

Autozulieferer - Wohin geht die Reise?

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Risk Engineering Services



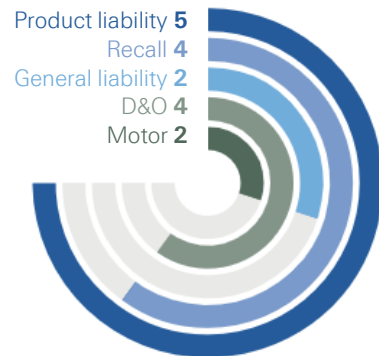
Agenda

- Trends Autobranche
- Rückruf Beispiele
- Swiss Re Rückrufanalyse “Elektromobilität”
- Elektromobilität Kollisionen und Reparaturkosten

Global trends in automotive area with a high impact on the insurance industry

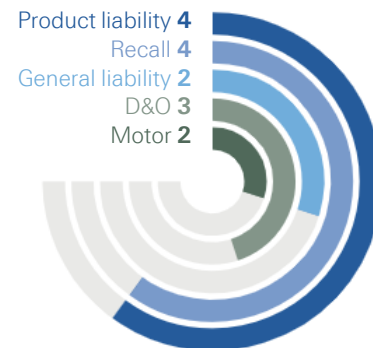
New players disrupting the status quo

Casualty relevance



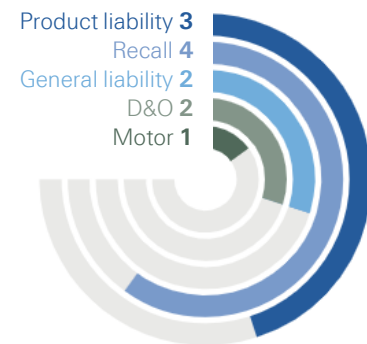
Risk sharing through collaborations

Casualty relevance



Vehicle contract manufacturing

Casualty relevance





Out now!

[Casualty Risk Trends: Automotive industry | Swiss Re](#)



Autonomes Fahren:
zurück auf den Boden
der Realität



Autozulieferer &
Nachhaltigkeit



Elektromobilität:
Autozulieferer sehen
Chancen

Global EV market and a Focus on Switzerland



Global EV sales grew by 25%
(Q1 '24 vs Q1 '23)



**In 2024, the market share of electric cars
could reach up to 45% in China, 25% in
Europe and over 11% in US**



EVs have a 18% global sales share, in 2023

Source: International Energy Agency (IEA)

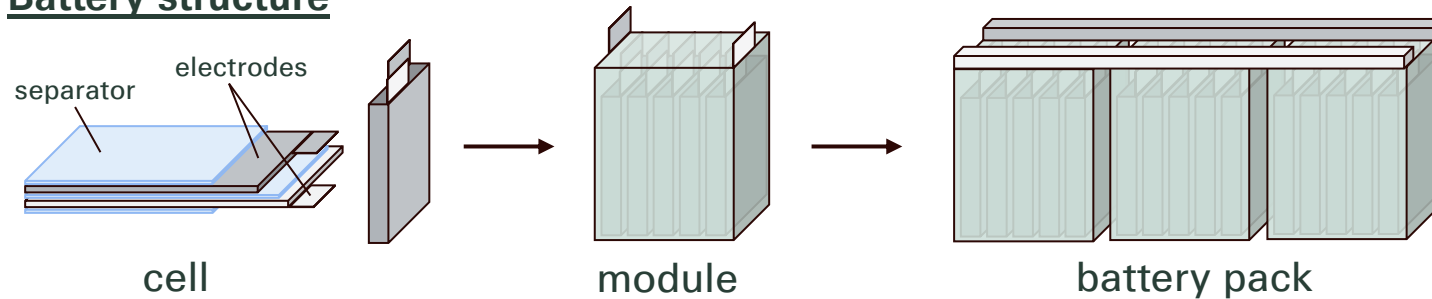
Rückruf Beispiele



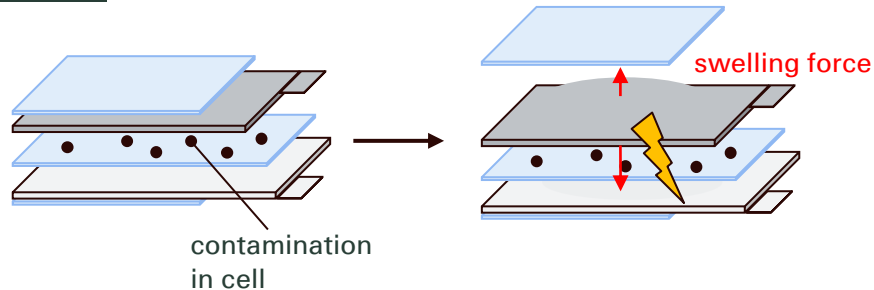
Recall of defective battery cells

In 2020, an OEM became aware of field incidents in which new model year hybrid vehicles experienced thermal events in their high voltage batteries.

Battery structure



Cause



- Supplier issue: weld spatter contamination in battery cell
- Battery utilisation causes electrodes to swell, increasing cell pressure
- Where contaminant is present, insulation layers may be damaged, possibly resulting in electric short circuits and subsequent thermal runaways

Recall of defective battery cells

In 2020, an OEM became aware of field incidents in which new model year hybrid vehicles experienced thermal events in their high voltage batteries.

