

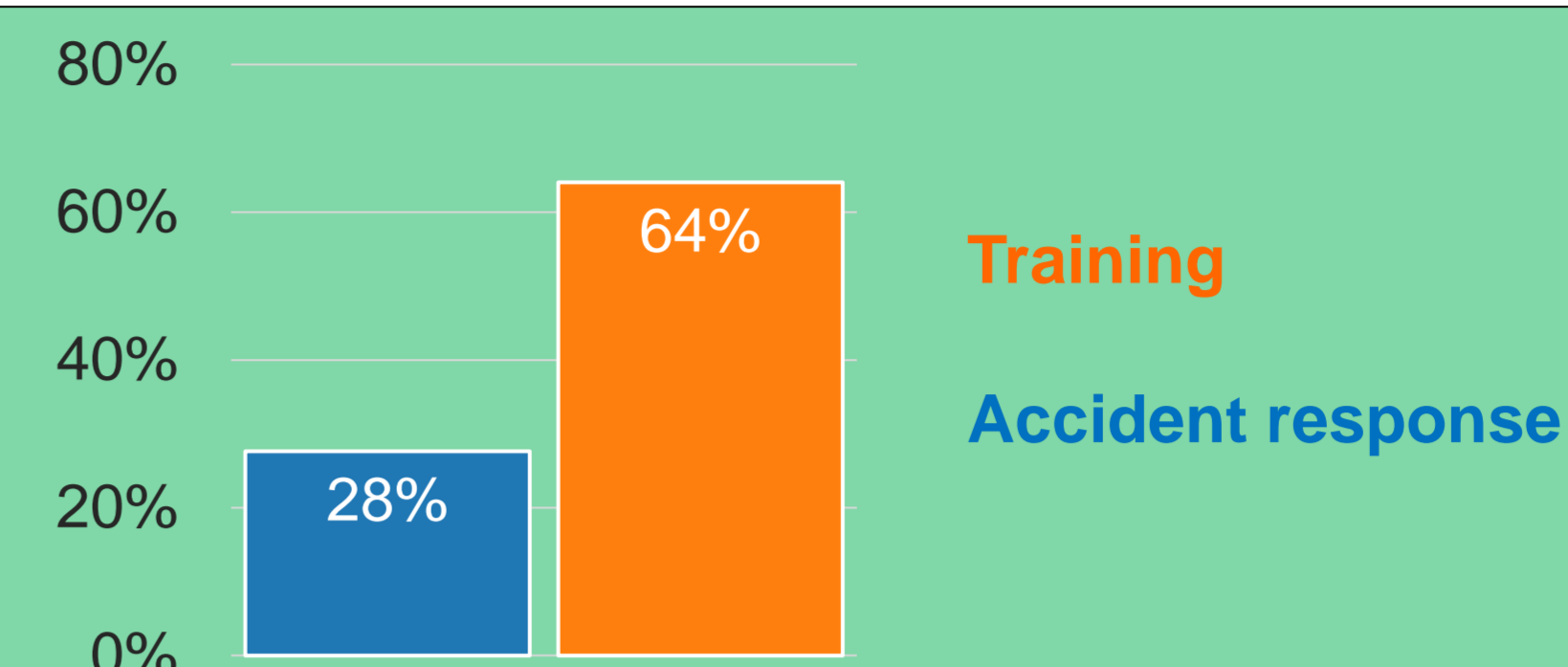
Safe-Handling of E-vehicle after Accidents: Recommendations for the Rescue Chain

Current tactical standards

Identification of electric vehicles

- „AUTO“-Rule
 - „Auslaufende Betriebsstoffe“ - leaking consumables: electrolyte
 - „Unterboden“ - Underbody: orange high-voltage components
 - „Tankdeckel“ – Fuel cap: charging plug
 - „Oberfläche“ – Surface: model name, label
- Check of vehicle registration number

