

## OBJECTIVES

- **Development and demonstration** of PEM electrolyser system, electrochemical compressor and fuel cell system comprising state-of-the-art technology.
- **Execution of a test and evaluation programme** of the Don Quichote technologies benchmarked to existing technologies.
- **Life-cycle based assessment of environmental and cost aspects** of Don Quichote technologies, analysis of regulatory aspects and development.

## THE SYSTEM

- A PEM electrolyser, which offers a wider operating range, higher efficiency and a faster response time than the alkaline electrolyser.
- An electrochemical compressor which offers scalability, higher efficiency, and contamination free operation compared to traditional compressors.
- Composites storage vessels and a 90 kW fuel cell system.

## PROJECT FEATURES

- Extensive testing of the existing system, focused on dynamic behavior, efficiencies, actual degradation figures, availability, total cost of operation.
- Doubling the hydrogen capacity by adding a very efficient and dynamic PEM-electrolyser (storage 130 kg/day).
- Developing, testing, demonstration and validation of direct coupling between wind turbine (1,5 MW) and solar panels (1050 kW) and the electrolyser technology.





## About

The DON QUICHOTE project demonstrates the technical and economic viability of an integrated hydrogen storage system for renewable electricity linked to a hydrogen refuelling facility as an interesting commercial opportunity connecting intermittent renewable electricity to transport applications.

The project will run for 5 years from October 2012 to September 2017 and is implemented at a large logistics centre of Colruyt. This centre is interconnected to an existing hydrogen refuelling facility that supplies hydrogen to a fleet of material handling vehicles to form an integrated energy storage and dispensing system in a smart grid setting.

The integrated system receives its energy from renewable energy: wind and solar power. The existing hydrogen refuelling facility consists of an alkaline electrolyser system (30 Nm/h), diaphragm compressor, steel hydrogen storage vessels and a dispenser system at 350 bar.

## Contact Us

**Hydrogenics**  
jseykens@hydrogenics.com  
+32 14 462 139

**WaterstofNet**  
wouter.vanderlaak@waterstofnet.eu  
+32 620 943 104

**FAST - Federazione delle associazioni scientifiche e tecniche**  
ahmed@fast.mi.it  
+39 02 777 90315

## Partners



# DONQUICHOTE

## HYDROGEN OUT OF WIND TURBINE ENERGY

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