Remedy

- Replacement of battery modules containing defective cells
- A test procedure was applied to identify defective cells and thus reduce the number of full-scale battery cell / module replacements otherwise needed

Average key numbers:

19'000

Vehicles at risk

7

Modules per vehicle

7 days

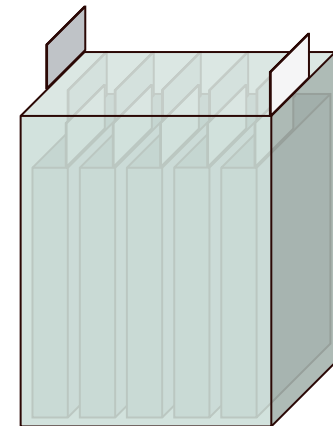
Completion of test procedure

8'000

Modules replaced

4-9h

Module replacement

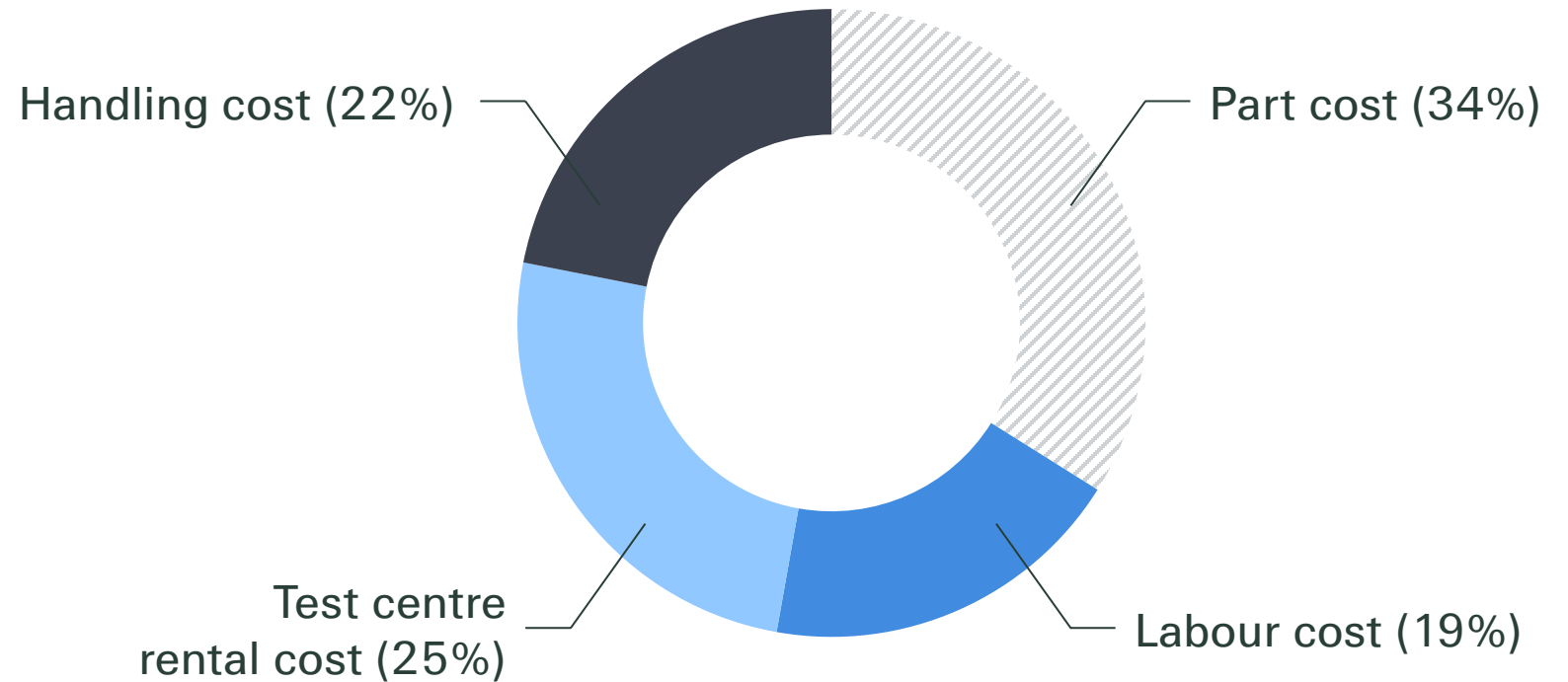


module

Recall of defective battery cells

In 2020, an OEM became aware of field incidents in which new model year hybrid vehicles experienced thermal events in their high voltage batteries.

Costs:



High voltage heater defect causing windows to ice up

- Supplier of high voltage heaters for hybrid and electric vehicles
- Due to a short circuit device can no longer be turned on
- Consequence: Lack of heating can cause icing of vehicle windows
- Recall could not be carried out at times due to lack of spare parts



