The Economic Feasibility of Energy Sugar Beet Biofuel Production in Central North Dakota

Authors: Cole R. Gustafson and Thein Maung

This study examines the financial feasibility of producing ethanol biofuel from sugar beets in central North Dakota. Under the Energy Independence and Security Act (EISA) of 2007, biofuel from sugar beets uniquely qualifies as an “advanced biofuel”. EISA mandates production of 15 billion gallons of advanced biofuels annually by 2022. A stochastic simulation financial model was calibrated with irrigated sugar beet data from central North Dakota to determine economic feasibility and risks of production for a 10MGY (million gallon per year) and 20MGY ethanol plant. Study results indicate that ethanol sales from both types of plants account for the majority of total sale revenue. Feedstock costs, which include sugar beets and beet molasses, account for more than 70% of total production expenses. The estimated breakeven ethanol price for the 20MGY plant is $1.52 per gallon and $1.81 per gallon for the 10MGY plant. Breakeven prices for feedstocks are also estimated and show that the 20MGY plant can tolerate larger ethanol and feedstock price variations than the 10MGY plant. Our results also show that one of the most important factors that affect investment success is the price of ethanol. At an ethanol price of $1.84 per gallon, and assuming other factors remain unchanged, the estimated net present value (NPV) of the 20MGY plant is $41.58 million which is well above zero. By comparison, the estimated NPV of the 10MGY plant is only about $1.78 million. Other factors such as changes in prices of co-products and utilities have a relatively minor effect on investment viability.