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Is Corn Ethanol Economically Viable in the Long-Run?

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CORNHUSKER ECONOMICS

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Market Report	Yr Ago	4 Wks Ago	2/6/09
Livestock and Products, Weekly Average			
Nebraska Slaughter Steers, 35-65% Choice, Live Weight	$90.63	$83.00	80.69
Nebraska Feeder Steers, Med. & Large Frame, 550-600 lb.	125.62	111.30	112.95
Nebraska Feeder Steers, Med. & Large Frame 750-800 lb.	*	98.12	95.52
Choice Boxed Beef, 600-750 lb. Carcass	148.57	144.50	139.72
Western Corn Belt Base Hog Price Carcass, Negotiated	56.04	56.71	55.07
Feeder Pigs, National Direct 50 lbs, FOB	47.13	69.87	60.00
Pork Carcass Cutout, 185 lb. Carcass, 51-52% Lean	61.03	58.50	57.18
Slaughter Lambs, Ch. & Pr., Heavy, Wooled, South Dakota, Direct	90.50	97.25	92.50
National Carcass Lamb Cutout, FOB	254.89	255.91	248.62
Crops, Daily Spot Prices			
Wheat, No. 1, H.W. Imperial, bu.	10.14	5.15	5.17
Corn, No. 2, Yellow Omaha, bu.	4.75	3.53	3.66
Soybeans, No. 1, Yellow Omaha, bu.	12.27	9.24	9.87
Grain Sorghum, No. 2, Yellow Dorchester, cwt.	8.55	5.11	5.14
Oats, No. 2, Heavy Minneapolis, MN , bu.	3.40	2.16	2.01
Feed			
Alfalfa, Large Square Bales, Good to Premium, RFV 160-185 Northeast Nebraska, ton.	135.00	185.00	140.00
Alfalfa, Large Rounds, Good Platte Valley, ton.	85.00	87.50	77.50
Grass Hay, Large Rounds, Premium Nebraska, ton.	*	77.50	*
Dried Distillers Grains, 10% Moisture, Nebraska Average.	172.50	146.00	140.00
Wet Distillers Grains, 65-70% Moisture, Nebraska Average.	58.37	50.87	46.75

***No Market**

The corn ethanol industry is in the pits, with plants being idled and firms declaring bankruptcy. Not only that, but each month seems to bring a new study assailing corn ethanol because it doesn't help the environment,[1] or it doesn't reduce dependence on foreign oil, or it drives up food prices, or it is harmful to health.

These assertions each have some basis, and they have gone far to undermine public policies in support of corn ethanol. So what then is the future for the industry? Can it survive without mandates and subsidies? To answer, we must first look at the cost structure.

During 2007-08, my colleagues and I conducted a detailed survey of production costs at seven recently constructed corn ethanol plants, one each in Nebraska, South Dakota, Minnesota, Iowa, Missouri, Wisconsin and Michigan.[2] We found that these plants were more efficient than generally thought, with lower carbon footprints than regulatory agencies have been estimating. The average operating costs for these firms in 2006-07, plus our estimate of capital cost is shown in Table 1.

If corn and other prices were the same today, these plants would be just about breaking even, as current ethanol prices are in the vicinity of this total cost. But corn costs are higher, raising cost by about $0.20/gal. Some firms currently have much higher capital servicing payments than the capital cost estimate here (due to short-term borrowing), creating cash flow problems they are unable to survive.

In the longer run, corn ethanol may have to compete without benefit of mandates or subsidies. The figure below helps to see how corn ethanol competes with petroleum.

Oil price is currently about $40/barrel, which if it persists, would translate to a wholesale (rack) price of premium gasoline of about $1.30/gal. With no blenders' credit, the energy value of ethanol would then be, from the dashed red line, about $0.85/gal. and the energy value of corn would be only about $0.85/bu. The current blenders' credit of $0.45/gal. raises these values to about $1.30/gal. and $2.50/bu.

Hence, corn ethanol cannot compete with $40 oil unless corn price is below $2.50/bu. with the current blenders' credit, or $0.85/bu. without that credit. Looked at another way, with current corn price of about $3.50/bu., corn ethanol cannot compete unless oil prices rise to at least $55/barrel. Without the blenders' credit, oil price would have to be at least $80/barrel for ethanol to be able to compete.

