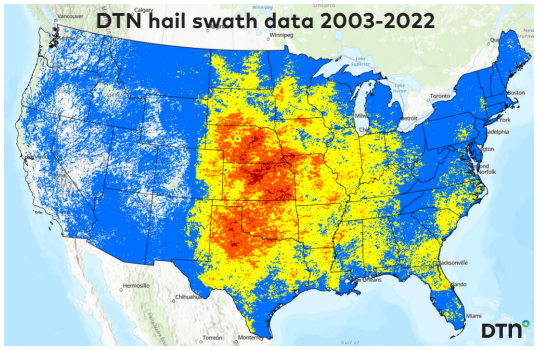
Should I stay or should I stow?

Mitigating hail risk for solar arrays

The costliest weather event threatening the solar industry is not the most frequent or deadly. Hailstorms are the biggest risk for asset damage and loss. During the summer of 2022, hail caused over $300 million in damage to solar fields — a figure 10 times more costly than the solar damage caused by 2020's Hurricane Hanna.

The infamous Hail Alley

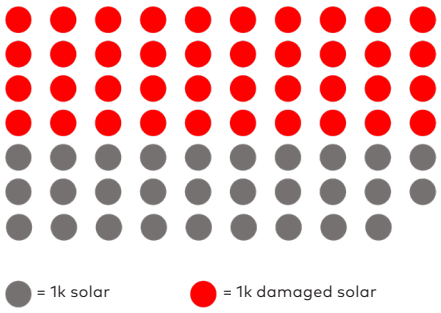
When skies turn stormy, a large part of the United States braces for hail. This area, known as Hail Alley, starts at the juncture of Nebraska, Colorado, and Wyoming, encompassing portions of the three states, plus Arkansas, Iowa, Kansas, Missouri, New Mexico, Oklahoma, South Dakota, and Texas.



Its land and atmospheric features are perfect for hail formation, and it doesn't just receive more hailstorms than the rest of the country but also more severe ones.

An expensive industry wake-up call

In May 2019, hail caused the largest weather-related financial loss — so far — at a U.S. solar project, damaging nearly 60% of the 685,000 panels at Midway Solar's 1,500-acre generating facility in west Texas. According to GCube, the loss was a staggering $70-$80 million.



70% of solar industry losses over the last 10 years occurred since 2017.

Source: GSource (via PV Magazine)

There is an average of 7-9 hail days a year in Hail Alley.

Source: NOAA

Hail Alley houses nearly 50% of the United States' 200GW installed renewables capacity.

Source: Power Factors

Climate change is expected to create stronger, more frequent hail events — and add three days to Hail Alley's annual average by 2100.

Source: Discover Magazine

An expensive industry wake-up call

Historically, the approach to risk was solar panels could withstand golf ball-sized hail, and there was insurance for anything larger.

Today, insurance companies are implementing stricter underwriting terms, raising deductibles, and lowering coverage limits, creating a hard market and more loss exposure for solar operators. As a result, proactive information and action are a must.

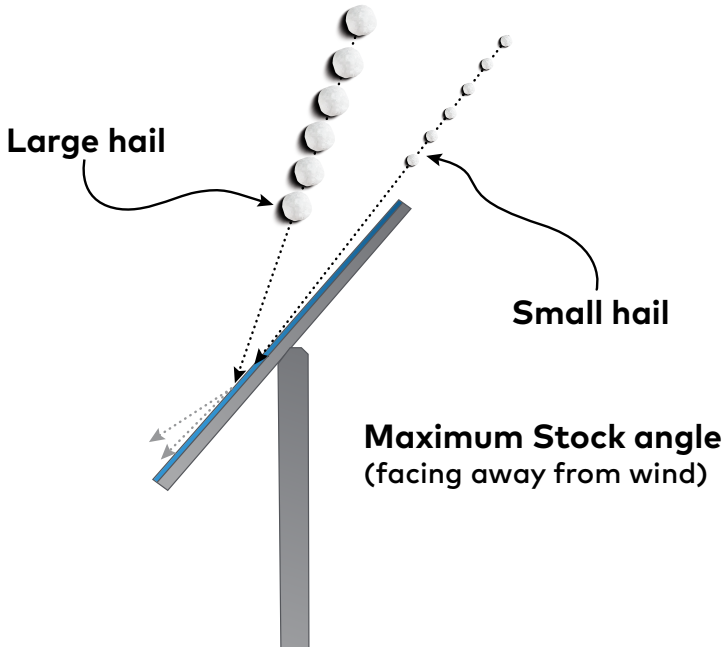
Make data-driven stow decisions

DTN Storm Corridor data, available via API, projects the movement of hailstorms 30 minutes into the future allowing customers to automate the process of pivoting solar panels to a safe stow position. Storm Corridors contain information on the expected severity/size of hail and probability so customers can set triggers tailored to the specifications of their solar plant.

Maximizing production and protection

While it's safest to stow panels with a high degree of tilt overnight, generation and risk must be balanced during daylight hours. Weather data and forecasts are important when deciding when to stow and to what degree, well before a storm arrives to ensure sufficient time to tilt.

Defensive stow position optimized for hail



Hail risk resiliency best practices

On a DTN webcast, a leading solar developer's head of innovation and operational excellence shared some of their organization's best practices.

Act 30 minutes before arrival

This will ensure sufficient time to protect modules should conditions advance more rapidly than expected.

Adopt zero false negatives

Always stow panels if a potentially damaging hailstorm is expected to arrive at a site, especially in cloud cover.

Accept false positives

It's currently impossible to predict hail in a given area with 100% accuracy, and risk areas are often very large compared to actual swaths.

In one example, moving panels into hail stow mode resulted in $12,000 in production losses – just 0.01% of the asset's $9.75 million estimated annual revenue.

Source: Renewable Energy World

An active hail defense posture can reduce insurance claims by up to 35% and premiums by millions per year.

Source: Renewable Energy World

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