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HIGREEW – Deliverable Report

D3.1 – Preliminary Cells Design

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Publishable summary

The HIGREEW project set out to design, build, and demonstrate a prototype of a new high energy density generation of Aqueous Organic Redox Flow Battery (AORFB), based on a water-soluble low-cost organic electrolyte, and featuring low-cost components and long service life.

A key part of the HIGREEW concept was the design of a high-performance battery stack which could be volume manufactured at a relatively low cost. Volume manufacture for low cost requires an injection moulding approach to reduce the component cost of the cell frames and reduce the total number of components in a stack. The milder conditions in an organic redox flow battery makes material selection less restrictive and novel design concepts incorporating both seals and assembly features into the injection mouldings become possible by which cost savings are achievable.

This report provides a summary of the basis of design used for the stack, the concept for a low-cost injection moulded stack, stack sizing, materials selection, recyclability / end of life and the outline design work carried out on an injection moulded stack. Areas for potential cost savings for this organic redox flow battery compared with a vanadium RFB are highlighted.

This report also includes a description of the initial design being done for a machined stack and the sealing concepts that are being considered to offer increased flexibility during the development of the HIGREEW without the time constraints of an injection moulding approach.

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Project partners:

#	Partner	Partner Full Name
1	CICe	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-GESELLSCHAFT ZUR FÖRDERUNG DER ANGEWANDTEN FORSCHUNG E. V.

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