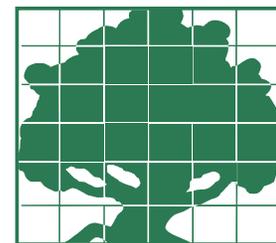


# Agricultural and Resource Economics UPDATE



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## Giving an Inch and Keeping a Mile: Why the Corn Lobby Let the Ethanol Tax Credit Expire

**Aaron Smith**

Ten percent of motor gasoline in the United States is comprised of ethanol produced from corn. This production level is required by law, a requirement that confers large benefits on corn producers by keeping corn demand and prices high. In comparison, the recently expired ethanol tax credit was a small perk.

*With growing concerns about gridlock in Washington and greed on Wall Street, Americans are wondering whether anyone with a stake in public policies is willing to sacrifice their short-term advantage for a greater good. Well, someone just did. Without any opposition from the biofuels sector, the tax credit for ethanol blenders (the Volumetric Ethanol Excise Tax Credit –VEETC) expired on January 1.*

Bob Dinneen, President and CEO,  
Renewable Fuels Association,  
1/5/12. RFA press release.

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**O**n January 1 of this year, deficit hawks, environmentalists, livestock producers, and food processors celebrated the expiration of the Volumetric Ethanol Excise Tax credit (VEETC). This federal program, which had existed in various forms since 1978, gave \$0.45 to ethanol producers for every gallon they produced and cost taxpayers \$6 billion in 2011. So why did the corn-ethanol lobby let it expire without an apparent fight? Did they really “sacrifice their short-term advantage for the public good” as suggested by the above quote from the CEO of the national trade association for the U.S. ethanol industry?

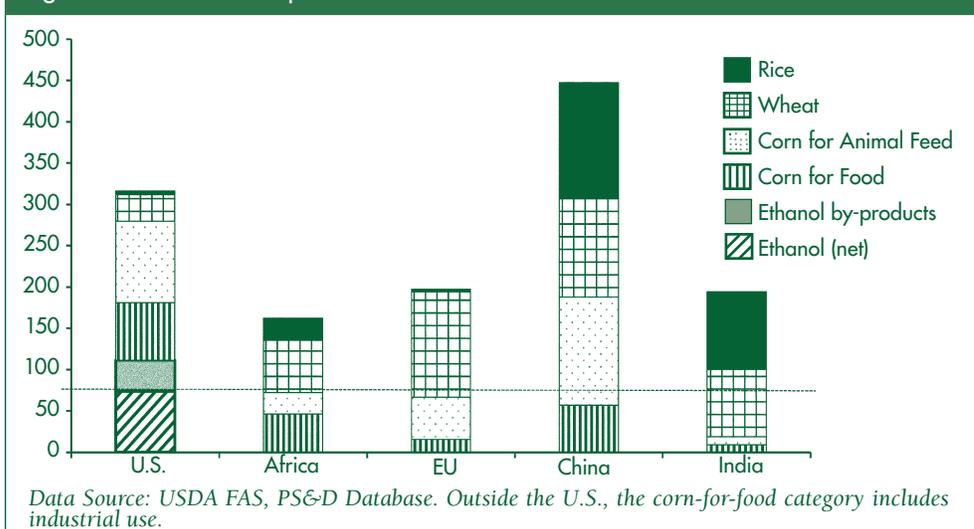
In this article, I argue that the VEETC generated small benefits relative to the benefits the ethanol industry reaps from legislation known as the Renewable Fuel Standard (RFS). As such, the industry was willing to let the VEETC expire so as to earn political points in its fight to preserve the RFS.

The RFS mandates that a minimum quantity of ethanol be blended into gasoline each year. It was first introduced in the U.S. Energy Policy Act of 2005, and then expanded in the U.S. Energy Independence and Security Act of 2007. Under the expanded RFS, corn ethanol now comprises 10% of finished motor gasoline in the United States, up from 3% in 2005. In a recent paper, Colin Carter, Gordon Rausser, and I estimate that the 2007 expansion in the RFS caused a persistent 30% increase in the price of corn. Moreover, the RFS has created a vulnerable corn market in which even the slightest production disturbance in 2012 will have devastating consequences for the world’s poor.

In 2011, about 15% of global corn production, or about 5% of global grain production, was used in U.S. corn-ethanol production. One-third of this quantity returns to the food system in the form of ethanol by-products that can be used as animal feed, so the net loss to the food system is 3.3% of global grain production. Figure 1 shows that this volume of grain is substantial: it exceeds total corn consumption on the African continent. It also exceeds total rice consumption in all countries other than China and India.

