



**FUEL CELLS AND HYDROGEN**  
JOINT UNDERTAKING

## Transport

### Topics in the 2019 call

E. Girón

29/01/2018



# Transport Pillar Overview

Demonstration and research

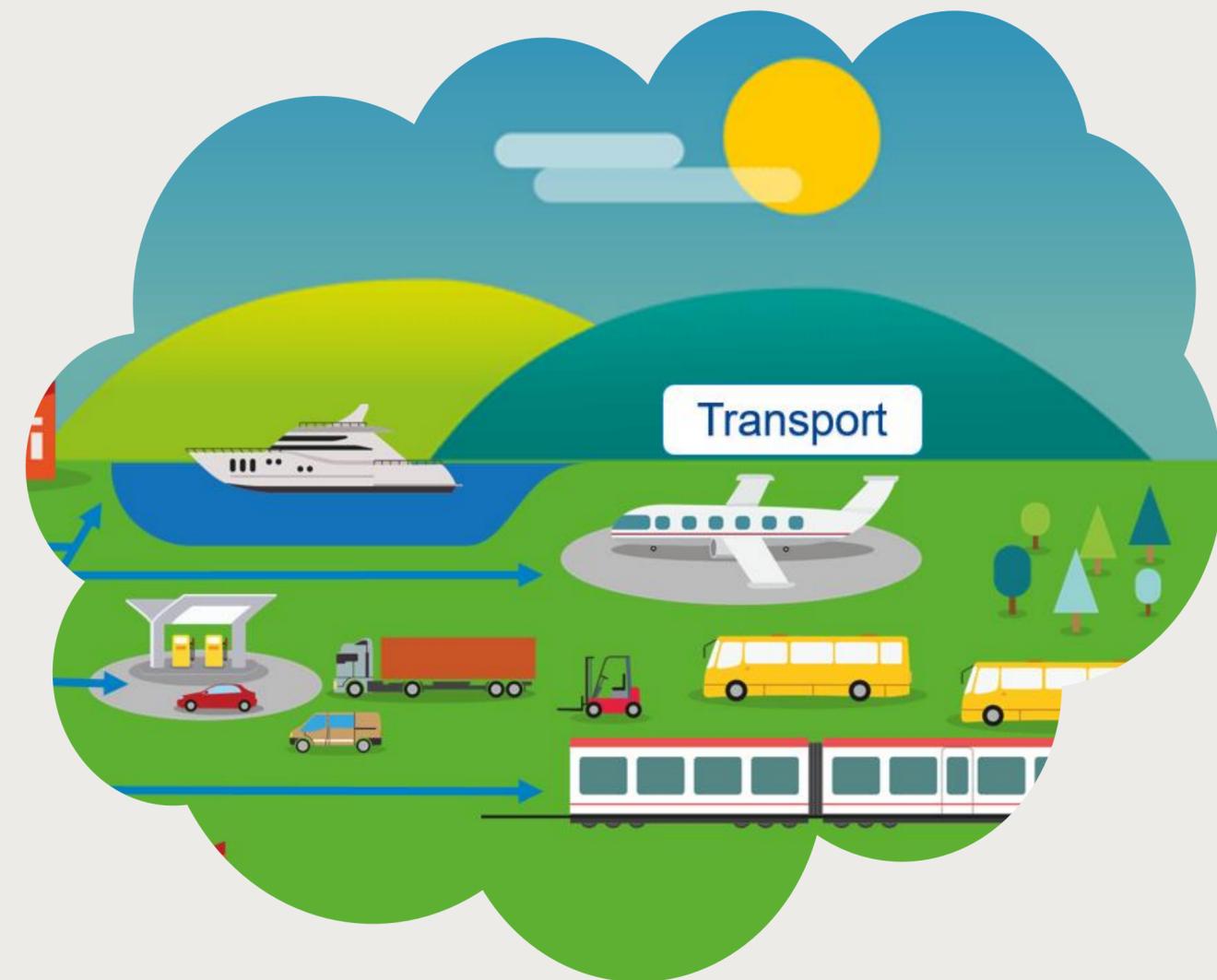


## Main Focus

- Consolidating **non-transport application**:
  - Scaling up on **maritime** applications
  - Full industrial ecosystem for **logistic vehicles**
- **Research** for improve use of PEM fuel cells in transport applications:
  - Breakthroughs in **MEA**
  - **Hybrid drivetrain** optimization
- Improve HRS: **footprint** reduction

## What is new

- Hybrid system **platform**
- Large industrial ecosystem with **multiple fuel cell vehicle types**
- **Underground storage**