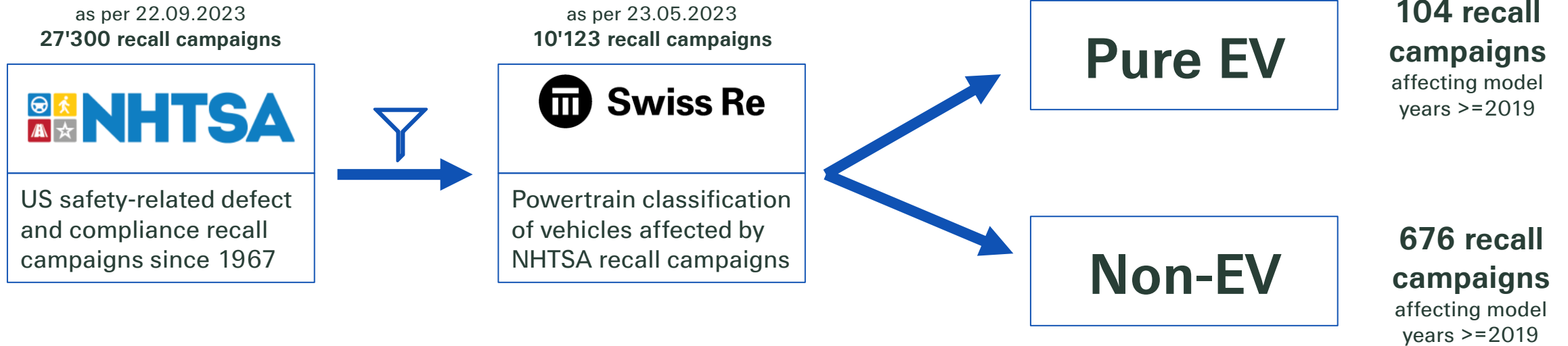
Defective roller bearing at 3 EUR cost causing 10 hours repairs per vehicle

- Roller bearing used for electric motors
- High rotation frequency 16'000 RPM
- Cause: improper grinding of the balls
- Approx 8000 vehicles affected
- **Issues:**
- Replacement of entire engine, requiring approx 10 hours (1000-1500 EUR)
- repair cost differences from contry to country

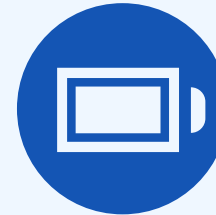
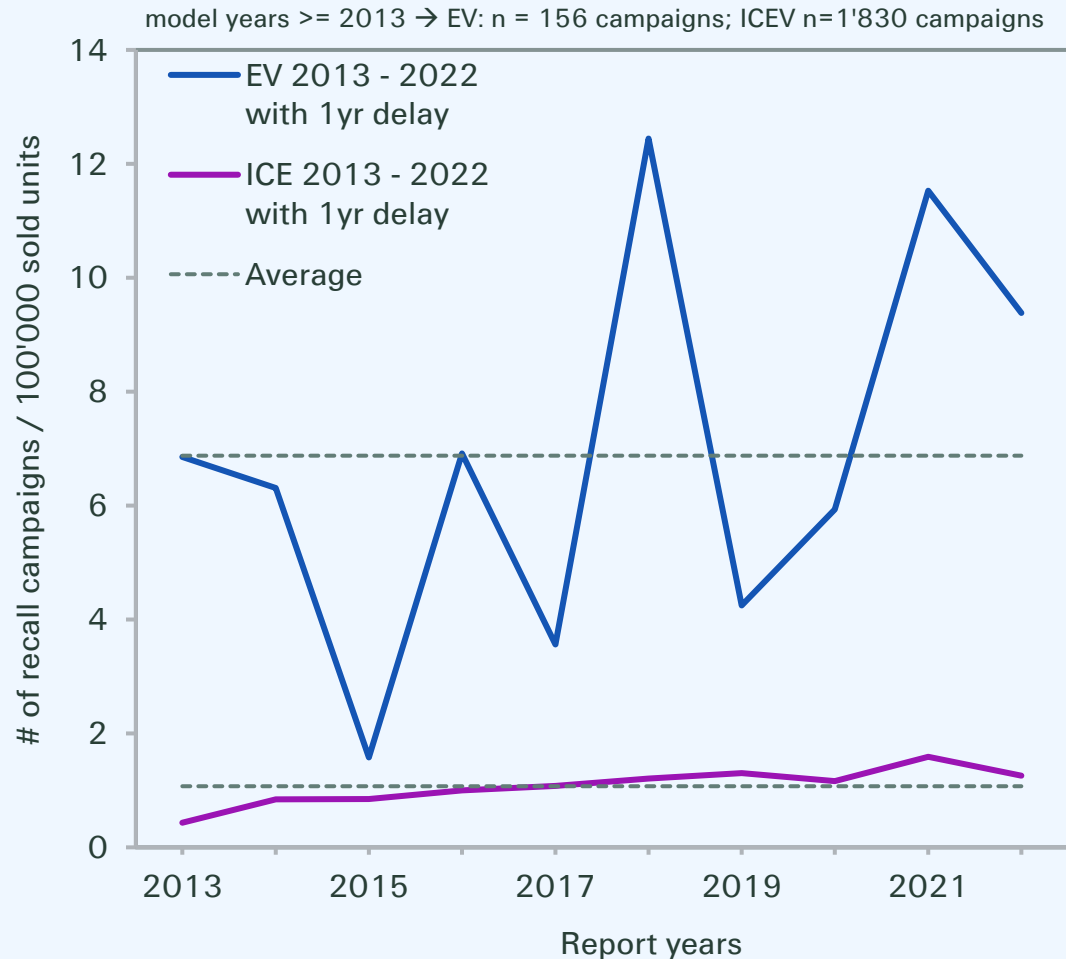


Swiss Re Rückrufanalyse “Elektromobilität”

Data sources



Are EV recalls more frequent than ICEV recalls?



