

## Solar Energy South Africa

# Greenland bess fires



## Overview

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What causes a Bess fire?

One of the biggest misconceptions is that all BESS fires are started by poor-quality or faulty batteries. But when you look at the stats, only 11% of fires and explosions are linked to battery module failures, while 65% of incidents are linked to operational and integration issues around the batteries. For example:.

How many Bess fires are there?

led to an uncontained fire.<sup>4</sup> BESS Incidents Worldwide There have been over 30 recorded BESS fires and thermal runaways since 2017. For example, a 20 MWh Liverpool BESS thermal runaway in September 2020 resulted in fire, explosion and release of.

What are the hazards related to fires and explosions in Bess?

In the past few years, the hazards related to fires and explosions in BESS have garnered significant attention due to various incidents. These occurrences not only lead to substantial financial losses but also threaten public safety and can inflict environmental harm.

What causes a Bess battery fire?

Failures of Power Conversion Systems (PCS), BMS Systems, or HVAC/Cooling systems can lead to fires that spread to the batteries. Manufacturing defects, poor-quality battery materials, and management systems are also major causes of BESS fires. Mitigating BESS Fire Risks.

How dangerous is a Bess thermal runaway?

ays in Battery Energy Storage Systems (BESS) worldwide. In 2020 a 20 MWh BESS in Liverpool took over 11 hours to contain a d resulted in an explosion and release of toxic gasses. The Outline Battery Storage Safety Management Plan does not identify and mitigate all the hazards associated with a BESS

thermal runaway. Instead it primarily refe.

What is Bess safety?

The foundation of BESS safety lies in the design and implementation of engineering controls. By incorporating advanced safety features, we can significantly reduce the risk of fire and explosion incidents. One of the most critical components in BESS safety is the Battery Management System (BMS).

## Greenland bess fires



### Fire at auto body shop closes part of Route 33 in Greenland

3 ???· Part of Route 33 in Greenland, also known as Portsmouth Avenue, was closed Monday night due to a two-alarm fire, authorities said. The fire broke out at Reflections Auto Paint & Bodyworks, located

### What Are the Biggest Misconceptions Around BESS

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#### ESS



### Fire Suppression for Energy Storage Systems & Battery Energy ...

Challenges of BESS Fires Fires involving BESS are problematic, for several reasons: Thermal runaway causes an ever-escalating fire. The consumption of the cathodes in the cell are believed to self-generate oxygen. Thermal runaway events are exothermic, and the heat release makes extinguishment difficult.

### Carnegie Road Energy Storage System Failure Response, ...

CCTV captured an explosion within the Carnegie Road BESS facility and the facility was disconnected from the grid. As the fire burned, the BMS lost communication with the other battery zones, disabling further telemetry and alarms. Upon arrival, the fire service was unaware what the Carnegie Road BESS facility was. The watch manager initially



## Sungrow achieves success in world's largest BESS fire test

The fire was effectively contained within the container and damage was limited. This demonstrated the BESS's ability to autonomously respond to extreme fire situations, highlighting a robust passive fire protection design that minimizes risk. Safety is the cornerstone of the energy storage industry.

## Fike Blue

Protection for BESS Fires & Thermal Runaway. Thermal runaway of a lithium battery cell results in an uncontrollable rise in temperature and propagation of extreme fire hazards within a battery energy storage system (BESS). It was once thought to be impossible to suppress a cascading thermal runaway event, until now with Fike Blue(TM).



## "Let-It-Burn" is not an Effective Fire Suppression Solution for BESS

The provision for fire suppression in open parking garages can be waived if large-scale fire testing proves that the BESS does not present an exposure hazard to vehicles nor impede egress.



When it comes to providing fire suppression, automatic sprinkler systems are mentioned, along with the requisite water supply requirements to support the

## Investigation confirms cause of fire at Tesla's Victorian ...

The Victorian Big Battery is currently Australia's largest BESS installation and went into operation just before the end of 2021. Image: Victoria State government. A liquid coolant leak caused thermal runaway in battery ...

### DETAILS AND PACKAGING



## BESS fire safety: 'AHJs increasingly want active protection from

Wärtsilä aimed to replicate worst case scenarios in tackling fire and explosion safety of its GridSolv Quantum BESS units (pictured). Image: Colbún S.A./Wartsila. More and more Authorities Having Jurisdiction (AHJ) over where energy storage systems get built are requiring battery storage projects to have active means of protection against

## Setting a New Safety Benchmark for the Industry: Sungrow ...

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## Emerging Hazards of Battery Energy Storage System Fires

The fire service is unaware and inexperienced with the fire and explosion hazards of BESS. The FP& S R& D study started with a laboratory test in which a single cell failed in one commercial storage module containing a total of 14 cells. In one of the early tests, when a single cell failed, smoke and gases were released that ignited and burned



## A Review of Fire Mitigation Methods for Li-ion BESS

owing to the effective cooling properties of water. However, effectiveness of water -based fire protection systems for LIB-based BESS fires needs to be investigated. At present, there is a gap in data from full -scale fire and suppression testing showing the overall effectiveness of water-based systems on suppression of LIB-based BESS fires. 4



## Utility-scale BESS: Best practices to mitigate hazards

The report concluded that a battery management system is important for reducing incidents and limiting their effects, as well as



dialog with fire departments and first responders about BESS installations. Some BESS manufacturers are focusing on battery management system design and operation procedures, to improve safety.

## BESS FIRES

It was found that some BESS fires occurred in coastal areas with higher humidity, which may be a point to raise regarding the siting at Coldharbour. The Fordham-Allison-Melville paper describes many incidences of recent battery fires, and examples are described below. The paper explains how fires can propagate, often from deep inside the system.



