

**Testimony to
House Committee on Energy and Commerce
Presented by
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April 18, 2007**

Good morning to you Mr. Chairman and to the Members of the Committee. Thank you for the invitation to appear before you this morning. I appreciate the opportunity both to comment on the tremendous potential of cellulose ethanol and to offer our thoughts how the government can work with industry to help unlock that potential.

My name is Brian Foody and I am the President and CEO of Iogen Corporation. Iogen Corporation is one of the world leaders in the cellulose ethanol field. We are proud to have been selected as one of the winners of the recent Department of Energy cellulose ethanol grant solicitation and look forward to a successful completion of our negotiations with the DOE.

At Iogen, we have been producing cellulose ethanol in our demonstration plant in Ottawa since 2004. To attend this hearing, I drove to the airport in a cellulose ethanol fuelled E85 flexible fuel Chevy Impala. In fact, we have been producing sufficient volumes of cellulose ethanol – primarily from wheat straw – to fuel our own fleet of FFVs as well as the fleets of two Canadian government Departments.

Let me say a few words about the benefits of cellulose ethanol and its potential to help America achieve several important policy objectives.

There are at least three important government policy objectives that cellulose ethanol can help achieve.

- Energy security
- New economic opportunities for rural communities
- Reduced greenhouse gas emissions associated with operating our cars and trucks

Of these, the most pressing is energy security. So the question many of us are asking is, how much can the emerging cellulose ethanol industry really deliver on its potential, and how quickly can it be done?

In order to answer that, we need to start with the feedstock opportunity. The Department of Energy and the Department of Agriculture worked together on a study of this issue. Their findings, published in an April 2005 report now known as the “Billion Ton Study”, found that even with conservative assumptions about yields from crop residues and dedicated energy crops, the United States can annually produce in excess of one billion tons of cellulose feedstock for conversion to ethanol and other bio-refinery products.

That study is available online at
http://feedstockreview.ornl.gov/pdf/billion_ton_vision.pdf.

At the current state of demonstrated efficiency, cellulose ethanol production facilities could convert that material into 30 billion gallons of ethanol. Now there are obvious hurdles between here and there that will greatly effect how much and how quickly ethanol can be produced from that feedstock material.

The first issue is commercial demonstration of the technology. This Committee's work in EPACT established both a grant and a loan guarantee program to accelerate the demonstration of conversion technologies, and likely you are familiar with the state of implementation of those programs.

Next will be the challenges of building large-scale production facilities – as large as or larger than current starch ethanol facilities – in the feedstock basins around America. These challenges are common to any new production facility. Sites will have to be chosen and permits obtained. Feedstock supply contracts will have to be entered into and delivery programs will have to be established. Offtake contracts will have to be reached, and the transportation of the finished product will have to be arranged.

These challenges are not insignificant, but neither are they likely to prevent the rapid deployment of any robust cellulose conversion technology that has been proven to the satisfaction of likely investors. Investors are eager for opportunities to diversify energy holdings when there is an opportunity for sustained profitability.

One illustration of investor interest in new energy technologies is in the recent, steady expansion of integrated oil sands operations. That sector has been adding roughly 10 billion gallons per year of addition capacity with few signs of slowing.

In short, cellulose technology continues to face important business challenges, but I have every confidence that each challenge is manageable, and that ethanol from cellulose feedstocks can be a significant component in this nation's transport fuel mix.

The real challenge to unlocking the potential of cellulose ethanol is quickly becoming more about policy than technology. In order for the industry to begin producing the tens of billions of gallons of which it is capable, billions of dollars of private investment must be deployed to build plants and infrastructure.

The first challenge facing public policy is assisting industry to complete demonstrations at commercial scale for technologies that have been proven at smaller scale. Congress squarely addressed this need when it included loan guarantee and grant opportunities in the Energy Policy Act of 2005 (EPAAct). The Department of Energy (DoE) is actively implementing those provisions now.

