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A review on blue and green hydrogen production process and their life cycle assessments

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Abstract

Green and blue hydrogen are two types of hydrogen generated from renewable energy sources and fossil fuels, respectively. Green hydrogen is created by splitting water molecules into oxygen and hydrogen using renewable energy sources such as wind, solar or nuclear power in a process known as electrolysis. Blue hydrogen, on the other hand, is produced by reforming natural gas and capturing and storing the resulting carbon emissions. The production of both green and blue hydrogen has implications for the environment, and a life cycle assessment (LCA) can be used to evaluate the environmental impacts of hydrogen production and use. An LCA considers the entire life cycle of a product, from raw material extraction to end-of-life disposal and assesses the potential environmental impacts at each stage. The LCA of green hydrogen production generally shows a lower environmental impact compared to blue hydrogen production. This is because green hydrogen production does not emit any carbon emissions during the process, whereas blue hydrogen production still results in the emission of carbon dioxide. However, the environmental impact of green hydrogen production can vary depending on the source of the renewable energy used for electrolysis.

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Abstract

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