Life Cycle Sustainability Assessment of Green Hydrogen Production

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Shifting to the hydrogen economy requires complex decisions from process economics to sustainable environment and social acceptance. To ensure sustainability, hydrogen must be derived from renewable, and abundant energy in cost-effective, environmentally and socially benign ways. Using LCA techniques, typically, the environmental assessment of energy systems is carried out. LCA has grown into a new method called Life Cycle Sustainability Assessment (LCSA) to resolve the constraint. LCSA's field of research on hydrogen energy systems is limited, because economic and social aspects are not yet well understood. The aim of this study will be to address the current gap in this field by applying the LCSA techniques to hydrogen energy systems resulting in a detailed multi-criteria sustainability review taking all three sustainability pillars into consideration. The proposed work is intended to provide input in decision-making processes at both industry and hydrogen technology policy-makers level.