The price effects from turning food into fuel have particularly devastating consequences for consumers in less-developed countries, where a relatively large percentage of income is spent on

Figure 1. Grain Consumption in 2011/2012



food, and where grains, rather than processed foods, constitute the major portion of the diet. According to the Food and Agriculture Organization (FAO) of the United Nations, grains comprised 57% of calories consumed in least-developed countries in 2007 but only 22% in the U.S. and 27% in the European Union. World Bank economists Maros Ivanic and Will Martin estimate that when the World Bank's food-price index jumped by approximately 30% in 2010, 44 million people were forced below the extreme poverty line of \$US 1.25 per day.

## History

Ethanol, also known as ethyl alcohol, is the type of alcohol in alcoholic beverages. It became a significant motor-fuel ingredient in the United States only recently, but it has a long history as a prospective motor fuel. This history has been punctuated by government action. The first such action came in 1862, when the Lincoln administration imposed a large excise tax on alcohol to help fund the Civil War. This tax quadrupled the price of both drinkable and fuel alcohol and persisted until 1906, when the Free Alcohol Act made industrial alcohol exempt from the alcohol excise tax.

The 1862–1906 period coincided with the development of the internal

combustion engine and the automobile. In the mid-1800s, some early internal combustion engines were fueled by ethanol, and ethanol was used extensively for lighting. One may wonder whether ethanol could have established itself as a viable motor fuel if it had not been subject to the alcohol excise tax. However, after industrial alcohol was made exempt from the excise tax and the price of ethanol consequently dropped by at least 75%, it still remained double the price of gasoline. Abundant petroleum supplies, especially in Pennsylvania, made gasoline inexpensive and it seems unlikely that ethanol could have established itself as a motor fuel even if it had not been subject to the alcohol excise tax.

By 1920, the picture looked different. The Pennsylvania oilfields were in decline and the U.S. Geological Survey estimated that peak petroleum production would be reached within a few years. This assessment raised expectations that ethanol distilled from grains and potatoes would become the dominant motor fuel. Articles expressing this expectation appeared regularly in major newspapers such as the *Los Angeles Times* and the *New York Times*.

At about this same time, European agricultural production recovered from World War I, which led U.S. agricultural prices to drop. These lower prices motivated U.S. agricultural producers

to look to ethanol as an alternative market for their crops. However, the attempt to make ethanol profitable failed because newly discovered oil reserves in the U.S. Southwest kept petroleum production high and prices low.

After 50 years of low oil prices, the Arab oil embargo and the associated oil price spikes in the 1970s gave new hope to ethanol advocates. However, ethanol production remained far from cost effective; even when oil prices peaked in 1980, the cost of producing ethanol was double that of gasoline.

The 1978 Energy Tax Act marked the beginning of the current wave of federal programs to support ethanol production; it included a subsidy that exempted ethanol/gasoline blends from the gasoline excise tax. This subsidy existed until the end of 2011, although its magnitude and form changed somewhat. In its last four years, the subsidy took the form of a 45 cent per gallon tax credit to firms that blend ethanol with gasoline (the VEETC). This program cost taxpayers about \$30 billion between 2005 and 2011.

Although the RFS was not enacted until 2005, bills containing variants of the RFS entered the U.S. Congress regularly between 1978 and 2004. In chronological order, these bills were the Gasohol Motor Fuel Act of 1978 (S.2533), the Ethanol Motor Fuel Act of 1987 (H.R.2052, S.1304), Amendment to the Energy Policy Act of 1992 (H.AMDT.554), Renewable Fuels Acts of 2000 and 2001 (S.2503 and S.670. IS), and the Energy Policy Acts of 2003 and 2004 (H.R.4503, S.2095). However, declining oil prices throughout the 1980s meant that large-scale ethanol production remained unprofitable. Ethanol comprised less than 1% of finished motor gasoline in 1990.

The 1990 amendments to the Clean Air Act provided the next opportunity for the corn ethanol industry to lobby for favorable legislation. The amendments required that, in regions prone

to poor air quality, oxygenate additives be blended into gasoline to make it burn more cleanly. When the amendments were first introduced to Congress in 1987, ethanol and methyl tertiary butyl ether (MTBE), a natural-gas derivative, were the main contenders to fulfill the oxygenate requirement.

