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Do Current U.S. Ethanol Policies Make Sense?

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On March 25, 2010, the Renewable Fuels Reinvestment Act (RFRA) was introduced in the U.S. Congress. The bill (HR 4940) would extend the $0.45 per gallon blenders' credit—the Volumetric Ethanol Excise Tax Credit (VEETC)—as well as the $0.54 per gallon secondary tariff on imported ethanol until Dec. 31, 2015 (U.S. Congress, 2010). There is a debate about the necessity of continuing these measures. Together with the Renewable Fuel Standard (RFS) under the 2007 Energy Independence and Security Act (EISA), subsidies and tariff protection have supported the development of the U.S. ethanol industry. In this article we examine inconsistencies that are emerging in these policies. Without a change in approach, the objective of achieving a major increase in the use of renewable fuels in the United States is unlikely to be realized.

According to recent news reports, the ethanol industry is nearing the so-called blend wall—the maximum amount of the fuel that can be blended with gasoline at the current 10% blending limit (Wisner, 2010). Car manufacturers' warranties and extended warranties for non-flex-fuel vehicles—those specifically designed to use variable blends of gasoline and ethanol—cover only those using gasoline with a maximum ethanol share of 10% (E10) because higher blends may damage the engine and other components. If the U.S. Environmental Protection Agency (EPA) does not increase the permitted ethanol blending rate beyond the current level the domestic market potential for ethanol tops off at approximately 12.5-13.5 billion gallons (RFA, 2010b). The ethanol industry is asking the EPA to increase the blend ratio to 15%, but automakers and oil companies are resisting the change because of the risk of engine damage. The use of up to 12% ethanol could be an intermediate step (RFA, 2010a). Given the current fuel delivery infrastructure and limited prevalence of flex fuel vehicles, the demand for higher ethanol blends is expected to remain small for the foreseeable future (Taheripour and Tyner, 2008).

As we approach the blend wall, U.S. ethanol producers have begun to look overseas for markets. In the first quarter of 2010, 83.5 million gallons of ethanol for non-beverage use was exported, roughly a five-fold increase over the first quarter of 2009. Ethanol exports in the first three months of 2010 equaled 71% of the total exported in 2009 and at the current rate more than 330 million gallons of ethanol—roughly 3% of expected total U.S. ethanol production of about 12 billion gallons—are expected to be exported in 2010 (RFA, 2010b; USDA, 2010). Major drivers of the export surge are tighter sugar-based supplies of ethanol from Brazil—the world's other major producer—due to high sugar prices and added Brazilian demand resulting from the removal of import tariffs on ethanol. Although U.S. exports are still small, they could expand if the world sugar price remains high and the demand for ethanol in the European Union, Brazil, and other regions increases. In Germany, for example, the amount of ethanol allowed in gasoline blends will be increased from 5 to 10% by the end of 2010. However, many analysts expect world sugar prices to fall sharply as supply returns to more normal levels and this will exert downward pressure on world ethanol prices.

Although U.S. corn-ethanol producers are currently finding it profitable to export, what will happen if world prices fall? To examine this, we need to determine what will happen if domestic demand for ethanol continues to be limited due to the blend wall, at the same time as the mandated use of renewable fuels increases under EISA and the tax credit and tariff are continued under H.R. 4940. It is important to understand the implications of these policies for the future evolution of the market for ethanol.

The U.S. Policy Mix

The key components of current U.S. ethanol policy are tax credits, tariffs, and mandates. Both Federal and state tax credits have contributed to the development of the industry. The current Federal credit is 45 cents per gallon. The tax credit is claimed by blenders, rather than producers of ethanol, and they only collect it by producing gasoline-ethanol blended fuel.

Tariffs on imported ethanol are composed of a 2.5% *ad valorem* tariff and a 54 cents per gallon specific tariff, amounting to a combined total of roughly 60 cents per gallon (or an *ad valorem* equivalent of roughly 25%), except for imports under the Caribbean Basin Initiative. Since the tax credit is potentially applicable to foreign ethanol used in blended fuel, the tariff exists to offset the credit that U.S. blenders would otherwise receive for imported ethanol and to encourage the use of the domestic product.