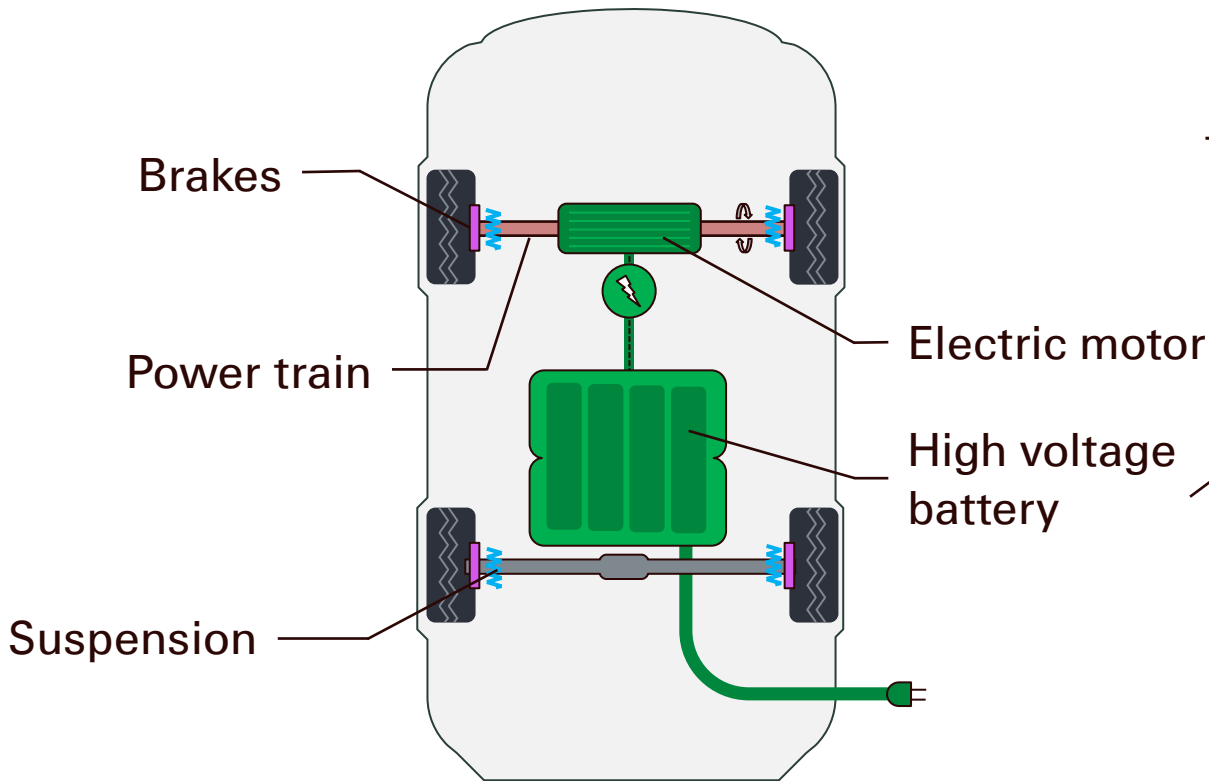
7 EV recall campaigns
per 100'000 vehicles sold



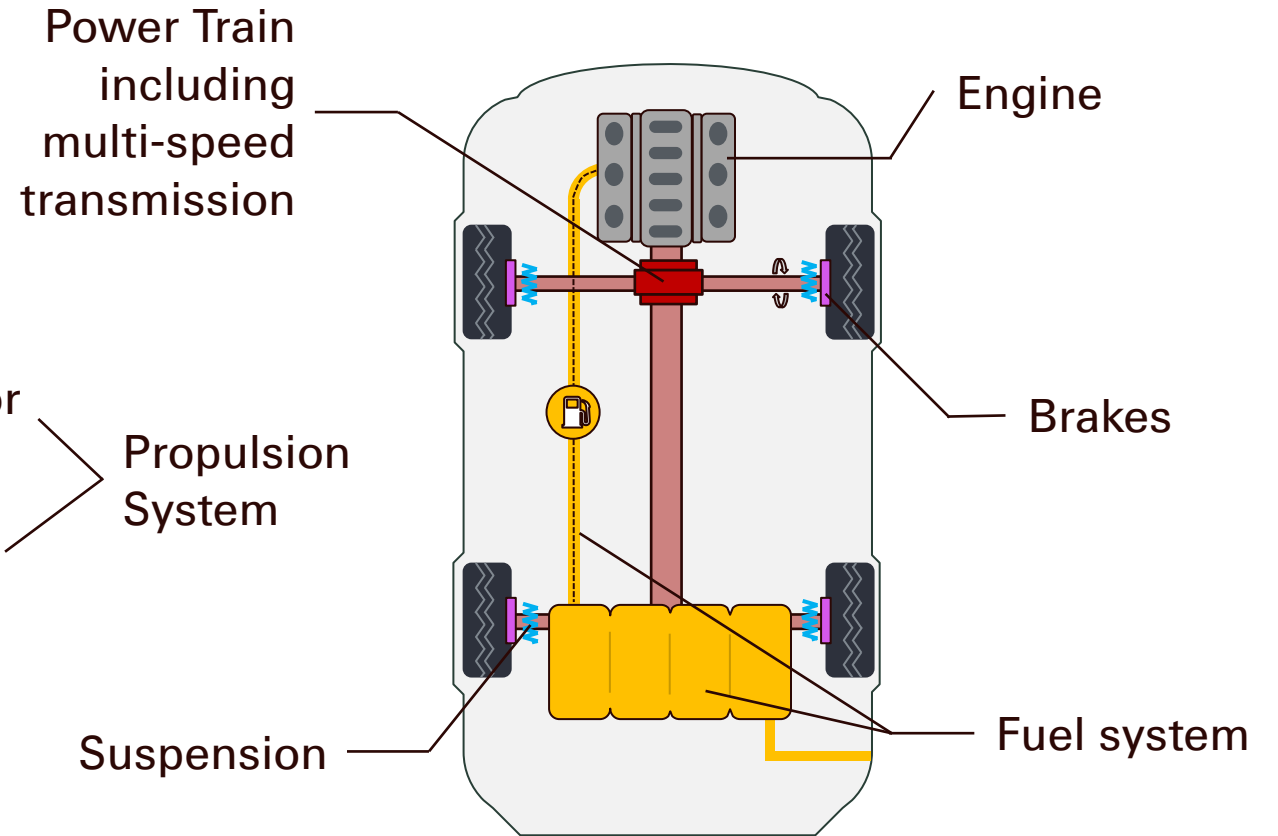
1 ICEV recall campaign
per 100'000 vehicles sold

