

EUROPEAN COMMISSION

HORIZON 2020 PROGRAMME - TOPIC H2020-LC-BAT-2019
Affordable High-Performance Green Redox Flow Batteries

GRANT AGREEMENT No. 875613



HIGREEW – Deliverable Report

D7.5 – HIGREEW II Workshop



The research leading to these results has received funding from the European Union under Grant Agreement no. 875613

Deliverable No.	HIGREEW D7.5	
Related WP	WP 7	
Deliverable Title	HIGREEW II Workshop	
Deliverable Date	2023-05-31	
Deliverable Type	OTHER	
Dissemination level	Public (PU)	
Written By	Alessandra Lucini Paioni (UNR)	23/05/2023
Checked by	Anna Molinari (UNR)	24/05/2023
Reviewed by (if applicable)	All Partners	30/05/2023
Approved by	Estibaliz Crespo (CICe)	30/05/2023
Status	Final	31/05/2023

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 HIGREEW Consortium. Neither the HIGREEW 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 HIGREEW 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.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 875613. The information and views set out in this publication does not necessarily reflect the official opinion of the European Commission. Neither the European Union institutions and bodies nor any person acting on their behalf, may be held responsible for the use which may be made of the information contained therein.

Summary

This document reports on the programme and attendance of the second official project workshop organized by the HIGREEW coordinator CIC energiGUNE in Vitoria-Gasteiz (Spain) on the 16th and 17th of May 2023. The workshop focused on the technology development of Redox Flow Batteries (RFB) and successfully addressed all critical steps of the RFB value chain: high-level scientific presentations on materials and components; different solutions for possible applications and the related challenges; market perspective and legislation-related aspects.

As stated in the Description of Work (under task 7.1), the HIGREEW project organised 2 project workshops addressing the energy sector, battery manufacturers, and material developers: for central- and local governments and for other relevant stakeholders.

The two workshops are linked to two project deliverables: the first project workshop at M29 (D7.4, March 2022) and the second one in the final stage of the project at M43 (D7.5, May 2023).

Contents

1	Introduction.....	5
2	Final project workshop.....	6
2.1	Agenda and programme.....	6
2.2	Participants.....	8
2.3	Presentations.....	10
2.4	Used dissemination and communication tools and documents	12
2.5	Selected pictures	15
3	Conclusion	18
4	Acknowledgement.....	19

Uniresearch B.V.
838 followers
3w • Edited •

The registration for the HIGREEW Workshop: flow batteries, bringing the technology to the market is open until the 5th of May. The workshop will be only face-to-face in order to facilitate networking and discussion. ...see more

Uniresearch B.V.
838 followers
1mo •

News alert 📢 Join us for the HIGREEW final project workshop on the 16th and 17th of May 2023!
We will have the chance to discuss the future of Redox Flow Batteries tec ...see more



HIGREEW Workshop II
higreew-project.eu • 2 min read

CIC energiGUNE
25,307 followers
1w •

Today & for the next 2 days, **CIC energiGUNE** welcomes the members of the HIGREEW project & the main agents in the **#battery #industry** for the project's final **#workshop**, highlighting **#RedoxFlowBatteries** potential for **#decarboniza** ...see more







CIC energiGUNE
25,307 followers
1w • Edited •

CIC energiGUNE organiza en **#VitoriaGasteiz** el **#seminario** final del **#HIGREEW** Project, que ya ha hecho posible la instalación de un prototipo de **#batería** orgánica de flujo **#redox** en **Siemens Gamesa #Zaragoza**. ...see more

[See translation](#)



CIC energiGUNE organiza en Vitoria-Gasteiz el seminario final del proyecto HIGREEW, que ya ha hecho posible la instalación de un prototipo de batería...
cicenergigune.com • 2 min read

Estibaliz Crespo Acillona • 1st
Stakeholder engagement | Business development | Project management
3w •

Interested in **#redoxflow** technology? Don't miss the opportunity to join the **#HIGREEW** workshop: Flow batteries, bringing the technology to the market organized by **#CICenergiGUNE** the 16-17 May in our premises in Vitoria- ...see more



HIGREEW WORKSHOP II
higreew-project.eu • 2 min read

Juan Asenjo Pascual and 12 others | repost

Ivan Salmeron-Sanchez • 1st
R&D Electrochemist | Flow Battery Research | Membrane devel...
2d •

So glad to have contributed to the HIGREEW workshop II held in Vitoria-Gasteiz (Spain) on May 16th-17th 2023. I am grateful to have shared my last research advances in ion exchange membranes for aqueous organic redox flow be ...see more



