Lithium battery challenges

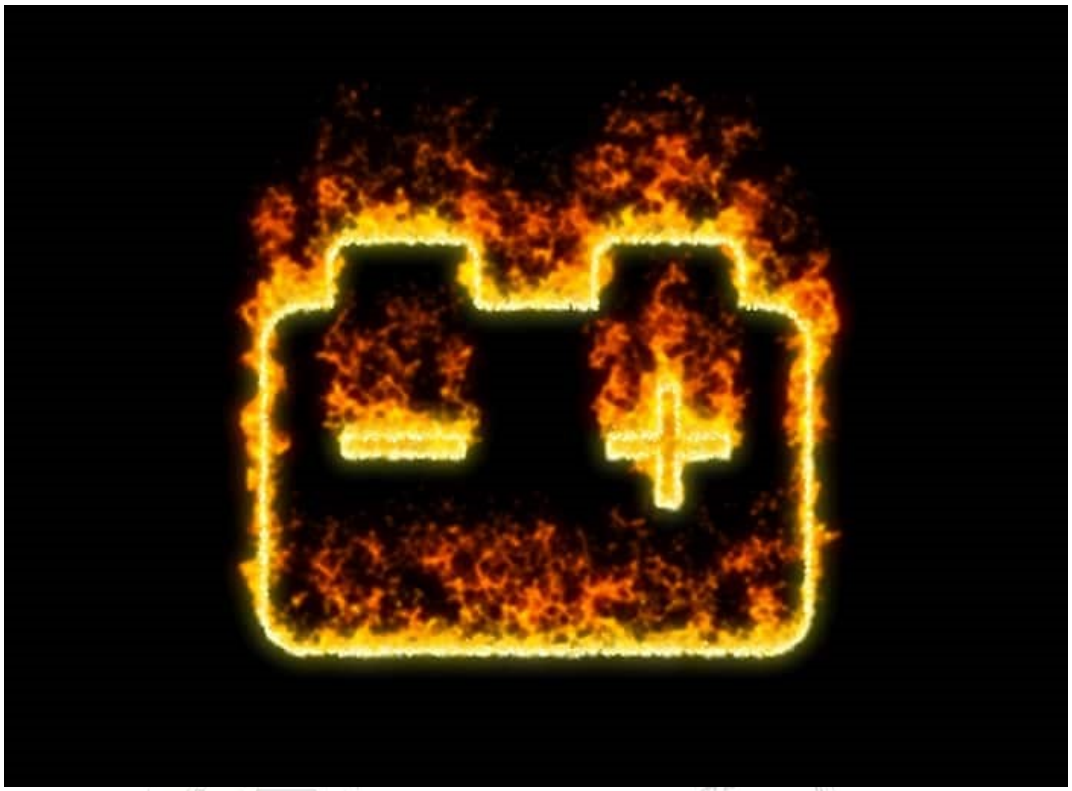
Lithium batteries' instability in certain circumstances is a serious issue that manufacturers have managed to mitigate but not eliminate with design changes.

A fire at one of the largest Tesla battery installations in the world at Moorabool near Geelong in Australia graphically illustrated the technology's flammability. The fire took three days to get under control. That fire started during testing in a shipping container holding a 13-metric-ton lithium-ion battery, according to the Financial Times, and spread to a second battery pack.

PHOTO PROVIDED BY www.teslarati.com/tesla-megapack-battery-fire-victoria-details/

Although not commissioned yet, the "Victorian Big Battery" project using the Tesla Megapack is said to be the largest in the country, with 210 packs capable of storing up to 450 megawatt-hours of energy for the electricity grid.

Nor is this a one-off. The post reports there have been a total of 38 large lithium-ion battery fires since 2018, some resulting in deaths and serious injuries.



Risk assessment

All power generation technologies have risks.

Petroleum and natural gas are highly flammable. Nuclear power is radioactive. Even coal has serious long-term risks of lung damage from particulate emissions that have resulted in hundreds of thousands — probably millions — of deaths over the years.

But the risks are quantified and mitigating technologies and procedures are widely applied to reduce the risks. Thermal runaway in lithium-ion batteries can result in a rise in temperatures and the release of oxygen that perpetuates the fire and makes them very difficult to put out. The process is understood but predicting when is still in its infancy.

In time better, safer, versions using different materials and safer designs will be developed. However, the fire risk remains an area of concern for all lithium-ion's applications. That is particularly true for at-scale grid storage and home installations in heavily urban areas, just as it is for that EV parked in your garage.