

# Prospects and challenges for a green hydrogen economy in Sri Lanka

Karunasena D.I., Himal S.N.L., Subasinghe S.A.D.T.<sup>#</sup>, Egodage S.M.<sup>#</sup>

Department of Chemical and Process Engineering, University of Moratuwa,  
Sri Lanka.

<sup>#</sup>thusharas@uom.lk and segodage@uom.lk

The global energy landscape is experiencing a significant shift towards Green Hydrogen as a sustainable and clean energy paradigm. This research highlights Sri Lanka's potential to invest in this new venture due to its abundant renewable energy capacity. This study evaluated the most suitable hydrogen producing electrolyzer for Sri Lanka and Green Hydrogen production capacity in Sri Lanka against available renewable energy. Further, studies about favourable hydrogen utilization pathways in Sri Lanka. A literature survey was conducted to obtain data related to the AWE, AEM, PEM, and SOE electrolyzer technologies and they were evaluated against capital expenditure, operating expenditure, performance, and technological maturity in selecting an electrolyzer for Sri Lanka. Projected renewable energy capacity for 2030 with peak demand and average demand was considered in the calculation of producible Green Hydrogen amount. For utilization pathways in Sri Lanka, the intensiveness of infrastructure requirement, cost-effectiveness, policy and regulations, environmental impact, and safety were analyzed for selected utilization opportunities which included grid balancing, fertilizer production, and fuel blend. Implementing an Alkaline Water Electrolyzer (AWE) was identified as the optimal choice for Green Hydrogen production technology in Sri Lanka and has the capacity to produce 13,500 MWh of Green Hydrogen. It was concluded that produced Green Hydrogen can be utilized as energy storage to mitigate grid imbalance or as a feedstock for fertilizer production. Although use of this technology holds tremendous potential for supporting Sri Lanka's energy needs, an in-depth study should be done towards utilization pathways.

**Keywords:** Green hydrogen, Sri Lanka, electrolyzer technologies, renewable energy, utilization pathways