ANALYSIS OF ECO-EFFICIENCY AND ECONOMIC OF AN ENERGY CONVERSION PROJECT IN PT. X

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STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, not material which to a substantial extent has been accepted for the award of may other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.

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Chairman of the Examination Steering Committee Date

ABSTRACT

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Dr.rer.nat. Linus Pasasa, Thesis advisor

The purposes of this study are two folds. The first is to evaluate effectiveness of company investment to energy conversion project from fuel oil and LPG into Natural Gas (NG) in PT. X. The second purpose is to evaluate the impact of energy conversion to environment which was not included in the project proposal. Net Present Value (NPV), Internal Rate of Return (IRR) and Payback Period (PP) are used as investment appraisal tools with sensitivity evaluation such as appraisal on fuel price and production rate changes. Eco-efficiency which represents the impact to environment is calculated by comparing product's value over load to environment. Product's value is represented by product volume and load to environment is represented by CO_2 emission. Non-Product Output (NPO) analysis method was used to identify the non-product output by value and volume. By using 31.8 % production rate, the calculation was resulted at NPV is equal to 0, IRR 18 % and PP 5 years, while at 100 % production rate the NPV is USD 1,536 million, IRR 102 % and PP 1 year. Therefore the investment is effective when production rate is 31.8 % or higher. Eco-efficiency is decreased from 4.76 to 4.69 or equal to 1.47 % which caused by increasing of carbon dioxide emission. The analysis show that energy consumption of natural gas for each metric ton product (1.91 MMBTU/MT) is almost 23 % higher than energy consumption from fuel oil plus LPG (1.47 MMBTU/MT).

This eco-efficiency reduction does not meet the expectation so it is recommended to conduct further evaluation such as root-cause analysis.

DEDICATION

I dedicate this thesis to my father -who already in heaven- and my mother for their never ending struggle in their whole life just to keep me alive and do the better things. To my lovely children : *Niza, Aria* and *Rafi* for keeping me the spirit even only giving it through their eyes and to my wife *Teh Yayat* for being patient while I was not able to give her enough time for being close with her. To *Cherie* who always inspire me and gives more even for only get less.

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