

**Science and Technology Committee
Energy and Environment Subcommittee
United States House of Representatives**

**Hearing on
H.R. 547 - the Advanced Fuels Infrastructure Research and Development Act**

Testimony of

**Bob Dinneen
President & CEO, Renewable Fuels Association**

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Good afternoon, Mr. Chairman and Members of the Subcommittee. My name is Bob Dinneen and I am president of the Renewable Fuels Association, the national trade association representing the U.S. ethanol industry.

This is an important and timely hearing, and I am pleased to be here to discuss the growth in the domestic ethanol industry, and the increasingly important role of continued research and development of infrastructure for our nation's biofuels industry. The rapid growth of our domestic ethanol industry since the passage of the Energy Policy Act of 2005 (EPAct) had led to the growth of ethanol's virtual pipeline. The continued expansion of the industry will require greater development of infrastructure in many areas around the country. Research into the feasibility of transporting ethanol by pipeline from the Midwest to the East and West coasts, such as the provisions outlined in H.R. 547, will also be important.

The ethanol industry today is on the cutting edge of technology, pursuing new processes, new energy sources and new feedstocks that will make tomorrow's ethanol industry unrecognizable from today's. Ethanol companies are already utilizing cold starch fermentation, corn fractionation, and corn oil extraction. Companies are pursuing more sustainable energy sources, including biomass gasification and methane digesters. And there is not an ethanol company represented by the RFA that does not have a cellulose-to-ethanol research program.

The Science and Technology Committee can have an important role in accelerating these efforts by promoting and targeting research and development funds appropriately. The U.S. ethanol industry has identified several areas where new research can advance the renewable energy agenda further:

- Increase utilization of co-products and development of new co-products;

- Development of harvesting equipment, and tools to streamline the transportation and storage of cellulose feedstocks;
- Improve energy efficiency and reduce energy consumption; and,
- Improve cellulose feedstock conversion technologies.

Support through research to build upon the industry's advancements in technologies will be critical to the future growth of the biofuels industry. Programs authorized by EPAct, such as the cellulose ethanol loan guarantee programs (Title XV and Title XVII) and biorefinery grant program (Section 932(d)), to accelerate the commercialization of cellulose ethanol must be fully funded.

Background

Today's ethanol industry consists of 111 biorefineries located in 19 different states with the capacity to process more than 1.8 billion bushels of grain into 5.4 billion gallons of high octane, clean burning motor fuel, and more than 12 million metric tons of livestock and poultry feed. It is a dynamic and growing industry that is revitalizing rural America, reducing emissions in our nation's cities, and lowering our dependence on imported petroleum.

Ethanol has become an essential component of the U.S. motor fuel market. Today, ethanol is blended in more than 46% of the nation's fuel, and is sold virtually from coast to coast and border to border. The almost 5 billion gallons of ethanol produced and sold in the U.S. last year contributed significantly to the nation's economic, environmental and energy security. According to an analysis completed for the RFA¹, the approximately 5 billion gallons of ethanol produced in 2006 resulted in the following impacts:

- Added \$41.1 billion to gross output;
- Created 160,231 jobs in all sectors of the economy;
- Increased economic activity and new jobs from ethanol increased household income by \$6.7 billion, money that flows directly into consumers' pockets;
- Contributed \$2.7 billion of tax revenue for the Federal government and \$2.3 billion for State and Local governments; and,
- Reduced oil imports by 170 million barrels of oil, valued at \$11.2 billion.