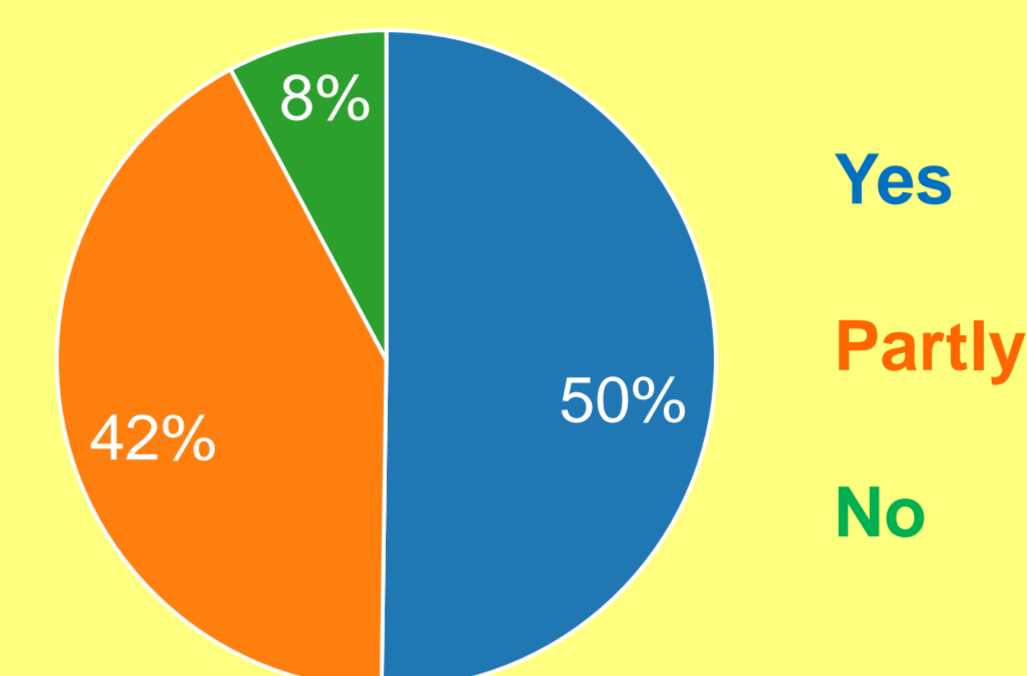
Survey of fire brigade members on the Safe-Handling of E-vehicles



Have you already taken part in training and/or accident response with an electric vehicle?

Potential additional hazards

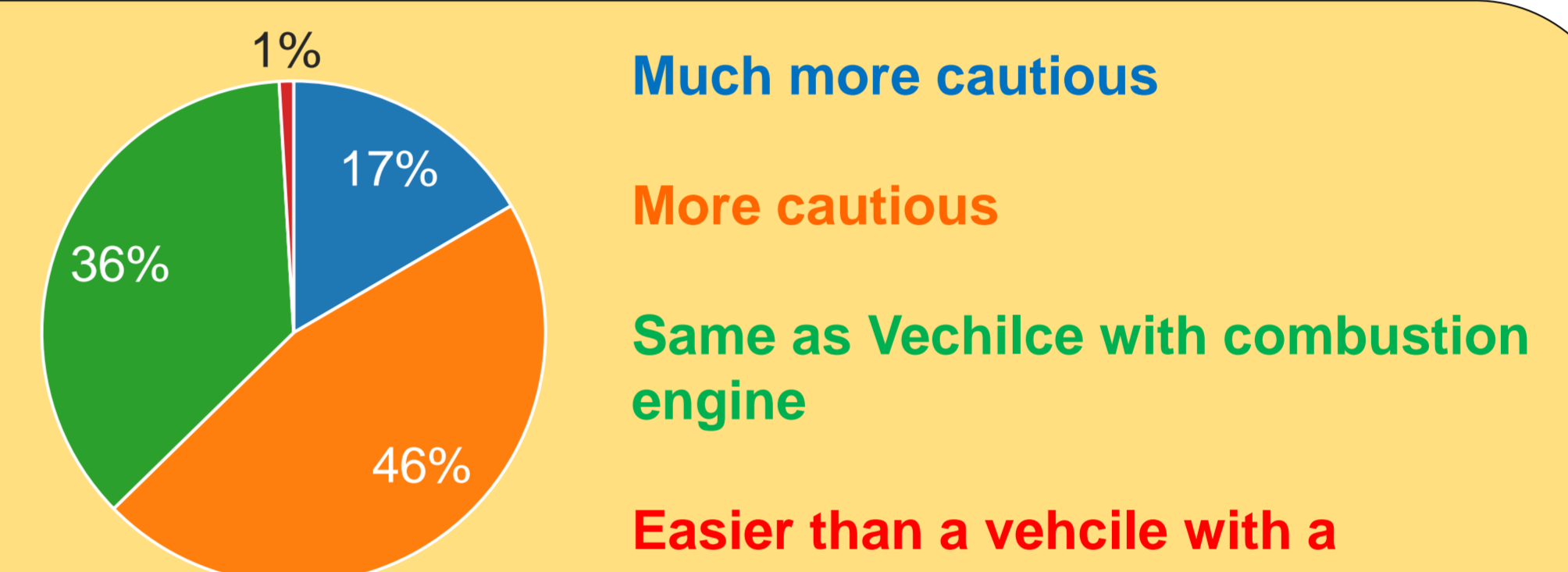
- **Respiratory toxins:** electrolyte fumes / venting gases / fire smoke
- **Spreading:** leaking electrolyte liquid / battery fire
- **Fear reaction:** wrong measures due to uncertainty in dealing with electric vehicles
- **Chemical hazards:** leaking electrolyte
- **Explosion:** thermal runaway
- **Disease/Injury:** electrolyte contamination
- **Electricity:** exposed high-voltage components