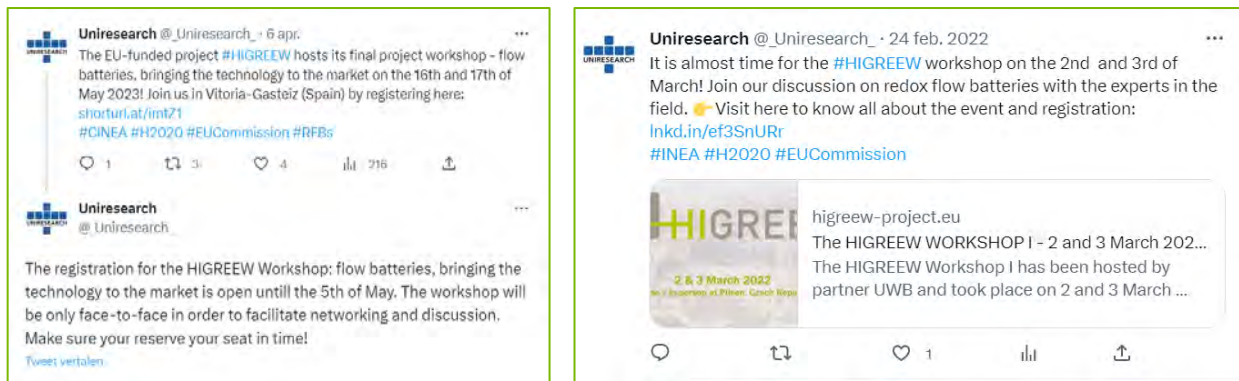


Figure 2-7: Selected social media posts on the workshop

The event was further promoted via:

- [Batteries Europe](#)
- UK Flow Battery network newsletter mailing list
- Battery Plat newsletter
- AEPIBAL platform newsletter
- MATERPLAT platform newsletter
- Direct distribution of information via partner's network
- Batteries Partnership Association (BEPA)
- Batteries 2030+
- Flow Batteries Europe

HIGREEW WORKSHOP II

16 and 17 May 2023 in Vitoria-Gasteiz, Spain


HIGREEW Final workshop: Flow batteries, bringing the technology to the market

The second and final HIGREEW Workshop took place 16 and 17 May 2023. The event was organized at the project coordinators' premises, CIC energigUNE in the beautiful medieval city Vitoria-Gasteiz (Spain). More than 70 participants representing 10 different EU countries, met for two days in order to discuss the future of Redox Flow Batteries. The workshop successfully addressed all critical steps of the RFB value chain: high-level scientific presentations on materials and components; different solutions for possible applications and the related challenges; market perspective and legislation-related aspects.

Participants also got the opportunity to visit CIC energigUNE labs and open-platform and...not less important to enjoy – during the networking social activity – the beautiful city and the culinary culture of the Basque Countries.

This discussion has been the continuation of what started in Pilsen in March 2022 at the time of the [first project workshop](#) and the perfect conclusion of our interesting project. At the same time, it has been an opportunity to start new active talks on new ideas, planning/reinforce future collaborations and start creating the basis for new projects.

We want to thank everyone who contributed and/or participated in this second HIGREEW Workshop!



Group picture at the workshop at CIC energigUNE

To view the full programme and presentations of all the invited speakers, see below:

- [Programme](#)

Day 1 (16 May)

Session Market and Policy

- Energy storage and advanced grid functionalities: the missing piece of the 100% renewable puzzle by Juan Barandian (Managing director, Gamesa Electric)
- RFB Market by Juan-Carlos Mejia (Director Sales Microgrid Solutions, Enercor GmbH / CellCube)
- Redox flow battery R&D in Shell by Peter Klusener (Senior process development chemist, Shell Global Solutions International B.V. Domain lead redox flow battery technology) – presentation not public
- Battery Sustainability Regulation in context of redox-flow technology by Marek Bielewski (Scientific officer at Joint Research Centre of EC)

Session Materials

- HIGREEW Project: a journey through new generation AORFB by Eduardo Sánchez (HIGREEW project coordinator and redox flow research line manager, CIC energigUNE)
- Characterization of AORFB by Jiri Chavril (Researcher, Laboratory of Energy Storage, NTC UWB and UCT Prague)
- Modified anion exchange membranes and other perspectives by Iván Salmerón Sánchez (PhD student, electrochemistry research group at Applied chemistry-physics faculty, University Autonomous of Madrid)
- The importance of the electrolyte-membrane combination for long lifetime-Vologen-TEMPO AORFB by Laura Pastor (PhD student, redox flow research line, CIC energigUNE)
- Membranes for AORFB by Qilei Song (Senior Lecturer, Imperial College, Project coordinator of ERC Starting Grant NanoMMS) – presentation not public

Session Cell/stack design and modelling

- Engineering Porous Electrodes for Redox Flow Batteries by Antoni Forné-Cuenca (Assistant Professor, Membrane Materials and Processes Group, department of Chemical Engineering and Chemistry at Eindhoven University of Technology)
- How active can be the graphite felt electrode in redox flow battery electrolyte? by Mathieu Elieune (Research director, CNRS)
- Development of a multiphysics model for an aqueous organic redox flow battery by Aitor Beloki (PhD student, redox flow research line, CIC energigUNE)
- Results of the European project SOHAK with Deeper insight into Microstructure Simulations of Flow Batteries by Amadeus Wolf (Research associate, Institute of Mechanical Process Engineering and Mechanics, Karlsruhe Institute of Technology)
- Printed seals in redox flow batteries by John Collins (Principal engineer, C-Tech innovation Ltd).

