

## Economic Factors Affecting Greenfield Petroleum Refinery and Petrochemical Projects in Africa

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**Abstract :** This paper analyses economic factors that have affected the competitiveness of petroleum refinery and petrochemical projects in sub-Saharan Africa in the past and continue to plague greenfield projects today. Traditional factors like plant sizing and complexity, low-capacity utilization, changing regulatory environment, and tighter product specifications have been important in the past. Additional factors include the development of excess refinery capacity in Asia and the growth of renewable sources of energy - especially for transportation. These factors create both challenges and opportunities for the development of greenfield refineries and petrochemical projects in areas of increased demand growth and new low-cost crude oil production - like sub-Saharan Africa. This paper evaluates the strategies available to project developers and host countries to address contemporary issues of energy transition and the apparent reduction of funds available for greenfield oil and gas projects. The paper also evaluates the structuring of greenfield refinery and petrochemical projects for limited recourse project finance bankability. The methodology of this paper includes analysis of current industry data, conference proceedings, academic papers, and academic books on the subjects of petroleum refinery economics, refinery financing, refinery operations, and project finance generally and specifically in the oil and gas industry; evaluation of expert opinions from journal articles; working papers from international bodies like the World Bank and the International Energy Agency; and experience from playing an active role in the development and financing of US\$ 10 Billion greenfield oil development project in Uganda. The paper also applies the discounted cash flow modelling to illustrate the circumstances of an inland greenfield refinery project in Uganda. Greenfield refinery and petrochemical projects are still necessary in sub-Saharan Africa to, among other aspirations, support the transition from traditional sources of energy like biomass to such modern forms as liquefied petroleum gas. Project developers and host governments will be required to structure projects that support global climate change goals without occasioning undue delays to project execution.

**Keywords :** financing, refinery and petrochemical economics, Africa, project finance

**Conference Title :** ICPPE 2023 : International Conference on Petroleum and Petrochemical Economics

**Conference Location :** Houston, United States

**Conference Dates :** October 23-24, 2023