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Description of 2011 Biofuels Policy Alternatives

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In the US, at the end of 2010 Congress extended the ethanol tax credit (VEETC) of $0.45/gal. for one year with the clear message to the industry and lobby groups that it wanted a long-term solution to be passed and implemented by the end of 2011. Following are some of the policy options that are being considered in 2011:

- Continue the 45 cent/gallon subsidy and the import tariff as at present
- Shift the subsidy from blender to biofuel producer
- Subsidy that varies with the price of crude oil or gasoline
- Subsidy based at least in part on performance in reducing GHG
- Subsidy based on energy content of the biofuel
- Subsidy that is applied only for the quantity of biofuel in excess of the RFS
- Eliminate the subsidy and the import tariff, and use funds for other purposes
- Combinations of these options

We will describe and discuss the pros and cons of each of these options in turn below. However, before the one by one explanation, it is useful to indicate that the Renewable Fuel Standard (RFS2) and the blend wall are the driving forces in the biofuels market today. The blend wall is due to the 10 percent ethanol blend used in the U.S. today [1]. We consume about 138 billion gallons of gasoline type fuel annually. Ten percent of that would be 13.8 billion gallons, but we cannot blend 10 percent everywhere and throughout the year for a number of reasons. Our estimate of the effective blend wall is about 12.5 billion gallons. Production in 2010 was higher, but the U.S. exported an estimated 350 million gallons in 2010 [2]. EPA announced that they would approve an expansion of the blend percentage from 10 to 15 percent but only for automotive vehicles built since 2001 and excluding motorcycles, lawn mowers, marine engines, and other small engines. It is unclear if EPA will be able to implement the higher blending percentage and even if they do, to what extent the industry will adopt it. So long as the blending percentage stays at 10 percent, the blend wall is the major issue for the ethanol industry. The only way around that limit would be to rapidly grow the E85 market, but for a number of reasons, that will be very difficult to do in the short run [3]. To be competitive with E10, E85 must be priced at 78% of E10 or less. If E10 retails for $3.50, E85

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would have to retail for $2.73 or less to be economically competitive. That is difficult to do when the wholesale costs for gasoline and ethanol are in this range as they were in March 2011. Given the overshadowing importance of the blend wall, the policy option that is adopted for the subsidy does not matter as much because the operative constraint is the blend limit. However, if we are developing policy for the longer term, it is important to understand well the various options. Bearing this in mind, we will review the consequences of the different policy options that have been proposed.

Continue the Status quo

Perhaps the greatest barrier to this option is the federal government budget cost. At 2011 blending levels, the cost would be about $5.8 billion per year. When Congress is looking everywhere for cuts, this one may become a target, especially given that with the blend wall in effect, not much of the subsidy reaches the ethanol producer. Most of the subsidy is divided between the ethanol blender and the consumer in the form of lower E10 prices [1].

Maintaining the ethanol tariff also would continue to displease Brazil, even though exports in 2010 were miniscule. Brazil is producing more sugar and less ethanol as world sugar prices have surged. So currently they export little ethanol, but would want to be in a position to resume exports again once world market conditions change.

Maintaining the subsidy, if the blend wall is relaxed, also would help keep corn prices high, which is supported by corn farmers but not by livestock producers or the food production and distribution industries.

Switch to a Producer Subsidy instead of a Blender Tax Credit

As indicated above, currently the VEETC (blenders' credit) is not reaching the ethanol producer as it has in the past, due mainly to the blend wall. Ethanol producers believe that switching to a refundable producer credit would change that to insure that producers did get the credit. The credit would probably need to be refundable because many ethanol producers might not have enough tax liability to absorb the entire amount of the credit. With this change, the producers would receive the credit, but it is not at all clear that they would be able to keep it, as the ethanol price would be determined by supply and demand forces in the market place. Those same supply and demand forces would be operative whether the credit is initially received by the ethanol blender or the ethanol producer. Thus what appears on the surface to be an improvement for the producer likely would result in no change.

In addition, if the switch were made to the ethanol producer, a way would have to be found to prevent the ethanol that received the subsidy from being exported. Administratively, it might be difficult to control the movement of the ethanol once it left the production facility.

