

PROJECT

INSPIRE

Integration of Novel Stack Components for Performance, Improved Durability and Lower Cost

Funding: European (Horizon 2020)

Duration: May 2016 - Oct 2019

Status: Complete

Total project cost: €6,878,070

EU contribution: €6,877,870



Call for proposal: H2020-JTI-FCH-2015-1

[CORDIS RCN : 204317](#)

Objectives:

The objective is to develop and integrate the most advanced critical PEMFC stack components, many from recent FCH JU programmes, into an automotive stack showing BOL performance of 1.5 W/cm² at 0.6V, <10% power degradation after 6,000 hours, with a technical and economic assessment showing a cost of less than €50/kW at a 50,000 annual production scale.

This will be achieved by leading industrial and academic partners with expertise in the design and manufacture of PEMFC stacks, their components and materials. They will select and build on components which can achieve key target metrics, e.g. catalyst materials showing mass activities of 0.44 A/mg Pt. There will be focus on integration of the key components and optimisation of the interfaces regarding the electrochemistry, mass and heat transport, and mechanical interactions. Several iterations of an advanced stack design will be evaluated. Work is organised to optimise the flow of development, which begins with catalysts being advanced and down-selected, scaled then fed into the design and development of catalyst layers, integration with membranes and the demonstration of CCM performance. The CCMs feed into stack component development where they will be integrated with GDLs to form MEAs; and where bipolar plates will be designed and developed and supplied with the MEAs for iterative stack design, assembly and testing.

All mandatory and optional objectives of the FCH 2 JU Work Plan are addressed. Performance and durability are evaluated from small single cell to stack level using standardised test protocols. Degradation is addressed by stability testing, structural visualisation and modelling. Interfaces and specification alignment is an important focus, being integrated with the evaluation of new architectures and synthesis methods and informing balance of plant component specifications. Dismantling and recycling for the recovery and re-use of all critical MEA components is included in the costing evaluation.

Parent Programmes:

[H2020-EU.3.4. - Horizon 2020: Smart, Green and Integrated Transport](#)

Institute type: Public institution

Institute name: European Commission

Funding type: Public (EU)

Lead Organisation:

Johnson Matthey Plc

Address:

40-42 Hatton Garden
London
EC1N 8EE
United Kingdom

Organisation Website:

<http://www.matthey.com/>

EU Contribution: €1,591,634

Partner Organisations:**Teknologian Tutkimuskeskus Vtt****Address:**

TEKNIKANTIE 21
02150 ESPOO
Finland

Organisation Website:

<http://www.vtt.fi>

EU Contribution: €357,960

Technische Universitaet Muenchen**Address:**

Arcisstrasse 21
80333 MUENCHEN
Germany

Organisation Website:

<http://www.tu-muenchen.de>

EU Contribution: €227,675

Albert-Ludwigs-Universitaet Freiburg**Address:**

Fahnenbergplatz
79085 Freiburg
Germany

EU Contribution: €323,085

Technische Universitat Berlin**Address:**

STRASSE DES 17 JUNI 135
10623 Berlin
Germany

Organisation Website:

<http://www.tu-berlin.de>

EU Contribution: €356,126

Reinz-Dichtungs GmbH**Address:**

REINZSTRASSE 3-7
89233 NEU ULM
Germany

Organisation Website:

<http://www.reinz.com>

EU Contribution: €1,170,546

Pretexo**Address:**

36 CHEMIN D'ANTONEGRE
34660 COURNONTERRAL
France

Organisation Website:

<http://www.pretexo.com>

EU Contribution: €72,604

Centre National De La Recherche Scientifique**Address:**

3 rue Michel-Ange
75794 PARIS
France

Organisation Website:

<http://www.cnrs.fr>

EU Contribution: €490,671

Sgl Carbon Gmbh**Address:**

Werner-Von-Siemens-Strasse 18
86405 Meitingen
Germany

EU Contribution: €487,569

Bayerische Motoren Werke Ag**Address:**

Petuelring 130
80809 MUNICH
Germany

Organisation Website:

<http://www.bmwgroup.de>

EU Contribution: €1,800,000

Technologies:

Condition monitoring
IoT based application for monitoring vehicle's condition

Development phase: Research/Invention

STRIA Roadmaps: Vehicle design and manufacturing, Low-emission alternative energy for transport

Transport mode: Air transport

Transport sectors: Passenger transport, Freight transport

Transport policies: Environmental/Emissions aspects, Deployment planning/Financing/Market roll-out

Geo-spatial type: Other