

ABSTRACT

In the name of Allah and Prophet Muhammad SAW

This thesis evaluates the financial feasibility and profitability of constructing an integrated hydrogen and ammonia production facility in Brazil. Using a mixed methods approach, it combines primary insights from expert interviews with quantitative capital investment modelling and international benchmarking. The research addresses the profitability of such a project depends on the balance between capital costs, operational expenses, and revenue streams. It employs financial metrics such as Levelized Cost of Hydrogen (LCOH), Net Present Value (NPV), Internal Rate of Return (IRR), and Payback Period to assess economic viability. The findings indicate a competitive LCOH of \$2.10/kg and a robust NPV of \$228 million over a 20 year horizon, with a payback period of 4.36 years and IRR of 23%. These results position Brazil as a cost effective location for green hydrogen and ammonia production, supported by its abundant renewable resources and growing market opportunities. This research provides actionable investment insights and contributes to the strategic planning necessary for Brazil to emerge as a leader in the global hydrogen economy.

Keyword: *Hydrogen, Ammonia, Capital Investment, Profitability, LCOH, NPV, IRR, and Brazil*