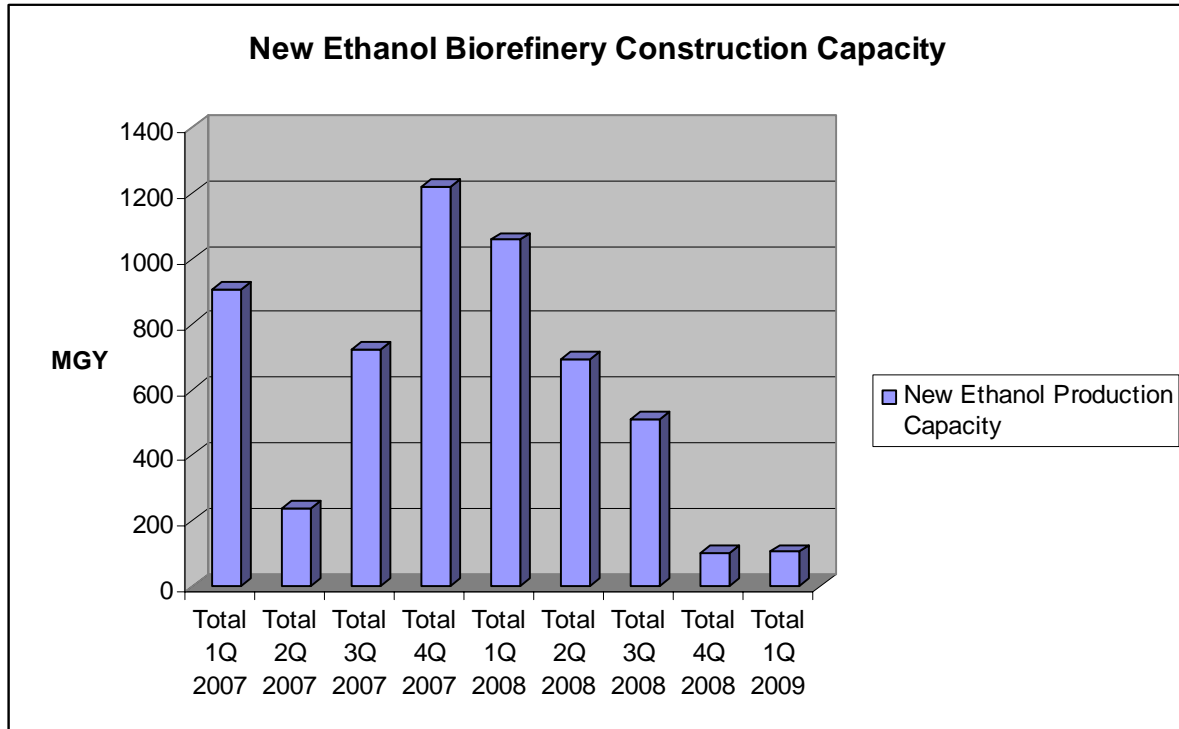
In addition to providing a growing and reliable domestic market for American farmers, the ethanol industry also provides the opportunity for farmers to enjoy some of the value added to their commodity by further processing. Farmer-owned ethanol plants account for half of the U.S. fuel ethanol plants and almost 40 percent of industry capacity.

This dynamic and growing industry is also empowering more of America to have a vital role in our nation's infrastructure. If a farmer in Des Moines doesn't want to invest in the local co-op, he can choose to invest in a publicly traded ethanol company through the stock market. As can a schoolteacher in Boston, or a receptionist in Seattle. Americans coast-to-coast have the

¹ *Contribution of the Ethanol Industry to the Economy of the United States*, Dr. John Urbanchuk, Director, LECG, LLC, December, 2006.

opportunity to invest in our domestic energy industry, and not just in ethanol, but biodiesel and bio-products. U.S. agriculture is evolving in very important ways, and rural America is primed to take advantage of these opportunities.

There are currently 78 biorefineries under construction. With seven existing biorefineries expanding, the industry expects more than 6 billion gallons of new production capacity to be in operation by the end of 2009. The following is our best estimate of when this new production will come online.



Infrastructure

The existing motor fuel pipeline system was built by the Federal government to accommodate an oil and gas industry producing in the Gulf Coast. To utilize the existing pipeline system, ethanol producers would have to ship ethanol first to the Gulf Coast to load up on a pipeline. It would be much more cost effective to instead ship the ethanol directly to the markets that demand the fuel.

Thus, over the past several years, the ethanol industry has worked to expand a “Virtual Pipeline” through aggressive use of the rail system, barge and truck traffic. As a result, we can move product quickly to those areas where it is needed. Many ethanol plants have the capability to load unit trains of ethanol for shipment to ethanol terminals in key markets. Unit trains are quickly becoming the norm, not the exception, which was not the case just a few years ago. Railroad companies are working with our industry to develop infrastructure to meet future demand for ethanol. The biofuels industry is working closely with terminal operators and refiners to identify ethanol storage facilities and install blending equipment. We will continue to

grow the necessary infrastructure to make sure that in any market we need to ship ethanol there is rail access at gasoline terminals, and that those terminals are able to take unit trains.

Incidentally, the existing oil and gas pipeline system itself is filled to near capacity today. The fact that ethanol does not have to be shipped on those pipelines, because the ethanol industry can get our product to the markets where it needs to go with the “Virtual Pipeline,” means that consumers are able to get 10 percent more volume shipped to their area on existing pipelines that is helping to hold down the cost of gasoline.