The Renewable Fuel Standard (RFS) was created by the Energy Policy Act of 2005 and amended by the Energy Independence and Security Act of 2007. It requires that transportation fuel sold or introduced into commerce in the United States contain minimum specified volumes of renewable fuel, advanced biofuel, cellulosic biofuel, and biomass-based diesel (EISA. H.R.6 Title XV, Subtitle A, Sec. 202). Although the RFS specifies the minimum amount of renewable fuel to be used, it is likely to be enforced through a blending requirement using RINs (Renewable Identification Numbers). The EISA of 2007, SEC. 202., specifies that the mandate will "…ensure that transportation fuel sold or introduced into commerce in the United States—except in noncontiguous States or territories—on an annual average basis, contains at least the applicable volume of renewable fuel…". The applicable volume is 12.95 billion gallons in 2010 and rises steadily to 36 billion gallons by 2022. According to the Federal Trade Commission Act of 1914, SEC. 44., "commerce" in the United States is defined as that "among the several States or with foreign nations…". The implication is that while the amount of renewable fuel that has to be used by blenders is mandated, the blended fuel that they produce does not have to be consumed in the United States. This will prove to be significant if the blend wall continues to constrain U.S. consumption of blended fuel.

The Tax Credit and the Blend Wall

If the minimum volume of ethanol required to satisfy the RFS is less than the maximum amount that can be consumed domestically, ethanol use will increase until its price is close to that of gasoline because the two fuels are similar products, although there is still likely to be a price differential because ethanol has only two-thirds the energy content of gasoline. The tax credit encourages an expanded supply of ethanol and increased usage beyond the RFS minimum requirement (Babcock, 2010). Once the blend wall is reached, providing there is no foreign ethanol demand, there will be downward pressure on the consumer ethanol price and the price of mixed fuel. The tax credit generates little or no additional consumer demand for ethanol and will simply encourage Americans to consume more fossil fuel because the overall price of fuel will be lower. Ethanol and corn producers do not obtain any additional benefit from the tax credit, since demand is constrained. So, if world ethanol prices are low or exports are prevented by trade policies in other countries, the tax credit would have perverse consequences—that is, lower fuel prices and increased consumption of fossil fuel.

If corn-based ethanol is competitive in the world market due to a favorable world price, the United States would likely export ethanol. Even if the blend wall did not exist, the United States could export when the world price is higher than the domestic price, taking into account transportation costs and trade policies in foreign countries, although domestic use is likely to be more attractive because of the tax credit. But with the blend wall, more U.S. ethanol would become available for export because the domestic price would drop in the absence of trade. A serious issue in this context is that ethanol refineries and blenders would have an incentive to produce blended fuel for export in order to use up additional supplies of ethanol and to collect the tax credit. In that case, the tax credit would act as an export subsidy for blended fuel. This has already happened with U.S. biodiesel. The biodiesel industry used the blenders' credit to subsidize exports of up to 80% of its production—which was based on imported biodiesel from Asia and South America—to Europe until the European Commission imposed antidumping and countervailing duties in March 2009. With the blend wall in place, the U.S. ethanol industry might choose to follow the earlier example of the biodiesel industry and this could stimulate a similar response in the form of antidumping or countervailing duties in potential importers.

The RFS and the Blend Wall

Enforcement of higher levels of ethanol use through the RFS in the presence of the blend wall will mean that the resulting excess supply of ethanol or blended fuel will have to be disposed of on international markets. Without a tax credit, this would result in lower profits for blenders, but the tax credit helps to offset the costs of moving mandated excess production into international markets. Again, the result is either dumping or an implicit export subsidy as U.S. ethanol or mixed fuel is sold internationally at a discount. Naturally, the domestic price of mixed fuel would

also be reduced, but given inelastic domestic demand it is unlikely that expanded domestic consumption would be sufficient to absorb all the additional blended fuel that would need to be produced to satisfy the RFS. Discounted exports of mixed fuel would also exert downward pressure on international oil prices, so there would be some stimulus to fuel consumption in the rest of the world. Exporters of ethanol, such as Brazil, that would otherwise be active in international markets would probably find that demand for their product was reduced because of the availability of competing low-priced ethanol or mixed fuel from the United States.

