



CELEBRATING
55 YEARS

nerej

Lowering the risk of fire when installing roof mounted solar panels - by Greene and Travers

October 24, 2025 - Front Section



Tracey Greene

Kenneth Travers

As businesses throughout the country take steps to lower energy costs and access new power solutions, the use of solar energy continues to gain momentum. According to the Solar Energy Industries Association, solar production across the U.S. grew by 25% from 2010-2024 as many new projects came online in 2024.

The use of solar power can have positive impacts on the environment and generate long-term energy cost savings, but there are several factors that commercial property owners and facilities managers should consider prior to investing in solar energy.

One of those risks is fire. Although considered to be relatively safe, when a rooftop solar panel fire occurs, it can be devastating.

Adding a renewable energy source to a building does pose potential for an increased fire hazard. That's why it's important that panels are installed and maintained properly to mitigate that risk.

According to SolarKal – a leading solar advisor for real estate owners, while solar PV systems generally do not pose a higher fire risk compared to other electrical systems, it is important to address any potential hazards both during and after installation. When installing or maintaining existing solar panels, commercial property owners and facilities managers should consider the following suggestions to help reduce fire risk.

Work With Reputable Manufacturers and Installers

As market demand for solar has increased, so has the number of contractors and companies supporting the industry. SolarKal reports that the United States counted more than 275,000 workers employed in solar as of 2023; of which 178,812 were installation and project development jobs.

Certification is important. Not all installers are certified for solar power, which may lead to questionable workmanship, improper installation and increased fire risk. Solar contractors and installers who have earned their North American Board of Certified Energy Practitioners voluntary certification are considered more favorably by insurers.

Building owners should confirm if an installer holds a manufacturer's certified designation as part of their regular course of due diligence. Additionally, owners should ensure that installers follow the National Electric Code (NEC) guidelines. These have been adopted in all 50 states and represent the benchmark for safe electrical design, installation and inspection.

If a contractor is unfamiliar with NEC, that's a red flag.

Use Quality Solar Panel Materials and Evaluate Rooftops

Facilities managers should also consider the materials that solar panels are built with. Make sure the panel module frame and back sheets are not constructed of plastic, especially foamed plastic, which can be highly combustible and lead to a rapidly developing fire.

Another frequently overlooked solar panel risk is the combustibility of a building's roof. There are four different insurance classes for roofs. Class one is fire-rated and is the safest for solar panel installation. Lower roof classes often have combustible insulation underneath the roof cover, which can make electrical fires worse on a rooftop panel.

Combustible insulation can easily ignite and move a rooftop fire down into the building's structure.

Create a Rapid Shutdown and Rooftop Access Plan

Solar panels can also create issues for firefighters during fires ignited elsewhere, creating a risk of shock and electrocution as they're working and trying to put out flames. It's important for commercial building owners and managers to create written emergency plans with clear lines of responsibility for shutting down solar power. Those plans should be developed in partnership with the local fire department. Panels installed before 2017 may require a manual shutdown process. Those put in place after 2017 are now designed to include a rapid shutdown feature. Proper installation that adheres to manufacturer instructions is critical to ensure safety features are working correctly, as is keeping current on any product recalls.

Additionally, adequate space must be available on the roof for firefighters to combat a fire. Typically, rooftop panels should have 4-to-6-ft. perimeters on the roof and 4-to-6-ft. perimeters between panels. They may need to cut holes and open a roof to allow smoke and hot gases to exit a building. But if solar panels are placed too closely together, it may prevent them from doing this.

Inspect Solar Connectors

Solar panels rely on cables that connect inverters and combiner boxes to transfer electrical energy. When supply chains were disrupted during the pandemic, some solar panel installers used incompatible cables and connectors that were not from the same manufacturer. That can create a potential electrical failure point causing a short circuit and possibly initiating a fire.

For arrays installed between 2020 and 2023, it's recommended to have a reputable electrician experienced in PV installation update connectors as soon as possible to ensure compatible parts are used. Electricians should also conduct a thermographic inspection of all PV panels, inverter and combiner box connectors to check for overheating and thermal damage, as well as replace any thermally or physically damaged components.

Schedule Regular Maintenance and Testing

As with any system, solar panels are susceptible to wear and tear and require regular testing and maintenance. Detailed inspections are recommended every two years. This includes powering off the entire system and testing all elements. There are a growing number of reputable national firms that building owners can hire to conduct this work.

Incorporate Battery Storage in the Equation

Battery Energy Storage Systems (BESS) are installations of one or more batteries meant to store and distribute electrical energy. They are quickly becoming popular additions to solar energy systems and require the same attention to installation detail and maintenance. Adherence to National Fire Protection Association guidelines is necessary as these lithium-ion batteries can fail and ignite a "thermal runaway fire." Extremely dangerous, thermal runaway occurs when the batteries catch fire and release combustible gases, spreading flames rapidly in a cascading fire-event.

Minimize Weather-Related Hazards

Fire hazards are not the only risk of solar panels. Damage from area vegetation or weather-related events can occur as well. Depending on the geographic location, additional measures can be taken to reduce the likelihood of loss from weather-related events. These can include additional clearing and trimming of trees around the building or installing special guards to protect the panels during a weather event.

Consider the Costs

Installing a solar energy system on a commercial building is a big investment. Making the choice should come after thorough research and exploration. As with any business decision, it's important to evaluate the overall risk and reward of adding solar. Consider how energy savings and any tax incentives will offset the costs to install, insure and maintain solar panels.

Tracey Greene is a real estate industry practice leader and Kenneth Travers is a technical manager of property risk engineering at The Hartford, Hartford, CT