That said, many stakeholders in the biofuels industry are beginning to look at the practical issues involved with shipping ethanol via a dedicated pipeline. Shipping ethanol in pipelines is done today in Brazil, and it has been done at times in the U.S. as well, in dedicated pipelines. If the marketplace demands it, as it does in Brazil, and there is enough ethanol demand to warrant the investment in the infrastructure for dedicated pipelines, such a system will develop in the U.S.

The Renewable Fuels Association has also supported the concept of regional “corridors” that concentrate the E-85 markets first where the infrastructure already exists.

Ethanol today is largely a blend component with gasoline, adding octane, displacing toxics and helping refiners meet Clean Air Act specifications. But the time when ethanol will saturate the blend market is on the horizon, and the industry is looking forward to new market opportunities. As rapidly as ethanol production is expanding, it is possible the industry will saturate the existing blend market before a meaningful E-85 market develops. In such a case, it would be most beneficial to allow refiners to blend ethanol in greater volumes, e.g., 15 or 20 percent. The ethanol industry today is engaged in testing on higher blend levels of ethanol, beyond E-10. There is evidence to suggest that today’s vehicle fleet could use higher blends. An initial round of testing is underway, and more test programs will be needed. Moving to higher blend levels with our current vehicle fleet would have a significant positive impact on the U.S. ethanol market, without needing to install new fuel pumps and wait for a vehicle fleet to turn over in the next few decades. It might also allow for a smoother transition to E-85 by growing the infrastructure more steadily.

Research & Development, Deployment and Commercialization of New Technologies

The Department of Energy’s Advanced Energy Initiative has set a goal of making cellulosic ethanol costs competitive by 2012. Funding for additional research in cutting-edge methods of producing ethanol from corn stover, wheat straw, rice straw, wood chips and switch grass – to name just a few -- will play a critical role in the Initiative’s success or failure.

The most effective way to speed the commercialization of cellulose ethanol is to fully fund the programs enacted in the Energy Policy Act of 2005 (EPAct) for research and development for cellulosic ethanol. The technology exists to process ethanol from cellulose feedstocks; however, commercialization of cellulosic ethanol remains a question of economics. The capital investment necessary to build cellulosic ethanol facilities remain about five times that of grain-based facilities. Those costs will, of course, come down once the first handful of cellulosic facilities are built, the bugs in those “first mover” facilities are worked out, and the technology

continues to advance. The enzymes involved in the cellulosic ethanol process also remain a significant cost, as well. While there has been a tremendous amount of progress over the past few years to bring the cost of those enzymes down, it is still a significant cost relative to processing grain-based ethanol.

Increasing funding for such EAct programs as the federal loan guarantee program for cellulose-based biorefineries, and the biorefinery grant program would do more to advance the commercialization of cellulose ethanol in a shorter period of time than to enact any of the cellulose-related legislation proposed since EAct as enacted. Funding for EAct programs like the bioenergy program for biofuels and bioproducts would encourage industry and university partnerships to develop price competitive biochemical and thermo chemical conversion technologies from lignocellulosic feedstock and enzyme-based processing systems.

As flexible fuel vehicle (FFV) production is ramped up, it is important to encourage the use of the most efficient technologies. Some FFVs today experience a reduction in mileage when ethanol is used because of the differences in BTU content compared to gasoline. But the debit can be easily addressed through continued research and development. For example, General Motors has introduced a turbo-charged SAAB that experiences no reduction in fuel efficiency when E-85 is used. There is also technology being development that utilizes “variable compression ratio engines” that would adjust the compression ratio depending on the fuel used. Thus, if the car’s computer system recognized E-85 was being used, it would adjust the compression ratio to take full advantage of ethanol’s properties. This technology could dramatically improve E-85 economics by eliminating or substantially reducing the mileage penalty associated with existing FFV technology.

Conclusion

The 109th Congress enacted several polices that clearly put our nation on a new path toward greater energy diversity and national security. Additional and more focused research and development programs, and increased funding levels for EAct 2005 programs, will be critical to the rapid deployment and commercialization of new technologies for biofuels. Infrastructure will need to continue to expand and advance as the biofuels market does. The continued commitment of this Committee, the introduction of legislation such as H.R. 547, and the 110th Congress will all contribute to ensuring America’s future energy security.

Thank you.