

## VIEWS FROM THE FRONT LINES: KEY INSIGHTS FROM FIRST ANNUAL UNDERWRITER SURVEY

Cirrus exists to bridge the gaps between renewable energy industry participants involved in the insurance and risk management value chain. Our premise is that proper incorporation of insurability considerations in the planning and development stages is essential in building resilient, profitable projects.

As part of our mission, in Q4 2022, the Cirrus team conducted its **first annual Renewable Energy Underwriter Survey** with the aim of bringing insurer feedback "up in time" so that it can be considered and incorporated earlier in the project lifecycle. We asked underwriters to advise on how elements of design, construction, operations and loss history impact their underwriting decisions, with specific focus on solar, wind and battery energy storage operations.

Included here are some key takeaways from our survey. They proved accurate as we continued to navigate a challenging insurance market during the 2023 renewal cycle. We hope they prove useful as insureds embark upon ambitious 2023 construction targets.



#### **GENERAL TAKEAWAYS**

When asked to rank the factors that would contribute to long-term insurability of renewable energy assets, **80% of** *respondents chose "Site Selection" as the most important factor.*\* This highlights the fact that as the renewable energy industry works to build the infrastructure necessary to respond to climate change, the assets themselves are impacted by the increased frequency and severity of natural catastrophe events and claims associated with these events can impede our efforts. Large hail losses in particular continue to impact underwriting results, with some underwriters going so far as to say that developers should not build in hail-prone locations. Even for projects with excellent weather monitoring systems and dialed-in operational communications protocols in place, markets are still wary of taking on this type of risk.

(\*Other options included O&M, Design, Equipment Choice, Prototypical Equipment, and EPC Choice/Experience.)

- "Large hail happens too often to seem like a fortuitous loss."
- "Even more resistant panels are not able to withstand large hail."
- "Stowing seems to reduce significant damage, but the losses are still substantial."
- "The fragile nature of the technology means major loss is a when rather than an if."
- "The market for this peril will enter a harder position than in the past due to the 2022 loss experience on solar plants in TX."

This perspective is especially problematic given the anticipated growth of solar installations in TX and CO, two hail-prone locations. Over the next five years, Texas is expected to install 34,324 MW of solar (first for growth in the nation), and Colorado is expected to install 2,347 MW of solar.<sup>1</sup>

It is vital to underwriters that developers demonstrate thoughtful consideration of design and equipment choice from the earliest stages of project development, including adherence to hydrology and geotechnical report recommendations. Insureds should be prepared to fully explain how they have mitigated various risks as part of the underwriting submission, as this will help differentiate the risk and, in some cases, determine whether coverage is quoted at all.

Insurers are continuing to "learn as they go," incorporating loss experience and aggregation data into future underwriting decisions. Collaborating with insurers in the deployment of renewable energy projects should be considered a vital component of a project's risk management strategy.

#### **SOURCES:**

THE FOLLOWING SECTIONS HIGHLIGHT FEEDBACK FROM UNDERWRITERS FOR SOLAR, WIND AND ENERGY STORAGE PROJECTS, WITH CONSIDERATION FOR DESIGN, CONSTRUCTION AND OPERATIONAL PHASES.

## **SOLAR PROJECTS**

Risk mitigation measures that could improve rates, lower deductibles, give rise to higher limits or even allow an underwriter to quote at all include:



- Ensure design properly elevates panels, inverters and substations above the flood plain (generally 2 – 3 feet).
- Ensure fasteners and racking are appropriate for given wind and weather regime.
- Consider equipment with stow modes to raise panels out of possible flood waters.
- Introduce lightning masts on solar sites.
- Consider Main Power Transformer redundancy at large sites.
- In high windstorm areas, consider bolting panels to trackers instead of clamping.
- Avoid building in storm surge prone areas due to concerns about saltwater impacting equipment.
- 2.8mm thick glass modules with fixed tilt racking in critical hail regions are an automatic decline for some underwriters.

#### **CONSTRUCTION**

- Consider risk management measures for assets in lay down areas prior to installation (storage, staging at site).
- Ensure installation meets design specs by holding EPCs accountable; for example, piles must be driven to proper depth to support anticipated wind speeds.
- Build berms and irrigation canals during preconstruction to protect equipment during installation.
- For high hazard flood and windstorm areas, pursue a strategy of immediate installation of equipment upon delivery to site to avoid prolonged storage.

#### **OPERATIONS**

- Invest in a comprehensive weather monitoring system at the site and a remote operations center that can quickly place panels into proper stow position.
- Demonstrate positive data where weather monitoring/operations team has successfully triggered stow position to mitigate storm damage.
- Hold OEMs accountable for functional lightning protection systems.
- Prepare and adhere to a detailed vegetation management plan from an experienced O&M, including the provision of photographic evidence of vegetation at site to demonstrate adherence to O&M protocols, including the following:

#### SUGGESTED O&M PROTOCOLS TO MITIGATE WILDFIRE RISK

<ul> <li>Boundaries and firebreaks, preferably with 6 to 10 feet of gravel</li> <li>T&amp;D lines of non-combustible materials</li> <li>No-smoking policies</li> <li>O&amp;M vehicles outfitted with fire extinguishers</li> <li>Onsite roads used as natural fire barriers</li> </ul>	<ul> <li>Cutting/maintenance of vegetation</li> </ul>	• Properly trained employees
<ul> <li>T&amp;D lines of non-combustible materials</li> <li>O&amp;M vehicles outfitted with fire extinguishers</li> <li>O and the set of th</li></ul>	<ul> <li>Boundaries and firebreaks, preferably with 6 to 10 feet of gravel</li> </ul>	• Proper equipment maintenance
<ul> <li>O&amp;M vehicles outfitted with fire extinguishers</li> <li>Onsite roads used as natural fire barriers</li> </ul>	<ul> <li>T&amp;D lines of non-combustible materials</li> </ul>	No-smoking policies
	<ul> <li>O&amp;M vehicles outfitted with fire extinguishers</li> </ul>	• Onsite roads used as natural fire barriers

 Built-in conditions that determine when maintenance will be performed, such as grass at a certain height, # of days since last mow, # of days of rain, etc.

