Brown & Brown

WHITE PAPER

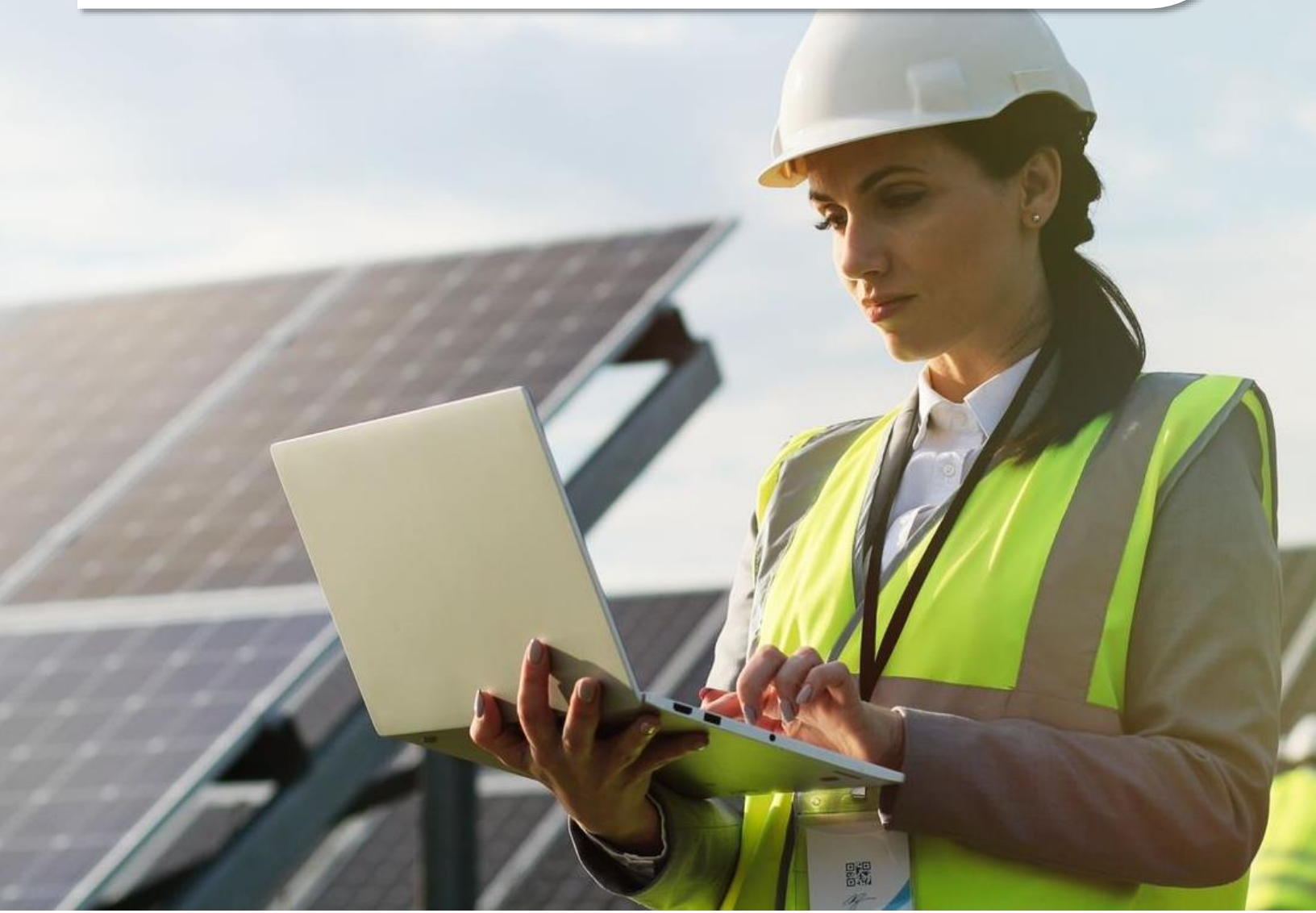
Insurance Market Report – Renewable Energy

