

Nuclear essential to hydrogen future, says LucidCatalyst

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Untapped options for clean hydrogen - including the use of advanced modular reactors - can put the world back on the pathway to meeting the Paris climate goals, according to a new report from energy research and consultancy firm LucidCatalyst. The report says the clean energy transition from oil to hydrogen-based fuels could be achieved with a global investment of USD17 trillion, spent over 30 years from 2020 to 2050.



(Image: LucidCatalyst)

The world can still meet the Paris goals of limiting temperature changes to 1.5–2°C if sufficient, low-cost, clean hydrogen is produced to replace oil and gas in shipping, aviation and industry, LucidCatalyst says. "If difficult-to-decarbonise sectors continue to be ignored, the world risks experiencing increasingly extreme climate impacts." However, the report says the amount of hydrogen required to do this is far more than can be produced with renewables alone. For this reason, a new generation of advanced modular reactors will be required to produce enough climate-neutral fuel to displace the 100 million barrels of oil that are currently consumed around the world each day.

"For the hydrogen revolution to take place, hydrogen must be generated from non-fossil sources, at a price which is competitive with cheap oil," LucidCatalyst says. In its [report](#) - titled *Missing link to a livable climate: How hydrogen-enabled synthetic fuels can help deliver the Paris goals* - it says new modelling results show that hydrogen must achieve a target price of USD0.90/kg by 2030 to enable broad scale fossil fuel substitution. However, current published projections for renewable-generated hydrogen estimate prices of USD0.73–USD1.64 will not be achieved before 2050. New hydrogen production facilities powered by advanced modular reactors could instead deliver at global scale for USD1.10/kg, with further cost reductions reaching the target price of USD0.90/kg by 2030. These cost reductions, it says, are enabled by a shipyard-based manufacturing and delivery model for advanced reactors.

The overall cost of this approach, the report shows, is less than the existing investment that would otherwise be needed simply to maintain fossil fuel flows in future decades. The clean energy transition from oil to hydrogen-based fuels could be achieved with a global investment of USD17 trillion, spent over 30 years from 2020 to 2050. This is substantially lower than the USD25 trillion investment the oil and gas industry expect to spend in order to maintain fossil fuels flows in future decades, and dramatically less than the USD70 trillion investment that would be needed for an equivalent hydrogen strategy based only on wind and solar.

Advanced modular reactors are the only technology that can realistically achieve this low price from electrolysis in the short to medium term, LucidCatalyst says. "Therefore, for the near term we are referring to advanced modular reactors, but in the longer term, advanced heat sources could also include fusion and high-temperature geothermal."

"This transition will not begin without urgent action by governments and other actors to bring down costs and accelerate innovation and deployment," the report says. "Innovative heat sources need to be fully brought into the world's decarbonisation efforts." It adds, "This report sets out a pathway to decarbonise a substantial portion of the global energy system, for which there is currently no viable alternative."

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"This report has demonstrated that the roadblocks to net zero are not economic or technical," LucidCatalyst said. "Instead they are cultural and political."

"Just to be clear: we are strongly pro-renewables," said LucidCatalyst Managing Director Eric Ingersoll. "The strategies described in our report are intended to be additional to the contribution from renewables, not an alternative. We need to throw everything we've got at the climate problem and this report shows we have an important new tool in the box."

"There is simply no other way to make the numbers add up," added Kirsty Gogan, LucidCatalyst's managing director. "This truly is the missing link we need to maintain a livable climate on this planet."

Researched and written by World Nuclear News

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