



## How to Fix a Broken Biofuel Incentive System

Posted by [Robert Rapier](#) on October 14, 2011 - 3:10pm

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The Renewable Fuel Standard (RFS) program, created under the Energy Policy Act of 2005, mandated that increasing volumes of ethanol must be blended into the nation's gasoline supplies. The [2007 Energy Independence and Security Act](#) accelerated and expanded the original mandates with the RFS2. The RFS2 also mandated the use of advanced biofuels: 100 million gallons of cellulosic ethanol in 2010, 250 million gallons in 2011, 500 million gallons in 2012, and eventually [16 billion gallons of cellulosic biofuels by 2022](#). This mandate was issued despite the fact that there were no commercial cellulosic ethanol plants in operation.

While the mandates for corn ethanol have been met, [I said quite explicitly](#) from the start that the cellulosic ethanol mandates were wishful thinking, and that there was practically zero chance of meeting the targets. There are a number of reasons for this, but the fundamental reason is that cellulosic ethanol is not new technology, and can't be expected to advance according to [Moore's Law](#). The United States actually [had two commercial cellulosic ethanol plants](#) in operation by 1920. Both plants were later shut down due to poor economics, and there were numerous attempts over the ensuing decades to commercialize cellulosic ethanol.

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To illustrate one of the key issues in simple terms, imagine that you have to extract the ethanol from Bud Lite as the fuel for your car. Beer contains about the ethanol concentration that is achieved when cellulosic ethanol is produced (and in many cases, beer has a higher alcohol concentration). Of course Bud Lite is mostly water, and it takes a lot of energy to get that water out. Therein lies one of the biggest problems.

Of the 100 million gallons mandated in 2010 and 250 million gallons mandated this year, how much was actually produced? **Zero qualifying gallons.** As of today, there is still [no qualifying production](#). For 2012, the EPA is considering reducing the 500 million gallon mandate to [as little as 3.5 million gallons](#). This is a reduction of over 99%, and should be a crystal clear indication that this system is not working as intended.

But even though product isn't being delivered, taxpayers and consumers are still paying a price. We are on the hook for grants and loan guarantees that have been given to plants that have not — and in some cases never will — produce any cellulosic ethanol. Further, [the system penalizes gasoline blenders](#) for not purchasing cellulosic ethanol — despite there being no qualifying cellulosic ethanol on the market to buy. Due to the mandates, blenders must either purchase cellulosic ethanol — or buy waivers that are akin to [indulgences](#) for their sin of not purchasing cellulosic ethanol. This drives up costs for blenders and ultimately consumers. So taxpayers are subsidizing plants, blenders are spending money to meet mandated obligations that can't be met — and zero gallons of qualifying cellulosic ethanol have been produced under this system. The current system is failing badly for a very fundamental reason: You can't mandate technological breakthroughs, and therefore the government should not attempt to choose technology winners

such as cellulosic ethanol.

Congress is now under intense pressure to slash spending across the board. There is a real risk of total loss of support for next-generation biofuels given the history of the program to date. What is really needed is a different system that provides incentives only when product is delivered, and doesn't penalize taxpayers, consumers, and gasoline blenders if no product is delivered. The current system is convoluted and hard to understand for most people, and it makes it easy to hide behind excuses if promised technology fails to deliver. So let's strip it down, make it simple, and reduce the risks to taxpayers.

### **My Plan: Award Direct Per Gallon Subsidies for Oil Displacement**

Instead of offering grants and loan guarantees for cellulosic ethanol producers — and forcing blenders to pay when they can't purchase product — simply change the system to a direct per gallon subsidy for product that is sold. Here is how such a system could work.

