



ChemTech

International Journal of ChemTech Research

CODEN (USA): IJCRGG, ISSN: 0974-4290, ISSN(Online):2455-9555
Vol.9, No.05 pp 904-913, 2016

Feasibility study of biodiesel production from microalgae grown on domestic wastewater: A case study of Egypt

El Shimi, H.^{1*}, Moustafa, S.²

¹Chemical Engineering Department, Cairo University, Gamaa Street, Giza, Egypt

²Microbiology Department, Agriculture Research Center (ARC),
Gamaa Street, Giza, Egypt

Abstract : First test diesel engines using blends with algal biodiesel are already carried out but still optimized. The purpose of microalgae growing is mainly for food and feed markets, but algal biofuel has much attention in recent years worldwide. Technical data about feasibility of cultivation system, lipids extraction and conversion into biodiesel are still limited. Potentials of microalgae have incentive the Egyptian scientists to conduct a preliminary economic assessment for 0.25 Million tons biodiesel production from microalgae grown in wastewater, which had a range of expected accuracy $\pm 20\%$. Process units required have been sized. Total capital investment (TCI), total manufacturing cost (TMC), net profit, rate on return (ROR) and payback period were all calculated to be USD138134136, USD576517352, USD121584271, 88% and one year, respectively based on feedstock cost of USD400/ton and biodiesel selling price of USD2000/ton. As well, sensitivity and break-even analyses were evaluated on variations in feedstock cost, product prices and microalgae lipids content using ROR and payback time. Results recommended that for profitable algal biodiesel business, the biomass cost cannot be higher than USD530/ton, algal biodiesel price and biomass lipids content must be above USD1578/ton and 30% on dry basis, respectively.

Keywords : Algal biodiesel, transesterification, preliminary economic assessment, sensitivity and break-even analyses, rate of return.

El Shimi, H *et al* /International Journal of ChemTech Research, 2016,9(5),pp 904-913.
