



Next generation Alkaline Membrane Water Electrolysers with Improved Components and Materials

Abstract

Green hydrogen is one of the most promising solutions for the decarbonisation of society. Alkaline water electrolysis (AWE) is already a mature technology but its large footprint makes it inadequate for producing the energy vector at GW scale. Proton exchange membrane water electrolysis (PEMWE) on the other hand is compact but its dependence on iridium and other expensive materials poses a serious threat for up-scaling. Anion exchange membrane water electrolysis (AEMWE) combines the benefits of both technologies. However, its key performance indicators (KPI) do not reach commercial requirements and are lacking competitiveness. NEWELY project aims to redefine AEMWE, surpassing the current state of AWE and bringing it one step closer to PEMWE in terms of efficiency but at lower cost. The three main technical challenges of AEMWE: membrane, electrodes and stack are addressed by 3 small medium-enterprises (SME) with their successful markets related to each of these topics. They are supported by a group of 7 renowned R&D centres with high expertise in polymer chemistry and low temperature electrolysis. The SMEs and one of the largest hydrogen companies in the world will oversee that the new developments have a clear commercial perspective, placing Europe at the lead of AEMWE technology in three years. In this period, the NEWELY consortium will develop a prototypic 5-cell stack with elevated hydrogen output pressure. It will contain highly conductive and stable anionic membranes as well as efficient and durable low-cost electrodes. It will reach twice the performance of the state of the art of AEMWE operating with pure water feedstock only. The targeted performance of the NEWELY prototype will be validated in a 2,000 hours endurance test. The new AEMWE stack will lead to a significant cost reduction of water electrolysis having a relevant impact in the cost of green hydrogen.

1. January 2020

www.newely.eu



This project has received funding from the Fuel Cells and Hydrogen 2 Joint Undertaking under grant agreement No **875118**. This Joint Undertaking receives support from the European Union's Horizon 2020 research and innovation programme and Hydrogen Europe and Hydrogen Europe Research



FUEL CELLS AND HYDROGEN
JOINT UNDERTAKING