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TECHNOLOGICAL EVOLUTION OF LARGE-SCALE BLUE HYDROGEN PRODUCTION TOWARD THE U.S. HYDROGEN ENERGY EARTHSHOT

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WHAT THIS STUDY IS ABOUT

This study estimates the evolving costs of blue hydrogen production and to further examine the economic effect on technological evolution of the Inflation Reduction Act's tax credits for carbon sequestration and clean hydrogen.

WHY IT WAS NEEDED

Hydrogen has the potential to have a crucial role in the U.S. transition to a net-zero emissions economy. In 2021, the U.S. Department of Energy launched the Energy Earthshots Initiative that aims to accelerate breakthroughs of more abundant, affordable, and reliable clean energy solutions by 2030. Learning from large-scale hydrogen projects will boost technological evolution and innovation toward the U.S. Hydrogen Energy Earthshot.

WHAT WAS CONCLUDED

The break even cumulative production capacity required for gas-based blue hydrogen to reach the $1/kg H_2 target highly depends on tax credit, natural gas price, inflation rate, and learning rates.

Learning-by-doing alone can decrease the levelized cost of blue hydrogen by about 11% from the current levels when the cumulative production capacity reaches 10 million metric tons per annum. Without tax incentives, however, it is hard for blue hydrogen production to reach the cost target of $1/kg H_2. Tax incentives reduce the time-related learning experience necessary to reach a cost goal. However, it is still hard to reach the cost target for coal-based blue hydrogen with tax incentives. Inflation can remarkably elevate challenges for blue hydrogen to reach the cost target.

READ THE STUDY

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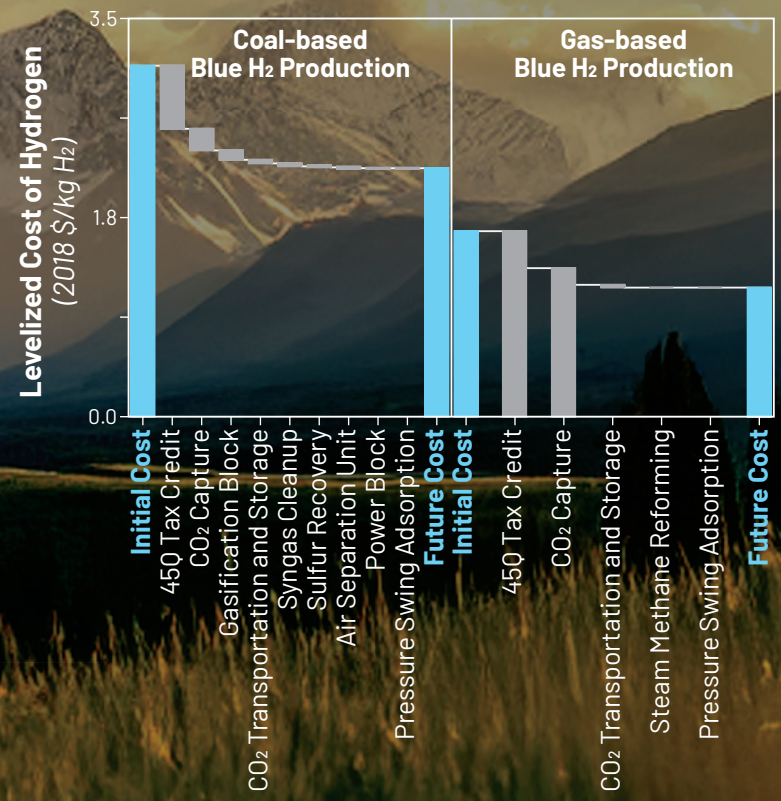
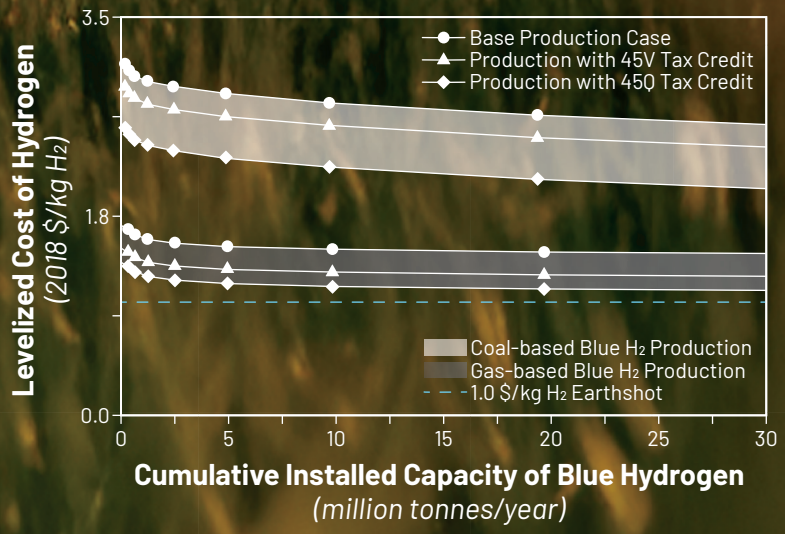
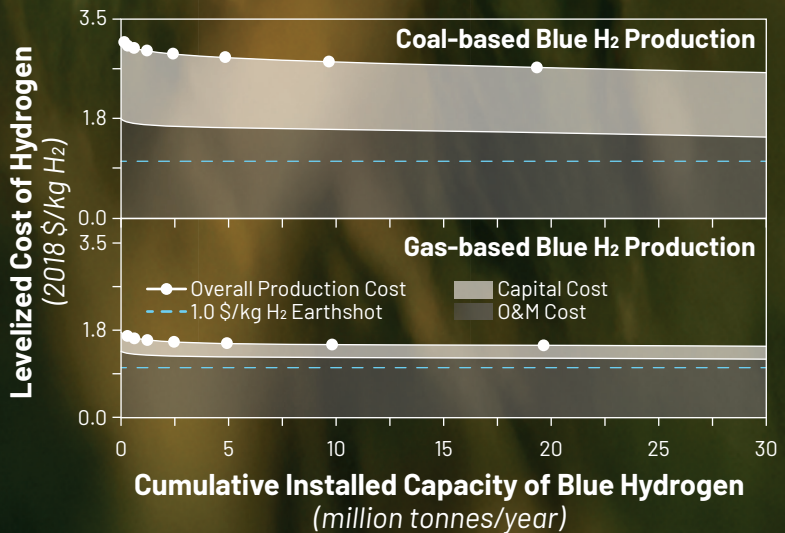
Cost Reduction by Subsystem
at Cumulative Installed Capacity of 10 MMTA Blue Hydrogen







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