

SO-FREE

SOLID OXIDE FUEL CELL COMBINED HEAT AND POWER: FUTURE-READY ENERGY



Project ID:	101006667
PRD 2023:	Panel 4 – H2 end uses – stationary applications
Call topic:	FCH-02-4-2020: Flexi-fuel stationary SOFC
Project total costs:	EUR 3 100 605.00
Clean H₂ JU max. contribution:	EUR 2 739 094.00
Project period:	1.1.2021–31.8.2024
Coordinator:	Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile, Italy
Beneficiaries:	AVL List GmbH, Elcogen Oy, Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung EV, ICI Caldaie SpA, Instytut Energetyki, Kiwa Limited, Kiwa Nederland BV, PGE Polska Grupa Energetyczna SA, Università degli Studi Guglielmo Marconi – Telematica

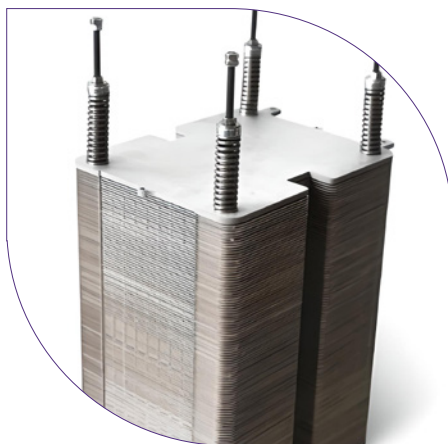
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PROJECT AND OBJECTIVES

The project's development and demonstration of a fully future-ready solid oxide fuel cell (SOFC)-based system for combined heat and power (CHP) generation allows for an operation window of 0–100 % of H₂ in natural gas, with additions of purified biogas. Furthermore, SO-FREE will endeavour to realise a standardised stack–system interface, allowing full interchangeability of SOFC stack types within a given SOFC CHP system.

NON-QUANTITATIVE OBJECTIVES

SO-FREE aims to realise a unique, standardised stack module–system interface for flexible system integration. The first alignment of two stack modules with a single interface has been proposed.

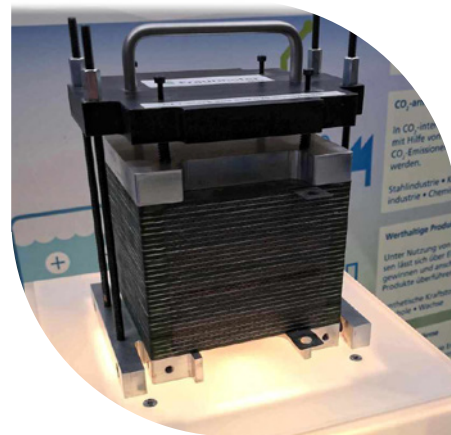


PROGRESS AND MAIN ACHIEVEMENTS

- The project has made two identical test stations for independent stack validation.
- SO-FREE has designed a unique stack module–system interface for flexible system integration.

FUTURE STEPS AND PLANS

- Stack validation and mapping were expected to be completed by February 2023.
- The final design of the system was due to be finalised in April 2023.
- Stack production and delivery are due to be completed in October 2023.
- The systems are expected to be ready for demonstration in December 2023.



QUANTITATIVE TARGETS AND STATUS

Target source	Parameter	Unit	Target	Achieved to date by the project	Target achieved?
	Degradation	%	< 1	N/A	⚙️
AWP 2020	Efficiency in H ₂ consumption	%	48	53	✓
	CAPEX	€/kW	8 000	N/A	⚙️