# Conceptual design of seaweed based bio-refinery: An economic assessment

Peyman Fasahati, 유준†
부경대학교
(jayliu@pknu.ac.kr†)

This study evaluates the potentials of brown algae as biomass for biofuel production in a bio-refinery structure. Proposed biorefinery have three main stages of biochemicals extraction, mixed alcohols production, and pyrolysis of solid residues for biooil and biochar production. A techno-economic model was developed to calculate return on investment (ROI) and payback time to reach break-even point after 20 years for a 10% internal rate of return and 100% equity financing. Two scenarios of with and without incentives from CO2 mitigation are considered. ROI and payback time for the case with incentives from CO2 mitigation are calculated to be 34.3% and four years, respectively, and for the case without CO2 mitigation incentives are 24% and 6.3 year, respectively. Results show that incentives from CO2 mitigation can enhance the economics of the biorefinery. In addition, low payback time and high ROI of the process shows the economic performance of the biorefinery and, therefore, industrial practice of the proposed biorefinery is recommended.