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The role of insurance and risk management in solar power project financing

Insurance | Prior to 2019, there was an ample number of insurers willing to provide renewable energy insurance, leading to plentiful, affordable cover being available for solar power project finance transactions. However, with increased claims and risks, price rises and lower availability of cover is impacting the sector. Duncan Gordon, head of Renewable Energy at specialist energy insurance brokerage and risk management firm Gallagher, provides an overview of how solar power project owners can navigate a challenging insurance market.

Project finance and loan agreements are necessary for the majority of renewable energy asset investments. Typically comprising on average a 30%/70% equity/debt split, lenders across a panel with a lead arranger will provide a credit facility which can be drawn down by the project owner, acting as borrower to the facility.

As part of the loan agreement, insurance requirements are outlined by the lender – specifying the type of insurance and level of cover the owner will need to

arrange. Insurance policies are assigned to the lender via supporting notice of assignment documentation and the lender specified as a loss payee – a party who is authorised to accept money paid out under an insurance policy.

The typical types of insurance required to be taken out by the owner includes construction all-risk cover, which offers protection against loss or damage to the building works, construction plant, equipment and machinery. It also provides cover for third-party claims involving

Hail damage witnessed at a solar farm in Texas, US.

property damage or bodily injury arising in connection with a solar construction project.

Delay in start-up (DSU) cover protects owners against financial consequences – such as loss of revenue or additional interest charges or refinancing fees – suffered following damage to the works that causes a delay in completion.

While marine cargo insurance provides cover against loss or damage to goods whilst being transported worldwide by road, rail, sea or air, marine DSU coverage

offers protection against any consequential losses suffered when a project commencement is delayed as a result of goods being lost or damaged during the transit.

Once a solar power plant is up and running, operational all-risk insurance provides cover for physical damage or loss that affects the plant, while business interruption insurance helps to replace lost income if the project is unable to go ahead on a temporary basis due to the aforementioned physical damage or loss.

The changes seen in the insurance market in the last few years have highlighted the importance of owners working with an experienced insurance broker to ensure that cover is optimised, whilst also meeting lender insurance requirements.

Current market challenges

The renewable energy insurance market has undergone a significant adjustment over the course of the last two years. Whilst a common perception of insurers is that they always make profits from premiums, the reality over the last decade of underwriting solar (and more recently

batteries) has seen most insurers repeatedly reporting annual losses.

The surge in volume of installed gigawatt-level capacity globally had seen steep growth in premiums received by the leading renewables insurers. However this premium growth was largely attributable to portfolios and projects or assets which had secured the market floor rating seen pre 2019. A few catalytic factors for change which coincided with the meteoric rise in installed megawatts was a broader range of claims, involving varying causes, territories, technologies and magnitudes. This affected annual loss ratios (the overall ratio of claims to premium earned) which saw substantially inflated underwriting losses.

Notable single asset natural catastrophe claims such as a US\$80 million hail claim to a solar asset in Texas, wildfire claims across North America and windstorm events in Puerto Rico greatly impacted these consecutive year underwriting performances. The significant rise in volume of events caused a tipping point for the market which had already been challenged by the evolving attritional losses - which are more common, minor

events resulting in damage, as opposed to major incidents such as natural catastrophes, for example - caused by human error in workmanship, mechanical and electrical breakdown failures and weather damage, which have accompanied the rapid rise in renewables. Relatively, these loss frequencies are low when compared to the volume of growth and installed megawatts but impactful when compared to the low premium rates which supported that crucial growth period.

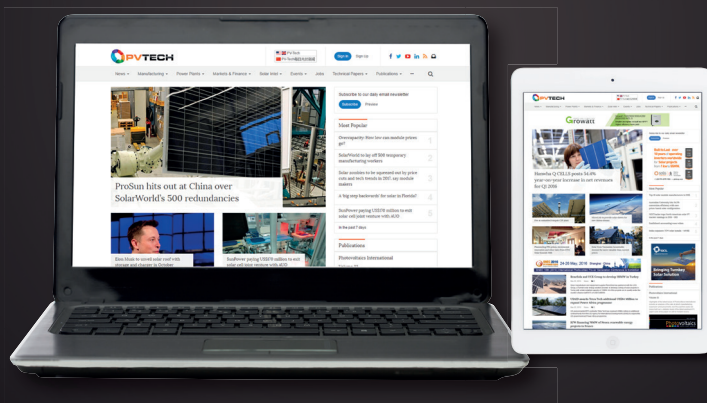
This eventful period resulted in almost all renewable energy insurers changing their approach to underwriting. This market wide adjustment took place over an 18-month period, firstly in Europe followed by Asia and North America, reaching unanimity by January 2021. The common message being broadcast was that the shift in approach to underwriting was necessary for the insurers to be able to remain in business, and to support the continued growth of the industry.

