

PROJECT

MARANDA

Marine application of a new fuel cell powertrain validated in demanding arctic conditions

Funding: European (Horizon 2020)

Duration: Mar 2017 - Feb 2021

Status: Complete

Total project cost: €3,704,758

EU contribution: €2,939,458



Call for proposal: H2020-JTI-FCH-2016-1

[CORDIS RCN : 207654](#)

Objectives:

In MARANDA project an emission-free hydrogen fuelled PEMFC based hybrid powertrain system is developed for marine applications and validated both in test benches and on board the research vessel Aranda, which is one of about 300 research vessels in Europe. Special emphasis is placed on air filtration and development of hydrogen ejector solutions, for both efficiency and durability reasons. In addition, full scale freeze start testing of the system will be conducted.

When research vessels are performing measurements, the main engines are turned off to minimize noise, vibration and air pollution causing disturbance in the measurements. The 165 kW (2 x 82.5 kW AC) fuel cell powertrain (hybridized with a battery) will provide power to the vessel's electrical equipment as well as the dynamic positioning during measurements, free from vibration, noise and air pollution.

One of the major obstacles for wider implementation of fuel cells in the marine sector is the hydrogen infrastructure. To alleviate this problem, a mobile hydrogen storage container, refillable in any 350 bar hydrogen refuelling station will be developed in this project. This novel solution will increase hydrogen availability to marine sector as well as many other sectors.

The consortium of this project contains companies from the whole fuel cell value chain, from balance-of-plant components to system integrator and end user. The fuel cell system will be tested in conditions similar to arctic marine conditions before implementation to the target vessel. In addition, long-term durability testing (6 months, 4380 operating hours) of the system will be conducted at an industrial site.

The project will increase the market potential of hydrogen fuel cells in marine sector, which have for long lagged behind road transportation. General business cases for different actors in the marine and harbour or fuel cell business will be created and therefore the impacts in the whole industry will be notable.

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:

Teknologian Tutkimuskeskus Vtt

Address:

TEKNIKANTIE 21
02150 ESPOO

Finland

Organisation Website:

<http://www.vtt.fi>

EU Contribution: €975,749

Partner Organisations:

Abb Oy

Address:

Hiomotie 13
380 Helsinki
Finland

EU Contribution: €300,231

Suomen Ymparistokeskus

Address:

Mechelininkatu
251 Helsinki
Finland

Organisation Website:

<http://www.environment.fi/syke>

EU Contribution: €155,013

Powercell Sweden Ab

Address:

Ruskvadersgatan 12
418 34 Goteborg
Sweden

EU Contribution: €982,840

Omb Saleri Spa

Address:

VIA ROSE DI SOTTO 38/C
25126 BRESCIA
Italy

EU Contribution: €396,250

Persee

Address:

12 PL FONTAINE
39130 PONT DE POITTE
France

EU Contribution: €129,375

Swiss Hydrogen Sa

Address:

PASSAGE DU CARDINAL 1
1700 FRIBOURG
Switzerland

Organisation Website:

<http://www.swisshydrogen.ch>

EU Contribution: €0

Technologies:

Fuel cells and hydrogen fuel
Hydrogen refuelling station using ionic compressor

Development phase: Research/Invention

Fuel cells and hydrogen fuel
Hydrogen production using an electrolyser system

Development phase: Research/Invention

STRIA Roadmaps: Transport electrification, Low-emission alternative energy for transport
Water transport (sea &

Transport mode: inland)

Transport sectors: Passenger transport, Freight transport

Transport policies: Environmental/Emissions aspects

Geo-spatial type: Other