

Project partners



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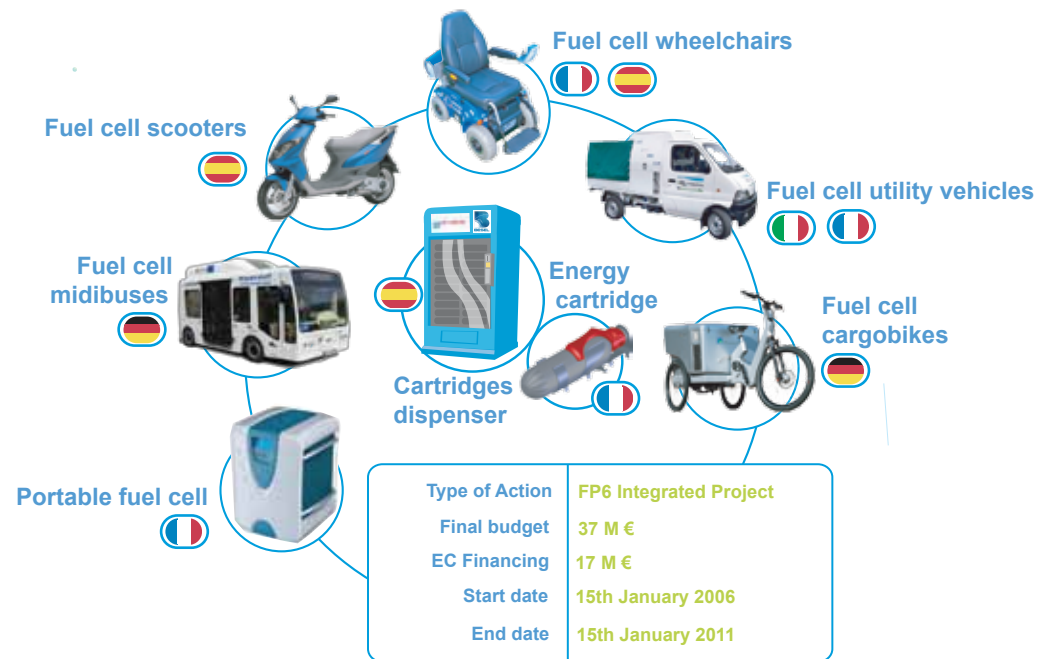
HYCHAIN at a glance

Our objectives

- 1 Demonstrate low power (up to 10 kW) fuel cell captive fleets in selected early market niches for transport.
- 2 Integrate common fuel cell “power modules” to achieve a minimum critical mass for early industrialization, gaining a significant reduction of costs
- 3 Set up a micro-infrastructure for hydrogen refueling and address cross-cutting actions promoting awareness and public acceptance

HYCHAIN in figures

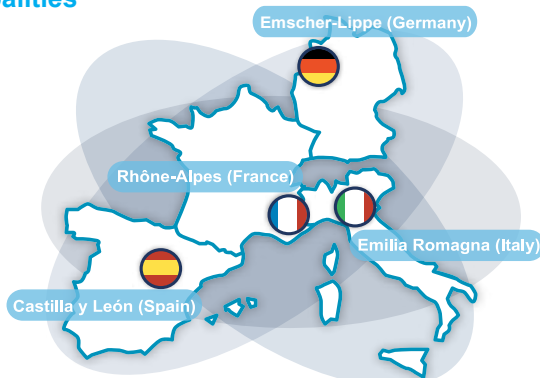
- ➡ 50 hydrogen low-power fuel cell vehicles of five different types
- ➡ More than 10 participating cities in 4 European regions
- ➡ 24 European partners from industry, government and academia



Working closely with regions and municipalities

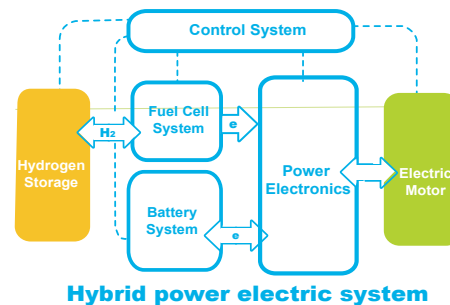


The combined international and regional approach ensures the sustainability of the initiative



Promoting hydrogen for clean urban transport

Hydrogen is a promising energy carrier that can be used to power vehicles. It can be produced from different resources. If produced with renewable energy sources, hydrogen can provide energy free of pollutants and the greenhouse gases that lead to climate change.



A fuel cell is a device that can efficiently transform hydrogen into electricity, producing only water vapour as waste. Fuel cell vehicles can improve local pollution issues in city centres.