Are you trained/informed about the operational measures and the dangers in the event of accidents with electric vehicles?

Additional measures

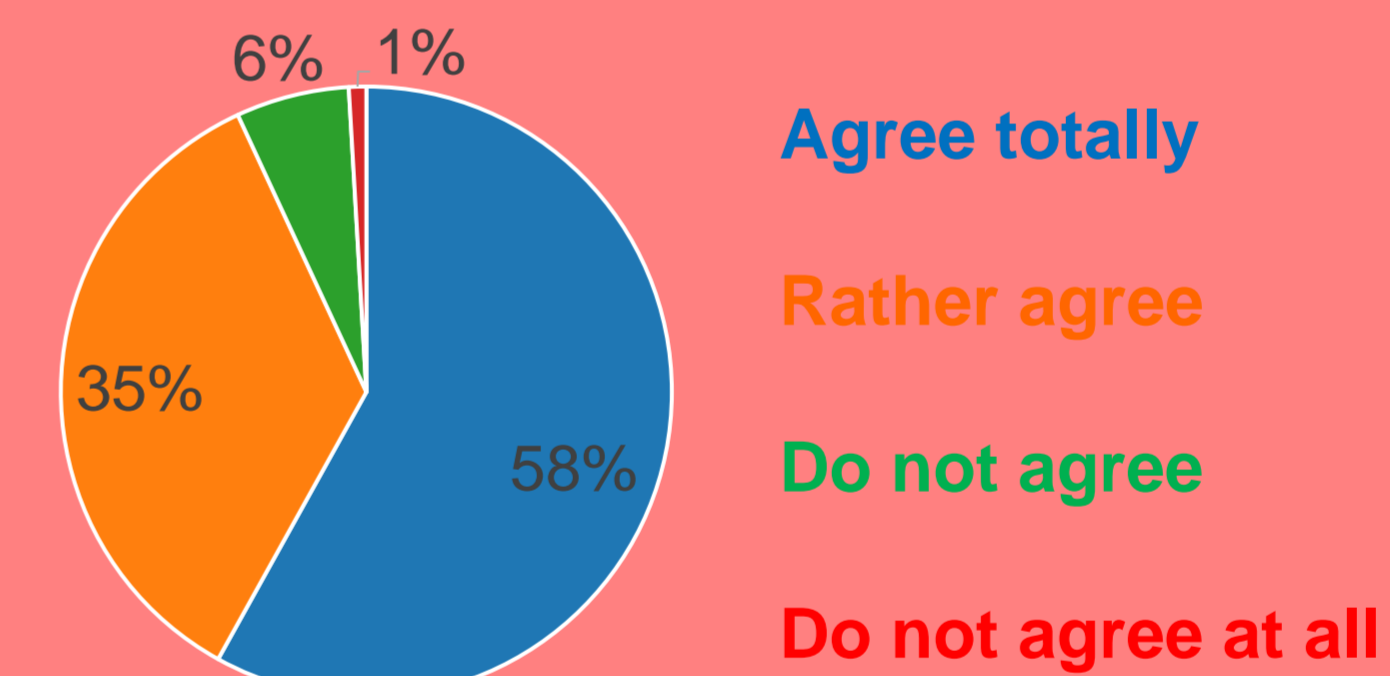
- Safe decommissioning of the vehicle
 - Separating the car from the charging infrastructure
 - If necessary, manual shutdown and voltage isolation according to rescue data sheet
- Covering exposed live components
- Rescue: No mechanical load in the area of the high-voltage battery
 - Stabilization / Lifting / Starting point for rescue equipment
 - Cuttings



How would you assess yourself: Would you be more cautious or would you treat electric vehicles in the same way as a vehicle with an internal combustion engine?

