

Understanding PV Solar Panel Systems

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Objectives

- To help attendees understand what PV Solar Systems are, their components and different types of systems there are out there.
- Stats of Solar Installation.
- What you could you expect during claims.
- Q&A at the end of the presentation.

What are PV Solar Panels

- What does PV stand for?
 - It stands for Photovoltaic
- What does Photovoltaic mean?
 - Photovoltaic technologies convert sunlight to electricity through naturally occurring process in certain types of material, which are called semiconductors.

Continued....

- What are PV Solar Panels?
 - They are made up of many solar cells that link together to form a circuit. They generate DC electricity which then must be converted by an inverter to AC power.



Main Components of PV Solar

- Here are the main components but not all necessary of a PV Solar Panel System
 - The Solar Panels
 - Inverters
 - Racking/Mounting Systems
 - Batteries (not needed for all systems)

Component Details

- PV Solar Panels
 - Likely found on a structures roof or freestanding system. As stated before they are made up of many solar cells that link together to form a circuit. They generate DC electricity which then must be converted to AC power.



Component Details

- Inverters
 - They are the like the brains of the solar system. They take the DC electricity from the solar panel system and uses it to create AC electricity. They also provide ground fault protection and system stats.



Component Details

- Racking/Mounting Systems
 - They are used to secure the solar panels to each other; often made from aluminum frames and clips capable of withstanding the elements.



Component Details

- Batteries
 - PV Solar Systems can be comprised of high-capacity batteries that store excess energy generated by solar panels for use at night or as a back-up during outages or other times a solar system cannot generate energy.



Batteries Continued...

- More often you see solar battery storage used in Farm and Commercial use.
 - This way there is less dependence on the grid/panels to supply the power.
- Although, it is not uncommon to see solar battery storage used in residential use.

Types of Batteries

Lead Acid Batteries

- They tend to be the cheapest solar battery option
- So How Much??
- Range around \$200.00 per solarreviews.com

Lithium-ion Batteries

- Higher quality batteries. They beat Lead Acid Batteries in all categories
- So How Much??
- Depending on the kWh capacity they range anywhere from \$6,500-\$33,000 per solarreviews.com



Types of PV Solar Panel Systems

Structure Mounted



Ground Mounted/Freestanding System



Its Not Coming.. Its Already Here

- Massive Growth of Installed Systems
 - According to Solar Energy Industries Association (SEIA), since 2000 solar has experienced an average annual residential and non residential growth rate of ??????

49%!!!!

How has Covid-19 Affected Solar Installations?

- 2020 Solar Installation Forecasts
 - According to Woods Mackenzie (also known as WoodMac), they are now forecasting a 33% growth for residential and non-residential markets for 2020.
 - This is a 16% decrease in average Solar installation growth in previous years.

So How Much?

- I want to install a PV Solar Panel System but how much will it cost?
 - I have a 2000 sq ft home and I use on average of 11,000 kWh/year. Through my normal electrical provider, I pay an average of \$1,200/year
 - Without any Federal or State Tax Incentives and a quote for 21 solar panels with no solar battery system is..

\$29,752.80



How To Insure?

- Disclaimer:
 - At no point in these following two slides are we (WRC) suggesting this is how you should or could write PV Solar Systems. This is just a review of what we have seen in the field in the past.

How To Insure? Continued..

- When Structure Mounted:
 - Being included in structure limit
 - Being listed on dec with specific coverage amounts.
 - Forms have been designed to limit solar panels to ACV.
 - Forms have been designed to limit the remove/reset cost in the event they need to be removed due to a covered loss.



How to Insure? Continued..

- Ground Mounted/Freestanding System:
 - Being insured as Coverage B/E- ACV
 - Being insured as Coverage B/E- with RCV Endorsement
 - Will not insure for more than \$7,500- ACV
 - Will include a separate and higher deductible

How Have You Insured Them

- If you have written properties with solar panels, please type in the chat box how you have decided to write them.



Potential Causes of Loss to Solar Panel Equipment

Fire



Lightning



Potential Cause of Loss To Solar Panel Equipment- continued..

High Voltage Surges



Freezing Conditions



Potential Causes of Loss to Solar Panel Equipment- continued..

Hail



Wind



Potential Causes of Loss to Solar Panel Equipment- continued..

- Per strikecheck.com High Voltage Surges and Wear & Tear were found to be the two main causes of loss in 2019.
- What I found interesting is that Lightning and Hail only accounted for 5% of losses to PV Solar Equipment in 2019.

Issues With These Potential Causes of Loss

Fire

- Firefighters may be unable to access the roof in order to ventilate the structure for removal of smoke and noxious gases
- The panels may be energized, so there is the risk of electrocution.
- With the added weight of the panels, there are also increased risks of possible collapse
- Due to these, the decision is sometimes made by firefighters to let building burn.

Issues With These Potential Causes of Loss

- Hail/Wind
 - Even if the panels are not damaged by hail/wind the rest of the roof could be.
 - There would be an increased cost to remove/reset panels to repair/replace dwelling/structures roof.
 - These increased costs for remove/reset could be over \$6,000.

Adjusting Challenges

- The insurance company and or adjuster may not have the knowledge of these systems to be able to determine what the next step is. What do you do?



Adjusting Challenges continued...

- Are panels repairable?
 - If not, can I find like, kind and quality?
- Will prior components work on new panels?
 - If not, additional costs would apply
- Can I find qualified contractors to perform work?
- Correct amount of depreciation to apply?

Adjusting Challenges continued...

- In the event there is roof damage and the panels need to be removed/reset there are significant costs.
 - If done by a subcontractor will general contractor apply overhead and profit for this?

Claim Scenario

- Hail has severely damaged the dwelling roof however, the solar panels are fine. How do you proceed?
 - A- Replace only the shingles that were exposed to the hail. (not shingles under solar panels)
 - B- Replace entire roof but will not pay to remove/reset solar panel system.
 - C- Replace entire roof along with remove/reset solar panel system.
 - D- None of the above- please type your answer in chat.

Loss Prevention

- Risk
 - Is there a plan of the system posted?
 - What type of structure are these on?
 - Type of roof (material type, age and # of layers)
 - What is the truss span that these are mounted to?
 - Can the truss system support added weight
 - Are the trees regularly pruned around the area?

Loss Prevention continued...

- Electrical
 - Is the electrical and Solar System installed in accordance with NEC chapter 690?
 - Is there a shut off switch to de-electrify panels?
 - Is the system grounded? Is there surge protect?
 - Is there proper ventilation of the battery charging area (part of system)?
 - Are there safety warnings on panels and disconnects?

Loss Prevention Recommendations

- The panel system should be designed and approved by structural engineer.
- Installation should be completed by NABCEP certified professionals.
- Routine maintenance per manufacturers recommendations.
- A plan of the system should be posted with location of disconnect switches.

Questions???

Need additional assistance? Reach out anytime!

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