

ECONOMICAL AND ENVIRONMENTAL IMPACTS OF MICROALGAE-BASED
BIOREFINERY

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Biofuel production has received significant attention because of unstable oil prices, exhaustion of petroleum resources, and national security problem. To verify the potential of the future use of biofuel, we need to analysis its economical impacts. In previous research, we proposed a microalgae based biorefinery superstructure and found the optimal pathway which is considered only for economical factor. It could have different optimal pathway if we consider the environmental factors. To improve economic performance while reducing environmental impacts, systematic modeling and optimization superstructure could be a great solution to evaluate sustainability and get optimal pathway. Therefore, in this work, we expand the previous optimization framework by addition of environmental objective functions. Based on MINLP model, we obtain the optimal biorefinery configuration with environmental objective functions by solving in GAMS. The results is compared with biofuel production and GHG gas emissions.