It is clear that the DoE is working hard to move those programs along quickly. We would encourage all policy makers to support those efforts. We would also encourage those charged with implementation and oversight of the Loan Guarantee program to

assiduously avoid the temptation to consider using this form of assistance for projects or technologies that are not capable of proving their readiness for commercial demonstration. Technologies that need further time for research and development should be given generous opportunities to receive grants and other R&D assistance because America needs all its creative potential to address its policy goals. But the Loan Guarantee instrument is not well suited for projects that either lack a mature technology that has been through rigorous validation at an industrial scale, or lack a thorough analysis of the financing fundamentals including the ability to repay a loan from project revenue.

Having largely addressed commercialization assistance in EPAct, this Committee's next challenge is to prepare the way for significant cellulose ethanol production capacity by establishing policies that will draw sufficient capital into the effort to deploy proven technologies.

The key on this front will be establishing policies that create enough certainty in the market to unleash the private sector equity and energy needed to build this industry. Absent that certainty, investors will be cautious, and will demand higher returns where they perceive higher risks. That will drive up the costs of supplying the market. Absent that certainty, farmers will be reluctant to consider planting dedicated energy crops or signing contracts to supply food crop residues to potential buyers.

So Congress should act to establish clear, ambitious, and visionary targets for future cellulose ethanol production. By setting a national expectation for a market in cellulose ethanol, the government will establish the first component of certainty necessary for significant private investment – anticipation of market demand.

Any legislation developed to drive investment in cellulose ethanol should address some basic needs. For example, a bill should create a system that will allow cellulose ethanol producers to join the fuel market in a way that does not undermine or conflict in any way with the established starch ethanol producers. That is critical because starch ethanol will remain the bedrock of the biofuels industry for some time to come. Without starch ethanol, the country would simply not be able to achieve ambitious targets for alternatives to foreign oil.

Additionally, legislation should send a clear signal that the government is serious about a steady expansion of its commitment to cellulose ethanol. The goals of 3 billion gallons of advanced biofuels by 2016 and 21 billion gallons by 2022 included in S. 987 by your colleagues in the Senate are both ambitious and achievable. These targets would set the fundamental precondition to the development of an advanced biofuels industry by establishing a clear market demand for the product.

Establishing such targets will further energize the industry to complete the commercial demonstration of its technologies and begin deploying them. Furthermore, these targets will establish a basis for confidence among all participants in the value chain that business opportunity of cellulose ethanol is very real. That confidence is an essential

precursor to the preparations, planning, negotiations, and other business activities needed to grow this industry.

If such legislation is enacted, farmers will begin to think seriously about the possibilities of selling their residues for profit, and managing their crops to enable them to do that. When the time comes for farmers to consider planting dedicated energy crops such as switchgrass, absent a clear signal that the market opportunity exists, they would be crazy to take such a leap. The same is true of the capital markets that will be needed to support the deployment of cellulose ethanol production technologies. Investors will not risk capital if there is not confidence that the market will sustain adequate returns.

Some of your colleagues might ask why you need to offer market guarantees in this free-market system. My answer would be simply, that this is a case where we do not want the market to dictate the outcome unaided by clear policy guidance. The main policy goal at hand should be to secure for America the myriad benefits of a more diverse, and domestically produced, fuel supply. Left to its own, the market will not accomplish that outcome because absent a policy signal there is no means of valuing energy security in the marketplace. Once the industry has confidence that a sustained market demand has been established, business will engage aggressively to not only supply that market, but to do so better, faster and cheaper than anyone else.

Now let me turn to another aspect of using policy to create market certainty – designing a safety valve to complement any market targets that might be established in legislation. The government needs to concern itself about over-committing to cellulose ethanol as much as it needs to commit to it. That is a tough balance. Some of your colleagues will ask what will happen if the technology cannot deliver the desired volume. Not only will you and your colleagues want assurances that the cellulose ethanol industry can deliver, that delivery must come at reasonable cost. Nobody wants to commit the nation to buying ethanol at unreasonably high prices.

By the same token, the cellulose ethanol industry and its investors will need to know that, the significant investments needed to deliver the anticipated volume will not be stranded by future changes in policy. The private sector will need confidence that the Program can be relied upon not to disappear or change radically.

