



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

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BOGOR
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

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

DEPARTMENT OF AGROINDUSTRIAL TECHNOLOGY FACULTY OF AGRICULTURAL ENGINEERING AND TECHNOLOGY IPB UNIVERSITY BOGOR 2025





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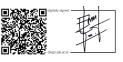
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Exam Date: July 21, 2025



FOREWORD

Praise and gratitude are offered to the presence of God Almighty, because with the presence of His grace and blessings the author can complete this scientific work entitled "Techno-Financial Evaluation of Furan Production from Palm Oil Empty Fruit Bunches" The research was conducted in January-June 2025. On this occasion, the author would like to express his gratitude to:

- 1. Prof. Dr. Endang Warsiki, S.TP., M.Si. and Prof. Dr. Erliza Hambali, S.TP, M.Si, as academic supervisors for their guidance, direction, and suggestions provided during the research.
- 2. The Department of Agroindustrial Engineering and all the lecturers, education staff, technicians, and laboratory assistants of the TIN Department who have taught me many things and provided me with the facilities so that I can pursue a bachelor's degree at IPB University.
- 3. PT Ratu Bio Indonesia and all employees who have provided opportunities and knowledge and become partners for research.
- 4. All members of the Produta team, including Nanda Ratri Haryanti, Sulthan Fakhri Dien C, and Nabil Muzzhafar
- 5. TIN 58 colleagues, who always provide support, help during lectures, assignments, exams, and together through the happy and difficult times of the lecture period.
- 6. Both parents, Father and Mother, who always provide support, encouragement, motivation, and prayers in pursuing education.
- 7. Sincere gratitude goes to Io, Angel, Gerald, Sammie, Sharon, Iella, Nicky, Jack, Shasha, Nita, Chris, Taqy, Nay, Fafa, and Radit for their invaluable support, warmth, humor, and encouragement throughout the lecture period and the completion of this thesis.
- 8. Other parties who have assisted with consultations and other indirect assistance. We hope this scientific work will be beneficial to our partners, authors, readers, and the advancement of science.

Bogor, Juli 2025

Anastasia Fidella Carmelita

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