Component Categories

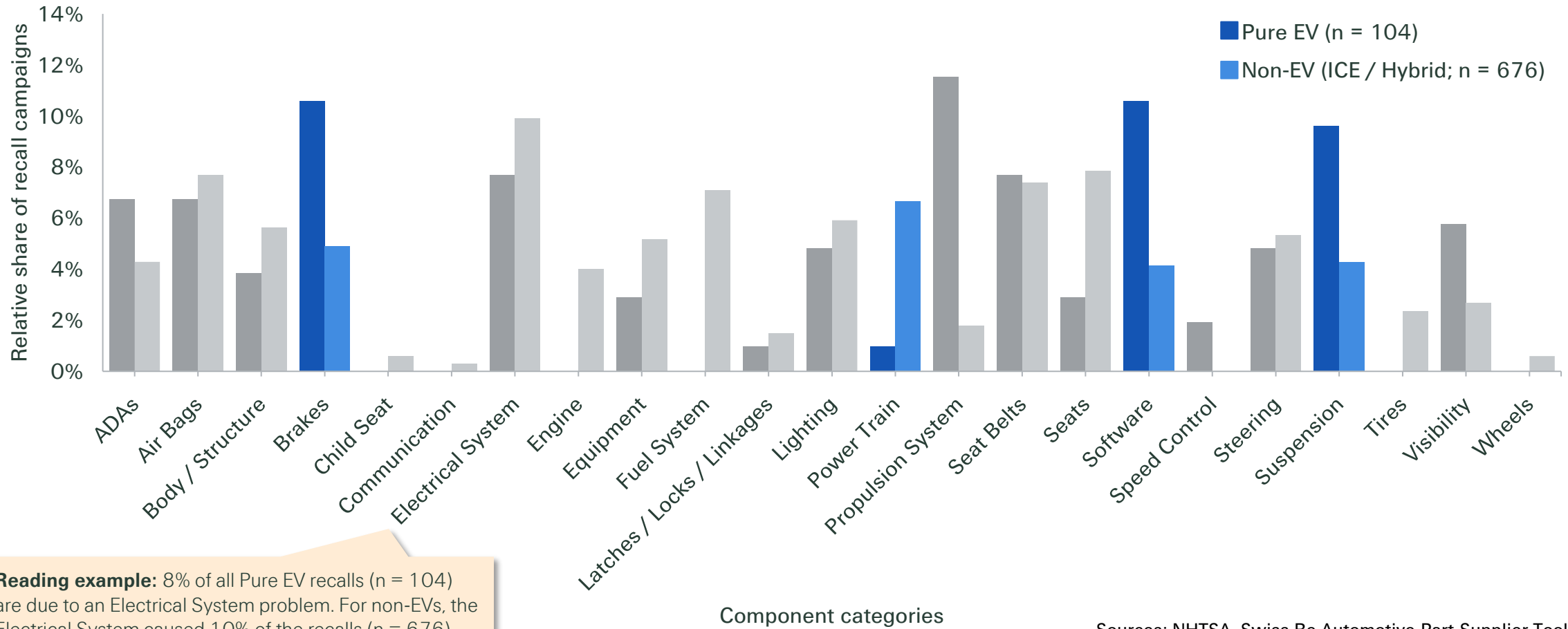
EV



ICEV



Relative share of affected components in NHTSA EV and non-EV recall campaigns Model years 2019 - 2023