The situation is complicated further by the fact that if no new supplies of alternative 'advanced biofuels' emerge, enforcement of the part of the RFS mandate that relates to that category would require imports of foreign sugarcane-based ethanol regardless of the level of the world ethanol price, since sugar-based ethanol qualifies as an 'advanced' biofuel in the legislation. With a blend wall, importing sugar-based ethanol to satisfy the advanced biofuel mandate does not make sense. It would simply increase the amount of corn-based ethanol that would need to be exported since total consumption of ethanol is constrained. Finally, lower ethanol and mixed fuel prices would reduce the incentive to develop second and third generation fuels derived from woody biomass or algae commercially except for those that are not constrained by blending limits, green hydrocarbons, for example. These new generation biofuels may have environmental advantages over agriculturally-based supplies of ethanol, and their production would likely exert less pressure on food prices.

The magnitude of the effects on world energy markets from this distorted mix of U.S. policies will depend on the degree to which the RFS exceeds the blend wall and consequently how much ethanol will have to be exported to satisfy the mandate. Applying the RFS of 36 billion gallons to current blend-wall estimates of around 13 billion gallons clearly indicates a significant surplus. Estimating what the actual surplus might be in the future is extremely complicated since future domestic demand for ethanol will be influenced by a whole range of factors, including vehicle technology (average miles per gallon, what blend ratios will be usable), how many vehicles there will be and how many miles their owners will choose to drive. The latter will be influenced by fuel prices and consumer incomes, as well as changing demographics. Fuel efficiency standards and how vehicle manufacturers choose to implement these will also have an impact on total fuel use and its composition.

Future policy directions

Although the future demand for renewable fuels in the United States is difficult to predict, it seems clear that the renewal of the excise tax credit as proposed under HR 4940 would not be advisable if we wish both to contain the costs of continuing to develop the domestic biofuel market and to limit domestic and international market distortions. With limited domestic demand due to the blend wall, the tax credit would increase fossil fuel consumption by depressing fuel prices or act as an export subsidy. Whether or not the tariff should be maintained is open to debate. If world prices of ethanol fall as a result of downward price adjustments in the world sugar market, continued tariff preference could be important for sustaining the domestic ethanol industry in the absence of the tax credit. Conversely if the objective is to replace fossil fuel use in the United States with renewable fuels, regardless of their source, tariff protection could be eliminated.

It also seems clear that future quantities of renewable fuel use mandated under the RFS will have to be revisited in light of the evolution of transportation fuel demand in the United States. If the mandated volume exceeds feasible domestic consumption because of the blend wall, the RFS will be problematic both nationally and internationally. It could have serious negative impacts on U.S. ethanol producers, blenders, and/or world ethanol producers. If the aim is to stimulate the significant replacement of liquid fossil fuels by renewable substitutes—and that objective remains open to debate— it would seem to be appropriate to refocus policy on the development of the infrastructure to deliver new fuel blends and on promoting the development and adoption of the vehicles needed to use these blends. Existing policies contain some modest initiatives in these areas, but overall there appears to be a need for a major shift in policy orientation if this is to be achieved. Another policy direction would be to promote the production of green hydrocarbons that are near perfect substitutes for fossil fuels—gasoline, diesel, and jet fuel—and, thus, can be used in the existing fuel system seamlessly—no need for blending limits, flex fuel vehicles, or a separate distribution infrastructure. Half of the biofuel projects funded by the U.S. Department of Energy (DOE) in December 2009 using stimulus money are directed to the development of such biofuels.

For More Information

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