Subsidy that Varies with the Price of Crude Oil or Gasoline

Tyner and others have introduced a biofuel subsidy that varies with the price of crude oil or gasoline [1]. In this proposal, there is a price of crude oil (or gasoline) at which the subsidy begins, say $90/bbl., and a rate of change of the subsidy. If the start point were $90 crude oil, there would be no biofuel subsidy when crude oil is over that price. When crude oil is below that price, the subsidy would be equal to ($90 – Pc)*C. So if crude oil were $50 and the rate of change 0.015, then the subsidy would be 60 cents per gallon. This system is designed to provide a safety net for ethanol producers when crude oil prices are lower without providing the subsidy when crude oil prices are high. In terms of operation, the subsidy would probably change each quarter, with the subsidy in quarter two being based on the average crude oil (or gasoline) price in quarter one. Thus, the subsidy would always be based on crude oil or gasoline prices lagged one quarter. It also could be done on a monthly basis, but the added administrative cost probably would exceed the gain from a more frequent change.

Another variant that has been proposed is that the subsidy would vary with the difference between the ethanol and gasoline wholesale prices [4]. Under this proposal, the subsidy would be equal to the difference between ethanol and gasoline prices up to the max level of $0.45. If the difference were negative (gasoline greater than ethanol), the subsidy would be zero. Thus the subsidy would be

zero for much of the time since the norm is that gasoline is greater than ethanol. This alternative could work in the absence of the blend wall. However, with the binding blend wall, ethanol is priced on corn, not on gasoline. Between March and October 2010, the correlation between weekly corn and ethanol prices was $0.98. If corn price goes up, ethanol price goes up. With constant gasoline price, a variable subsidy based on the ethanol/gasoline margin would have the subsidy increasing as corn price increased, increasing the incentive to produce and increasing corn demand.

In the case with no blend wall, ethanol regains its price relationship with gasoline. That is, there is a high correlation between gasoline and ethanol price. While there might be short-term fluctuations, with no blend wall the prices have moved closely together. In that event, this ethanol/gasoline difference based subsidy remains essentially a fixed subsidy since the two prices move together. What may make the gasoline – ethanol spread seem attractive is that in the past couple of years, we have moved between an ethanol price based on gasoline to one based on corn. The point here is that there are problems with the price spread approach whichever regime plays out in the future, the spread approach does not function as envisioned in many circumstances.

Some have argued that the subsidy should be based on the ethanol/corn spread as is done in California [4]. That could work for a small part of the total market, but if it covered the national market, it would provide a strong incentive to expand production. The ethanol corn/spread goes down, the subsidy goes up, which increases the incentive to produce, which increases the corn price, which decreases the ethanol/corn spread, and the cycle continues. At a national level, over time this approach would result in the max subsidy permitted under the system, and would provide added pressure on corn prices.

Also, while public reliable data is available on gasoline (RBOB) and crude oil (NYMEX or WTI), the same is not true for ethanol. There is lots of regional variability in the ethanol market. So even constructing the margin could prove problematic.

Another possibility would be to base the credit on crude oil futures prices rather than current market prices. That could be done, but would not change the levels much as the market and near futures prices contain very similar information. That is, there is a high correlation between near term futures and current market prices.

One impact of the variable subsidy option that would need to be considered is the effect on RIN markets. In the early phases of implementation of this system, there could be some disruption in the RIN markets as market players learned how to adjust to the new ground rules. However, after an adjustment period, the RIN markets likely would function efficiently under a subsidy that varied with the price of crude or gasoline.

Subsidy Based in Part on Performance in Reducing GHG

One of the national objectives in promoting renewable fuels is to reduce GHG emissions. This proposal focuses on that objective in that it rewards ethanol plants to the extent that they reduce GHG emissions. Essentially, the subsidy would be divided into two parts: 1) a fixed component, say 20 cents per gallon, and 2) a component that would be a function of the extent to which each ethanol plant reduced GHG emissions. The fixed component either could be a fixed amount per gallon of biofuel or a fixed amount per energy unit of biofuel produced. That is, it could be volume or energy content based. Implementing this option would require a means of certifying the carbon footprint for each ethanol facility. In essence, this certification would require estimation of the total GHG for the plant from the farm through the ethanol consumption, as would be required to obtain certification for a non-default number for the California Low Carbon Fuel Standard. Alternatively, it could be based on the GHG footprint for the conversion facility alone. The advantage of this approach is that at least part of the subsidy would be “pay for performance” and would provide an incentive for plants to reduce their carbon footprint. A disadvantage would be that it might be costly to certify the carbon footprint for each plant and to repeat the certification each time the plant made investments to reduce its carbon footprint. We would need to get a good idea of how large this cost would be to ascertain the potential viability of this approach.