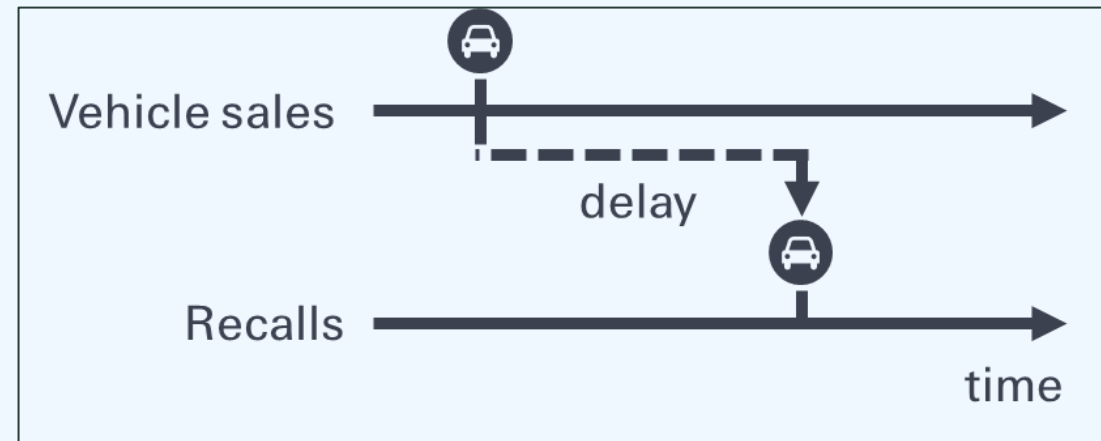
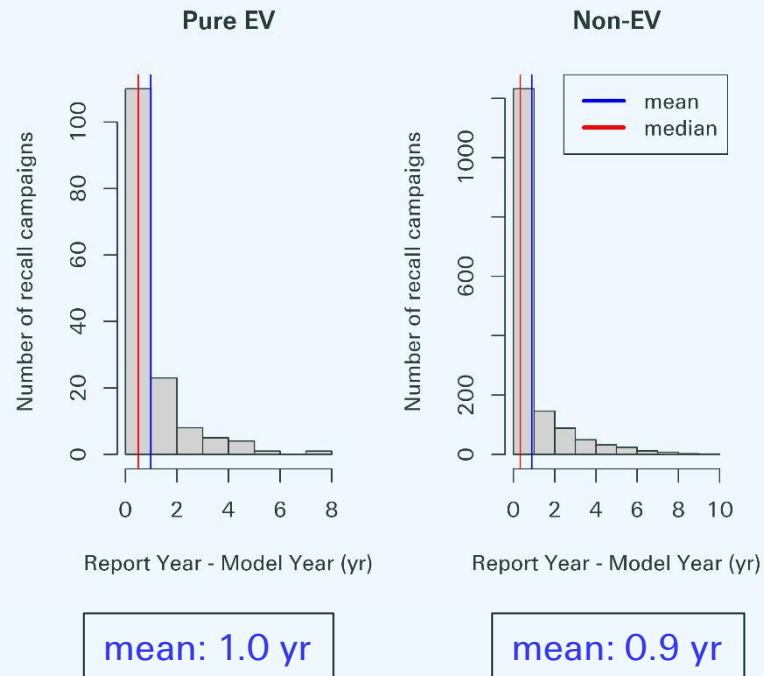


Reading example: 8% of all Pure EV recalls (n = 104) are due to an Electrical System problem. For non-EVs, the Electrical System caused 10% of the recalls (n = 676).

Sources: NHTSA, Swiss Re Automotive Part Supplier Tool

Elapsing time between vehicle production and recall

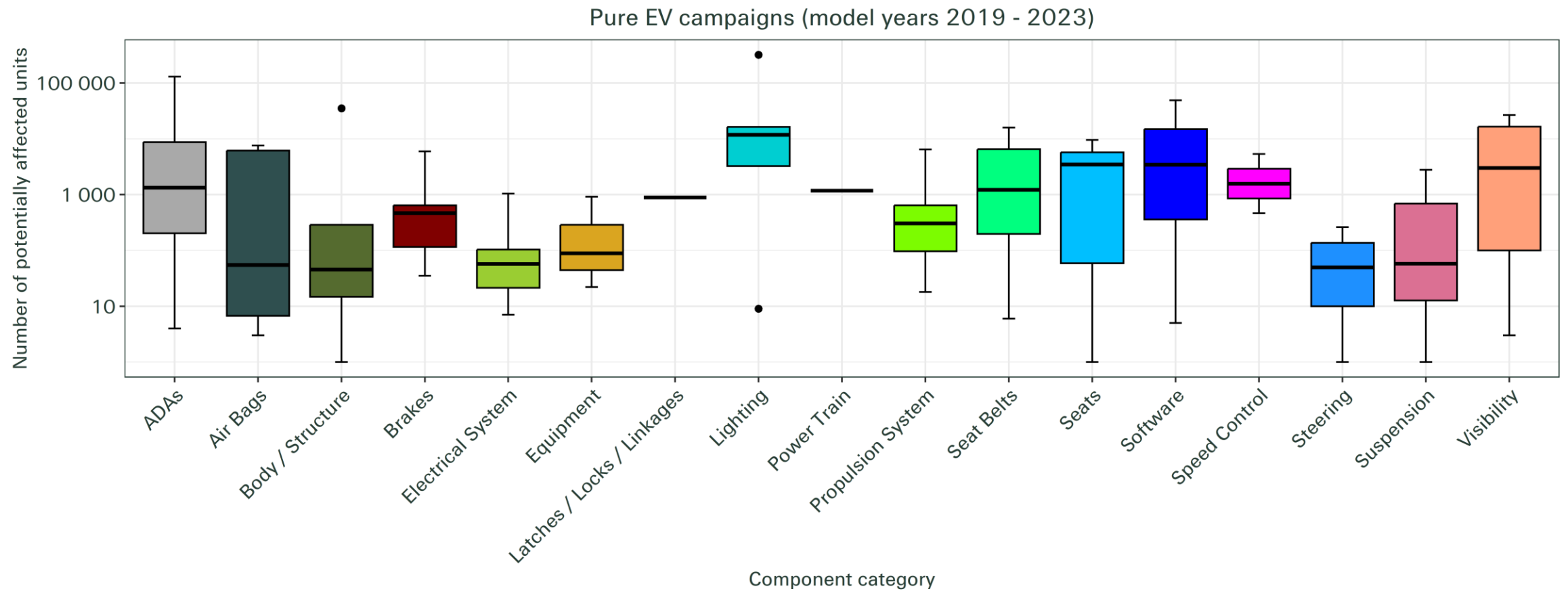
model years \geq 2013



Typically, there is a delay between the sale of a vehicle and the start of a recall campaign affecting it. The histograms above show the distribution of these delay times

