

# INTERNATIONAL ASSOCIATION OF FIRE FIGHTERS



## The Hazards of Lithium-Ion Batteries

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# Overview

## Prevalence of Lithium-Ion batteries

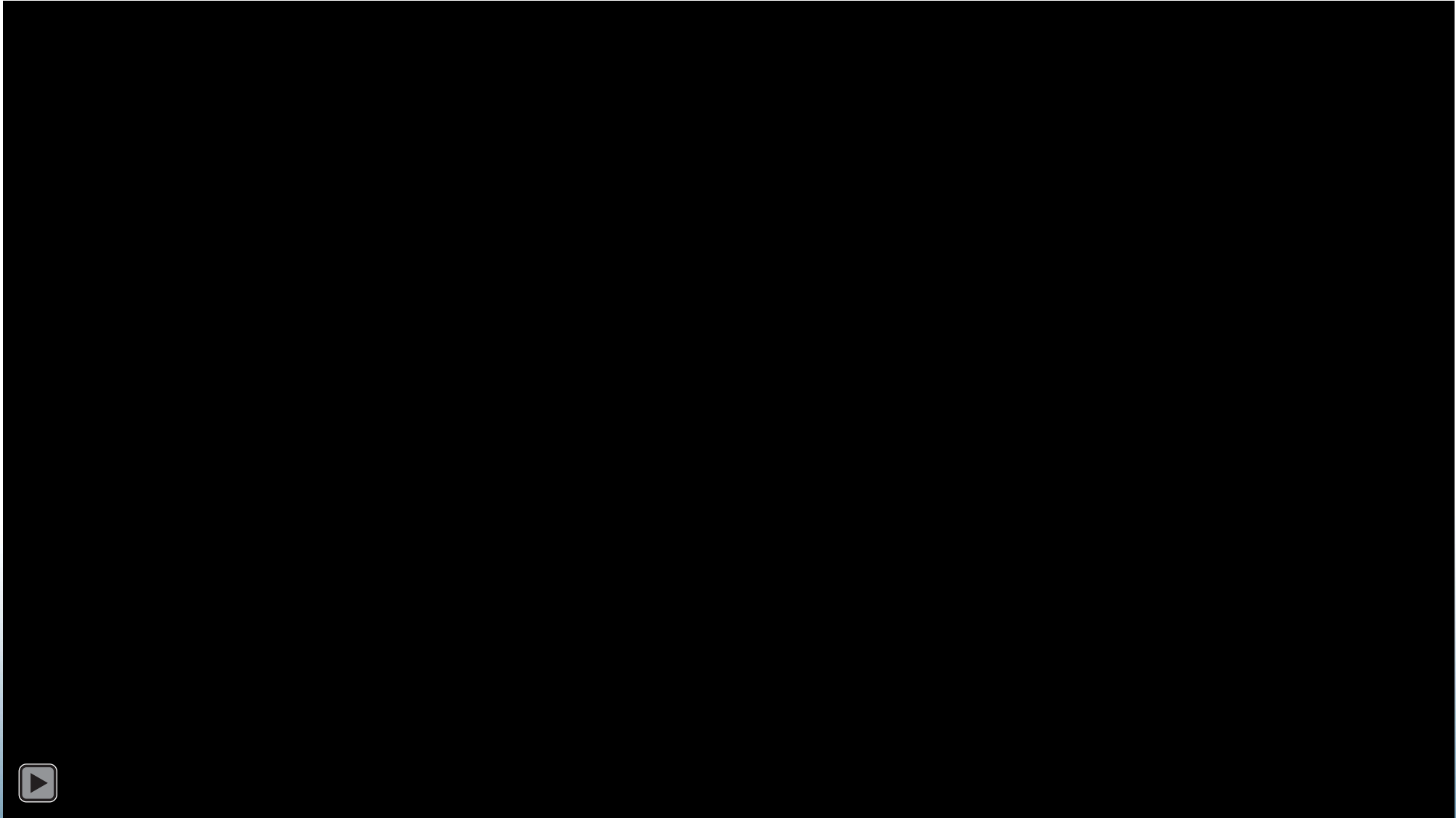
- Incidents not only involve electric cars and large energy storage systems but also smaller devices, like anything from cell phones, headphones and watches to e-bikes and e-scooters.
- LI related fires have increased 5X in only six years.
- LI batteries burn hotter, faster, and longer than legacy fuels
  - A combustion engine vehicle fire could be suppressed with 500-1000 gallons of water, a fully electric vehicle can require between 30,000-40,000 gallons of water to fully extinguish
- The fire service has not been able to keep up with the rapid rise of LI battery sources. Think about all of the rechargeable devices in your own home!



# Where are we seeing these?



# The Problem



# The End Result

abc 7 WATCH LIVE

## Queens fire that killed 8-year-old caused by lithium-ion battery, FDNY says

Sunday, September 18, 2022



The New York Times

## 2 Die in Harlem Fire as Warnings Mount About Scooter Battery Hazards

The fire, which occurred at a New York Housing Authority building, also left the child's father in critical condition, according to the police.

Give this article



# Hazards of Exposure (Inhalation)

- Gases present during LI battery fire
  - Hydrogen
  - Hydrogen Fluoride
  - Carbon Dioxide
  - Dimethyl Carbonate
  - Ethane
  - Ethylene
  - Methane



# Hazards of Exposure (Thermal)

- The primary concern with lithium-ion chemistries are significant generation of heat and venting of flammable gases.
- As the flammable gases vent, they may ignite and cause jetting flames. If the gases do not ignite during venting, then an explosion hazard can develop if the gases accumulate in an enclosed space.
- In addition to these potential fire, explosion, and toxicity hazards, product enclosures typically prevent suppression media from reaching the problematic battery cells.
- If a fire is suppressed, reignition may occur hours or days after an initial event if all of the cells are not consumed in the initial incident.