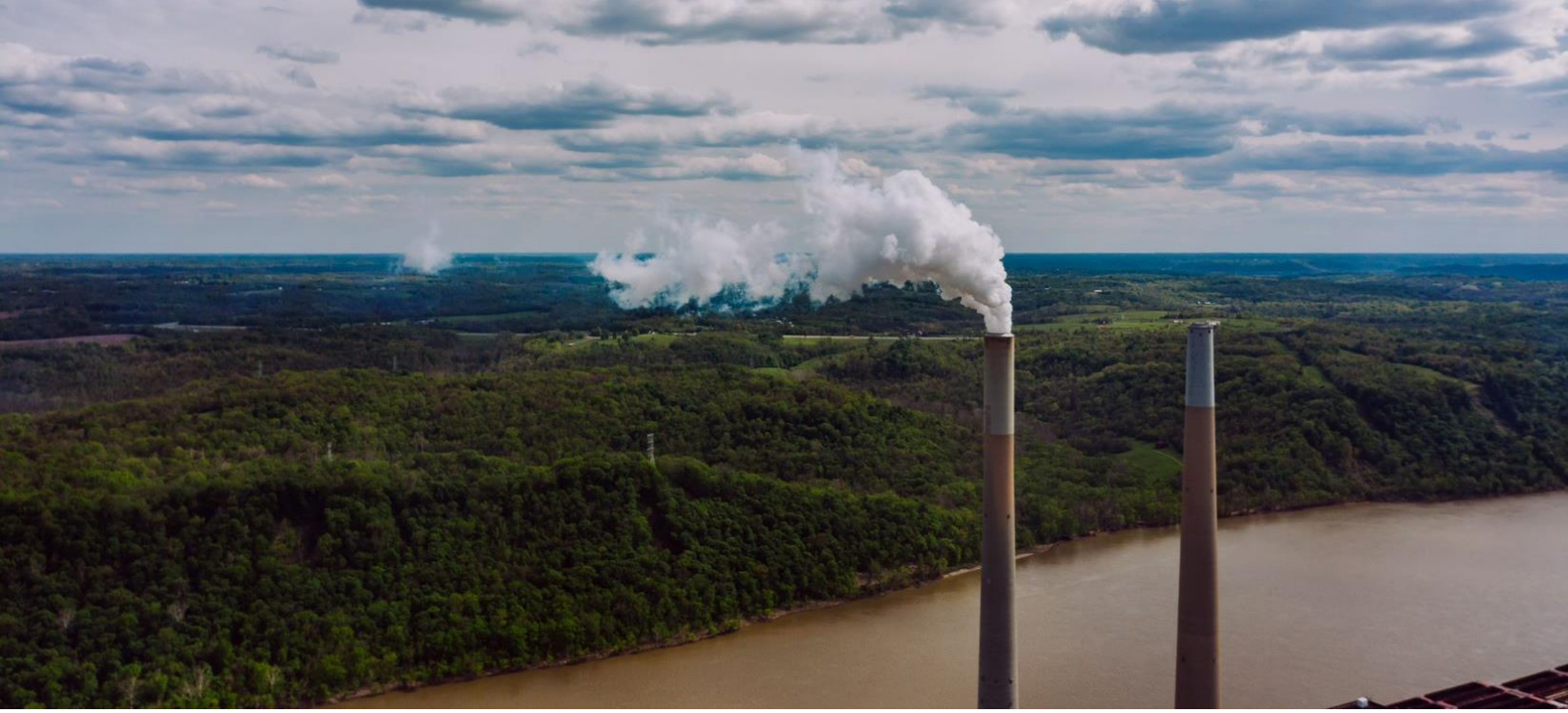
January 2022

AUTHORED BY:

Michael Perron
Senior Managing Director

Danny Seagraves
Senior Managing Director





Introduction

Carriers See More Favorable Market Conditions, But More Losses Cloud Results

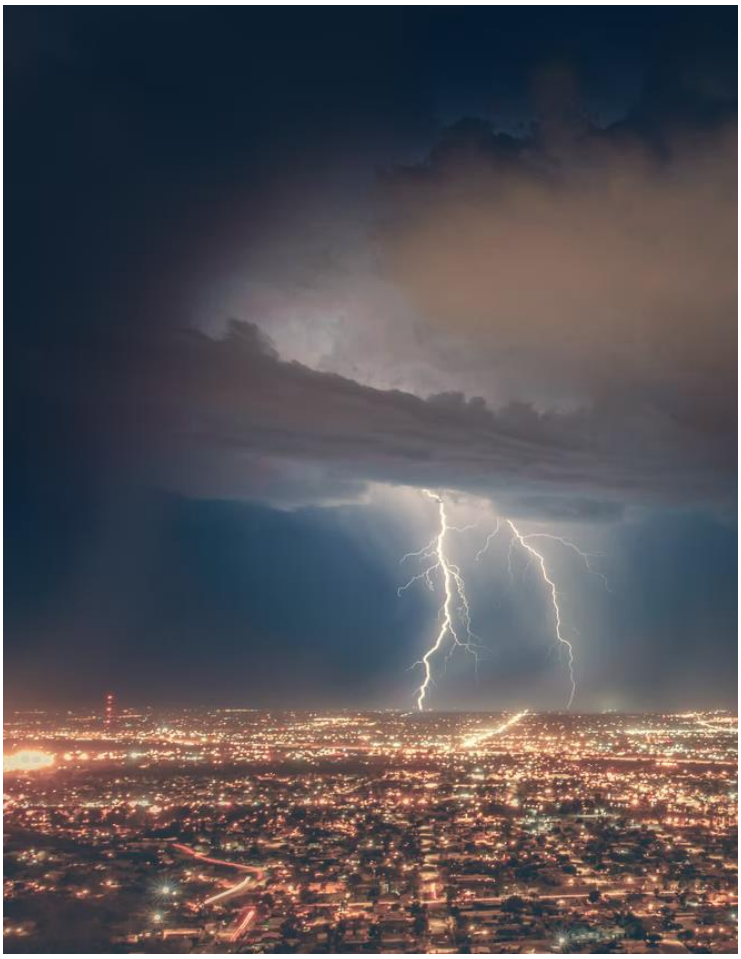
Buoyed by more favorable terms (recent pricing and retention increases), conventional insurers eager to meet ESG initiatives and replace shrinking fossil fuel revenues are pushing the likes of AXIS, GCube and PERse on Solar, Wind and Battery Storage (BESS) business. The list includes Swiss RE, Munich RE, Allianz, AEGIS, AIG, StarrTech, Liberty, HDI, capacity from London and Bermuda and others. This influx of capacity is helping to stabilize the market. AEGIS' renewable energy team is deploying significant capacity leading placements for their members and serving as a follow-market for non-members. Other entrants such as NARDAC and PPS Specialty Underwriters also offer additional capacity, some of which is beholden to them, with more capacity being developed. Travelers, HSB and Hartford continue to lead smaller placements. Zurich will reenter the renewables sector in 2022, and FM Global plans to expand its footprint as well.

Rates were up 10-20% or more through most of 2021 for most renewables customers, and we anticipate tempered increases in 2022 (flat – 15%). Rate increases were higher for customers in tougher classes and customers with losses and properties in CAT-prone areas, particularly hail and wildfire areas.

Overall, renewables would be profitable at current terms to date in 2021 if not for a few significant losses involving offshore wind cables, wildfire, battery thermal runaway reactions and hail damage to PV Solar projects. Projects with these exposures will see larger rate increases than the sector overall. Carriers will strive to continue increasing rates into 2022, but rates have moderated, and we expect market conditions to continue to improve.