Affected components

Number of potentially affected units

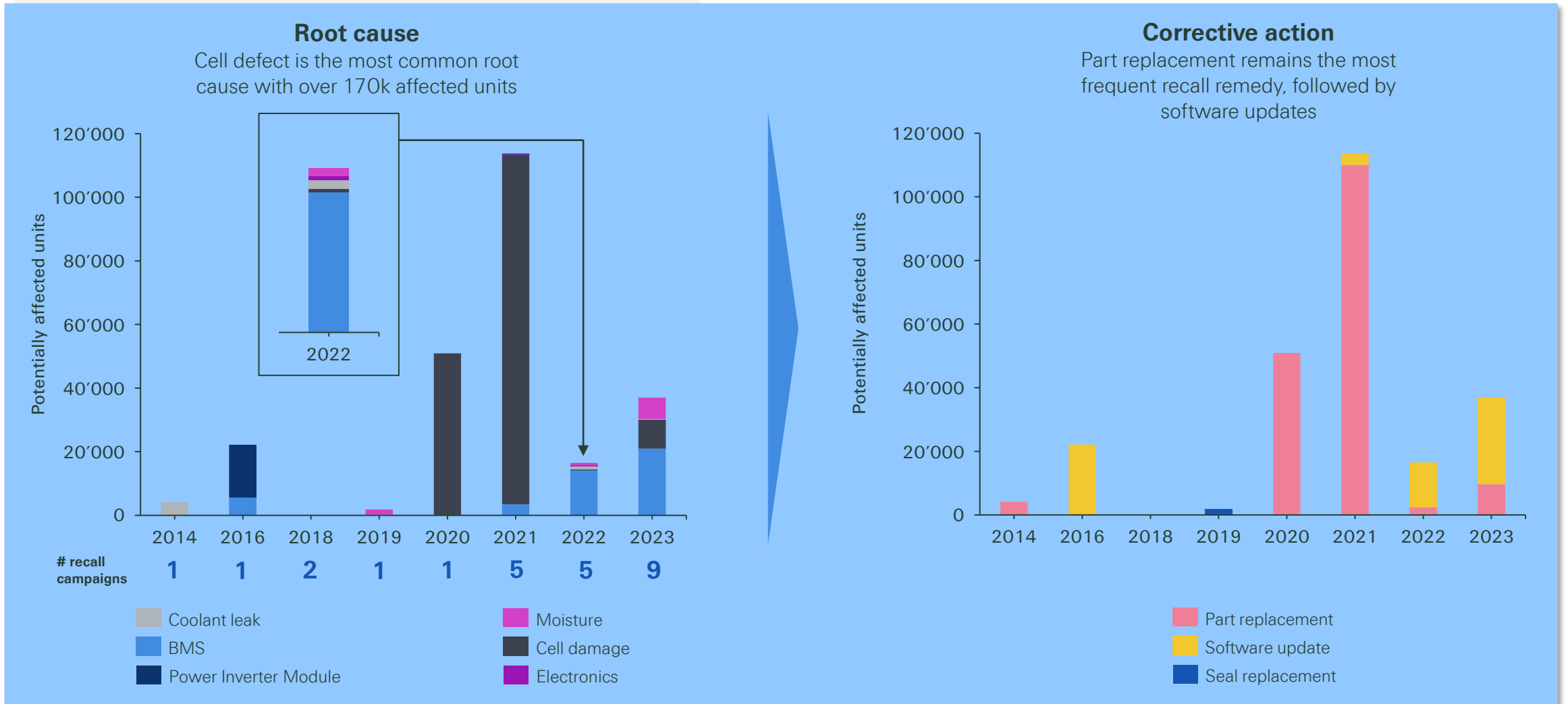


Data sources: NHTSA, Swiss Re Automotive Part Supplier Tool

Fokus Antriebsbatterien

Electric Vehicle Propulsion Batteries - Overview

Significant increase in traction battery recalls from 2020 to 2023



EV traction battery fires

Myths vs. facts

Frequency of fires



Currently available data suggests that the risk of fire is likely to be comparable or lower for EVs than for ICEVs¹.

Contributing factors for EV battery fires:



extreme weather



charging



crash



external factors

Severity of fires



Li-ion EV battery fires have heat release rates comparable to petrol ICEV fires, but the EV fires are harder to extinguish¹.

Challenges associated with EV battery fires:



reignition



toxic gases



jet flames & debris



large amounts of suppressant required

Sind Brände mit EV intensiver als jene von Verbrennern?