1. Administer this program from the Department of Energy rather than the Environmental Protection Agency. This is more in line with their area of expertise and responsibility.
2. Eliminate the de facto carve-out for cellulosic ethanol. We want to displace petroleum here, but it isn't necessary to pick technology winners. Perhaps someone has a viable process for [biomass-based DME](#) that could displace lots of diesel and [drastically reduce emissions](#). Under the current system, the playing field is politically tilted strongly in the direction of cellulosic ethanol. But let's assume for a second that cellulosic ethanol simply fails to deliver. Then under the current system we have done a tremendous disservice to competing biofuels by choosing cellulosic ethanol as a winner, and we have wasted valuable time and money chasing dead ends.
3. Offer an initially generous, but declining direct per gallon subsidy for all qualifying biomass-based fuels. For example, offer a direct \$2/gallon subsidy for the first 250 million gallons of qualifying fuel produced and sold as transportation fuel from a facility, and then \$1/gallon for the next 250 million gallons of qualifying fuel produced. Based on the expected size of these facilities (probably no more than 50 million gallons or so due to logistical issues) then that would amount to a government subsidized off-take for 10 years.
4. Require all interested parties to register and pay a modest fee to the DOE to have their process evaluated. That sets the bar pretty low, but serves as a filter against the DOE being overwhelmed with half-baked ideas. If the DOE approves the process as qualifying (which I would base largely on the level of oil actually displaced -- which means processes have to have favorable energy balances) both parties sign a contract committing the DOE to subsidize the qualifying product. This lowers the risk of having funding cut on the basis of the next election.
5. Eliminate all grants and loan guarantees for these facilities. Why? Because they subject taxpayers to undue risk, and under the proposed system the prospective producer has what is effectively an off-take agreement with the DOE that should be financeable by a bank.
6. Let the technologies then battle it out for supremacy in the marketplace just like other products breaking into new markets. We will have simply tilted the playing field away from oil and toward biofuels. If a \$2/gallon subsidy isn't enough to generate some next generation biofuels, then we will need to seriously reevaluate the viability of some of the next generation candidates. This system will certainly separate the pretenders from the contenders.

### **Private Business Should Take Over From the Government and Taxpayers**

Such a system would have huge advantages over the current system. First, private business is now assuming the technology risk, and therefore will be responsible for conducting a high level of

due diligence. This takes the technology risk assessment out of the hands of the government. Second, taxpayers won't end up financing plants that never deliver, and gasoline blenders won't pay penalties for product that never appears. Third, such a system makes it really clear just how "out of the money" certain technologies are. For instance, if you don't see any algal biofuel producers stepping up under this system, then you know their costs are more than \$2/gallon above those of the equivalent petroleum product.

Critics of this system might suggest that refiners would refuse to buy the product because they don't want competition for oil. There is absolutely no merit in that argument. Oil companies have to buy most of the oil they refine anyway. They buy raw materials and sell them as fuel. A refiner is in the business of making money. If a cellulosic ethanol producer can produce ethanol for \$1 or \$2 a gallon — as many have claimed — they could sell to the refiner at far lower than the price of oil. For that matter, if they made it for \$1/gallon they could give it away and make money with a \$2/gallon subsidy. The refiner is going to buy whatever makes them the most money (which is [why oil refiner Valero bought six ethanol plants](#)). Maybe that's cellulosic ethanol for \$1.50 a gallon, or maybe it's drop-in algal diesel at \$2.50 a gallon. But what oil companies will not do is spend \$3 a gallon buying oil from Venezuela if they can get renewable diesel from [Solazyme](#) at \$2.50 a gallon.

Other critics might say that we have no business subsidizing biofuels in any case. On that point, I disagree. I think our dependence on oil is a threat to our economy and our national security, and as such warrants spending money on aggressively developing alternatives. While biofuels can't possibly replace the amount of oil we consume, they can make a contribution and I believe they can be done responsibly. But I leave that debate for another day. For the sake of this essay, let's say that *if* we decide that biofuels should be subsidized then what I am proposing is a better way to go.

Who might oppose such a system? Obviously, those who have gotten (or expect to get) grants and guarantees under the current system — but who will not be able to deliver per their promises — would be the ones most staunchly opposed. After all, these are the companies that are ultimately unaccountable for the taxpayer money they spend. A second category that might come out against my proposal are suppliers of equipment and raw materials who are benefiting under the current system. As a hypothetical, under the current system we might see ten plants built and one deliver. Under my proposed system, we might see five plants built and three deliver because more of the pretenders will be screened out. Who loses in that scenario? Anyone who lost out on building those five additional plants that ended up rusting away when they couldn't deliver. (In fact, Novozymes, a clear beneficiary under the current system since they are a major provider of enzymes to this imagined industry -- unsurprisingly [came out against my proposal](#)).

The system I am proposing would be a transparent way to filter out those who are essentially just hyping their technologies in order to receive tax dollars. Thus, you can imagine that those who are after tax dollars under the current system might strongly oppose such a change. But if a cellulosic ethanol producer can really produce ethanol for \$2/gallon — and you don't see them building plants when a \$2/gallon subsidy is available — then you can be pretty sure that they can't really do what they claim they can do. Producers will be paid for what they deliver as opposed to what they claim they can deliver, and it isn't taxpayers who are on the hook for their hype.

*Note: I will be presenting at [this year's ASPO Conference](#) in Washington, D.C. Current plans are that I will give a talk on how to conduct technical due diligence on energy companies, a talk on our "new energy reality", and then finally I will participate in an investors roundtable that includes Jim Hansen, Charles Maxwell, and Charles Schlumberger.*



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