

The challenge of enzyme cost in the production of lignocellulosic biofuels

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Project Goal:

Determine reliable, documented, and open process models of biofuel processes that can be used to guide research, investment, and policy

With the aim of understanding the contribution of enzymes to the cost of lignocellulosic biofuels, we constructed a technoeconomic model for the production of fungal cellulases. We found that the cost of producing enzymes was much higher than that commonly assumed in the literature, e.g. the cost contribution of enzymes to ethanol produced by the conversion of corn stover was found to be \$0.68/gal if the sugars in the biomass could be converted at maximum theoretical yields, and \$1.47/gal if the yields were based on saccharification and fermentation yields that have been previously reported in the scientific literature. We performed a sensitivity analysis to study the effect of feedstock prices and fermentation times on the cost contribution of enzymes to ethanol price.