Blue Hydrogen Via Autothermal Reforming

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Abstract

Clean hydrogen (H_2)—produced from renewables, nuclear, or fossil fuels with carbon capture, utilization, and storage (CCUS)—can help to decarbonize a range of sectors, including long-haul transport, chemicals, and iron and steel, where it is otherwise difficult to reduce emissions. It can also help to improve air quality in cities and improve energy security.

Hydrogen is mostly produced from steam reforming of fossil fuels and emits 8–10 tons of carbon dioxide (CO_2) per ton of hydrogen produced.

In this review, we analyze production of blue hydrogen using autothermal reforming (ATR) technology coupled with an amine-based carbon capture, which reduces the CO_2 emissions (Scope 1 and Scope 2) by more than 90%.

The capacity selected is 100,000 metric tons a year (mt/y) of hydrogen (137,460 Nm^3/h or 127 MMscf/d).

This review will be a valuable resource for planners, producers, and designers who are looking for an authentic evaluation of capital and production costs for blue hydrogen production.

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