Project activities

1. Research and Development

HYCHAIN innovates by finding new ways of storing hydrogen at high pressure (700 bar) in lightweight cylinders, with state-of-the-art connection for quick and easy exchange of empty cartridges with full ones. Research expertise is ensured by the long-standing experience of Air Liquide, world leader in gases for industry, health and the environment.



2. Hydrogen Production and Distribution

Hydrogen is produced from various sources and stored in two types of cartridges: 3-litre cartridges for the smaller vehicles and 20-litre cylinders at 300 bar for the utility vehicles. These are distributed through a dedicated distribution system to the customer's location. Two quick-filling stations have been built for the buses in Germany and Spain.



3. Training

The project has implemented a full set of training seminars, materials and an e-learning system for participants within the project (engineers, maintenance staff, mechanics, logistic operators and end users) and interested public.

4. Vehicle Demonstration

HYCHAIN vehicle fleets will be operated by selected representative services, such as municipal services (maintenance, waste collection, post delivery, green areas), public transport companies, etc. The companies operating the vehicles receive training and technical support. Regional authorities have, in some regions, co-financed the purchase, making HYCHAIN an example of joint financing of innovation.



5. Dissemination and assessment of project performance

With the aim of stimulating a self-maintaining market for hydrogen fuel cell applications for transport, activities include knowledge management and intellectual property protection, dissemination activities and socio-economic studies.





Fuel Cell Scooter

Municipal maintenance services, police, private transport companies, mail delivery services or private use.



This Fuel Cell Scooter has the following advantages:

- ➔ Silent and zero tail-pipe emissions
- ➔ Quick refill (< 2 min) with exchangeable cartridges
- ➔ Extended driving range compared to electric models (+16%)

Integrator & manufacturer	Rucker / Besel (Spain)
Original vehicle	Derbi (Spain)
2 kW fuel cell system	
1 x 3-litre cartridge at 700 bar	Air Liquide (France)

Fuel Cell Wheelchair*

People with reduced mobility, disabled people (when accompanied), associations, residential homes for the elderly, hospitals, airports, museums, municipalities and public spaces



This Fuel Cell Wheelchair has the following advantages:

- ➔ Silent and zero tail-pipe emissions
- ➔ Reduction in weight (20%)
- ➔ High autonomy (min. 40 km at 300 bar or 60 km at 700 bar)
- ➔ Lower recharging time (< 5 min) than conventional wheelchairs

Integrator & manufacturer	Besel (Spain)
Original vehicle	Meyra (Germany)
350W fuel cell	Axane (France)
1 x 3-litre cartridge at 300 bar	Air Liquide (France)

* Only for outdoor use

Fuel Cell Cargobike

Municipal companies (maintenance, local services), logistics, mail delivery



This Fuel Cell Cargobike has the following advantages:

- ➔ Silent and zero tail-pipe emissions
- ➔ No driving licence needed
- ➔ Assisted-peddalling system
- ➔ High payload (up to 100 kg)
- ➔ Quick refill (< 2 min) with exchangeable cartridges
- ➔ Increased autonomy (min. 150 km)

Integrator & manufacturer	Masterflex (Germany)
Original vehicle	Hawk Bikes (Germany)
Fuel Cell module 250 W	Masterflex (Germany)
1 x 3-litre cartridge at 300 bar	Air Liquide (France)

Fuel Cell Utility Vehicle

Municipal maintenance services (waste disposal green areas, urban furniture, street cleaning); public urban transport; private transportation companies, mail delivery



This Fuel Cell Utility Vehicle has the following advantages:

- ➔ Silent and zero tail-pipe emissions
- ➔ Extended driving range compared with electric models (+30%)
- ➔ Auxiliary power 230 VAC available for additional applications (lighting, small tools...)
- ➔ Quick refill (< 5 min) with exchangeable cartridges

Integrator & manufacturer	VEM (Italy)
Original vehicle	VEM (Italy)
2.5 kVA fuel cell system	Axane (France)
2 x 20-litre cartridges at 300 bar	Air Liquide (France)

Fuel Cell Midibus

Public transport, shuttle for historical areas, natural parks, university campus, industrial sites, airports, shopping centres, theme parks



This Fuel Cell Midibus has the following advantages:

- ➔ Silent and zero tail-pipe emissions
- ➔ Simple and fast refuelling
- ➔ Extended driving range (up to 200 km, compared to current battery-only versions (60-80 km)
- ➔ Meets regulation for urban transport

Integrator & manufacturer	Hydrogenics (Germany)
Original vehicle	Tecnobus (Italy)
Fuel cell module 10 kW	Hydrogenics (Germany)
Hydrogen storage: 2 tanks at 200 bar (2.5 kg each)	Dynatek (Germany)