

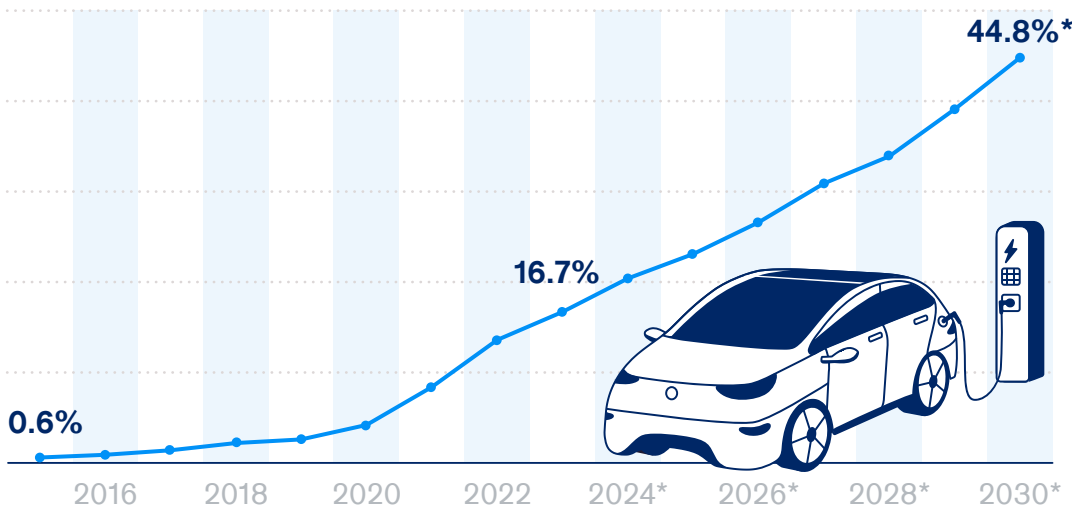
First Responder Safety

Gas detection considerations for incidents involving vehicles with alternative drive systems

Major growth in alternative drives

Since 2015, there has been **strong growth** in electric vehicles. That year, they accounted for just **0.6%** of global passenger car sales. By 2023, this figure had risen to 16.7%, and it is expected to reach **44.8% by 2030**. The increasing use of alternative drive systems presents unique safety challenges for first responders.

Global market share of electric vehicles within passenger car sales







In 2023, there were about 88,000 fuel-cell electric vehicles using hydrogen worldwide.

H₂

* Forecast; sources: EV Volumes (2025), IEA (2024)

New challenges for first responders

-  Battery-cell thermal runaway – the overheating of the cell due to a self-reinforcing heat generation process
-  Release of toxic and flammable substances during incidents
-  Risk of jet flames and deflagration
-  Increased risk of explosion where gases and vapours can accumulate in poorly ventilated areas (e.g. tunnels, garages)



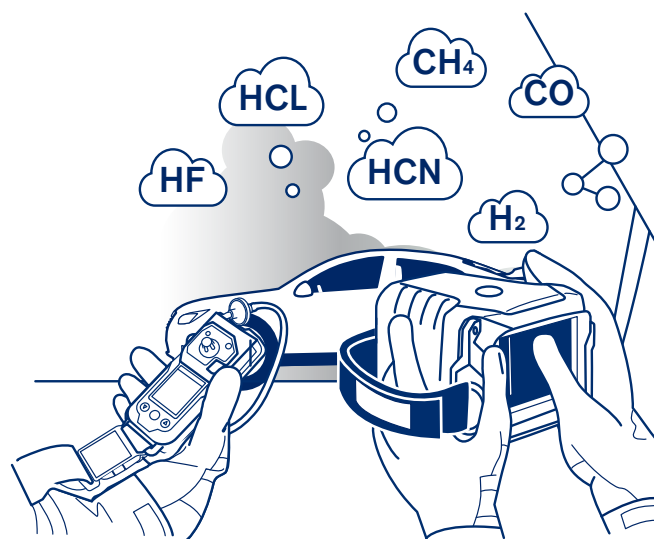
In an incident involving an alternative drive vehicle there are **2 possible scenarios:**



Scenario 1 – without flames

In the event of an incident involving an alternatively powered vehicle, the release of toxic and flammable emissions (e.g. hydrogen, methane, various heavier hydrocarbons, CO, NO₂, SO₂, HCL, HCN, HF and various VOCs) must be considered to ensure the safety of first responders.

Use Dräger gas detectors to identify hazardous substances and monitor temperature with a thermal imaging camera.



Scenario 2 – visible flames

In the event of an accident involving a fire, emergency personnel must take special protective precautions due to the inherent hazards of a burning vehicle.

Be aware of:



Toxic emissions
(e.g. CO, HF, HCl, HCN, SO₂, NO₂, PAHs) from burning materials



Elevated levels of **hydrogen fluoride, metal particles and ions**

Key actions:



Always use **SCBA and full PPE** due to these emissions



Substances can accumulate on gear and skin, making **proper post-incident hygiene** critical



Personnel not wearing an SCBA must **maintain a safe distance from the vehicle** to avoid exposure to hazardous emissions. A gas detector can help determine this.

Would you like to know more?

> **Get in touch!**