## WIND PROJECTS

Risk mitigation measures that could improve rates, lower deductibles, give rise to higher limits or even allow an underwriter to quote at all include:

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- To mitigate wildfire risk, use utility poles made of non-combustible material versus wooden for new builds, and consider fire blankets on existing wood poles in areas of high wildfire exposure.
- Consider multiple entry points to the site to mitigate potential need to build additional roads following an event.
- Ensure proper drainage of the site and along roadways.
- Consider Main Power Transformer redundancy.
- Main Power Transformer should be stored above base flood elevation.

#### 윤 CONSTRUCTION

- Demonstrate contingency planning for flooding, both inland and following windstorm events, as large losses are accumulating due to inundation of water in foundations and access roads.
- Ensure proper storage/tie-down of major components, especially blades, pending installation. Timing of blade delivery is critical to minimize time between when blade arrives on site and when it's installed, especially during windstorm season.
- Time the majority of critical installation for outside of windstorm season.
- Properly maintain access roads and other civil engineering during construction.

#### **OPERATIONS**

- Ensure all critical equipment is stored at least 2 feet above base flood elevation.
- Use a Lightning Protection System to properly ground strikes.
- Vegetation management plan should provide for no vegetation surrounding WTGs or at substations.
- Provide detailed transmission line inspection reports allow underwriters to be more aggressive on longer lines.
- Provide MPT replacement plans and blade replacement plans would provide material benefit.
- Underwriters have negative past experiences with some lightning protection systems, locking pin systems, and certain blades, as well as with some OEMs lacking warranty and retrofit processes. Known issues in these areas will result in no coverage or very high deductibles.
- Provide adequate underlying limits for liability and provide details about whether limits are provided by the O&M contract.

## **BATTERY ENERGY STORAGE SYSTEM (BESS) PROJECTS**

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- Ensure operation of auxiliary power systems, especially when needed for cooling the containers; underwriters expressed concern about loss of power which would prevent the proper regulation of the internal temperature and humidity of the BESS units.
- GSUs and BESS units should be on concrete pads elevated at least 2 feet above base flood elevation, with proper drainage/grading throughout the site.
- Use Lightning Protection Systems at the site and demonstrate how it protects all containers.
- Substation design should include static masts, and inverters that are grounded and equipped with Surge Protective Devices.

- Demonstrate how a BESS would be tested and brought back online after an earthquake.
- BESS yards should be completely or substantially graveled/rocked.
- Ensure sufficient spacing between containers of at least 12 feet.
- The ground surrounding containers must be bare, with fire breaks and/or fire roads around the perimeter and to inverter skids.
- Significant preference for containers as opposed to building-based design.

## HOW LOSS HISTORIES IMPACT UNDERWRITING DECISIONS AND RISK MANAGEMENT PRACTICES

- Nat cat events are happening with more frequency and severity than the markets can bear at current pricing, limits, etc.
- The frequency and severity of hail damage to solar projects is top of mind for insurers and will continue to be as more large projects are built in high-hazard locations.
- It's not enough to have tracking and detection systems if they are not used properly. **Specific loss examples include:** 
  - Non-operational tracking system, which therefore did not detect hail and left panels in horizontal position during storm.
  - Tracking system with conflicting stow positions (mix of panels stowing for wind versus hail).
  - Storm event included straight line winds, causing panels to detach from racking system; the 'clips' holding panels to racking proved ineffective.
- There have been significant flood losses on projects outside of Flood Zone A, which is causing insurers to closely evaluate all flood risks.
- Lightning protection systems (LPS) retrofits may not be effective and locking pin issues can reoccur.
- One insured conducted an entire revamp of the contingency and spares procedures after a large loss, which allowed coverage to be renewed rather than non-renewed.
- Seeing certain insureds that have been able to get back online quickly post-catastrophe has led to leaner deductibles for some.
- Insureds successfully pushing back on manufacturers or contractors for defect in design or workmanship is received positively.
- Declared values are not accounting for inflation and shipping times which is leading to a reevaluation of how business interruption exposure is rated.
- Delay in Start Up losses are mounting, specifically regarding Mechanical/Electrical breakdown of transformers. This is leading to more emphasis on obtaining monthly Business Interruption breakdowns from insureds.
- Taller wind turbine towers are leading to larger Business Interruption losses due to large crane availability.
- Wind construction continues to perform poorly, largely due to contractor error. EPC choice is a key determinant of insurability.
- Flood losses during construction are resulting in increased emphasis on flood mitigation measures taken prior to start of construction.
- Frequent gearbox failures suggest the need to change O&M procedures or move to a different third-party O&M provider.
- For BESS systems, faulty triggering of the fire suppression system released fire suppressant and damaged equipment.



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Cirrus will conduct the second annual Renewable Energy Underwriter Survey in Q3 2023 to track any changes or developing trends. Going forward, Cirrus will continue to share insights from this survey with the renewable energy community as part of our efforts to connect underwriters with developers, thereby contributing to our combined efforts to move the renewable energy industry forward.



## **OUR MISSION**

Helping the renewable energy industry more accurately design, build, budget and finance projects with insurability in mind, thereby enabling a more resilient and profitable global energy transition.

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## **OUR GOAL**

To connect project developers, sponsors, insurers and the project finance community with risk assessment tools that align all parties on the risks of every project.

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