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New Anion Exchange Membrane Electrolysers

GRANT AGREEMENT No. 875024

Anion Exchange Membrane Electrolysis for Renewable Hydrogen Production on a Wide-Scale

ANIONE – Deliverable Report

D5.2 – Optimised large-area MEAs supply for stack testing

This project has received funding from the Fuel Cells and Hydrogen 2 Joint Undertaking (now Clean Hydrogen Partnership) under Grant Agreement No 875024. This Joint Undertaking receives support from the European Union's Horizon 2020 Research and Innovation program, Hydrogen Europe and Hydrogen Europe Research.

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Disclaimer/ Acknowledgment

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Publishable summary

D5.2 summarises the work that has resulted in the selection of the final ANIONE MEA design, a decision based on a single cell screening study performed by CNR-ITAE on 5 and 100 cm^2 cells. The final ANIONE MEA consists of a NiFe-oxide anode on a Ni-felt, an anion exchange membrane, and a Ni-alloy cathode on carbon gas diffusion layer. The information and results of the screening study have been transferred to IRD to scale-up the selected formulations for the full-size MEA manufacture. The scale-up challenges that have occurred and been overcome are also discussed. The scaled-up MEA performs as expected from the screening study. IRD is completing the manufacturing of 25 full size MEAs for the full size ANIONE stack. 25 MEAs are sufficient for additional small stack test and leaving a few MEAs for replacement if needed. Three (3) full-size MEAs have been manufactured by IRD and provided already to the partners; One (1) MEA was shipped to CNR-ITAE for electrochemical check, and two (2) MEAs were sent to Hydrogenics for the initial stack assembly trials. The latter has resulted in a small size adjustment of the MEA, but nothing that has significantly changed the manufacturing. CNR-ITAE tested the MEA with very encouraging results for both performance and durability. These test results made base for the decision of completing all 25 full size ANIONE MEAs. All 25 MEAs are expected to be delivered to Hydrogenics in November 2022.

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Project partners:

#	Partner	Partner Full Name
1	CNR-ITAE	CONSIGLIO NAZIONALE DELLE RICERCHE
2	CNRS	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE
2.1	UM	UNIVERSITE DE MONTPELLIER
3	HydroLite (formerly PoCellTech)	HYDROLITE
4	TFP Hydrogen (formerly PV3)	TFP Hydrogen Products Ltd
5	IRD	IRD FUEL CELLS A/S
6	HYDROGENICS	HYDROGENICS EUROPE NV
7	UNR	UNIRESEARCH BV

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