Year-to-Date: Fewer Storm Events, Higher Total Insured Losses

The 2021 storm season produced fewer storms than 2020 but had higher losses. The Insurance Information Institute (III) reports that “Insured losses from natural disasters worldwide hit a 10-year high of $42 billion in the first half of 2021, with the biggest loss related to extreme cold in the United States in February.” The loss estimates from Winter Storm Uri range from $15 billion to $20 billion. The hurricane season is near completion, and it is already an above-average, record-breaking season.



Insured losses range from $100 million to $18 billion due to Claudette, Elsa, Grace, Henri and Ida. As in 2020, damage to renewable energy projects from named storms has been relatively small. Severe convective storms (SCS) and wildfire events have caused far more significant damage. Insurers also report some losses to PV Solar projects at windspeeds well below design levels, requiring the original equipment manufacturer (OEM) to repair damaged tracking systems under warranty.

Carriers continue to focus heavily on natural catastrophe exposures, particularly wind, SCS, flood and wildfire, as more projects are built in California, Texas and other areas subject to these risks. Significant attention is being given to loss control measures designed to mitigate potential losses involving these types of events in the future, including vegetation management programs in wildfire-prone areas and early stowage protocols for PV Solar projects in areas subject to SCS. For BESS, insurers seek more robust spacing between battery containers or cabinets to isolate thermal runaway reaction damage.

Other Renewable Energy Risks – Offshore Wind, Landfill Gas, Bio-Risks, Hydropower

London leads most offshore wind projects, though U.S. carriers are now involved. Many carriers that previously insured waste-to-energy risks (including landfill gas, biomass, biogas and biodiesel) have withdrawn from the market, making such placements more challenging, particularly for risks that do not rate well from a fire protection/loss prevention standpoint. Many carriers have stopped targeting hydropower risks, making the placement of these risks challenging.

PV Solar

Insurance in the PV Solar marketplace is evolving following continued hail and wildfire losses. After a roughly $80 million hail loss in 2019 in West Texas, 2020 was a relatively quiet year for SCS; however, 2021 brought another large hail loss detailed in the photovoltaics section of this update. Work is needed to prepare solar farms from hail damage, and even when prepared, losses can occur.

In addition to weather events, PV losses have involved contractor issues, inverter breakdowns and transformer events.

More than for windstorm, flood or earthquake, hailstorm modeling is imprecise and untested, requiring more work to ensure reliable results. Further event data is needed to contrast the resilience of different panel and tracker system designs to hail impact. Insurers are wary of their hail exposure and are reducing sublimits and line sizes offered in hail-prone areas. Site-specific, engineering-based hail modeling is being developed to replace probabilistic modeling better suited for insurers' large portfolios.

After continued wildfire losses, including a $50 million COVID-19 related wildfire loss in 2020, several insurers developed wildfire protective safeguards endorsements on risks subject to wildfire, excluding fire loss if the customer cannot prove they have maintained vegetation below certain thresholds. This approach can create challenges for customers.. Consensus coverage wording is needed providing the coverage customers and their financial partners need that is acceptable to insurers. Consensus LMA wording is expected to be finalized by the new year, but it will likely continue to exclude fire loss in some instances. Some carriers are instead increasing deductibles associated with wildfire rather than fully excluding the event, which is more promising. This approach assures carriers that customers are now stakeholders that will help ensure the loss prevention measures are followed. Newer projects being developed can build vegetation management measures into program design to help manage the risk.

Carriers seek to limit coverage to non-visible damage to PV solar panels following hail loss. Microcracking damage can occur at any time, not just due to hail contact, and insurers want to connect damage back to the cause of loss before paying claims. Carriers limit the amount of microcracking testing they will cover to prevent customers from testing every panel on the insurers' dime; however, even as measures to determine damage have improved significantly, it is impossible to determine how an event might impact performance of the panel over its lifetime. Carriers prefer specific panels using thin-film technology that are more resilient to hail, but such panels are more expensive and do not last as long as polycrystalline panels.