- Efficient Higher Revenue**
  - Max. Efficiency 97.5%
  - Max. PV Input Voltage 600V
  - 500% Peak Output Power
  - 2 MPPT Trackers, 100% DC Input Utilization
  - Max. PV Input Current 25A, Compatible with High-Power Modules
- Intelligent Simple O&M**
  - IP66 Protection Degree: support outdoor installation
  - Smart I/F Curve Diagnostic Function: locate PV string faults accurately and automatically detect faults
  - DC & AC Type II SPDs: prevent lightning damage
  - Battery Reverse Connection Protection
- Flexible Abundant Configuration**
  - Plug & Play, EPC switching under 20ms
  - Compatible with Lead acid and lithium batteries
  - Max. 6 units Inverters Parallel
  - AFCI Function (Optional): when an arc fault is detected the inverter immediately stops operation



## BESS fire safety: 'AHJs increasingly want active ...

Wärtsilä aimed to replicate worst case scenarios in tackling fire and explosion safety of its GridSolv Quantum BESS units (pictured). Image: Colbún S.A./Wartsila. More and more Authorities Having Jurisdiction (AHJ) ...

## What You Need to Know About ESS Fire Protection

As BESS numbers increase, so does the possibility of a fire or explosion in an installation. Given the violent and dangerous nature of BESS fires, it is critical to recognize and take the necessary steps to mitigate the associated risks and ...





## **BESS: The charged debate over battery energy storage systems**

A US database listing fires at BESS sites found 63 examples worldwide since 2011. Scott Donegan, a West Yorkshire Fire and Rescue Service area manager, said: "One of the concerns we do have is

### **What Are the Biggest Misconceptions Around BESS Site Fires?**

One of the biggest misconceptions is that all BESS fires are started by poor-quality or faulty batteries. But when you look at the stats, only 11% of fires and explosions are linked to battery module failures, while 65% of incidents are linked to operational and integration issues around the batteries.



### **Fire at battery storage facility in California triggers evacuation**

Update 9 September 2024: The fire was "out and cold" by 1am on Friday, 6 September, around 13 hours after it was reported at 12:09pm Thursday, according to a joint statement from SDG& E and the Escondido Fire Department. Evacuation orders were lifted at noon the following day. The fire was contained to one BESS unit of the 24 at the site.

### **New York Fire Code updates: 'added BESS safety,**

## standardisation'

"As a contributing member of the Governor's Interagency Fire Safety Working Group, ESRG is proud to leverage our experience in battery energy storage safety, large-scale fire testing, and emergency response to ensure the greatest level of safety for BESS across the New York State," the company said.



## Fires at two of three approved BESS facilities in San Diego County

Fires at two of three approved BESS facilities in San Diego County Jim Desmond's concerns surrounding battery storage technology stem from recent high-profile fires at two of three BESS facilities green-lit for construction by San Diego County officials. As reported in Energy-Storage.News, a battery unit at Terra-Gen's 140MW/560MWh Valley Center BESS ...

## RAI Energy in permitting for hybrid 2GWh BESS in rural Colorado

With this being said, local authorities are much more aware of the dangers and possibilities of BESS fires, and are putting mitigation measures in place if a fire were to occur. As stipulated by Morgan County's zoning laws, any party proposing to construct a BESS within the county must submit fire mitigation and emergency operation plans



## BESS for Rolling Stock , Stat-X® Fire Suppression



Effective at Disrupting a BESS Fire. Stat-X has been third-party tested on a lithium-ion BESS fire by the world-renowned testing agencies, DNV and PVEL. The tests demonstrated that Stat-X is effective at suppressing lithium-ion BESS fires, disrupting thermal runaway, and preventing the explosion that so often accompanies these events.

## Arizona battery fire's lessons can be learned by industry to

...

In response to a number of fires at BESS projects in South Korea over a period of about a year, beginning in August 2017, DNV GL had said previously that it was important that minor defects or other issues did not lead to more catastrophic failure situations. The group noted in its report on the McMicken fire that those incidents were



## [BESS Incidents](#)

This is a follow-up to an article published in February 2022 on Battery Energy Storage Systems (BESS), which was the sixth in a series as follows: 1. Battery Failure Analysis and Characterization of Failure Types 2. BESS Frequency of Failure Research 3. Review of Fire ...

## Fire incidents at two New York battery storage projects, no ...

Fire incidents at BESS installations are rare, as can be seen from the EPRI Battery Failure Event Database, which keeps a tally, albeit this information is scraped from media reports and

does not appear to be updated full-time; the Convergent Energy and Power incident is not on there as yet, for example.

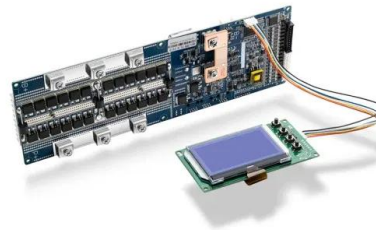


## Fire at PG& E Tesla battery unit at Moss Landing under control

PG& E commissioned the Elkhorn Battery, a 182.5MW/730MWh BESS which uses Tesla Megapacks, in April this year. It is not to be confused with the Moss Landing Energy Storage Facility, a 400MW/1,600MWh BESS which is located at the same site but is an entirely separate system owned by Vistra Energy, but also providing power to PG& E.

## Fire Suppression in Battery Energy Storage Systems

The Stat-X ® condensed aerosol fire suppression system is the ideal agent for BESS fire suppression. Stat-X has been tested extensively, resulting in verification of its performance in these categories. First, Fireaway contracted DNV--the same organization that investigated the APS incident--to conduct trials of Stat-X on lithium-ion battery



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