Crawford®

FACT SHEET

Common causes of loss

Considering the challenges faced in the successful operation of renewable energy resources

Hail risk to solar farms

Hailstorms pose a significant risk to large solar farms due to the potential for damaging the solar panels. Hailstones can be as large as several inches in diameter, and the impact can crack or shatter the glass surface of solar panels, reducing their efficiency and potentially rendering them inoperable.

The cost of repairs or replacement of damaged panels can be substantial, and the downtime required to complete repairs will usually result in lost revenue for the solar farm. Additionally, the physical location of a solar farm can increase the risk of hail damage, as they are often situated in areas where hailstorms are more common, such as regions prone to extreme weather events.

Large losses

There have been several reported instances of large hailstorms causing damage to solar farms. Here are a few examples:

- In 2017, a hailstorm hit a 13.7 MW solar farm in Texas, causing extensive damage to more than 100,000 solar panels. The damage was estimated to be several millions of dollars.
- In 2018, a hailstorm in Colorado damaged a 4.8 MW solar farm, requiring the replacement of more than 3,000 solar panels.
- In 2019, a hailstorm in Queensland, Australia, caused significant damage to a 42 MW solar farm, requiring the replacement of more than 62,000 solar panels.

These are just a few examples, but they highlight the significant risk that hailstorms can pose to large solar farms.

Fig 01 – Hail damage to solar panels

Microcracking

Assessing damage to solar panels can be difficult, especially when it comes to micro cracking.

Micro cracks are small fractures in the solar panel's surface that can be difficult to detect but can still significantly reduce the panel's efficiency. The difficulties associated with assessing damage to solar panels and micro cracking are:

- **Specialised equipment:** Some types of damage, such as micro cracks, are nearly impossible to detect without specialised equipment. The equipment used to detect these types of damage can be costly and may require trained personnel to operate.
- **Time-consuming inspections:** Thorough inspection of solar panels requires time, and a large solar farm can be time-consuming. Each panel needs to be carefully examined, which can be a challenge, especially when dealing with large-scale solar farms.
- **Limited visibility:** Solar panels are often installed at elevated heights (on roofs or solar trackers), making it challenging to conduct a close-up visual inspection. This limited visibility can make it hard to spot small cracks and other forms of damage.
- **Weather conditions:** Inspections of solar panels must be conducted during daylight hours and in favourable weather conditions. Cloudy or rainy weather can make it challenging to identify damage or micro cracking, and the inspection process must be postponed