# Transport Pillar

Topics and type of action



<i>Topic</i>	<i>Type of Action</i>	<i>Ind. Budget (M€)</i>
<i>FCH-01-1-2019: Demonstrating the blueprint for a zero-emission logistics ecosystem</i>	<i>IA</i>	<i>10*</i>
<i>FCH-01-2-2019: Scaling up and demonstration of a multi-MW Fuel Cell system for shipping</i>	<i>IA</i>	<i>10*</i>
<i>FCH-01-3-2019: Cyber-physical platform for hybrid Fuel Cell systems</i>	<i>RIA</i>	<i>1.8**</i>
<i>FCH-01-4-2019: Towards a better understanding of charge, mass and heat transports in new generation PEMFC MEA for automotive applications</i>	<i>RIA</i>	<i>2</i>
<i>FCH-01-5-2019: Underground storage HRS</i>	<i>RIA</i>	<i>1.5**</i>

*\* Eligibility criteria: maximum funding*

*\*\*Maximum 1 project to be funded*



# Transport Pillar Overview

Innovation and Research topics



## FCH-01-1-2019: Demonstrating the blueprint for a zero-emission logistics ecosystem



Demonstrate the **distinct operating advantages** of fuel cell logistic and production vehicles in **comparison to battery solutions**

- Demonstrate at least **250 fuel cell logistic vehicles** at one or two industrial or logistic end-user sites
- Minimum **10 trucks/tow tractors, 10 vans/small trucks, 10 new logistic vehicles and 30 forklifts**
- Adaptation might be included but **not powertrain component development**
- Minimum demonstration time/operation hours per vehicle to be taken into account
- Focus on a healthy and diversified **European value chains**



## FCH-01-2-2019: Scaling up and demonstration of a multi-MW Fuel Cell system for shipping



Give a solution to the urgency of **introducing ultra-low and zero-emission solutions for shipping**

- Adapt, scale up and demonstrate a fuel cell system for shipping with a total **minimum nominal power output of 2 MW**
- Open to **all types of FC technologies** and **all types of fuels** but must **reach >70% CO2 reductions**
- Minimum power: **500 kW/fuel cell unit** ; Adapted for **maritime conditions** ; Assessment of **scalability to 20 MW**
- If H2 is the fuel: study on a **bunkering concept** with the potential **for scaling** up to the requirements for 20 MW
- Special focus on relevant **regulation and codes ongoing activities**, promoting **international collaboration** beyond EU
- Minimum 12 months and 3,000 h of operation



# Transport Pillar Overview

Research topics



## FCH-01-3-2019: Cyber-physical platform for hybrid Fuel Cell systems

Increase the competitiveness of fuel cell systems for automotive through **optimization of the hybridization**

- Develop a validated **fuel cell system model and its hybridization** (both modelling tool and physical platform)
- Offer an **open, seamless and highly integrated** development platform for **fast prototyping** (XiL) for software or hardware models and create a common simulation, experimental and validation platform
- The XiL platform should be **open** regarding the interfaces **to other third party simulation and testing modules and tools**
- Several **end-users or vehicle manufacturers** to be part of the consortium

## FCH-01-4-2019: Towards a better understanding of charge, mass and heat transports in new generation PEMFC MEA for automotive applications



Reduce the cost of fuel cells for transport application

- Reach understanding of promising **MEAs and MEAs components** to meet the target of **high-power density** PEMFC single repeat unit
- MEA targeting: **ultra-low Pt loading** ( $< 0.08 \text{ mg/cm}^2$ ), **high power density** ( $> 1.8 \text{ W/cm}^2$ ) and **compact design** (two to three-times thinner than today)
- Understanding of durability issues is **not part of the topic but it should be tested**
- At least **one OEM partner** should take part in the technical work

**TRL 2 to 3-4**



## FCH-01-5-2019: Underground storage HRS



Allow the display of HRS where space is a constraint by **reducing footprint**



- Design, certify, build and operate for at least **6 months** a hydrogen retail station with **underground storage of hydrogen**
- Should be integrated into a **multi-fuel refueling station** that dispenses gasoline, diesel, and preferably also LPG and/or CNG
- Should develop recommended procedures for **safety assessment** and **permitting process** steps
- Include a minimum of one hydrogen dispenser capable of refueling **350 and 700 bar** FCEV
- **Equipment not related to storage are not eligible costs**
- “CertifHy Green H2” guarantees of origin should be used

# Overarching topics Overview

Focus: sector coupling through hydrogen



Topic	Type of Action	Ind. Budget (M€)
<i>FCH-03-1-2019: H2 Valley</i>	IA	20*

*\* Eligibility criteria: maximum funding*

## FCH-03-1-2019: H2 Valley



Developing, deploying and demonstrating replicable, balanced and integrated fuel cell and hydrogen-overarching solutions in both energy and transport fields



- At the end of the project hydrogen should be **100% green** (“CertifHy Green H2” should be used)
- At least **3 FCH applications** must be demonstrated from at least **two different sectors**: transport, energy and industrial
- At least **1,500 t H2 / year** should be used in the project, minimum 20% or **1 t H2/d per application**
- The **replicability** of the project is fundamental
- Secure additional **regional funding**
- Long-term vision (roadmap) how to **serve all energy needs from H2 and RES** based on a local/regional H2 economy **until 2050**

