

# LITHIUM-ION BATTERIES: PUBLIC EDUCATION MESSAGING

With the ever-increasing use and popularity of electric vehicles, e-bikes, e-scooters, and other lithium-ion battery-powered electronics, the risk of related fires has grown as well. The fire service plays a vital role in educating community members about potential hazards of lithium-ion batteries. Having a strong community risk reduction program in place can make a tremendous impact, helping ensure that populations and demographics at highest risk have the tools and information needed to use, maintain, store, and dispose of them safely.

In addition, lithium-ion fires can become quite serious within a very short window of time, requiring that people are alerted to them as quickly as possible. Reinforcing to the public the importance of smoke alarms, home escape planning, and home fire sprinklers is critical to keeping the community safe.

## Educational Resources

You can utilize existing resources to help enhance your lithium-ion battery public education program. These include:

- [Tip sheet](#) from the NFPA on Lithium-Ion Battery Safety
- [Resources](#) from the NFPA on how to use, store, and maintain e-bikes and e-scooters
- [Social media graphics](#) on lithium-ion battery safety from the U.S. Fire Administration
- [Safety tips](#) for lithium-ion batteries from the FDNY

## Electric Vehicles

Basic safety guidelines and recommendations can help prevent hazards associated with electric vehicles:

- ✓ Home charging equipment must be installed by a qualified electrician and use equipment that has been listed by an independent testing laboratory.
- ✓ Never hot-wire a charger on electrical equipment.
- ✓ Never charge a vehicle that has been submerged in water.
- ✓ If involved in an accident, check with the manufacturer to make sure that the battery pack has not been damaged.

## Take Action and Learn More

Visit [www.safetystanddown.org](http://www.safetystanddown.org) for more information and resources.

**Lithium-Ion Battery Safety**

Lithium-ion batteries supply power to many kinds of devices including smart phones, laptops, e-scooters and e-bikes, e-cigarettes, smoke alarms, toys, and even cars. If not used correctly, or if damaged, these batteries can catch on fire or explode.

**The Problem**

- These batteries store a large amount of energy in a small amount of space.
- Sometimes batteries are not used the right way; batteries not designed for a specific use can be dangerous.
- Like any product, a small number of these batteries are defective. They can overheat, catch fire, or explode.

**Safety Tips**

- Purchase and use devices that are listed by a qualified testing laboratory.
- Always follow the manufacturer's instructions.
- Only use the battery that is designed for the device.
- Put batteries in the device the right way.
- Only use the charging cord that came with the device.
- Do not charge a device under your pillow, on your bed, or on a couch.
- Do not keep charging the device or device battery after it is fully charged.
- Keep batteries at room temperature when possible. Do not charge them at temperatures below 32°F (0°C) or above 102°F (40°C).
- Store batteries away from anything that can catch fire.

**Signs of a Problem**

Only using the battery if you notice these problems: odor, change in color, too much heat, change in shape, bulging, or odd noises. If it is safe to do so, move the device away from anything that can catch fire. Call 911.

**Battery Disposal**

- Do not put lithium-ion batteries in the trash.
- Recycling is always the best option.
- Take them to a battery recycling location or contact your community for disposal instructions.
- Do not put discarded batteries in fire.

**Charging an E-Bike**

Charge your battery in a dry, dry area away from children, electrical equipment, liquids, tripping hazards, and in a location where the bike is not in use of others.

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**E-Bike and E-Scooter Safety**

The National Fire Protection Association (NFPA) has developed this tip sheet to help you understand the risks of e-bikes and e-scooters and how to use them safely. This tip sheet is intended for use by fire departments and other emergency responders.

**The Problem**

- E-bikes and e-scooters are becoming increasingly popular and are being used in a variety of ways.
- E-bikes and e-scooters are powered by lithium-ion batteries, which can catch fire or explode.
- E-bikes and e-scooters are often used in areas with high traffic, such as sidewalks and crosswalks.
- E-bikes and e-scooters are often used in areas with poor lighting, such as at night.
- E-bikes and e-scooters are often used in areas with poor weather, such as rain or snow.

**Safety Tips**

- Only use e-bikes and e-scooters that are listed by a qualified testing laboratory.
- Always follow the manufacturer's instructions.
- Only use the battery that is designed for the device.
- Put batteries in the device the right way.
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## Built Environment

It's easy to identify hazards associated with facilities that house a battery plant. However, simple techniques for *all* buildings should be implemented and monitored – and not only by inspectors but the entire fire service community, as follows:

- ✓ Basic charging principles should be used for all equipment. Do not leave equipment charging when the building is unoccupied.
- ✓ Only use the manufacturer's charging equipment and batteries that are listed and intended to be used on the equipment.
- ✓ Battery collection programs should be limited and meet Chapter 14 of NFPA 855.
- ✓ Develop programs for identifying possible damage to battery packs and best use of separating from other batteries and combustibles.

## Energy Storage Systems in the Home

Use of energy storage systems in the home can be a great way to add reliability to the home's power system. Recommendations for doing so safely include the following guidelines and recommendations:

- ✓ Installed equipment shall be listed per UL 9540 and installed per the listing and manufacturer's instructions. This means the right equipment must be used in the space for which it was designed. (For example, some equipment is designed to be installed on the exterior of the home vs. a garage.)
- ✓ Use a licensed contractor who is familiar with energy storage systems and the associated hazards.
- ✓ Homeowners should never make a DIY battery pack and energy storage system. These lack the basic safety features found in listed equipment.
- ✓ Work with local code officials (such as an electrical and/or building inspector) to highlight the requirements of home ESS systems found in the *National Electric Code*® (NEC®) and NFPA 855, *Standard for the Installation of Energy Storage Systems*.

## Fire Station

The same key safety points for the built environment should be applied to fire stations, which increasingly use lithium-ion batteries to power devices and equipment. From developing charging strategies to using the right charger for equipment, potential hazards can be limited in the following ways:

- ✓ Make sure everyone is fully aware of the potential fire hazards associated with charging batteries and knows if/when battery packs may have been subject to damage or moisture.
- ✓ Develop means for proper recycling and capture of battery packs.
- ✓ Only buy batteries that are listed for use with equipment, understanding that use of off specification or modified battery packs can lead to catastrophic failure.

## How Many Incidents?

Every department must find a means to capture incident data when batteries are involved.

How can your community capture response data to lithium-ion batteries?

[www.safetystanddown.org/](http://www.safetystanddown.org/)