FUEL CELLS AND HYDROGEN
JOINT UNDERTAKING

Transport Pillar

Topics in the 2020 call

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27/01/2020

Transport Pillar Overview

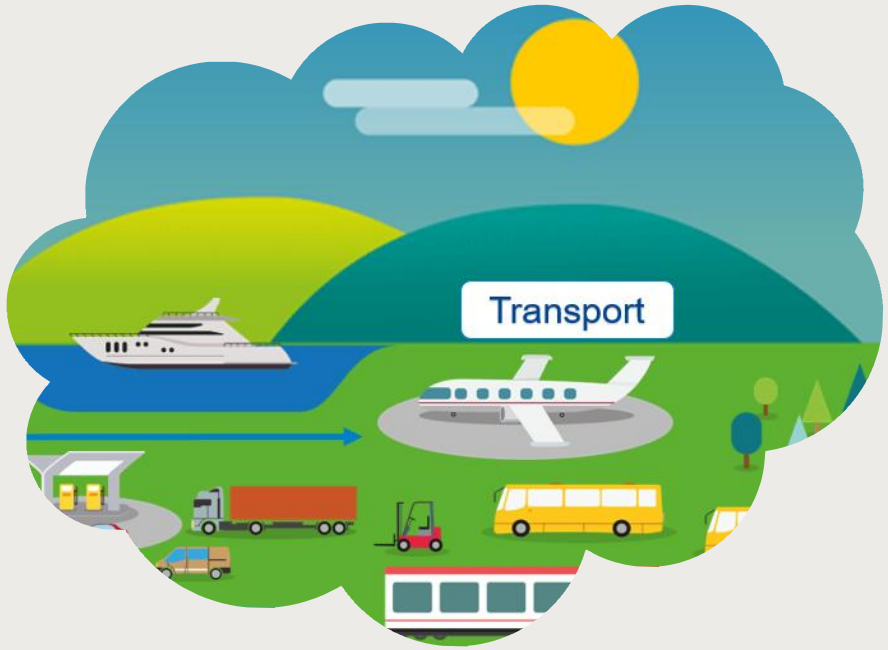
8 topics, 41M€

Main Focus

- Heavy-duty applications
  - Advance in the development and demonstration of new transport applications: coach buses, trains, ships
  - Improve on-board storage technologies
    - Focus on liquid hydrogen

What is new

- Coach buses
- Trains: new prototypes
- Advanced storage technologies



Transport Pillar

8 topics, 41M€

Topic	Type of Action	Ind. Budget (M€)
FCH-1-1-2020: Development of hydrogen tanks for electric vehicle architectures	*RIA*	*2***
FCH-1-2-2020: Durability-Lifetime of stacks for Heavy Duty trucks	*RIA*	*3.5***
FCH-1-3-2020: Liquid Hydrogen on-board storage tanks	*RIA*	*2*
FCH-1-4-2020: Standard Sized FC module for Heavy Duty applications	*IA*	*7.5**

** Eligibility criterion: maximum funding; ** Included under leftover budget flexibility*

Transport Pillar

8 topics, 41M€

Topic	Type of Action	Ind. Budget (M€)
FCH-1-5-2020: Demonstration of FC Coaches for regional passenger transport	*IA*	*5**
FCH-1-6-2020: Demonstration of liquid hydrogen as a fuel for segments of the waterborne sector	*IA*	*8**
FCH-1-7-2020: Extending the use cases for FC trains through innovative designs and streamlined administrative framework	*IA*	*10*,***
FCH-1-8-2019: Scale-up and demonstration of innovative hydrogen compressor technology for full-scale hydrogen refuelling station	*IA*	*3**

** Eligibility criterion: maximum funding; ** Included under leftover budget flexibility*

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Research and Innovation Action

FCH-01-1-2020: Development of hydrogen tanks for electric vehicle architectures

New 70 MPa tank system in a conformable shape that can be integrated in cars with flat architectures

- Must fit into a design space of 1800 x 1300 x 140 mm^3
- At least 10 prototypes to be built
- Exhaustive tank testing expected

Mission Innovation

FCH-01-2-2020: Durability-Lifetime of stacks for Heavy Duty trucks

Study degradation mechanisms and enable increased durability for heavy-duty stacks

Mission Innovation

- Characterize and rank most critical degradation mechanisms for HD use
- Can be done with aged samples (& corresponding ageing data from field tests or actual trucks) or by performing ageing tests in labs on short stacks following realistic load profiles
- Propose and validate more durable stacks based on re-designed MEAs

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RIA and IA

FCH-01-3-2020: Liquid Hydrogen on-board storage tanks

Feasibility of liquid H2 on-board storage for heavy-duty vehicles

- Evaluate feasibility through a design study and demonstration test bench
- Must be compatible with existing LH2 refueling technology
- Target capacity: 40-100 kg LH2; boil-off rates < 5%/day and compatibility with fuelling rates of up to 10 kg/min

FCH-01-4-2020: Standard Sized FC module for Heavy Duty applications

Develop and validate standard FC module for heavy-duty applications

- First 12 months: define standard module frame (size, connections, etc…); by min. 7 FC suppliers and 3 OEMs
- After 12 months, a minimum of 7 FC suppliers develop, build and commit their standard sized FC + BoP module
- FC module(s) to be tested on an independent reference test device (to be built during the project)

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Innovation Actions

FCH-01-5-2020: Demonstration of FC Coaches for regional passenger transport

Demonstrate FC-powered coach buses

- Design of coach buses, optimizing efficiency and space utilization
- Demonstration of at least 6 FC Coaches in two coach segments (inter-city and long-distance)
- To be operated for min. 2 years and 80,000 km per coach per year with a minimum daily travel distance of 100 km

FCH-01-6-2020: Demonstration of liquid hydrogen as a fuel for segments of the waterborne sector

Use of LH2 as on-board storage in ships

Mission Innovation

- Develop on-board storage of LH2; min 1.5tons capacity
- Must include integration into a ship (min 2MW power), bunkering and prove scalability up to 20MW
- Operational period ≥12 months (including both winter and summer season) & minimum 3,000 operational hours

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Innovation Actions

FCH-01-7-2020: Extending the use cases for FC trains through innovative designs and streamlined administrative framework

Develop new FC-powered train designs

- Innovative prototype design to be tested (demonstrate TRL 7)
- Can address: regional trains, shunting or main line locomotives
- Propose a normative framework for the placement on the market of trains using FCH propulsion

FCH-01-8-2020: Scale-up and demonstration of innovative hydrogen compressor technology for full-scale hydrogen refuelling station

Scale up and demonstrate new compressor technology

- Upscale and integrate innovative compressor in HRS
- Demonstration in HRS ≥200kg/d H2; can be 100% with innovation or in combination with conventional technology
- Testing period of >1year under real operation conditions with 700bar refuelling and meeting requirements (purity, etc…)

Thanks for your attention

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