



# Hydrogen Europe: European Hydrogen & Fuel cell Project Database

## Project HYTRANSFER

Pre-Normative Research for Thermodynamic Optimization of Fast Hydrogen Transfer

Hydrogen transfer concerns filling and emptying processes. Filling generates heat which can lead to overheating of composite pressure vessels especially when filling transportable containers or fuelling vehicles. Emptying generates cooling. Excessive cooling may occur during delivery of hydrogen from a trailer. The HyTransfer project will address both issues. As hydrogen vehicle refuelling is the leading application the project will thus focus on fast filling of composite tanks. To avoid overheating, the speed of transfer can be limited or the gas cooled prior to introduction. Both impacts performance and costs, temperature control is thus essential for optimization of gas transfer. Temperature limits of transfer can apply to material, that must not exceed design temperature (e.g. 85°C), or to gas that must not exceed a specified limit. HyTransfer aims to develop and experimentally validate a practical approach for optimizing means of temperature control during fast transfers of compressed hydrogen to meet the specified temperature limit (gas or material), taking into account the system's thermal behaviour. Whereas existing approaches focus on gas temperature and specify gas pre-cooling temperature, this project will be based on the implementation of a simple model predicting gas and wall temperature to determine the amount of cooling required to avoid exceeding the limit temperature, and on the specification of cooling energy, rather than a fixed pre-cooling temperature. The relevant parameters obtained from a simple test for characterizing the thermal behaviour of a tank system will also be determined. This project aims to create conditions for an uptake of the approach by international standards, for wide-scale implementation into refuelling protocols. The new approach will be thus evaluated and its benefits quantified with regards to performance, costs, and safety. Finally, recommendations for implementation in international standards will be proposed.

## Project Information

**Type of project :** Research

**Timing :** 01/06/2013 > 31/12/2016

**Project website:** <http://www.hytransfer.eu/>

**Project Budget :** 3.095.956 €

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## Funding

European Union through FCH JU: Grant agreement 325277 - [CORDIS link](#)

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## Project partners

**Coordinator :**

Ludwig-Boelkow-Systemtechnik GmbH

**Partners :**[L'AIR LIQUIDE S.A](#)[CCS Global Group Ltd.](#)[CNRS - Centre National de la Recherche Scientifique](#)

HEXAGON RAUFOSSAS

HONDA R&amp;D EUROPE (DEUTSCHLAND) GMBH

JRC - JOINT RESEARCH CENTRE- EUROPEAN COMMISSION

TESTNET ENGINEERING GMBH

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**Sub project(s)****Sub project 1****Country:** Germany**Address:**

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**Sub project categories**

Research

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Project Id: 1016

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