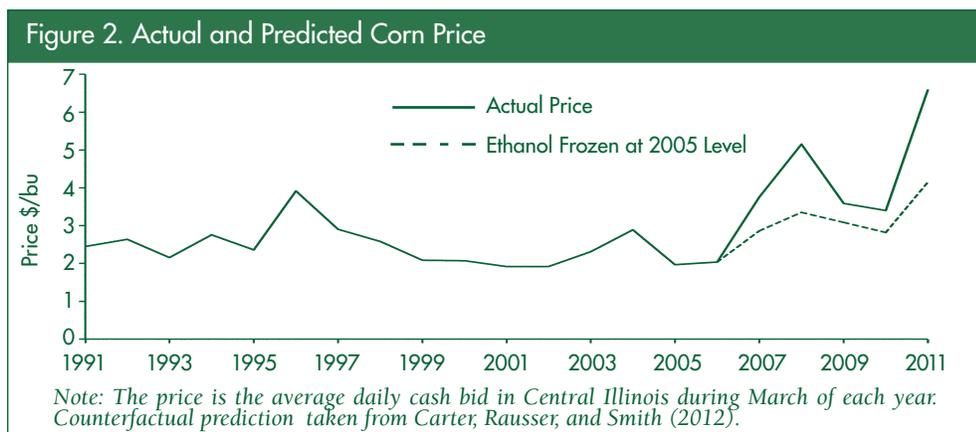
Johnson and Libecap documented the lobbying battle between advocates for ethanol and those for MTBE. MTBE became the dominant additive because it was less expensive, but subsequent leaks in underground storage tanks caused MTBE to contaminate drinking water supplies and it was consequently banned in at least 25 states.

The demise of MTBE allowed ethanol to establish itself as a fuel additive in the 2005 Energy Policy Act, which essentially replaced the oxygenate requirement with the Renewable Fuel Standard. Legislation to increase the RFS entered Congress even before the 2005 Energy Policy Act had passed, and more bills followed in 2006 (the 20/20 Biofuels Challenge Act of 2005 (S.1609), BOLD Energy Act of 2006 (S.2571.IS, H.R.5331.IH)).

These proposals led to the 2007 expansion of the RFS, which specified minimum renewable-fuel production each calendar year from 2007 through 2022. It required 9 billion gallons in 2008, with annual increases to 15.2 billion gallons in 2012 and 36 billion gallons in 2022. However, no more than 13.2 billion gallons of corn ethanol may be used to satisfy the RFS in 2012, and no more than 15 billion gallons of ethanol may be used after 2015.

### Effect of the RFS on Corn Prices

The 2007 RFS expansion caused ethanol plants to sprout across the country and especially in the Midwest. Firms could enter the ethanol industry secure in the knowledge that the government had guaranteed demand for their product. At the end of 2005, 4.3 billion gallons of ethanol-producing



capacity existed and 1.8 billion gallons of capacity was under construction. One year later capacity under construction had tripled and represented more production than existed at the time.

The ethanol construction boom gave the corn market fair warning of an impending increase in demand and enabled it to absorb the initial onslaught. Inventories accumulated and a record number of corn acres were planted in 2007. However, production has not kept up with demand. According to the most recent USDA estimates, carryover stocks into the 2012 crop year will be only 6.7% of annual use. Carryover stocks have only been this low once since 1950. In 1995 poor weather caused low crop yield and low inventory, but the effect was temporary because inventory was replenished by the next harvest. In contrast, the market shock that caused low inventory this year is a legislated permanent increase in demand.

The current price of corn on the Chicago Mercantile Exchange is about \$6.00 per bushel—almost triple the pre-mandate levels. What would the price be if ethanol production had been frozen at 2005 levels? In the 2005–06 crop year, 1.6 billion bushels of corn were used to produce ethanol; in the 2011–12 crop year, 5.0 billion bushels. When corn is processed into ethanol, approximately one third of its caloric value is retained in a by-product known as distiller’s grains that is fed to animals. Thus, an increase of 3.4 billion bushels of corn used for ethanol production

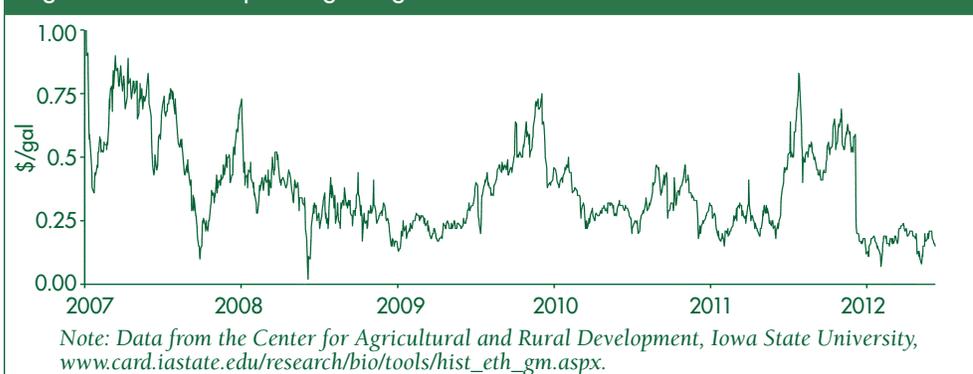
implies a loss of 2.3 billion bushels to the food system, equivalent to about 16% of the total U.S. supply of corn.

