LECG

ECONOMIC IMPACTS ON THE FARM COMMUNITY OF COOPERATIVE OWNERSHIP OF ETHANOL PRODUCTION

Prepared for the National Corn Growers Association

John M. Urbanchuk

Director, LECG LLC

September 2006

The ethanol industry is one of the most significant success stories in American manufacturing over the past quarter-century. From a cottage industry that produced 175 million gallons in 1980, the American ethanol industry is poised to produce nearly 6 billion gallons in 2006. The structure of the ethanol industry has changed dramatically over the past 15 years. In 1991, 35 plants produced 865 million gallons of ethanol. Two-thirds of capacity was accounted for by wet mill plants that had an average capacity of 96 million gallons per year (MGY). The 20 operating dry mill plants had an average capacity of 16.5 MGY. By August 2006, the ethanol industry was comprised of 109 plants with an annual capacity of 4.8 billion gallons. Dry mill plants accounted for more than 70 percent of capacity with an average size of 42 MGY. Virtually all new ethanol plants being built today are dry mills with an average plant size of 60 MGY.

Ownership of ethanol production also has changed. In 1991 the majority of ethanol plants and production were corporate owned and operated. Farmer-owned cooperatives accounted for a small share of ownership and production. By comparison today nearly half of all ethanol plants are owned and operated by farmer cooperatives or limited liability companies (LLC). These plants account for 38 percent of total ethanol production. During the last two years there has been a substantial influx of non-farmer venture capital into the ethanol market. This is illustrated by the fact that only two of the 43 ethanol plants reported by the Renewable Fuels Association to be under construction as of September 2006 are farmer-owned. These two plants represent about five percent of new capacity.

Since a farmer-owned cooperative ethanol plant is literally a member of the community, the full contribution to the local economy is likely to be as much as 56 percent larger than the impact of an absentee owned corporate plant.

1255 Drummers Lane, Suite 320, Wayne, PA 19087
main 610.254.4700 fax 610.254.1188 www.lecg.com

Objective

This study describes and quantifies the impact of a farmer-owned ethanol plant on the returns to the individual farmer-owner and to the local community in comparison to similar sized plant owned and operated by an absentee investor or corporate entity.

In many respects the economic impact of a farmer-owned and absentee owned ethanol plant on the local community are similar. There are, however, two significant differences that increase the impact of a farmer-owned plant.

- The share of expenditures for operation of a farmer-owned ethanol plant derived in the local community is likely to be larger than that of an absentee owned plant. For example, virtually all of the accounting, administrative, and marketing functions will be provided locally for a farmer-owned plant while many of these functions may be centralized off-site for corporate plants. Financing of a farmer-owned plant is more likely to be provided by local commercial or cooperative banks.

- Farmers will sell their corn to a local ethanol plant regardless of ownership and benefit from the larger local market. However, farmer-owners of a cooperative or LLC ethanol plant will participate in the profits of the ethanol plant through dividends. The distribution of dividend payments represents additional income to the individual farmer-owner and his family. Many cooperatives retain only enough revenue to cover contingencies and pay out a large share of profits. This additional income will circulate through the local community providing a potentially large impact on consumption and investment.

Methodology

The impact of ownership was estimated by projecting and comparing the costs and returns for a 50 MGY dry mill ethanol plant that is farmer-owned to a corporate or absentee-owned plant. The impact of the ethanol industry on the American economy was estimated by applying the appropriate final demand multipliers for output, earnings, and employment for the relevant supplying industry

calculated by the U.S. Bureau of Economic Analysis (BEA) to estimates of spending for ethanol production for each type of plant ownership.[1]

The costs of producing ethanol were estimated for a 50 MGY dry mill ethanol plant using current data for corn, distillers dried grains (DDG), natural gas, enzymes, yeast and chemicals, electricity, and wage rates.[2] An ethanol plant of this size will produce 51.5 million gallons of denatured ethanol annually from 18.1 million bushels of corn. In additional to ethanol, the plant will produce 154,500 tons of DDG. As shown in Table 1, the cost of producing ethanol in a dry mill plant currently totals $1.39 per gallon. Corn accounts for 63 percent of operating costs while energy (electricity and natural gas) to fuel boilers and dry DDG represents nearly 28 percent of operating costs.[3]