This was also reinforced by a number of insurers closing down their renewable energy operations due to significant repeated annual loss. In some instances, premiums doubled.



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This has been a period where tactful insurance broking has been crucial in order to minimise renewal premium increases for project owners – the strategy overall being to secure and offer pricing stability from the market to give greater insurance cost certainty for forecasts of capital expenditures (Capex) and operational expenses (Opex) financial models.

Lender insurance requirements

An important shift also took place regarding aspects of the insurance cover that insurers were now willing to give. Prior to 2019, the insurance annex of project finance agreements typically outlined requirements from lenders, which usually included broad coverage extensions and low deductibles – meaning the amount of money that a party is responsible for paying towards a loss before payment for a claim is made. Maximum permitted deductibles would typically fall in the range of €5,000 (US\$5,600) to €25,000 (US\$28,100) for property damage, with a timeframe of up to 21 days for any delay in start-up.

Almost in sequence, despite being a competitive marketplace, the impact of sustained losses had been so great that at renewal insurers started to increase deductible levels. The justification for this was the high frequency of attritional losses on solar and wind projects during construction and operations, with the resulting insurable damage events causing mounting insurable revenue losses. Without such change the adjustment in premium alone would not have been enough to enable the insurers to survive.

The growing involvement of lenders' insurance advisors (LIAs) in transactions – who conduct analysis of any project risk to make a full assessment of the hazards to which lenders are exposed – has exemplified that insurance is more than a mere checkbox for lenders. In recent years, there has been a greater impetus on the insurance broker to provide guidance to the LIA as to the extent of terms and conditions being offered by insurers, which then influences the insurance requirements stipulated by the lender within the project's finance loan agreement.

This dialogue between the owner's broker and LIAs has become more critical when renewing policies, with the challenge of securing the same historical low-level deductibles seen in historical finance agreements. Many lenders are

now being asked to waive low deductible requirements embedded within their financing documents due to the lack of market availability, as many financing agreements were negotiated prior to the challenging market conditions being seen today.

For newer projects and finance agreements, the insurance broker engaging early with prospective lenders on behalf of the owner can ensure that a realistically achievable level of deductible is set as an insurance requirement.

Battery energy storage systems (BESS) risk mitigation

Following the market adjustment period, a key area of interest for insurers has been the hybridisation of solar and battery projects and many have set out clearer risk mitigation expectations since the start of 2021.

Due to historical BESS claims involving global fire losses which have occurred across multiple technology and system types, insurers now pay close attention to mitigation strategies for ceasing or limiting the effect of fire, should it arise either from external perils such as lightning or internal risks such as cell electrical failure. Insurers now require fire suppression and

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protection standards to be met in line with the National Fire Protection Association (NFPA) 855 Standard for the Installation of Stationary Energy Storage Systems, which focuses on separation between storage containers and the fire suppression system to prevent reigniting through thermal runaway [1].

Should sites be compact with little spacing between containers, such as a one metre distance, then this increases the risk of fire spreading from one unit to another, therefore boosting the chances of a more significant claim being incurred. Optimally, insurers are requesting a 2.5 metre distance between each unit and therefore this consideration should be looked at during development design, as

site space can be restrictive.

Where fire suppression is concerned, there have been instances in the past where the inert gas systems within containers could not extinguish combustion, either as a result of oxygen being present due to inefficient seals or through thermal runaway and the temperature of cells continuing to increase without a cooling source such as water. If other measures of fire protection such as an on-site water supply and fire service in close proximity can be demonstrated, this can also be deemed favourable by insurers.

Though insurers are fairly open in regards to battery cell manufacturers, they have a more critical underwriting view towards contractors, checking that they have experience of complex installations such as step up transformers integration and solar production facilities in hybrid sites.

Solar technology risk management

From the perspective of major loss events and significant attritional loss events, the main insurer risks in solar are natural catastrophe perils and inverter failures. Insurers view those insureds more favourably in their risk management approach if there are positive aspects to consider, either in terms of risk mitigation or design features related to tracker design, notably to withstand high wind speeds; an inverter availability spares strategy, to mitigate revenue or business interruption-related loss through faster delivery to site and component replacement; and warranty tenures, given insurers scrutinise the varied provisions of warranty terms more closely now for assets over two years old.

In the case of warranties, there have been protracted issues which have arisen where technology providers – including panels, inverters, trackers and perhaps transformers manufacturers – are in financial difficulty. Insurers typically look to underwrite solely 'Tier 1' technology which implies financial stability. The solar boom in growth of the previous 10 years saw many manufacturers come and go but supply and demand has balanced for a more sustainable supplier space. Moreover, where credit risk is present to owners (and not insurance backed by a robust extended warranty product) they generally select only 'Tier 1' providers.

