IUMI Policy Agenda

11. Transport of electric vehicles (EVs)

Brief description

Considering the drive to decarbonize all modes of transport, the number of new energy vehicles has been on the rise and electric vehicles (EVs) sales are projected to match internal combustion engine vehicles (ICEVs) by 2030, and to surpass them by 2040.

Battery electric vehicles are usually fitted with a lithium-ion traction battery which is encapsulated and shielded by the vehicle's body. The battery is made of modules and cells. It is usually placed in the vehicle floor or undercarriage and protected by an anti-crash frame. Electric vehicles have extensive safety systems designed to isolate the battery pack when a collision or a short circuit is detected. The battery management systems (BMS) monitors and controls the battery and ensures safe operating conditions.

The state of charge (SoC) is the charge level of a battery compared to its total capacity. High SoC increases heat release rates, maximum temperatures, and concentrations of flammable and toxic gases during thermal runway, though it does not affect the total heat release. For EV transport onboard Pure Care and Truck Carriers (PCTCs) it is recommended to keep the SoC as low as practically possible.

Thermal runaway may occur if cells are abused, e.g. by heat, mechanically damaged, overcharged or defective. It is a self-sustaining chemical reaction that produces heat, raises cell temperatures and releases toxic and flammable gases. Heat can propagate from one cell to another and spread throughout the battery.

Safety standards such as casings and the BMS make the likelihood of thermal runaway very low. Statistics indicate that EVs cause fewer fires than ICEVs when compared over the same distance. However, EV fires carry a higher risk of re-ignition which can persist for longer periods.

Thermal runaway is difficult to stop unless the firefighting agents are injected directly into the battery to enable efficient cooling. Early fire detection and verification/confirmation, fast suppression and boundary cooling are essential to stop the spread to the battery and to adjacent vehicles. Extended monitoring and pre-cautions against re-ignition are necessary after a fire.

IUMI published recommendations on the safe transport of EVs on board PCTCs and ro-ro vessels. A second iteration of the paper was published in September 2025 to reflect the latest technological advances and research. At the IMO, the SSE Sub-Committee has placed the adequacy of fire protection, detection and extinction arrangements for ships carrying new energy vehicles on its agenda.

At SSE 11 in February 2025 a Fire Protection Working Group, with active participation of IUMI, developed a draft action plan that sets out a review of available studies and casualty reports, identification of hazards related to EVs compared to ICEVs, the consideration of a goal-based approach, the analysis of gaps in existing regulations and the preparation of possible future amendments.

The broad scope of work involving multiple technical aspects ranging from fire detection to extinguishing systems requires careful consideration and prioritisation of tasks. Further work is necessary and will continue in the Correspondence Group prior to SSE 12. IUMI participates in the CG and will attend the SSE 12 meeting in March 2026.

IUMI will:

- Be involved in the IMO's work to effect appropriate safety measures to address this risk.
- Cooperate with relevant maritime stakeholders to address the risks associated with the carriage of EVs.