Table 1
2006 Operating Costs
50 MGY Dry Mill Ethanol Plant

OPERATING COSTS	**Units/Gal**	**Unit Price**	**Cost Mil $/yr**	**$/gal**
Raw Materials				
Corn (bu)	0.364	$2.21	$40.18	$0.804
Enzymes (lb)	0.035	$1.02	$1.79	$0.036
Yeast & Chemicals (lb)	1.126	$0.02	$0.84	$0.017
Denaturant (gal)	0.030	$2.00	$3.00	$0.060
Electricity ($/KWh)	0.800	$0.06	$2.31	$0.046
Natural Gas ($/MCF)	0.036	$8.46	$15.23	$0.305
Process Water (thou gal/bu)	0.010	$0.37	$0.18	$0.004
Waste water (thou gal/bu)	0.008	$0.50	$0.19	$0.004
Direct labor + benefits ($.032/gal)			$1.60	$0.032
Maintenance & Repairs ($.026/gal)			$1.30	$0.026
GS&A ($.06/gal)			$3.00	$0.060
Total Costs			**$69.63**	**$1.393**

Source LECG LLC

[1] The multipliers used in this analysis are the detailed industry RIMS II multipliers for the United States estimated by the Bureau of Economic Analysis, U.S. Department of Commerce.
[2] Average prices for corn and DDG from USDA ERS. Energy prices from EIA and wage rates from the Bureau of Labor Statistics.
[3] January to June 2006 average No. 2 Yellow corn, Central Illinois of $2.11 per bushel plus a $0.10 per bushel transportation charge.

In order to estimate the economic impact of this ethanol facility we made several key assumptions:

- The capital cost to build the 50 MGY plant is $75 million ($1.50 per gallon of rated capacity). The capital cost is depreciated over 15 years.

- The capital structure is 60 percent debt (40 percent equity) financed over 10 years at 8.5 percent. We assume that the debt is borrowed locally by the farmer-owned cooperative and outside of the region for the absentee owner or corporation.

  Expenditures for administrative, overhead and marketing expenditures (G&A) are made locally for the farmer-owned plant. The corporate plant provides most of these as centralized services from outside the local community.

  Industry sources indicate that the vast majority of ethanol is marketed under contract at prices that are negotiated or tied to spot regular unleaded gasoline. Since the spot market price reflects marginal supply and demand, spot prices are higher than the contract or transactions price. Contract prices generally are not publicly available; however information reported by the Oil Price Information Service earlier this year suggests that typical contract prices may be $0.40 and $0.50 per gallon below Chicago spot market prices. Accordingly, we have adjusted plant revenue for the estimated lower transaction price.

- The farmer-owned cooperative retains 20 percent of net margin as retained earnings and pays the remainder to farmer-owners as dividends.

- The dividends paid to farmer-owners represent additional income that is spent and invested largely in the local community.

The spending associated with ethanol production circulates throughout the local economy several fold. Consequently this spending stimulates aggregate demand, supports the creation of new jobs, generates additional household income, and provides tax revenue. The size of the impact is directly linked to plant size and depends on the relationship between the ethanol plant and the local economy, specifically whether the plant is locally owned.

A 50 MGY ethanol plant makes a substantial contribution to the economy of the community in which it is located. This contribution is larger if the expenditures for goods and services to operate the plant are made in the local community. For purposes of this analysis we assume that all grain feedstock is procured from local farmers (i.e. corn produced within a 100 mile radius of the plant). In the case of a farmer-owned ethanol cooperative member farmers will most likely have supply agreements with the plant under which they sell a specified number of bushels at a specified price. This assures a market for farmers and a supply of feedstock for the ethanol plant. Members also may agree to buy DDG from the plant. Water, electricity, labor, administrative services, property taxes and insurance also are likely to be procured locally.

We expect that the local spending for a farmer-owned ethanol plant is slightly larger than for an absentee-owned plant. A corporate owned plant is likely to provide centralized administrative services, provide debt service, and supply inputs such as enzymes, yeast and chemicals which may be centrally purchased. As shown in Table 2, a 50 MGY farmer-owned ethanol plant is projected to spend $4.9 million more in the local community than a corporate or absentee-owned plant. This results in a 6.6 percent larger contribution to Gross State Product.

