



TECHNO-FINANCIAL EVALUATION OF FURAN PRODUCTION FROM OIL PALM EMPTY FRUIT BUNCHES

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**DEPARTMENT OF AGROINDUSTRIAL TECHNOLOGY
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2025**



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ABSTRACT

ANASTASIA FIDELLA CARMELITA. Techno-Financial Evaluation Of Furan Production From Palm Oil Empty Fruit Bunches. Supervised by ENDANG WARSIKI and ERLIZA HAMBALI

Indonesia is one of the world's largest producers of oil palm empty fruit bunches (EFB), generating vast amounts of biomass that often remain underutilized. This study develops a production scheme for furan derived from EFB, focusing on both process efficiency and economic viability. Process modeling in Aspen Plus produced integrated mass and energy balances, serving as the foundation for cost estimation. The results show that processing 1,000 kg of EFB per hour can produce 150.2 kg of high-purity furan, corresponding to a mass conversion yield of about 15%. The overall process is exothermic, with the most notable heat release occurring during dehydration and decarbonylation, while distillation accounts for the highest energy demand. From the financial perspective, the project records a positive NPV exceeding Rp 2 trillion over a 10-year span, an IRR of 125%, a BCR of 1.74, and a payback period of 1.94 years, all of which indicate strong investment potential. This work demonstrates that converting EFB into furan is both technically feasible and financially attractive for large-scale sustainable biomass utilization.

Keywords: energy analysis, furan, mass balance, financial analysis



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TECHNO-FINANCIAL EVALUATION OF FURAN PRODUCTION FROM PALM OIL EMPTY FRUIT BUNCHES

ANASTASIA FIDELLA CARMELITA

Thesis
as one of the requirements to obtain
a Bachelor's degree in 2025
Agroindustrial Engineering Study Program

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FOREWORD

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Bogor, Juli 2025

Anastasia Fidella Carmelita



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