Valuation and Inflation/Supply Chain/Limits

As the cost of solar panels and wind turbines fell, renewables achieved cost-parity on a $/MW basis with fossil fuel generation, helping to push projects forward. Higher costs for steel, aluminum and copper, combined with higher shipping and logistics costs and tariffs on Chinese Solar panels, make building renewable projects more expensive[1]. The cost of solar panels has risen as by 16% in the past year[2], and wind turbine blades and crane costs are similarly rising. Demand for renewable energy projects remains high, as off-takers and developers want projects online by the end of 2025 to take advantage of the investment tax credit before that program expires. So, there will be pressure to build projects quickly and efficiently as developers and contractors rush to meet deadlines. These developments have risk management and insurance ramifications. Rushed work and cost pressures can lead to cutting corners and increased loss activity. Higher material costs mean higher replacement cost values, resulting in larger limits needed and costlier claims, driving premiums higher.[3] Potential supply chain issues have developed with solar modules coming from Xinjiang, China, being held up by U.S. customs due to human rights concerns. Other supply chain challenges exist, and these challenges result in extended downtime and higher business interruption claims. Higher replacement costs also mean that limits and sublimits don't go as far as before, so limit adequacy needs to be reverified. Customers focusing on contingency planning, securing spare parts and equipment and implementing robust loss prevention programs will achieve more favorable renewals.

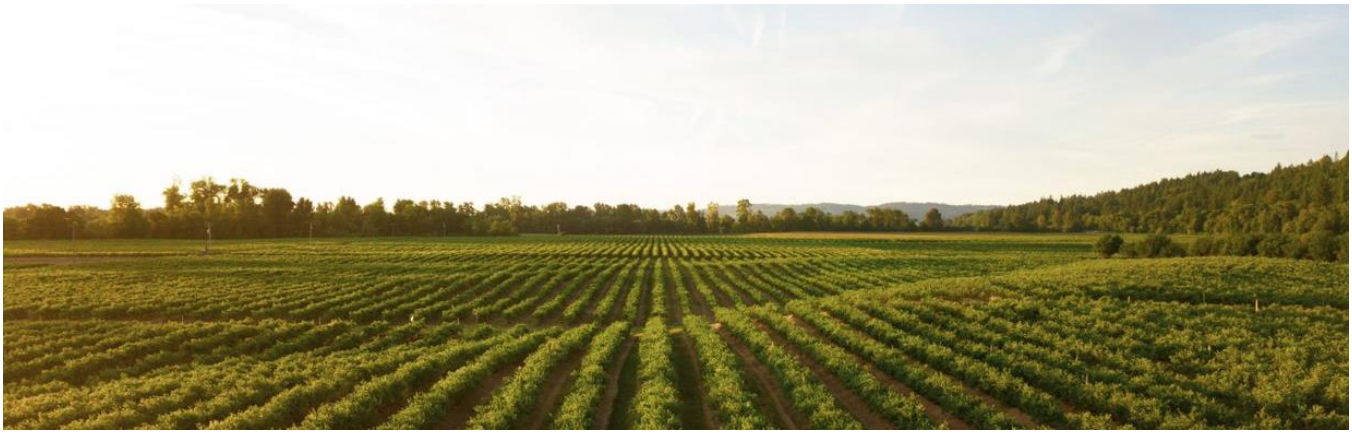
Onshore Wind

Larger wind turbines require larger retention levels. Carriers will also limit coverage to newer technologies until they deem them proven. Wind projects sustain more construction losses than solar. Wind construction issues include a combination of factors:

- Growth
- EPC issues (no skin in the game, contractual issues, problematic loss reporting)
- Wind OEMs continuing to push serial defect issues onto the owners' insurance
- Supply chain issues
- Technology issues
- Unit size increases

Consequently, underwriters are applying higher retention levels and restrictions in loss reporting to contractors in construction policies. Certain technologies require LEG 1 coverage, as often does repowering. Retention levels typically are now $500,000 - $1 million for physical damage with lengthy delays in start-up waiting periods, and renewable insurers often offer less capacity on such projects.