If these 2.3 billion bushels were returned to the food system, users would increase consumption and farmers would reduce production until prices had declined enough to absorb the excess supply. A simple calculation can give a ballpark estimate of how much prices would decline. In recent research, Michael Adjemian and I estimate that in recent years corn users would be willing to consume 2% more corn for every 10% reduction in price.

Nathan Hendricks, a 2011 UC Davis graduate, estimated in his PhD dissertation that U.S. farmers would plant 3% fewer acres to corn for every 10% reduction in price. Summing these effects implies that the market could absorb 5% more corn for every 10% of supply to the food system would reduce corn prices by about 32%

This simple calculation is consistent with the dynamic analysis in my recent work with Colin Carter and Gordon Rausser. In that paper, we isolate three main effects of the 2007 RFS expansion, each of which are apparent in Figure 2. First, the corn market anticipated the forthcoming ethanol boom and increased inventory demand accordingly. As a result, prices increased in 2006 in advance of the ethanol-production jump in 2007 and 2008. Second, we estimate that corn prices would have been, on average, 30% lower from 2006 through

Figure 3. Ethanol Operating Margin



2010 had no increase in the demand for corn from ethanol producers occurred. Our third finding is that a below-average harvest in 2010 caused inventory to be run down and prices to be about 50% above where they would have been if ethanol production had been frozen at 2005 levels. These results show that the effect of ethanol on corn prices gets magnified when inventory is low.

### Effect of Removing the Tax Credit

At most, removing the VEETC could have caused ethanol production to drop to mandated levels. In 2011, ethanol production exceeded the mandate by 1.3 billion gallons. Most of this excess was exported to Brazil, Canada, the United Kingdom, and the Netherlands to meet biofuel mandates in those countries. A bushel of corn produces about 2.7 gallons of ethanol, so above-mandate ethanol production used 0.48 billion bushels of corn and, after accounting for distiller's grains, it removed 0.32 billion bushels from the food system or 2.2% of total U.S. supply. Thus, if all above-mandate ethanol production became unprofitable upon removal of the tax credit, the calculations above imply that corn prices would have dropped by only 4.4%

However, ethanol production has declined little, if at all, since the removal of the tax credit. In the first quarter of 2012, the United States exported about a quarter of a billion gallons of ethanol, and so it is on pace to produce about the same amount of ethanol as last year. Figure 3 shows that the return to

ethanol producers over operating costs declined by the amount of the tax credit at the end of 2011. This drop erased the large operating margins that ethanol refiners had enjoyed in the last half of 2011 when strong export demand kept ethanol prices high. Moreover, it explains why ethanol production has not declined in 2012: after removing the tax credit, ethanol production at 2011 levels remains profitable.

### Outlook for the Future

Removal of the ethanol tax credit has had a negligible effect on corn prices because high export demand is holding up ethanol prices, which makes above-mandate ethanol production profitable. Even if export demand declines, the RFS guarantees that ethanol production could only drop by a small amount this year and would have to increase in the next few years as the RFS increases to its long-term level of 15 billion gallons per year. By keeping ethanol production high, the RFS places a high floor under the corn price; corn prices will remain high as long as the RFS is in place. It is for this reason that Jon Doggett, vice president of public policy for the National Corn Growers Association, commented recently that his members "view the RFS as more important than the farm bill."

The RFS has caused carryover stocks to be run down and has placed the corn market in a perilous position. If the 2012 crop is even slightly smaller than expected, then prices will

rise even further and plunge millions more people into extreme poverty. If they weren't constrained by mandates, then ethanol producers would respond to high prices by reducing their use of corn. Jim Costa (D-Fresno) and Bob Goodlatte (R-Va.) recently introduced legislation that would allow such a response; under their proposal the mandate would be reduced when corn stockpiles are low. This proposal is a small step in the right direction, but any proposed weakening of the RFS will be met by strong opposition from lobbying organizations such as Renewable Fuels Association, the National Corn Growers Association, and Growth Energy.

*An abbreviated version of this article appeared in American.com magazine on January 4, 2012. See [www.american.com/archive/2012/january/children-of-the-corn-the-renewable-fuels-disaster](http://www.american.com/archive/2012/january/children-of-the-corn-the-renewable-fuels-disaster).*

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### For further information, the author recommends:

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