The federal biofuel mandate calls for 50% more corn ethanol by 2015. If the mandate holds, price premiums for corn ethanol will rise until the incentive for that quantity is achieved. Corn ethanol will be profitable. But faltering public support creates concern that the mandate may be changed, and that the blenders' credit may expire. In that case, the only hope for a profitable industry is that oil prices rise to $80/barrel or more, so that the industry can afford to pay $3.50-4.00/bu. for corn.

[1] Perrin, Richard K. "Ethanol and Low Carbon Fuel Standards," *Cornhusker Economics*, Department of Agricultural Economics, UNL, October 15, 2008.

[2] Perrin, R.K., N.F. Fretes and J.P. Sesmero. "Efficiency in Midwest U.S. Corn Ethanol Plants: A Plant Survey," *Energy Policy* (2009), doi: 10.1016/j.enpol.2008.11.022.

Table 1. Cost of Production at Seven Midwest Corn Ethanol Plants, 2006-07.

Item	Units	Price/ Unit	Cost/ Gallon
Electricity	0.57 kwh.	0.044	0.025
Natural Gas	0.0263 MMBTU	7.20	0.190
Denaturant			0.070
Enzymes etc.			0.063
Labor & Mgt.			0.051
Maint. & Rep.			0.019
Misc.			0.037
Total Processing			0.454
Feedstock	0.35 bu.	3.04	1.063
Distillers Grains	14.9 lbs DM	0.044	-0.229
Oper. Costs			1.288
Est. Cap Cost			0.350
Est. Total Cost			1.638

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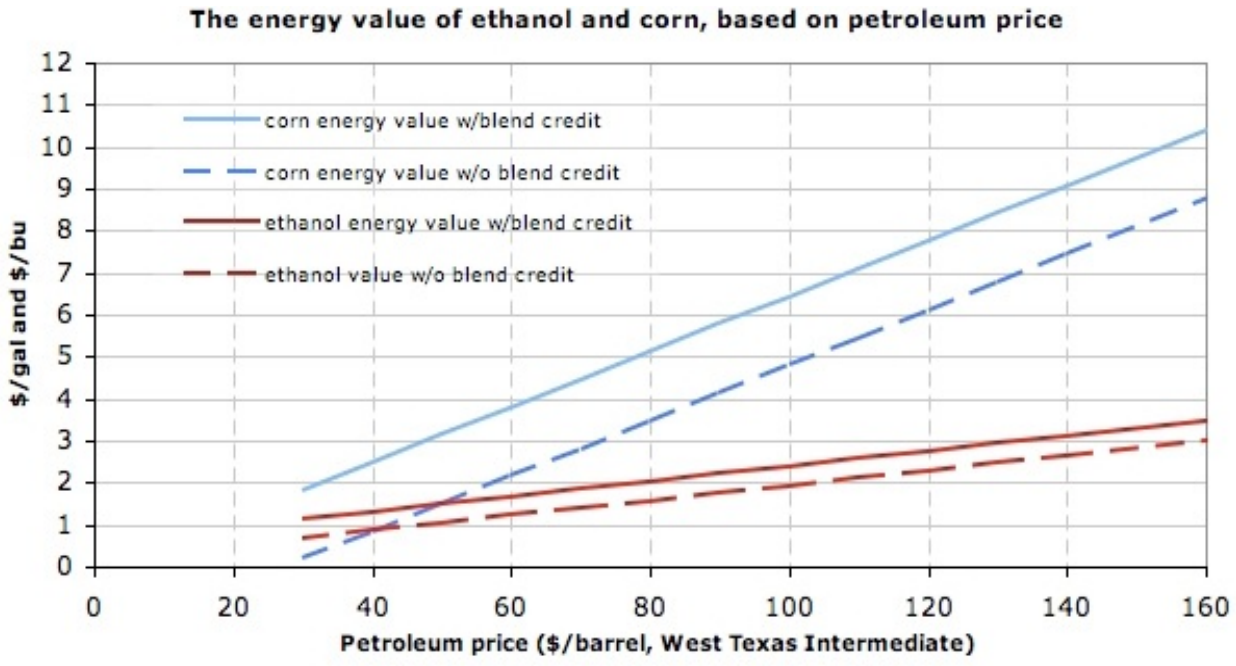

Figure 1. The Energy Value of Ethanol and Corn, Based on Petroleum Price.