Subsidy Based on the Energy Content of the Biofuel

At present both the corn ethanol subsidy of $0.45/gal. and the cellulose biofuel subsidy of $1.01/gal. are solely based on the volume of biofuel produced with no reference to the amount of energy produced. Particularly for the cellulosic biofuel, the volumetric basis for the subsidy favors biofuels like ethanol with a relatively low energy content because they receive a higher subsidy per unit of energy. The amount of foreign oil displaced depends on the energy content of the biofuel. A subsidy that is based on energy content is considered technology neutral. That is, the signal it sends is that the government wants to encourage renewable energy production and leaves it to the private sector to determine the most economical way to produce BTUs of renewable energy. For example, if we take the $1.01/gal. current subsidy for cellulosic biofuel and say that is pegged to bio-gasoline, then a gallon of cellulosic ethanol would receive a subsidy of $0.67, and a gallon of cellulosic diesel would receive a subsidy of about $1.14. So instead of subsidizing a volume of biofuel, this approach would subsidize biofuels based on their energy content. It levels the playing field among the different competing biofuel technologies. The Renewable Fuel Standard already takes this approach in that the RINs a biofuel receives are based on the energy content of the biofuel.

Subsidy Available only to the Quantity of Biofuel in Excess of the RFS

Many economists have argued that under certain circumstances the subsidy is redundant if we have a binding RFS mandate [5-7]. This alternative makes the subsidy available only to the quantity of biofuel blended (or produced, depending on where the subsidy is applied) in excess of the RFS. This option would substantially reduce the government budget cost of the subsidy as only the biofuel blended in excess of the RFS would receive the subsidy. According to the Renewable Fuel Association, we will have in 2012 14.6 billion gallons of ethanol production capacity, and the 2012 RFS for corn ethanol is 13.2 billion gallons. If all the capacity were used for domestic markets, the subsidy under this proposal would only apply to 1.4 billion gallons instead of the entire 14.6 billion, thereby saving $5.9 billion at the current subsidy rate.

This policy option would have no impact on corn demand relative to the current policy. Thus, whatever pressure exists on corn prices from the current policy would continue under this alternative.

The main impact of this policy would be in the RIN markets, and it would be complicated because there are unique RINs for each category of biofuels in the RFS. The proposed mechanism for implementing this option is through the RIN system. The blender would receive a tax credit for any RIN submitted beyond their blending obligation. For the conventional biofuels category, if a blender knows that they will receive 45 cents per gallon for every gallon blended beyond the RFS, then the RIN value, perhaps especially towards the end of the year, would approach 45 cents. Historically, RIN prices have been much lower than that.

There would also be complicated implementation and enforcement issues. RINs are administered by the EPA, and the blender's tax credit is administered by the IRS. So the EPA and IRS would have to coordinate carefully. In addition, since the VEETC is applicable to blenders, and "obligated parties" under the RFS2 are sometimes blenders and sometimes refiners or others, it could be very complicated to implement a system under this proposal that could function effectively.

Eliminate the Subsidy and Import Tariff and Use the Resources to Expand Demand

This option would phase out the subsidy and import tariff but retain the equivalent amount of government resources to subsidize expansion of blender pumps, E85 pumps, and other infrastructure. A common perception in industry is that much of the current subsidy is not reaching ethanol producers and that given the blend wall, the bigger problem is expanding ethanol demand. Thus, this approach argues for using government resources to help create the infrastructure needed for E85 and other blends. As Tyner et al. have documented [3], the amount of investment needed to create the infrastructure is large, and this policy approach is designed to get the investment moving.

Perhaps the biggest problem with this option is that even if the infrastructure exists, the price of E85 would have to be competitive with E10 to get consumers to purchase E85. As indicated earlier, if the retail price of E10 is $3.50, E85 would have to be $2.73 or lower to entice consumers to purchase E85. It is not at all clear that E85 can be produced and marketed for 78% of the price of E10, which is what would be needed. Some argue that if the infrastructure exits, oil companies would be forced to cross-subsidize E85 because they would have to meet the RFS levels that rise to 15 bil. gal. in 2015. The market might eventually evolve that way, but it is likely to be slow to get going.

Combinations of the Options

Some of these options could be combined to produce hybrid alternatives. For example, the energy based approach could be used along with a variable subsidy or along with the two part subsidy including "pay for performance."

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