Some might expect that setting ambitious targets for cellulose ethanol will be sufficient incentive for capital formation. But mandates alone still carry risk to investors who have a responsibility to question the future political stability of any policy that is the basis of an investment decision. Investors will ask, for example, how would policy makers respond if only 80% of the expected capacity can be on-line by a target date established in law? Would there be political pressure in such a case that would cause the targets and mandates to be repealed – possibly putting at risk investments already made? Might the level of gasoline prices in the future – either very high or very low – lead to entirely suspending a mandate for cellulose ethanol? What happens if ambitious goals for cellulose ethanol cannot be fully satisfied for any reason?

In the investment community, these uncertainties will translate into risk premiums. That will drive up the cost of supplying the ethanol to meet your targets. Conversely, greater certainty will enable lower costs and, therefore, make the policy not only more durable, but also more popular.

What we want to avoid is a situation similar to the California zero emission vehicle experience where laudable policy objectives were never achieved because the necessary safety mechanisms were not in place. In that case, there was clearly progress toward the goal, but not enough to sustain the program as originally envisioned. Those who invested based on the established public policy ultimately looked foolish, while those that chose not to invest in the new policy direction ultimately looked wise. Instead, public policy should reward and protect even incremental progress toward ambitious goals. At the same time policy should not hold the economy hostage when initial ambitions prove unreachable, because that creates political pressure to scrap the policy entirely.

So how do we manage these concerns? What mechanisms would we propose to ensure the industry can deliver billions of gallons of certifiable cellulose ethanol at a reasonable price, and achieve the Senate's policy objectives? Let me start by saying that we have given this question a lot of thought and we do not presume to have it all figured out.

It is important to create a safety valve that sustains the incentive to reach the overall goal while at the same time temporarily backing off the target only to the extent that it is beyond reach. If the cellulose ethanol industry were to succeed only in producing 80% of your ambitious targets by a given date, that should not precipitate a crisis. Instead, appropriate – and predictable – adjustments should be made that reward the progress and sustain the overall goal.

While exploring possible safety mechanisms to ensure success we have landed on some basic principles that could guide us. For example, we do not want to suspend market conditions within the market supplying the demand for advanced biofuels. We also believe that waivers should not reduce the Renewable Fuel Standard below current and planned production volumes unless additional volume can not come online at reasonable costs. Any safety mechanism should be both transparent and predictable. Doing so would improve the certainty offered potential producers and investors. It would also make any goal for expanding cellulose ethanol more sustainable and less subject to future changes in political moods and priorities.

Another area where more clarity would assist concerns how grain derived ethanol and cellulose derived ethanol will be differentiated. That becomes a concern because once ethanol is 'out the door,' ethanol is ethanol. So it will be important to create a mechanism that allows the market to treat all ethanol the same, no matter the feedstock that was used to produce it, but at the same time, will enable certainty as the government attempts to track compliance with the dual ethanol requirements for blenders. This might most easily be accomplished by certification of individual cellulose production facilities as they come on-line and assigning specialized tracking numbers to the tradable credits generated by those certified facilities.

There is one other important topic I wish to touch on. The auto industry is a critical part of the transition that is envisioned by this legislation. It is critical that they be given equally clear and reliable signals regarding what fuel their products will be expected to run on. And there will need to be sufficient time to allow the fleet to transition to accept new fuel blends. No matter whether the Congress decides to pursue maingrade blends of ethanol like E-15 and E20, or alternative blends like E-85, if the cars cannot accept it, the suppliers will not be able to sell it. I would urge the Members of this Committee to give that issue the attention it deserves.

But let me conclude by going back to my theme of certainty. Clearly the more certainty in any bill you might create, the less risk to the private sector and hence the lower will be the price of delivering the volume of cellulose ethanol you might want. Conversely, uncertainty creates greater risk and higher prices.

The Iogen team would welcome the opportunity to work with the Committee to explore possible legislative mechanisms to achieve the Committee's desired outcome.

Again, thank you for the opportunity to address this Committee.