# Fire safety experts call for stricter regulations as battery storage fires rise



The rapid expansion of Battery Energy Storage Systems (BESS) is becoming a focal point in the energy landscape, particularly as countries shift towards renewable sources such as wind and solar power. These systems are designed to store excess energy generated during peak production hours and release it when demand surges. Lithium-ion batteries, commonly found in everyday consumer electronics and electric vehicles, are predominantly employed in these large-scale storage solutions. However, as their proliferation increases, so too do concerns over safety, particularly in relation to fire risks associated with lithium-ion technology.

Recent warnings from fire safety officials, notably from Mr. Griffin, indicate that the scale of BESS has necessitated new training and response techniques for firefighters. He remarked on the complexities of handling fires associated with these systems, noting that “there can be complications with vapour clouds,” which present significant risks and challenges. Traditionally, fire services have operated under guidelines that limit their authority to mere advice, but Griffin advocates for more robust regulatory powers to enforce safety measures. He suggested a model akin to a regulatory order, asserting the need for enforcement capabilities to ensure compliance with safety protocols at BESS facilities.

Globally, the urgency surrounding safety in energy storage is recognised. In China, authorities are contemplating large-scale investigations into energy storage plants following a series of fire incidents, including a devastating event at a lithium battery factory in Seoul that resulted in the loss of 23 lives. This incident, coupled with a fire in a commercial energy storage facility in Wenzhou, highlights the peril of underutilised battery plants and the necessity for rigorous safety inspections and upgrades. Experts have voiced concerns regarding the reliability of batteries in these facilities, particularly those of lower quality, indicating a potential ticking time bomb if proper safety protocols are not established.

The stakes have been made glaringly apparent in recent incidents, such as the fire at Vistra Energy’s lithium battery plant in Moss Landing, California. This facility, one of the largest of its kind globally, faced significant smoke emissions and prompted the evacuation of approximately 1,500 residents. Remarkably, firefighters allowed the blaze to burn out due to the challenging nature of lithium-ion fires, which burn at exceptionally high temperatures and can release hazardous gases like hydrogen fluoride. While there were no reported injuries, the incident raised alarms about air quality and public safety, contributing to the broader conversation on the risks associated with expanding battery storage technology.

To mitigate the inherent fire hazards associated with BESS, adherence to established safety protocols, such as those outlined by the National Fire Protection Association (NFPA), is essential. These guidelines recommend strategic siting of battery storage installations away from critical infrastructures, ensuring adequate ventilation, and employing effective gas detection and fire suppression systems. Such measures are crucial in addressing the significant risks posed by thermal runaway—a phenomenon where an increase in a battery’s internal temperature leads to uncontrollable reactions, potentially culminating in explosions.

The overarching theme in this discourse is the balance between the pressing need for reliable, renewable energy uptake and the associated safety imperative. As more countries adopt battery storage solutions to combat electricity shortages exacerbated by climate change, the call for stringent safety measures becomes increasingly urgent. The continuing evolution of BESS carries with it both opportunity and risk; navigating these challenges will be vital for the safe integration of battery technologies into our energy systems.

## Reference Map:

* Paragraph 1 – [[1]](https://www.bbc.co.uk/news/articles/clyrmy61967o), [[5]](https://www.lithiplus.com/post/lithium-ion-battery-energy-storage-systems-bess-and-their-hazards-a-comprehensive-guide)
* Paragraph 2 – [[1]](https://www.bbc.co.uk/news/articles/clyrmy61967o), [[2]](https://www.reuters.com/markets/commodities/china-may-investigate-energy-storage-plants-fire-risks-local-media-says-2024-07-08/), [[6]](https://www.thehartford.com/insights/home-workplace-safety/reducing-fire-hazards-in-bess)
* Paragraph 3 – [[3]](https://apnews.com/article/7c561fed096f410ddecfb04722a8b1f8), [[4]](https://apnews.com/article/e5957a710670930ca23c4b2d2e3ed75f), [[7]](https://www.modernpowersystems.com/analysis/energy-storage/li-ion-grid-scale-batteries-addressing-safety-concerns/)

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## Bibliography

1. <https://www.bbc.co.uk/news/articles/clyrmy61967o> - Please view link - unable to able to access data
2. <https://www.reuters.com/markets/commodities/china-may-investigate-energy-storage-plants-fire-risks-local-media-says-2024-07-08/> - Chinese authorities are considering large-scale investigations into energy storage plants due to fire risks. This follows recent incidents, including a June 26 fire at a lithium battery factory in Seoul that killed 23 people, mostly Chinese migrant workers. In March, a fire at a commercial energy storage facility in Wenzhou led to safety inspections and upgrades. Many of China's energy storage plants, built to meet government mandates, have been underutilised, potentially posing safety risks. Experts express concern over fire hazards, especially with lower-quality batteries.
3. <https://apnews.com/article/7c561fed096f410ddecfb04722a8b1f8> - A fire at the Vistra Energy lithium battery plant in Moss Landing, California, caused significant smoke emissions and led to the evacuation of about 1,500 residents. The incident raised concerns about air quality due to the release of potential hazardous gases like hydrogen fluoride. Authorities allowed the fire to burn out, as lithium-ion fires are difficult to extinguish due to their high temperatures. No injuries were reported, and evacuation orders were lifted later, but residents were advised to keep windows closed and air conditioning off.
4. <https://apnews.com/article/e5957a710670930ca23c4b2d2e3ed75f> - A fire broke out at the Vistra Energy battery plant in Moss Landing, California, one of the world's largest battery facilities, causing mass evacuations and highway closures. The incident highlights the growing reliance on large-scale battery storage to bolster power reliability in California and Texas, driven by the need to address electricity shortages and blackouts exacerbated by extreme weather linked to climate change. Despite their importance in reducing carbon emissions, lithium batteries have raised concerns among nearby residents due to potential fire risks.
5. <https://www.lithiplus.com/post/lithium-ion-battery-energy-storage-systems-bess-and-their-hazards-a-comprehensive-guide> - Lithium-ion Battery Energy Storage Systems (BESS) store excess energy from renewable sources and release it when needed. However, they pose significant hazards, including thermal runaway, fire, and explosion risks. Thermal runaway occurs when a battery's internal temperature increases uncontrollably, leading to a self-sustaining reaction that can result in fire or explosion. This can be triggered by overcharging, overheating, or physical damage. Proper safety measures, including robust monitoring systems and fire suppression techniques, are essential to mitigate these risks.
6. <https://www.thehartford.com/insights/home-workplace-safety/reducing-fire-hazards-in-bess> - To reduce fire hazards in Battery Energy Storage Systems (BESS), adherence to the National Fire Protection Association (NFPA) 855 standards is recommended. Best practices include siting BESS containers away from critical buildings, ensuring proper ventilation to release off-gases, installing continuous gas detection systems, and implementing sprinkler protection systems. Following these guidelines can enhance safety and mitigate potential fire risks associated with BESS installations.
7. <https://www.modernpowersystems.com/analysis/energy-storage/li-ion-grid-scale-batteries-addressing-safety-concerns/> - Lithium-ion grid-scale batteries, used in Battery Energy Storage Systems (BESS), present safety concerns due to potential failure events that can lead to explosions. Incidents like the 2019 McMicken BESS explosion in Arizona, which injured first responders, highlight the need for improved safety systems. The explosion occurred when a clean-agent fire suppression system discharged in response to a cell thermal runaway, leading to a subsequent explosion when oxygen was introduced. This underscores the importance of robust safety protocols in BESS installations.