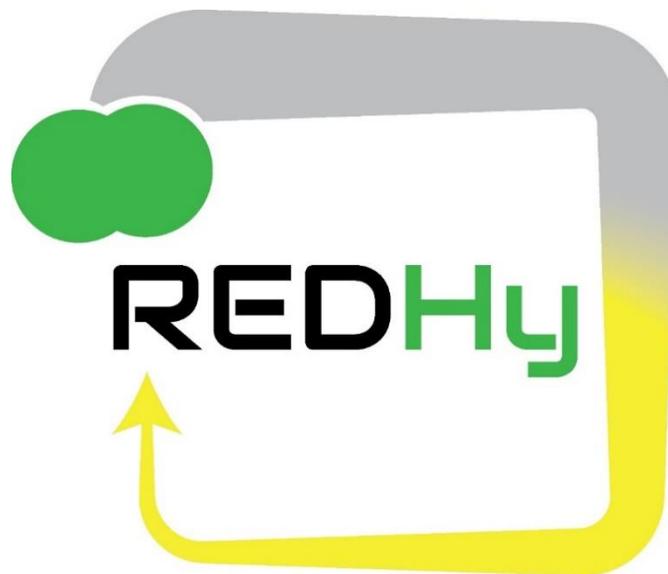


HORIZON EUROPE PROGRAMME
TOPIC HORIZON-CLEANH2-2023-01-01

GA No. 101137893

REDHY

**Redox-Mediated economic, critical raw material free,
low capex and highly efficient green hydrogen
production technology**



REDHY - Deliverable report

D1.3 – Annual Reporting for the Clean Hydrogen JU

Deliverable No.	1.3	
Related WP	1	
Deliverable Title	Annual Reporting for the Clean Hydrogen JU	
Deliverable Date	31.03.2025	
Deliverable Type	R	
Dissemination level	SEN	
Author(s)	Angelika Knoll	
Checked by	Tobias Morawietz	
Reviewed by (if applicable)	All	
Approved by	General assembly	
Status	submitted	

Document History

Version	Date	Editing done by	Remarks
1	11.03.2025	Angelika Knoll	
2	18.03.2025	Tobias Morawietz	

Public Summary

The REDHy project tackles the limitations of contemporary electrolyser technologies by fundamentally reimagining water electrolysis, allowing it to surpass the drawbacks of state-of-the-art (SoA) electrolysers and become a pivotal technology in the hydrogen economy. The REDHy approach is highly adaptable, enduring, environmentally friendly, intrinsically secure, and cost-efficient, enabling the production of economically viable green hydrogen at considerably increased current densities compared to SoA electrolysers. The REDHy method is based on the findings of numerous EU-funded initiatives and patented by the DLR (TRL2). It is uniting academic and industrial entities across a broad spectrum of expertise. Unlike SoA electrolysers, REDHy is entirely free of critical raw materials and doesn't require fluorinated membranes or ionomers, while maintaining the potential to fulfil a substantial portion of the 2024 KPIs. In accordance with Europe's circular-economy action plan, a 5-cell stack with an active surface area exceeding 100 cm² and a nominal power of 1.5 kW will be developed, capable of managing a vast dynamic range of operational capacities with economically viable and stable stack components. These endeavors will guarantee lasting and efficient performance at elevated current densities (1.5 A cm⁻² at E_{cell} 1.8 V/cell) at low temperatures (60 °C) and suitable hydrogen output pressures (15 bar). The project's ultimate objective is to create a prototype, validate it in a laboratory setting for 1200 hours at a maximum degradation of 0.1%/1000 hours and achieve TRL4. This final phase will emphasize the potential of the REDHy approach and its crucial role in the upcoming hydrogen economy, secure subsequent investments, and showcase the necessity for ground-breaking, innovative thinking to reach climate objectives in a timely fashion.

11 Acknowledgement

The author(s) would like to thank the partners in the project for their valuable comments on previous drafts and for performing the review.

Project partners:

#	Partner short name	Partner Full Name
1	DLR	DEUTSCHES ZENTRUM FUR LUFT – UND RAUMFARHT EV
2	CNRS	<u>CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIC</u>
3	UNR	<u>UNIRESEARCH BV</u>
4	UPV	<u>UNIVERSITAT POLITECNICA DE VALANCIA</u>
5	IDN	<u>INDUSTRIE DE NORA SPA-IDN</u>
6	CENMAT	<u>CUTTING-EDGE NANOMATERIALS CENMAT UG HAFTUNGSBESCHRANKT</u>
7	CNR	<u>CONSIGLIO NAZIONALE DELLE RICERCHE</u>

Disclaimer/ Acknowledgment



Copyright ©, all rights reserved. This document or any part thereof may not be made public or disclosed, copied or otherwise reproduced or used in any form or by any means, without prior permission in writing from the REDHY Consortium. Neither the REDHY Consortium nor any of its members, their officers, employees or agents shall be liable or responsible, in negligence or otherwise, for any loss, damage or expense

whatever sustained by any person as a result of the use, in any manner or form, of any knowledge, information or data contained in this document, or due to any inaccuracy, omission or error therein contained.

All Intellectual Property Rights, know-how and information provided by and/or arising from this document, such as designs, documentation, as well as preparatory material in that regard, is and shall remain the exclusive property of the REDHY Consortium and any of its members or its licensors. Nothing contained in this document shall give, or shall be construed as giving, any right, title, ownership, interest, license or any other right in or to any IP, know-how and information.

The project is supported by the Clean Hydrogen Partnership and its members.

The project has received funding from Clean Hydrogen Partnership Joint Undertaking under Grant Agreement No 101137893. This Joint Undertaking receives support from the European Union's Horizon 2020 Research and Innovation programme, Hydrogen Europe and Hydrogen Europe Research.

Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the Clean Hydrogen Partnership. Neither the European Union nor the granting authority can be held responsible for them.