REACTT

RELIABLE ADVANCED DIAGNOSTICS AND CONTROL TOOLS FOR INCREASED LIFETIME OF SOLID OXIDE CELL TECHNOLOGY

Project ID:	101007175
PRD 2023:	Panel 1 – H2 production
Call topic:	FCH-02-3-2020: Diagnostics and control of SOE
Project total costs:	EUR 2 712 322.50
Clean H_2 JU max. contribution:	EUR 2 712 322.50
Project period:	1.1.2021–31.12.2023
Coordinator:	Jožef Stefan Institute, Slovenia
Beneficiaries:	Agenzia nazionale per le nuove tecnologie (l'energia e lo sviluppo economico sostenibile), AVL LIST GmbH, Bitron SpA, Commissariat à l'énergie atomique et aux énergies alternatives, École Polytechnique Fédérale de Lausanne, Haute École Spécialisée de Suisse occidentale, SolydEra SA, Teknologian tutkimuskeskus VTT Oy, Università degli Studi di Salerno

https://www.reactt-project.eu/

PROJECT AND OBJECTIVES

REACTT aims to realise a monitoring, diagnostic, prognostic and control (MDPC) tool and reversible solid oxide cell stacks and systems to increase stack lifetime by 5 %; reach a production loss rate of 1.2 %/1 000 h; increase availability by 3 %, targeting overall availability of 98 %; and reduce operation and maintenance costs by 10 %. The additional cost of the MDPC tool will not exceed 3 % of the overall system manufacturing costs. The development of the hardware platform and embedded diagnostics and prognostics algorithms is under way.

NON-QUANTITATIVE OBJECTIVES

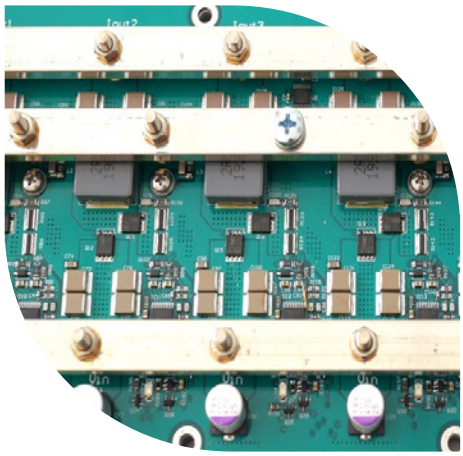
- **Education/training.** The possible inclusion of the topic of solid oxide cell technologies in MSc and PhD study programmes was to be considered.
- **Public awareness.** The project web page and dissemination material are the first step towards raising public awareness.
- **Safety.** Fault detection, isolation and mitigation in SOEC/SOFC preclude process disruption and potential hazards.
- **Regulations and standards.** The formulation of a new work item proposal set out in M12–M36 is to be submitted to Technical Committee 105 of the International Electrotechnical Commission.

PROGRESS AND MAIN ACHIEVEMENTS

The first prototype of the MDPC board was developed.

FUTURE STEPS AND PLANS

An application for a project extension has been made. Delays in stack delivery are likely to result in delayed data acquisition from the long-term experiments under various degradation modes. The data are an important prerequisite for the design and validation of the diagnostic and prognostic algorithms.



QUANTITATIVE TARGETS AND STATUS

Target source	Parameter	Unit	Target	Target achieved?	SoA result achieved to date (by others)
MAWP (2014–2020)	Availability	%	98		95
	Q & M cost	€/(kg/d)/year	120		N/A
	Electrical consumption at rated capacity	kWh/kg of H_2	39		40–45

Clean Hydrogen Partnership
Co-funded by the European Union