MEASURED

ADVANCED MEAS ENSURING HIGH EFFICIENCY HDV

Project ID	101101420
PRR 2024	Pillar 3 – H_2 end uses: transport
Call topic	HORIZON-JTI-CLEANH2-2022-03-02: Innovative and optimised MEA components towards next generation of improved PEMFC stacks for heavy duty vehicles
Project total costs	EUR 2 989 060.00
FCH JU max. contribution	EUR 2 989 060.00
Project start - end	1.6.2023–31.5.2026
Coordinator	Advanced Energy Technologies AE Ereunas & Anaptyxis Ylikon & Proiontonananeosimon Pigon Energeias & Synafon Symvouleftikon y Piresion, Greece
Beneficiaries	AVL List GmbH, AVL-AST Napredne Simulacijske Tehnologije d.o.o., Honeywell International s.r.o., Technische Universitaet Graz, Universitat Politècnica de València, University of Stuttgart, Univerza v Ljubljani

https://measured-horizon.eu/

PROJECT AND GENERAL OBJECTIVES

At Measured, we strive to improve the efficiency and lifespan of high-temperature membrane electrode assemblies (MEAs) for heavy-duty vehicles through a combination of experiments and simulations. Our focus is on developing and optimising MEA components to enhance the overall performance of fuel cells. Specifically, we aim to use high-temperature proton-exchange membranes (HT-PEMs), which we believe is the best scientific direction for the heavy-duty vehicle (HDV) industry. We plan to achieve key performance indicators beyond the current state of the art (SOA) by developing the ion-pair concept. Our consortium, led by Advent, an MEA manufacturer, and comprising fuel cell technology experts, is dedicated to linking HT-PEMs with HDV applications. We will optimise technical aspects to deliver an advanced MEA with high-end potential for the HDV sector based on cost and environmental analyses.

Our research will focus on improving MEA durability and performance through experimental and theoretical approaches. Our ultimate objective is to demonstrate a cost-effective MEA that operates at high temperatures (> 160 °C) with high performance.

The project's objectives are as follows.

- Develop an MEA for a HT-PEM suitable for an HDV that operates at a temperature > 160 °C with minimum phosphoric acid uptake and a stable porous microstructure ionomer / new type of platinum catalyst.
- Integrate MEAs in a short stack. Project stack performance based on short-stack measurements. Evaluate MEAs' performance according to the project's key performance indicators. The environmental assessment of the fuel-cell-manufacturing procedure is focused on cost reduction and the recycling of waste products.
- Integrate fuel cell stacks in HDVs in real conditions. Identify balance-of-plant components based on HT-PEM needs. Analyse the use of fuel cell technology for other applications (aviation, maritime, rail).
- Develop design and monitoring modelling (flow field, degradation) simulation tools.
- Carry out testing-, harmonisation- and standardisation-related activities.

NON-QUANTITATIVE OBJECTIVES

- Cultivate expertise in digital modelling techniques, enabling the team to develop sophisticated simulations that enhance understanding and inform design decisions.
- Conduct vehicle-level simulations, fostering a deep understanding of system-wide implications and interdependencies.

PROJECT TARGETS

Target source	Parameter	Unit	Target	Target achieved?
Project's own objectives and SRIA (2021–2027)	Cost of FC stack	€/kW	< 75	
	PGM loading for low TRL	g/kW	< 0.30	
	Stack durability	hours	20 000	
	Power density	W/cm² at 0.65 V	1.2	