



Prototype testing of green hydrogen production technology

A revolutionary green hydrogen production method using seawater has been developed by Torvex Energy Ltd with support from the Materials Processing Institute and SGS.

PROTOTYPE EQUIPMENT TESTING AND ANALYSIS

Prototype testing and gas analysis was carried out over a two-month period, with independent validation of gas analysis carried out by SGS. Hydrogen contents in the extracted gas sample showed a mean of 94% across 5 tests, with the remaining gases made up of air gases still present after the purging process. Testing was indicative of pure hydrogen production from the reactor.

Comparative and gap analysis of the seawater was also carried out at different stages of the process by SGS.

Hydrogen production showed significant increases with temperature (consummate with increases in conductivity, Fig 1) where a rise in water temperature from 10°C to 14°C saw an efficiency increase of 36%.

The Institute undertook operational testing of the prototype equipment used for the gas analysis.

BENEFITS

Currently most of the green hydrogen comes from electrolysis of purified water which requires significant energy use. The use of natural seawater enables hydrogen production without the need for costly and energy intensive purification.

Additionally green electricity, solar or wind, could be used to power the reactor, thus making this a fully green method of hydrogen production.

Rates of energy required for hydrogen production from the prototype are comparable to some current large scale commercial production. Scale up from prototype to commercial scale can make this process more efficient.



Prototype testing rig

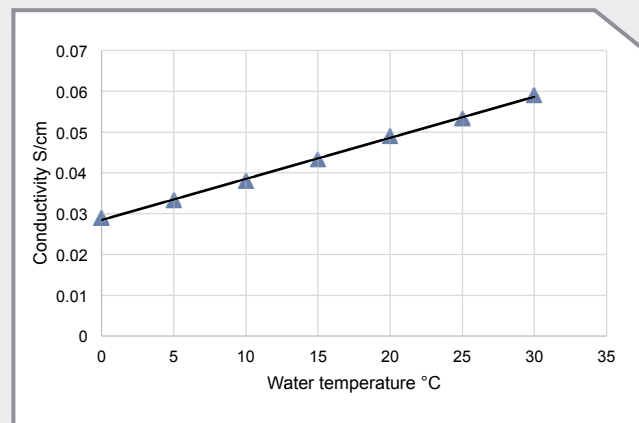


Figure 1: Seawater conductivity as a function of temperature

PROJECT PARTNERS



**Materials
Processing
Institute**

TORVEX
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SGS