GLOBAL ELECTRIC VEHICLE BATTERY FIRES  
as of 11th July 2022

EVs are less likely to catch fire than internal combustion vehicles...here’s what we know

**Why EV FireSafe?**

Transport emissions account for:  
25% of global greenhouse gas emissions, which has led to the rapid electrification of vehicles.

EV battery fire incidents have led to concerns about emergency responder safety when attending EV lithium ion traction battery fires.

To enhance emergency responder safety, we researched plug-in (BEV & PHEV) passenger electric vehicle battery fires from 2010 - 2022, breaking down our findings here & at evfiresafe.com.

**How many EV battery fires?**

Since 2010, the EV FireSafe research team found:

- **246** verified* EV traction battery fires globally
- **27** unverified - from a reliable source, waiting on further info
- **40** investigating - online rumour, tip off, clickbait

*(Not exhaustive. From more than one online source, interviews, first hand accounts, videos, images, academic & fire agency reports & online training)

**When did they occur?**

By year & EV global market share:

- **2010 / 0%**
- **2011 / 0.1%**
- **2012 / 0.2%**
- **2013 / 0.3%**
- **2014 / 0.4%**
- **2015 / 0.7%**
- **2016 / 0.9%**
- **2017 / 1.4%**
- **2018 / 2.3%**
- **2019 / 2.5%**
- **2020 / 4.3%**
- **2021 / 9%**
- **2022 / ?**

*As of 11th July 2022*

**EV battery fires are rare, but present new risks & challenges for emergency responders when they do occur. From these verified incidents, we found:**

**Cause**

Battery cell abuse, leading to thermal runaway & ignition or explosion, caused by:
- Unknown
- OEM battery fault
- Arson / malicious
- External fire
- Workshop / repair
- Overheating

**Location***

- 24.39% Underground / enclosed spaces
- 23.58% Outside & parked
- 31.71% Outside & driving
- 20.32% unknown

*Not exhaustive. From more than one online source, interviews, first hand accounts, videos, images, academic & fire agency reports & online training

**Ignition vs explosion**

- 94.72% Ignition
  - Jet like, directional flames
- 5.28% Vapour cloud explosion
  - Violent deflagration

**Vapour cloud explosion**

Of total vapour cloud explosion incidents:
- 71.43% Underground / enclosed space
- 28.57% Open air

**Charging**

Of total incidents:
- 18.70% EV connected to energised charging
- 2.44% EV disconnected from energised charging within 60 minutes

**Electrocution**

We found NO reports or evidence of electrocution or near miss of emergency responders from:
- Direct stream of water on HV
- Extrication of occupants
- Stranded energy

But electrocution is still a risk!

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