~2 GJ*



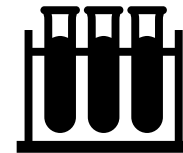
90 kWh Batterie

~2 GJ



60 Liter Benzin

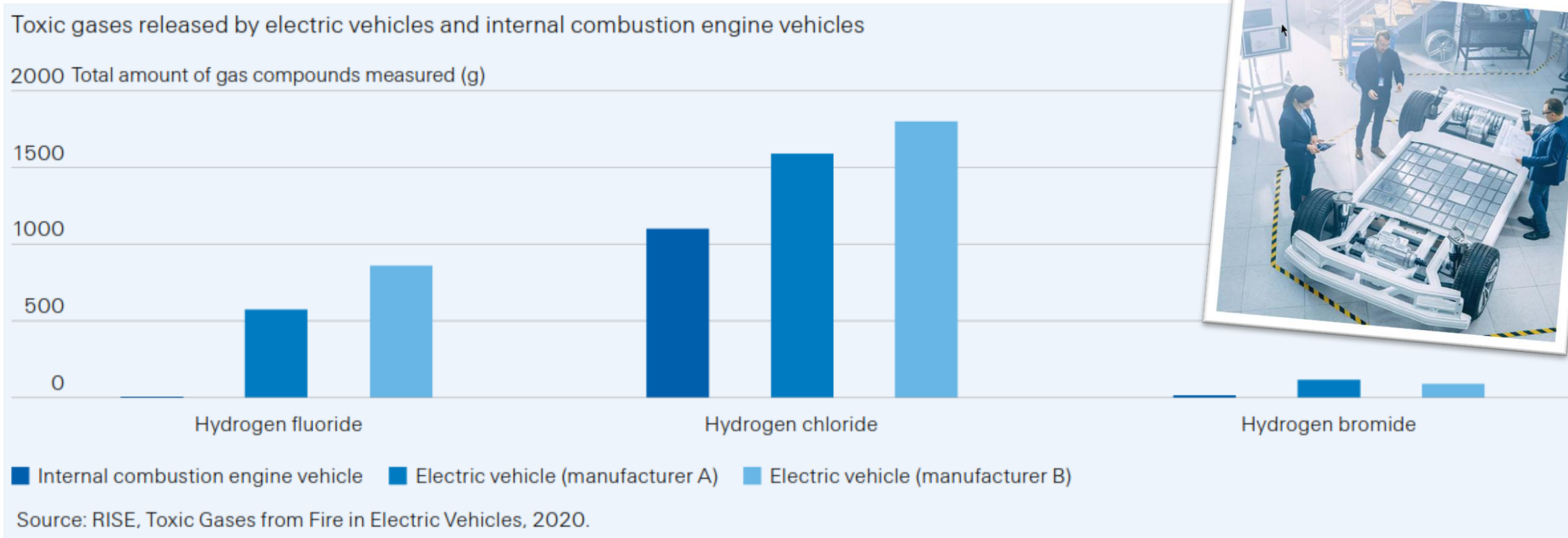
~3-7 GJ



Kunststoffe
z.B. Kabel, Sitze, Reifen

Quelle: RISE Research Institutes of Sweden, angepasst
GJ: Giga Joule

Are fire emissions from EV fires worse than ICEV?

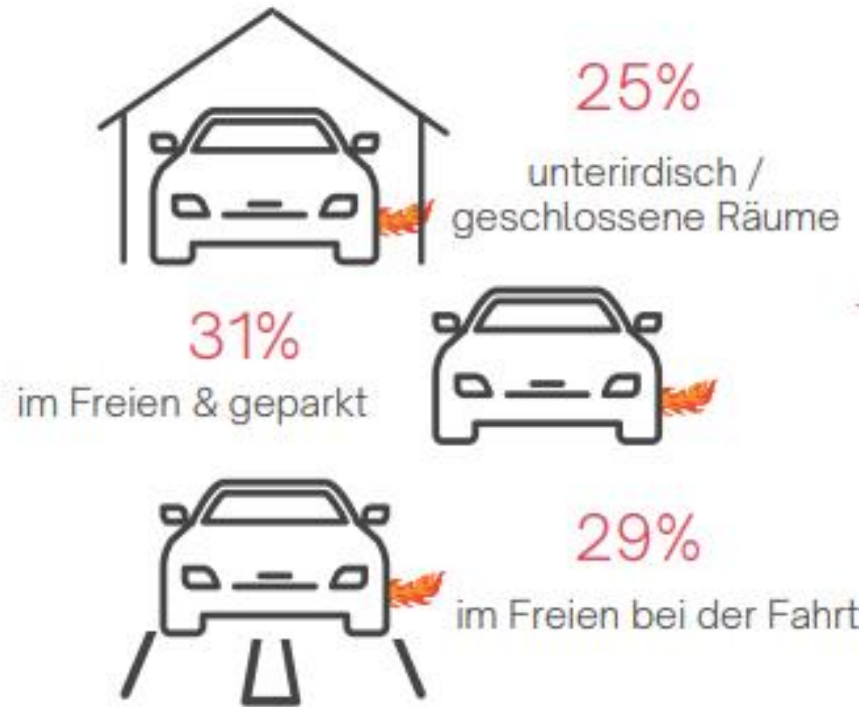


Siehe auch: Thermal runaway and fire of electric vehicle lithium-ion battery and contamination of infrastructure facility

Wo treten Brände von Elektrofahrzeugen auf?

Einsatzort*

*17% unbekannt



Laden

aus allen Vorfällen:

18%
während des
Ladevorgangs



2%
nach dem
Ladevorgang
innerhalb von 10
Minuten



Elektromobilität Kollisionen und Reparaturkosten

EV crashes in Norway 2011-2018

01

Crash severity
distribution of EVs
and ICEVs do not
show significant
difference

02

Half of EV crashes
occurred in urban
areas

03

Every third EV crash
involve cyclist and
pedestrians (Factor
1.5x of ICEV)

04

EV crashes less
likely on high-speed
roads

Source: Exploration of the characteristic and trends of electric vehicle crashes a case study in Norway

Conclusion



Electric vehicle (EV) sales have gained momentum and will continue to rise globally



Technology is still developing



Currently, EV recall rates are higher than for conventional (combustion engine) vehicles



Different recall pattern:

- Elevated relative frequency of brakes, software and suspension recalls
- Lower relative frequency of powertrain recalls



EV fire frequency lower but severity potentially higher





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