

### Mixed alcohols production from brown algae: impact of alcohols recovery on plant economics

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Mixed alcohols can be produced from brown algae through volatile fatty acids (VFA) platform. Brown algae are anaerobically digested to produce VFAs which are later recovered and hydrogenated to produce mixed alcohols. The process requires two recovery and dehydration units for VFAs and mixed alcohols. In this study, we will evaluate the application of pervaporation and vapor permeation in dehydration of aqueous alcohols and will compare the results with classical molecular sieve and distillation process. The processes are simulated in Aspen Plus v8.4. Techno-economic models were developed to assess the economy of the process. A minimum ethanol selling price (MESP) was calculated for each process using techno-economic models. The results showed that hybrid processes of pervaporation and vapor permeation are economically superior over classical process in terms of MESP. In addition, a sensitivity analysis were performed on economic and process parameters to explore the uncertainties and main parameters affecting the MESP.