BEST4Hy

SUSTAINABLESOLUTIONSFORRECYCLINGOFEND OF LIFE HYDROGEN TECHNOLOGIES

Project ID:	101007216
PRD 2023:	Panel 5 – cross-cutting
Call topic:	FCH-04-4-2020: Development and validation of existing and novel recycling technologies for key FCH products
Project total costs:	EUR 1 586 015
Clean H_2 JU max. contribution:	EUR 1 586 015
Project period:	1.1.2021–31.12.2023
Coordinator:	Parco Scientifico Tecnologico per l'Ambiente SpA, Italy
Beneficiaries:	Aktsiaselts Elcogen, Commissariat à l'énergie atomique et aux énergies alternatives, EKPO Fuel Cell Technologies GmbH, ElringKlinger AG, Hensel Recycling GmbH, IDO-Lab GmbH, Politecnico di Torino, RINA Consulting SpA, Univerza v Ljubljani

https://best4hy-project.eu/

PROJECT AND OBJECTIVES

The overall objective of BEST4Hy is to identify and develop viable recycling strategies, supported by innovative technologies, that will provide the best solution for material recovery from fuel cell and hydrogen products (i.e. proton-exchange membrane fuel cells (PEMFCs) and solid oxide fuel cells (SOFCs)), and to establish proof of concept for the recovery of iridium and palladium from proton-exchange membrane water electrolysis with novel technologies. Currently, the project is validating four recovery processes at laboratory scale (technology readiness level (TRL) 3) on materials of different ages (PEMFCs and SOFCs). BEST4Hy is performing life cycle analysis / life cycle cost analysis on fuel cell and hydrogen products and end-of-life processes. The regulatory aspects study / policymakers' involvement and the standardisation aspects started in December 2021.

PROGRESS AND MAIN ACHIEVEMENTS

- BEST4Hy achieved Pt recovery via the hydrometallurgical process (listed in the Innovation Radar).
- The project created a novel membrane electrode assembly gaseous-phase dismantling process (listed in the Innovation Radar).
- It achieved Ni-YSZ anode component recovery by HTH and HTM (listed in the Innovation Radar).
- It developed a novel electroleaching and electrolisciviation process for PEMFCs (listed in the Innovation Radar).

FUTURE STEPS AND PLANS

- Scaling up from TRL 3 to TRL 5 will be finalised in 2023.
- The initial results of the life cycle assessment / life cycle costing were expected in early 2023.
- The standardisation and regulations assessment will be performed, supporting the development of a final policy paper and a standardisation roadmap for end-of-life fuel cells.
- A dissemination and exploitation action plan will be created, involving several workshops and events to boost the project's impact and raise market awareness of the technologies.

QUANTITATIVE TARGETS AND STATUS

Target source	Parameter	Unit	Target	Achieved to date by the project	Target achieved?
Project's own objectives	Incoming Pt recovered	%	80	90	✓
	Incoming anode material recovered overall for SOFCs	%	80	> 80	✓
	Incoming Pt recovered	%	90	95	✓
	La and Co recovery	%	> 80	La > 78, Co > 87	✓
	Incoming membrane	%	100	N/A	⚙
	Greenhouse gas emissions in the overall production	%	– 20	N/A	⚙

Clean Hydrogen Partnership
Co-funded by the European Union