Day 2 (17 May)

Session Prototypes and deployment

- Electrolyte regeneration of vanadium flow batteries by Nicola Poli (PhD student, Electrochemical Energy Storage and Conversion Laboratory (EESCoLab), University Padova)
- Design and manufacture of a 50 kW vanadium redox flow battery by Ricardo Santamaría (Composite Materials Group, Department of Materials Science at Spanish National Research Council)
- Scale-Up of AORFB by Jaromír Pocolič (Co-Founder, PFES)
- Modular balance of plant for mass-customized flow battery production by Michael Schäfer (Redox Flow Battery, Applied Electrochemistry, Fraunhofer Institute for Chemical Technology ICT)
- The installation of a commercial-scale flow battery in the Son Orlandis photovoltaic plant by Pablo Fontela Martínez (Project manager R&D Unit- Endesa)
- The importance of flow batteries for hybrid generation systems by Alberto Alonso Cantalapiedra (Head of section renewables & storage power plants integration testing, SGRE)

Session Non-conventional RFB and hybridization

- Hydrogen bromine, case studies to upscale the technology: MELDOV project by Kamuran Yazici (Senior electrochemist, Elestor and scientific project manager, MELDOV project) – presentation not public
- Recent Advances and Future Challenges of Membrane Free Redox Flow Batteries by Rebeca Marcolla (Senior researcher, IMDEA Energy Institute) – presentation not public
- Hybrid redox flow batteries: technology upscaling, opportunities and challenges by Eneko Azaceta (Senior scientist & team leader, Green Energy Storage)
- Hybridization of RFB by Karl-Heinz Pettinger (Scientific director, Hochschule Landshut, University of Applied Sciences, HyFlow project coordinator)
- Redox-mediated flow batteries: first steps from fundamentals to application by Edgar Ventosa (Ramon y Cajal professor at the University of Burgos)


This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement no. 875613 

Figure 2-8: Final page dedicated to the workshop on the HIGREEW Website

2.5 Selected pictures



Figure 2-9: Welcome speech by Estibaliz Crespo, R&I project coordinator





Figure 2-10: Audience final HIGREEW Workshop.



Figure 2-11: Presentation by Juan-Carlos Mejia -Director Sales Microgrid Solutions, Enerox GmbH / CellCube.



Figure 2-12: Presentation by Peter Klusener - Senior process development chemist, Shell Global Solutions International B.V. Domain lead redox flow battery technology.



Figure 2-13: Group photo – Attendees to the last session of HIGREEW Workshop.

3 Conclusion

The final HIGREEW Workshop was a successful and fruitful event for the RFB community and beyond. The meeting served to define the way forward regarding the needs and trends of the industry, as well as the potential contribution of redox flow technology to the decarbonization of the economy, thanks to its ability to facilitate the storage of renewable energy.

As discussed in the interactive session with the Officer from the EC Joint Research Centre, the event also provided a great platform to promote redox flow technology on the political agenda and reaffirm its importance in the energy transition.

This discussion has been the continuation of what started in Pilsen in March 2022 at the time of the [first HIGREEW workshop](#) and the perfect conclusion of our interesting project, where the consortium presented all the latest results and project achievement to the community. At the same time, it has been an opportunity to start new active talks on new ideas, planning/reinforce future collaborations and start creating the basis for new projects. As it was done at the time of the first HIGREEW workshop, the non-confidential material presented at the workshop will be made publicly available on [HIGREEW website](#).

4 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	Partner Full Name
1	CIC energigUNE	CENTRO DE INVESTIGACION COOPERATIVA DE ENERGIAS ALTERNATIVAS FUNDACION, CIC ENERGIGUNE FUNDAZIOA
2	GAMESA	GAMESA ELECTRIC SOCIEDAD ANONIMA
3	UAM	UNIVERSIDAD AUTONOMA DE MADRID
4	CNRS	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS
5	C-TECH	C-TECH INNOVATION LIMITED
7	UWB	ZAPADOCESKA UNIVERZITA V PLZNI
8	PFES	PINFLOW ENERGY STORAGE, S.R.O.
9	UNR	UNIRESEARCH BV
10	SGRE	SIEMENS GAMESA RENEWABLE ENERGY
11	FRAUNHOFER	FRAUNHOFER INSTITUTE FOR CHEMICAL TECHNOLOGY



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement no. 875613