Based on historical trends, the standard period for typical inverter warranties has been seven or 10 years, which is optimal,

and 10 to 25 years for panel warranties. Insurers can occasionally look to apply out of warranty deductibles for assets which have had a particularly lively claims history.

Construction phase risks

The build volume of solar has seen a wider pool of contractors stepping in to the sector with little experience of solar structures and technology, and drawing in additional unskilled manpower. In some cases, this has led to potential workmanship defects, with workers not being equipped with the appropriate skills, tools or training to complete the work competently.

Another common feature of most project builds are delays due to shipment scheduling, site works being delayed due to weather, supply and access. Therefore when a damage event occurs, it often causes an additional delay to a project already behind schedule. Since the market adjustment, extensions of construction policies are scrutinised more than ever by insurers who keenly look at the new timescale of delivery, testing and completion of the substation at the site to ensure it has an appropriate buffer for contingencies.

Other potential risks include transit losses, which can be common as a result of truck or container falls and damage suffered during shipment.

In Europe in particular, cable theft has become more common. Loss to cable equipment can easily incur a claim, wiping out in excess of an entire premium for a construction project. Flood damage can occur to sites during build phase in laydown when equipment is temporarily on the ground a few days and a flash flood occurs. There is also a risk of wind damage to trackers or their mounting structure if there has been an error in the build method or design methodology, which means they are incapable of withstanding high wind speeds in multi directional scenarios, as seen in undulating topographies.

Operational phase risks

It is fair to say that the rapid rise in solar capacity has seen risk exposure increase due to the varied technology providers of panels, inverters and transformers bringing up less robust track records, and many claims incidents of inverter failure in particular have occurred. These are often failures within a specific batch that have

been destined to fail when installed by a contractor who has applied the same technique involving wiring, connection or software to a whole series.

Additionally, the vast volume of solar sites globally are located in natural catastrophe exposed areas, and insurers worry from a Probable Maximum Loss (PML) perspective - the value of the largest loss that could result from a natural disaster - if a substation is being exposed to wind

"The vast volume of solar sites globally are located in natural catastrophe exposed areas."

storm or flood as this could incur a full 12 months of revenue lost, which business interruption insurance cover would indemnify.

More common is wind and flood causing significant claims where the mounting structure has not been strong enough, especially now with trackers which can be more vulnerable to wind as a result of poor design, or panels which are not lifted high enough above ground level and are therefore susceptible to flood damage.

How to maximise value from the solar insurance market

More focus is being placed by insurers on risk management strategies when considering taking on a risk and there are a number of actions that owners can take to optimise risk-related procedures and controls, and maximise insurance outcomes.

Owners should be able to demonstrate that contractors working on the project have had prior experience of working on similar types of solar PV projects, especially those involving trackers, and in the same territory as the project is based, with an installed megawatts list - reducing the risk of installation and construction error.

Securing long term and robust warranties from well-known and reliable 'Tier 1' manufacturers can help to provide insurers with confidence about the performance of each of the components of the solar power system.

Insurers expect to see robust operations and maintenance (O&M) practices in place ensuring that plant infrastructure and equipment are well-maintained including

regular vegetation management, removing any weeds growing around solar installations which can create shading, potentially reducing the functionality of the system; clearing snow and ice from panels to prevent any damage; and heat thermal monitoring to detect any risk of the system overheating.

A realistic project timeline should be made available to the insurers from the owner and their contractor pre-policy inception, so that the underwriting is accurate. This avoids insurers declaring a material change in risk if the substation is then set to arrive one to two months out from the commercial operation date (COD), which could have implications on cover. In reality, the substation is usually tested some one to three months prior to COD, so this should be factored into the project timeline upfront.

Prior to construction, any nuances on site - including those involving flood, wind and ground settlement risk - should be properly addressed with conditions reports and then design reports showing how those higher exposure aspects for the site have been fully mitigated by the pre planning of the owner and contractor and their design.

The value of a broker

Due to the fact that risks will vary from one solar power project to the next, there is no such thing as a one size fits all approach to insurance and risk management. To ensure the best possible outcome when securing insurance for project finance transactions and to meet lender requirements, engaging the support of a specialist insurance broker with technical awareness of common risk exposures in solar power projects and how these relate to policy wordings, is key. They will work with owners to identify project risks, advise what type of insurance cover is appropriate, and make sure that cover is tailored to project requirements. ■

References

[1] <https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=855>

Author

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