1. https://www.greenbiz.com/article/why-supply-chain-disruptions-may-slow-down-clean-energy-deployments
2. https://www.rystadenergy.com/newsevents/news/press-releases/solar-powers-supply-chain-crisis-makes-15c-climate-target-a-major-challenge/
3. https://www.swissre.com/reinsurance/property-and-casualty/reinsurance/engineering-reinsurance/inflation-can-be-bad-news-for-engineering.html



Like PV Solar, wind projects are subject to SCS losses, including hail damage to blades and tornados damaging multiple turbines, resulting in large losses and impacting their life cycle. Technology issues include more locking pin issues and Switzerland's recent failure of a new two-piece wind turbine blade.

Carriers encourage customers to get maintenance work completed before OEM warranties expire to limit post-warranty losses and secure long-term servicing contracts post-warranty.

More Battery Storage Losses

Insurers were already wary of utility-scale BESS following a 2019 event before learning of two multi-million dollar BESS losses in 2021. While various mitigation and suppression methods have been developed and installed, passive protection in the form of spacing is the approach insurers prefer and often require. These measures prevent thermal runaway reactions from spreading via radiant heat exposure, limiting loss to a single battery container or cabinet. Water-based fire suppression systems are effective but less practical due to substantial water supply requirements. Fire-fighting foam is ineffective since it does not stop the thermal runaway at the cell level. Other systems such as hazard control technology encapsulator suppression agents and off-gas monitoring to shutdown battery cells before thermal runaway (Li-Ion tamer systems, pre-lighting via igniters) show more promise but do not yet have large-scale testing data to support suppression claims or insurers' blessing. Whether or not suppression systems are installed, carriers are wary of high-density BESS installations.

Hydrogen

Plans are underway to develop a hydrogen infrastructure to provide baseload energy storage capacity, but it will take years for hydrogen to provide meaningful energy storage. Hydrogen development will begin with simple and combined cycle turbines burning a blend of natural gas and hydrogen, with the hydrogen portion of the blend growing over time. Significant challenges remain, including technological, economic and safety-related issues.

Risk Engineering

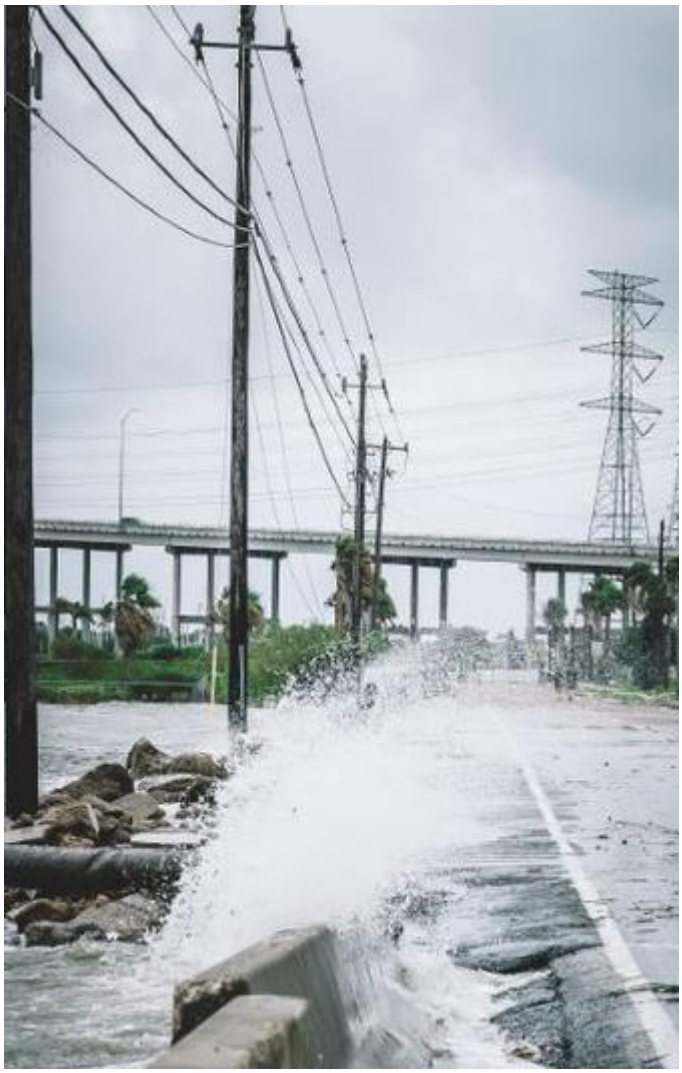
Losses and the entrance of engineered risk insurers have led to more emphasis on risk engineering for renewables. Carriers seek customers that understand and manage their risk well, including mechanical/engineering issues for wind, vegetation management, natural catastrophe resilience for solar, fire engineering issues for energy storage systems and business continuity planning for all risks. Engineering surveys and presentations to carriers are essential in developing and maintaining key insurance relationships.

