

NFPA Resources on Lithium-ion Battery Applications

Codes & Standards:

- NFPA 855, Standard on Stationary Energy Storage Systems: www.nfpa.org/855
- NFPA 1, Fire Code: www.nfpa.org/1

Informational Fact Sheets:

- ESS fact sheet: <https://go.nfpa.org/l/14662/2021-01-11/8h6lwf>
- ESS Quick Reference: <https://www.nfpa.org/-/media/Files/News-and-Research/Resources/Fire-service/ESS/ESS-Quick-Reference.pdf>
- Lithium-ion Battery Safety for Consumers: <https://www.nfpa.org/-/media/Files/Public-Education/Resources/Safety-tip-sheets/LithiumIonBatterySafety.ashx>

Research Resources from the Fire Protection Research Foundation (FPRF):

FPRF Project/Reports on Lithium-ion Batteries:

- **Active FPRF Project:** Improving Firefighter Safety on fire grounds involving lithium-ion batteries
- **FPRF Report:** [Phase I: Hazard and Use Assessment of Lithium-ion Batteries](#) (2011)
- **FPRF Report:** [Phase II: Hazard and Use Assessment of Lithium-ion Batteries – Flammability Characterization of Li-ion Batteries for Storage Protection](#) (2013)
- **FPRF Report:** [Phase III: Hazard and Use Assessment of Lithium-ion Batteries – Development of Protection Recommendations for Li-ion Battery Bulk Storage: Sprinklered Fire Test](#) (2016).

FPRF Projects/Reports on Lithium-ion Battery Energy Storage Systems:

- **Active Project:** Hazard Assessment of lithium-ion battery-based ESS being transported on marine vessels (2022 – present)
- **Active Project:** [Landscape of Battery Energy Storage System Hazards & Mitigation Strategies](#) (2021 – present)
- **Report:** [Firefighter safety for lithium-ion battery ESS: Explosion hazards from lithium-ion battery vent gas](#) (2021)
- **FPRF Report:** [Energy Storage System Research and Design Challenge](#) (2019)
- **FPRF Report:** [Sprinkler Protection Guidance for Lithium-Ion Based Energy Storage Systems](#) (2019)
- **FPRF Report:** [Hazard Assessment of Lithium Ion Battery Energy Storage Systems](#) (2016)
- **FPRF Workshop:** [Energy Storage Systems and the Built Environment](#) (2015)

FPRF Projects/Reports on Electric Vehicles:

- **Proposed FPRF Project:** [Electric Vehicle Hazards in Parking Garages – Full scale Testing](#)
- **FPRF Report:** [Emergency Response to Incident Involving Electric Vehicle Battery Hazards](#) (2013)

FPRF Reports on PV systems:

- **FPRF Report:** [Development of Fire Mitigation Solutions for Photovoltaic \(PV\) Systems Installed on Building Roofs](#) (2016)
- **FPRF Report:** [Commercial Roof-Mounted Photovoltaic System Installation Best Practices Review and All Hazard Assessment](#) (2014)
- **FPRF Report:** [Property Insurance Research Group Forum on PV Panel Fire Risk](#) (2014)

NFPA Training opportunities:

- ESS and PV training for first responders: <https://catalog.nfpa.org/Energy-Storage-and-Solar-Systems-Safety-Online-Training-P20882.aspx>
- ESS and PV general knowledge: <https://catalog.nfpa.org/Photovoltaic-and-Energy-Storage-Systems-Online-Training-Series-P22078.aspx>

Other Related EV resources:

- Emergency Response Guides for Alternative Fuel Vehicles: <https://www.nfpa.org/Training-and-Events/By-topic/Alternative-Fuel-Vehicle-Safety-Training/Emergency-Response-Guides>
- Submerged Hybrid/Electric Vehicles: <https://www.nfpa.org/-/media/Files/Code-or-topic-fact-sheets/BulletinSubmergedHybridEV.pdf>
- Electric and Hybrid Vehicle Quick Reference: <https://www.nfpa.org/-/media/Files/Training/AFV/EV-Fire-QR-info-card.ashx>

NFPA Journal Resources:

- Micro-mobility:
 - [Feature article on micro-mobility devices and the fire safety challenges/controversies in NY and beyond](#)
 - [NFPA Journal article on the potential E-bike/E-Scooter ban in NYC public housing and the backlash](#)
 - [Podcast on the e-bike and e-scooter issue, featuring FDNY Chief Jardin](#)
- Energy Storage Systems:
 - [ESS/Surprise Battery explosion](#)
 - [Podcast interview with Steve Kerber and FSRI ESS researcher on Surprise AZ](#)
- Electric Vehicle incident response:
 - [EV emergency response/stranded energy](#)

Relevant Blogs on NFPA Today:

- [Residential ESS regulations](#)
- [ESS Hazards and Failure Modes](#)

FDNY 2022 Symposium

https://drive.google.com/drive/folders/1zG1se9zzFwIPk-0QS0R8lIfftjxY4UdT?usp=share_link