

ABSTRACT

The electricity system in North Sulawesi Province is supplied by various power plants, including Geothermal (GPP), Coal-Fired (CFPP), Hydroelectric (HPP), Solar (SPP), Diesel (DPP), and Gas Turbine (GTPP) power plants, with an overall installed capacity of 589 MW. The system's Net Capacity (NC) is approximately 492 MW, while the Net Supply Capacity (SC) is around 462 MW, indicating a gap between installed capacity, NC, and SC. The province has experienced a high electricity sales growth rate of around 7.8% based on data from 2011 to 2020, and this growth is projected to continue. By 2025, the target contribution of New and Renewable Energy (NRE) in the energy mix is set at 23%, emphasizing the importance of developing renewable energy-based power plants.

The research aims to determine the results and feasibility analysis of GPP investments. Additionally, it seeks to assess the sensitivity of key variables affecting investment feasibility and propose parameter scenarios for GPP development planning.

This research applies a descriptive quantitative method. It applies capital budgeting techniques such as Net Present Value (NPV), Internal Rate of Return (IRR), Profitability Index (PI), Discounted Payback Period (PP), and Sensitivity Analysis (SA).

The research findings indicate that the investment is not feasible if funded entirely through full equity for both upstream and downstream operations. However, it becomes feasible with corporate loans for upstream and soft loans for downstream. Sensitivity analysis reveals that the key variables affecting feasibility include electricity tariffs, capacity factor, production well drilling costs, power plant costs, and loan variables such as interest rates and repayment periods. The proposed scenario with the best feasibility results involves a funding scheme of corporate loans for upstream and soft loans for downstream. Under this scenario, corporate loans with a minimum interest rate of 4% and soft loans with a maximum repayment period of 30 years yield an NPV of 12.941 thousand USD, an IRR of 20.47%, a PI of 1.06, and a payback period of 15 years.

Based on the research, it is recommended that the company develop the project using corporate loans for upstream and soft loans for downstream, securing the lowest possible interest rates and the longest repayment periods. The company should also focus on maximizing electricity tariffs and capacity factors while minimizing production well drilling costs. The government is advised to support investment feasibility through incentives or other fiscal policies, while the community and stakeholders are encouraged to create a synergistic and conducive investment environment.

Keywords: Investment Feasibility, Capital Budgeting, Net Present Value (NPV), Internal Rate of Return (IRR), Sensitivity Analysis (SA), Geothermal Power Plant (GPP).