

## Economics of Bioenergy Production

Biofuels production is an emerging phenomenon that profoundly affects the world of agriculture. Biofuels market structures are rapidly evolving, and energy and agricultural policies are becoming entangled. These considerations create a need for new approaches for evaluating biofuels projects under alternative policies and in evolving market conditions.

To address this need, the Agricultural and Food Policy Center (AFPC) developed a two-part modeling system. National price projections of biofuels industry activities and market conditions in the U.S.—considering commercialized production technologies, fossil-energy and agricultural market conditions, and government policy and their interactions—are provided by the Agricultural and Energy Market Interaction (AEMI) model. AFPC used this model to analyze the likely effects of a proposed increase in the federal renewable fuels standard.

Stochastic spreadsheet models use AEMI's probabilistic energy price projections to estimate the economic viability of alternative renewable energy production systems. Present and past analyses of this type carried out by AFPC include grain-based ethanol production in Texas, large-scale biomass to mixed fuel alcohol production, sweet sorghum to ethanol, integrating ethanol production at U.S. sugar mills, and cost of producing algal oil.

### How Modeling Works

- Realistic, market-based, probabilistic forecasts of fossil-energy prices are developed and updated as the future market signals fossil energy price changes.
- Probabilistic forecasts for agricultural market variables are generated from a large-scale econometric model.
- Renewable fuel market supply and demand schedules are derived from agricultural and fossil-energy market conditions, current renewable fuels market structure, production technologies and cost profiles, and policy situation or assumptions.
- Stochastic spreadsheet models for annual operations of biofuel facilities are simulated.
- Timely, credible, probabilistic forecasts of renewable fuels production levels/prices are generated.
- Feasibility analyses that are far superior, given the linkage to timely biofuel market projections and incorporation of production and market risks, are provided.
- Competent, objective analyses of biofuels market prospects to stakeholders, including industry investors, venture capitalists, local government officials, and the U.S. Congress, are provided.
- Project developers are enabled to see the impact of proposed changes in U.S. Energy Policy prior to being signed into law.

For more information, contact

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