

STORHY FINAL EVENT HYDROGEN STORAGE SYSTEMS FOR AUTOMOTIVE APPLICATION

PSA POISSY, JUNE 3-4, 2008



Integrated Project STORHY: Highlights

Automotive Requirements

- ❖ Hydrogen storage is a key enabling technology for the automotive use of hydrogen and for the mass market entry of hydrogen fuelled vehicles. StorHy has undertaken to advance the three main hydrogen storage technologies, based on requirements, such as storage densities, filling, reliability, safety, etc., which were set by the automotive partners.

Compressed Hydrogen Storage

- ❖ New generation 700 bar Type IV pressure vessels with a patented permeation barrier based on a polyamide rotomolded liner
- ❖ New vessel production technologies with ring winding head and modular siphon impregnation unit for future series production
- ❖ 700 bar filling components and fast filling concepts
- ❖ Advanced recycling technologies for carbon fibre composites
- ❖ Automotive prototype of 700 bar storage system as exchangeable rack



Source: CEA / Ullit



Source: IVW



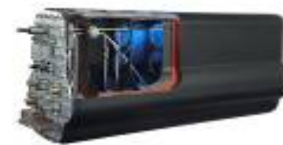
Source: WEH



Source: PSA

Cryogenic Hydrogen Storage

- ❖ First light weight free-form cryogenic storage demonstrator worldwide
- ❖ Concept scalable to different applications (cars, trucks, busses, etc.)
- ❖ Vacuum insulated double walled composite tank with novel permeation barrier by coating
- ❖ Gravimetric storage density increased by factor three compared to state-of-the-art
- ❖ Highly innovative components (e.g. multi-way valve) and production process



Source: SP Cryo

Solid Hydrogen Storage

- ❖ Fundamental understanding of physical and chemical behaviour of complex alanates as one example of solid storage materials
- ❖ Possible material production pathways
- ❖ Prototype tank systems with 8 kg of alanate material (with 0.4 kg hydrogen) to study heat management aspects

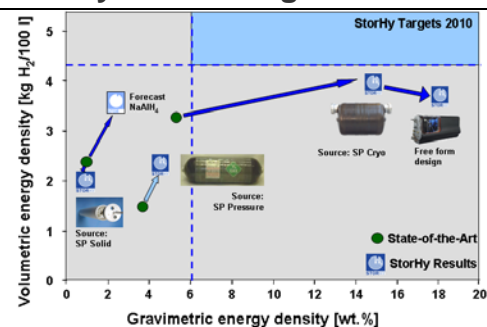


Source: GKSS / TUHH

Safety Assessments and Requirements

- ❖ Current safety regulations are not appropriate for mass market application.
- ❖ StorHy proposes an approach for improved safety regulations and safety assessment procedures, e.g. based on the Probabilistic Approach.
- ❖ A fundamental understanding of failure behaviour of composite and liner materials is required to define suitable design and testing requirements.

Evaluation: System Storage Densities



Source: CEA / MSF



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