Table 2
Local Spending and Economic Impact from Ethanol Operations

	Absentee Owned (Mil 2006$)	**Farmer Owned (Mil 2006$)**	**Difference (Mil 2006$)**
Feedstocks	$40.18	$40.18	
Chemicals, Enzymes & Yeast	$0.00	$0.66	
Natural Gas	$15.23	$15.23	
Electricty	$2.31	$2.31	
Denaturants	$3.00	$3.00	
Water	$0.37	$0.37	
Direct Labor & Benefits	$1.60	$1.60	
Maintenance Materials & Services	$1.30	$1.30	
GS&A	$1.50	$3.00	
Interest on debt	$0.00	$2.43	
Total Expenditures	**$65.49**	**$70.09**	**$4.59**

Table 2 (Continued)
Local Spending and Economic Impact from Ethanol Operations

	Absentee Owned (Mil 2006$)	Farmer Owned (Mil 2006$)	Difference (Mil 2006$)
Impact from Operations			
Gross Output	$189.9	$201.9	$12.0
Gross State Product	$104.5	$111.0	$6.6
Household Income	$37.5	$40.9	$3.4
Employment	1,106	1,184	$78.0

The most significant difference in the economic impact of a farmer-owned ethanol plant comes not from operations but from the impact of the distribution of profits from ethanol and DDG sales to farmer members. These dividends represent the distribution of shareholder equity and are a significant addition to income and the local economy. As outlined in Table 3, a 50 MGY ethanol plant operating under the assumptions described above is expected to generate $58 million in net profit (or net margin) this year. Assuming a Federal and State tax burden of 35 percent and retained earnings of 20 percent, $30.2 million ($0.59 per gallon) will be available for distribution to farmer-owners.

Table 3
Income Statement, 2006
50 MGY Dry Mill Ethanol Plant

REVENUE	**Mil $/yr**	**$/Gal**
Ethanol	$121.03	$2.3500
DDG	$14.13	$0.2744
Total Revenue	**$135.16**	**$2.62**
OPERATING COSTS	**$69.63**	**$1.35**
EBITDA	**$65.53**	**$1.27**
Depreciation	$5.00	**$0.10**
Interest	$2.43	**$0.05**
NET MARGIN	**$58.10**	**$1.13**
Fed and State Taxes	$20.33	**$0.39**
After Tax Margin	**$37.76**	**$0.73**
Retained Earnings	$7.55	**$0.15**
Available Dividend	**$30.21**	**$0.59**

The distribution of profits represents additional income for farmer-owners of the cooperative, most of which can be expected to remain in the local economy. To estimate the potential impact of the dividend flow, we assumed a conservative marginal propensity to consume of 0.36 meaning that 36 percent of the additional income represented by dividend payments would be spent and the remainder saved and invested.[4] While most, if not all of the savings and investment will directly impact the local economy as farmers utilize local financial institutions, not all of the consumption or spending will be made locally. To reflect this we assumed that 70 percent of spending will directly impact local retailers.

This additional economic activity enhances the impacts from ethanol plant operations and is summarized in Table 4.

Table 4
Economic Impact of Cooperative Dividend Payments

	Absentee Owned (Mil 2006$)	**Farmer Owned (Mil 2006$)**	**Difference (Mil 2006$)**
Impact from Dividends			
Dividend income	0	$30.2	
Share to consumption	0	36%	
Share to savings	0	64%	
Gross Output	0	$97.5	
Gross State Product	0	$53.6	
Household Income	0	$33.6	
Employment	0	743	
Total Impact			
Gross Output	$189.9	$299.4	$109.5
Gross State Product	$104.5	$164.7	$60.2
Household Income	$37.5	$74.5	$37.0
Employment	1,106	1,927	821

[4]see Lawrence Seidman and Kenneth Lewis "What Has Been Learned Since 2001 About Counter-cyclical Tax Rebates". Eastern Economics Association 2005 Conference Paper. February 2005

The economic impact of the spending and investing of the dividend income by farmer-owners and their families will add more than $53 million to the economy and generate an additional $33 million in household income. The economic activity resulting from the injection of dividend revenue from the farmer-owned ethanol plant to the community will support the creation of an additional 821 jobs in the entire economy. These jobs will be largely be concentrated in the sectors that support increased consumption such as retailing and services, but will also include jobs in manufacturing to the extent that the local economy produces goods supplied locally; jobs in agricultural support industries; and the finance, real estate and insurance sector.

When these impacts are added to the plant operations, a farmer-owned ethanol cooperative is expected to increase the local economy measured by Gross State Product half again as much (56 percent) as an absentee owned corporate ethanol plant.