Challenge: Determining the state the high-voltage battery

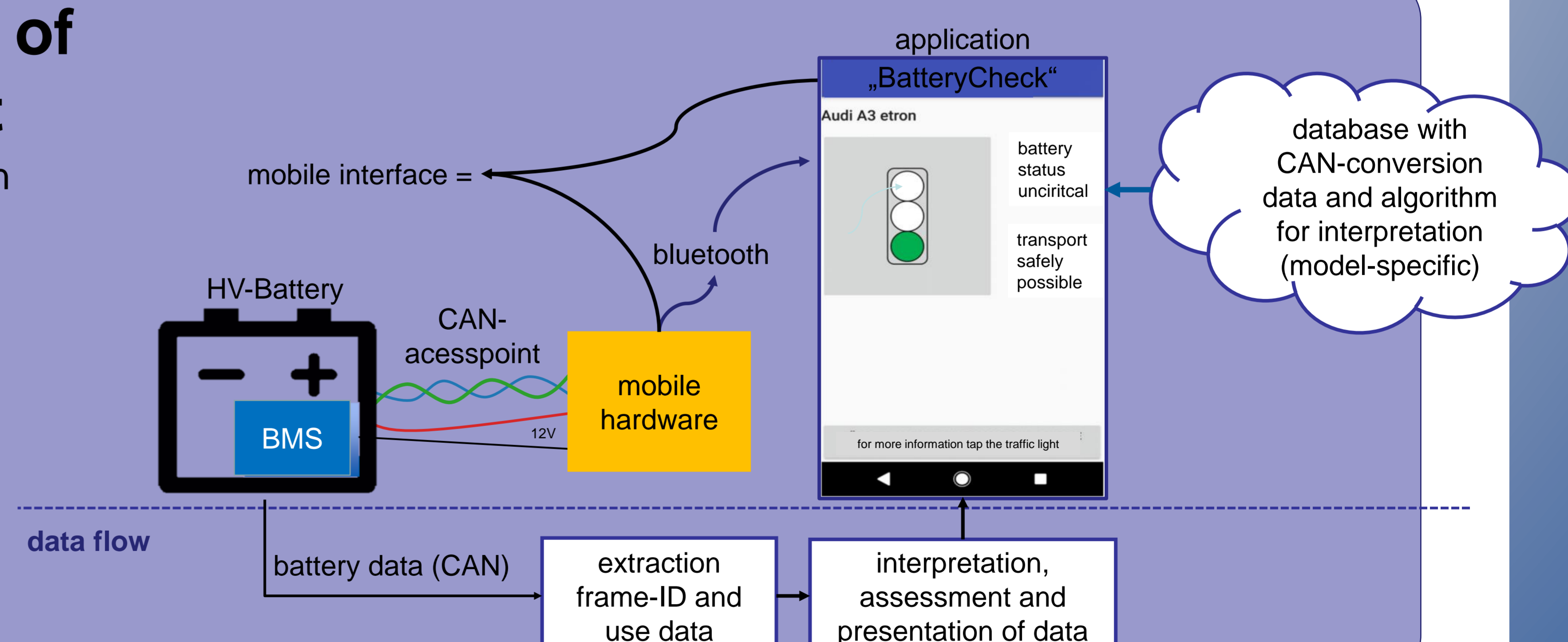
- Determination of necessary protective clothing / protective measures
- Setting rescue mode: Immediate – Fast – Gentle
- Danger: Additional patient damage due to incorrect procedure in case of misjudgement
 - Immediate rescue due to assumed dangers
 - Procedure according to „GAMS“-Rule for hazard material situations



To what extent do you agree with the following statement?
"It is difficult to assess the condition of the traction battery after a traffic accident."

Requirement: Reading and evaluation of battery data for condition assessment

- Avoidance of panic situations by stating about the battery condition
- Better basis for assessing the procedure
- Required data:
 - Cell chemistry: basic identification of the hazard potential
 - Battery temperature: prediction of thermal runaway
 - Evaluation of cell tension: estimation of accident damage



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