Liability

Like property renewals, liability renewals have stabilized; however, most customers are seeing modest rate increases. Wildfire exposure drives line sizes offered, and several markets have retracted capacity, reducing umbrella limits offered and layering towers. Battery storage and residential solar continue to be challenging. Rooftop solar also continues to be challenging since the Tesla/Walmart dispute was settled in 2019.

Photovoltaics (PV) – Severe Convective Storm Event

As the cost of solar construction has continued to decrease over the industry's relatively short lifespan, the benefits of increased generation associated with single-axis trackers have surpassed this technology's increased construction and maintenance cost. Another potential benefit has been the use of trackers to proactively stow modules in an optimum defensive position in advance of a threatening weather event. The recent focus has been the hail associated with Severe Convective Storms (SCS). In the February 4, 2020 report released by Renewable Energy Testing Center, such defensive stowage increases a module's resiliency up to 300%.[4]



The results for an active project may differ from the observed research testing results. This was the case in May 2021 when an operating project in Texas incurred more than $25 million in damages due to a hailstorm. The project was equipped with trackers armed with defensive stowage capabilities. The culprit was insufficient advance notice of approaching storm. The project relied on hail detection plates located close to the project site to trigger the defensive stowage. The storm arrived, inflicted damages and exited in advance of the defensive stowage positions being achieved.

The time required to achieve the original equipment manufacturer (OEM) prescribed defensive stowage angle varies by OEM. Some can stow in less than 10 minutes, while others may take 30 minutes or more. The potential benefits of this defensive stowage capability are eliminated unless the system recognizes the approaching threat with the requisite advanced notice. Given the potential magnitude of hail losses to a project's balance sheet, Brown & Brown works diligently with the industry in the development of redundancy throughout the weather forecasting and action communications process. These efforts help provide the requisite advanced notice and assure the instructions to implement the defensive stowage angle are received and actioned.

4. https://www.eeoc.gov/wysk/what-you-should-know-about-covid-19-and-ada-rehabilitation-act-and-other-eeo-laws

About the Authors

Michael Perron, *Senior Managing Director*

Michael Perron is Senior Managing Director – Global Energy & Climate Tech Practice, responsible for placement and service for renewable energy customers. Prior to joining Brown & Brown, Mike was the North American Power Generation Leader for a large broker.

Danny Seagraves, *Senior Managing Director*

Danny Seagraves is Senior Managing Director – Global Energy & Climate Tech Practice with more than 30 years of experience. Danny is responsible for the development and distribution of novel bankability, insurance and alternative risk finance solutions for all aspects of the Energy and Climate Tech sector.

Brown & Brown

Find Your Solution at BBrown.com