

ENABLEH2 Session EASN

Presentation 4:

Hydrogen – Enabling a Safe Fuel: “Safety Challenges and Opportunities for LH₂-fuelled aircraft and Supporting Infrastructure”

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A radical solution is needed to harmonise the conflicting drivers of increasing need for air travel, and the need to reduce global emissions and pollution. One proposed solution is hydrogen propulsion as hydrogen produces no carbon dioxide, and can produce little or no nitrogen oxide. High profile events, such as the Hindenburg disaster, have resulted in negative associations with hydrogen, but where used in transport & energy industries, with safeguards in place, hydrogen can have a similar level of safety to other fuels. However, managing this fuel and maintaining the impressive aviation industry safety record will require significant work.

The Enabling Cryogenic Hydrogen-Based CO₂-free Air Transport (ENABLEH2) project has therefore, made safety a cornerstone to ensure safety on-site (for experimental work) and in design processes. In order to assess the safeguards that may be needed, and the gaps in our current knowledge and technological ability, the project has a designated safety work package that, as well as safety management, comprises of several major analysis areas including:

- 1) Liquid hydrogen systems hazard analysis
- 2) Small scale experimental work to define fundamental hydrogen behaviour in low pressure, low temperature conditions
- 3) Modelling of large-scale liquid hydrogen dispersion and release scenarios
- 4) The assessment of hazards related to hydrogen use as airports

The presentation will show the project plan, and demonstrate the achievements so far, including preliminary hazard analyses liquid hydrogen use in combustion and fuel management systems, and at airports.