
- [Hailstorm Checklist](#)

All currencies listed are in US dollars unless stated

Disclaimer & Copyright

Copyright © 2026 Allianz Commercial / Allianz Global Corporate & Specialty SE. All rights reserved.

The material contained in this publication is designed to provide general information only. While every effort has been made to ensure that the information provided is accurate, this information is provided without any representation or warranty of any kind about its accuracy and neither Allianz Global Corporate & Specialty SE, nor any other company of Allianz Group can be held responsible for any errors or omissions.

All descriptions of insurance coverage are subject to the terms, conditions and exclusions contained in the individual policy. Any queries relating to insurance cover should be made with your local contact in underwriting and/or broker. Any references to third-party websites are provided solely as a convenience to you and not as an endorsement by Allianz of the content of such third-party websites. Neither Allianz Global Corporate & Specialty SE, nor any other company of Allianz Group is responsible for the content of such third-party websites and neither Allianz Global Corporate & Specialty SE, nor any other company of Allianz Group does make any representations regarding the content or accuracy of materials on such third-party websites.

Allianz Global Corporate & Specialty SE, Königinstraße 28, 80802 Munich, Germany.
Commercial Register: Munich, HRB 208312

March 2026