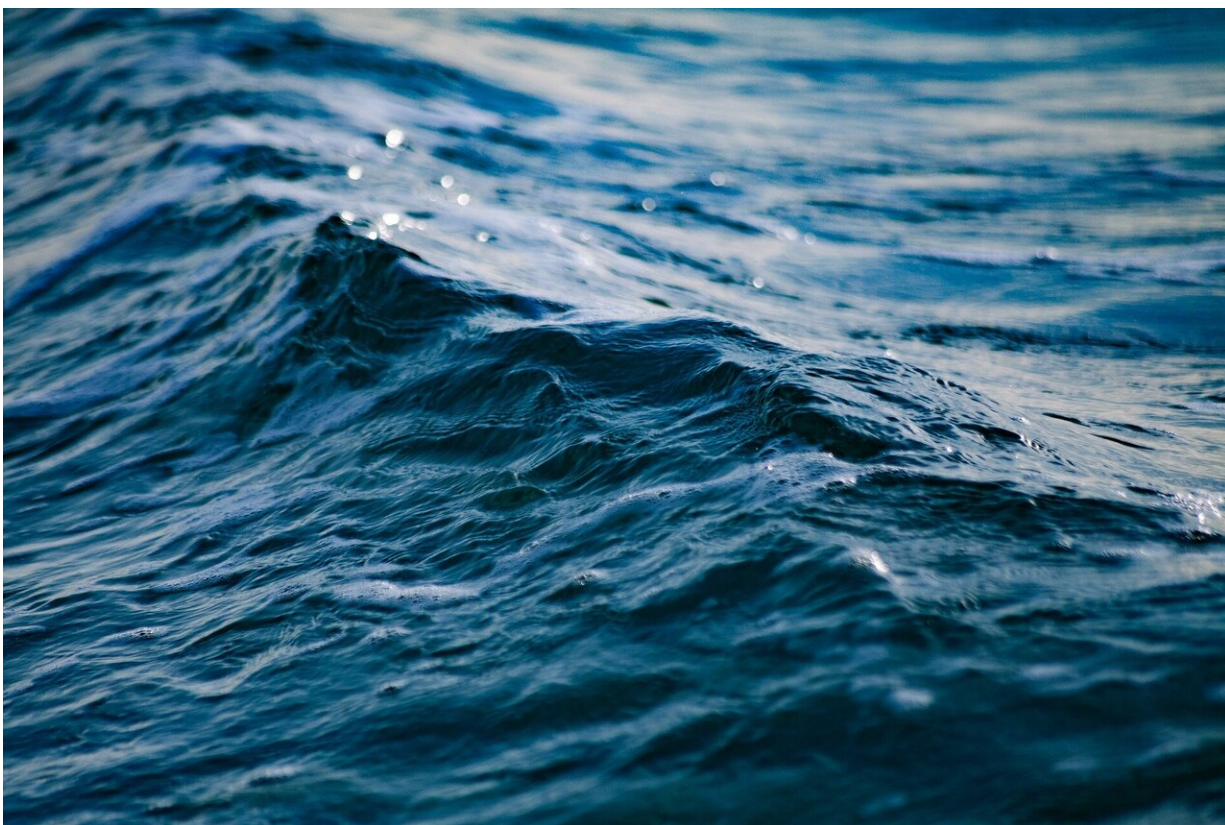


Research identifies barriers to development of seawater electrolysis technologies

February 19 2020



Credit: CC0 Public Domain

Researchers at the University Of Liverpool, in collaboration with NUI Galway and TU Berlin, have identified the key technological and scientific challenges of producing hydrogen through seawater

electrolysis.

In an article published in *Nature Energy*, researchers assessed the various issues hindering the development of electrolyser technologies capable of carrying out direct water electrolysis using low grade water, such as [seawater](#), as opposed to ultrapure water.

Generating hydrogen using saline water electrolysis provides an attractive route towards [energy](#) sustainability. Hydrogen is a clean and storable fuel which provides a viable fuel option for transport amongst other uses, and would be highly beneficial for coastal, rural and offshore installations.

Researchers undertook a review of recent developments in the field of saline water electrolysis and examined the challenges in the design of electrolyzers.

They found there was an urgent need for new catalysts and [electrode materials](#) that can overcome the competition between chlorine chemistry and water oxidation in seawater.

Whilst some progress has been made towards this goal in recent years, long-term stability and selectivity has not been achieved.

They also identified a real need for standardisation of testing conditions to ensure that meaningful comparisons between those materials discovered can be made.

Professor Alex Cowan from the University of Liverpool's Stephenson Institute for Renewable Energy, said: "This paper, which is an important part of the SEAFUEL project, identifies the key issues and critical barriers hindering the development of seawater [electrolysis](#) for [hydrogen](#) production.

"There is a strong need for further research programmes, such as those being delivered in the labs at Liverpool, Galway and Berlin, to overcome these challenges

"It is clear that an urgent need exists for new advanced electrode materials and catalysts and at Liverpool we have exciting research to directly address this issue which is beginning to deliver chloride tolerant catalysts."

The research at Liverpool and Galway was funded by the SEAFUEL (Sustainable integration of renewable fuels in local transportation) project which aims to demonstrate the feasibility of powering local transportation using fuels produced by [renewable energy](#) and seawater, with no net carbon footprint.

The article "Electrolysis of low-grade and saline surface [water](#)" is published in *Nature Energy*.

More information: Wenming Tong et al, Electrolysis of low-grade and saline surface water, *Nature Energy* (2020). [DOI: 10.1038/s41560-020-0550-8](#)

Provided by University of Liverpool

Citation: Research identifies barriers to development of seawater electrolysis technologies (2020, February 19) retrieved 2 May 2024 from <https://techxplore.com/news/2020-02-barriers-seawater-electrolysis-technologies.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--