April 29, 2013

The Honorable Fred Upton
Chairman
Energy and Commerce Committee
U.S. House of Representatives
2125 Rayburn House Office Building
Washington, DC 20515

The Honorable Henry A. Waxman
Ranking Member
Energy and Commerce Committee
U.S. House of Representatives
2322A Rayburn House Office Building
Washington, DC 20515

via email at: rfs@mail.house.gov

Dear Chairman Upton and Ranking Member Waxman:

The Biotechnology Industry Organization (BIO) is pleased to comment on the U.S. House of Representatives Committee on Energy and Commerce's (Committee) second Renewable Fuel Standard (RFS) assessment white paper[1] reviewing the RFS's agricultural sector impacts.

Introduction:

BIO is the world's largest biotechnology organization, with more than 1,100 member companies worldwide. BIO represents leading technology companies in the production of conventional and advanced biofuels and other sustainable solutions to energy and climate change. BIO also represents the leaders in developing new crop technologies for food, feed, fiber, and fuel.

These companies are developing new and innovative ways to help fuel America and the world; providing more environmentally friendly energy crops, cleaner-burning biofuels and renewable chemicals that help reduce greenhouse gas emissions and provide more sustainable sources of energy and materials. These companies are also developing biotechnology crops enabling farmers around the world to produce more abundant harvests on less land with reduced irrigation water, fuel and chemical inputs, and less stress on the environment. Given BIO's broad and diverse set of member companies involved in both energy and agricultural production, we are able to provide a unique perspective on the issues the Committee is seeking to have answered regarding the Agricultural Sector Impacts of the RFS.

As discussed in our response to the Committee's first white paper,[2] the RFS has been a success in driving the commercialization of technologies helping to reduce the U.S. transportation system's overwhelming reliance on foreign petroleum. The RFS provides exactly the type of long-

[1] U.S. House of Representatives Energy and Commerce Committee. 18 Apr. 2013. *RENEWABLE FUEL STANDARD ASSSESSMENT WHITE PAPER: Agricultural Sector Impacts* http://energycommerce.house.gov/sites/republicans.energycommerce.house.gov/files/analysis/20130418RFSWhitePaper2.pdf

[2] Biotechnology Industry Organization. 5 Apr. 2013. *BIO Comments on U.S. House of Representatives Committee on Energy and commerce's White Paper Reviewing the Renewable Fuel Standard (RFS)*. http://www.bio.org/ advocacy/letters/bio-comments-us-house-representatives-committee-energy-and-commerces-white-paper-re

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term regulatory stability needed to send a signal to investors to develop a domestic biofuels industry that lessens our dependence on foreign fuels and creates jobs in America, using homegrown technology.

This will help consumers out not only at the pump, but also at the grocery store, where it has been demonstrated the price of oil has the greatest impact on food inflation – and most other measurers of inflation – according to the U.S. Energy Information Administration.[3] Congress established the RFS to encourage the use of existing biofuels and the development of advanced biofuels in order to reduce our reliance on the rising cost and price volatility of foreign oil. Therefore, it is crucial we maintain the RFS in order to spur on alternative energy production to stabilize and lower both energy and food costs.

White Paper Response:

The Committee has again requested comments on a list of questions in this white paper. In order to properly address each question, this paper has each question italicized and listed below. BIO's response will directly follow each question.

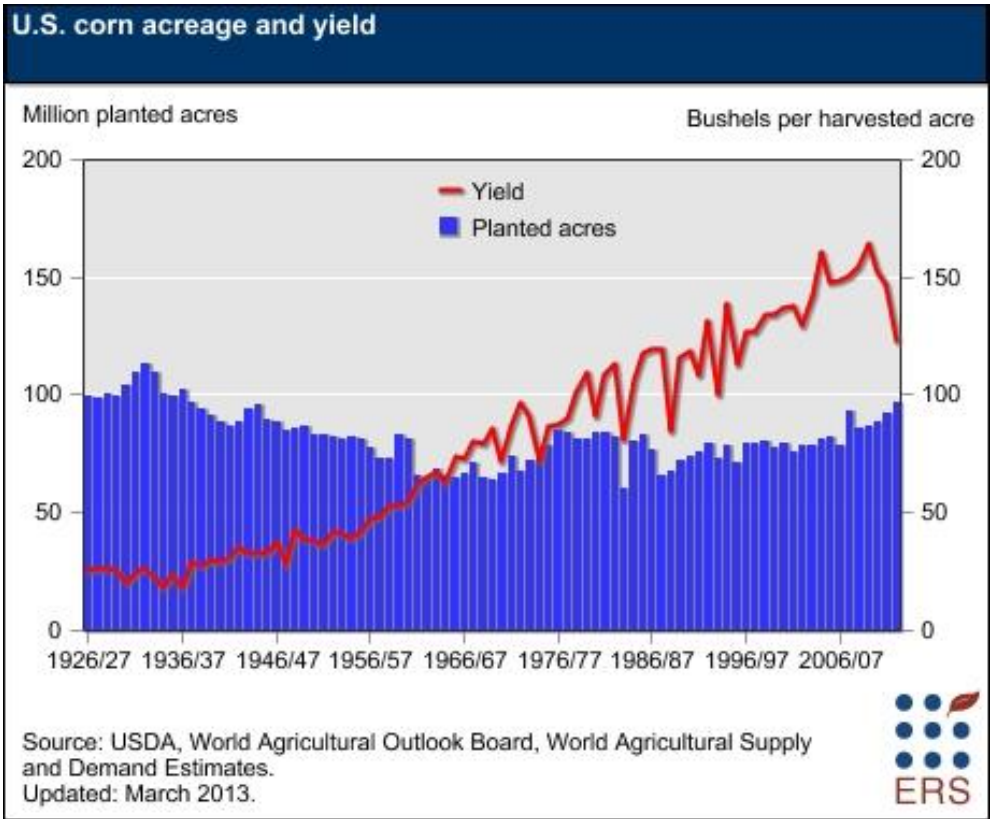
Energy and Commerce Committee, RENEWABLE FUEL STANDARD ASSESSMENT WHITE PAPER, Agricultural Sector Impacts, Questions for Stakeholder Comment

1. ***What has been the impact of the RFS on corn prices in recent years? What has been the impact on soybean prices? Have other agricultural commodity prices also been affected?***

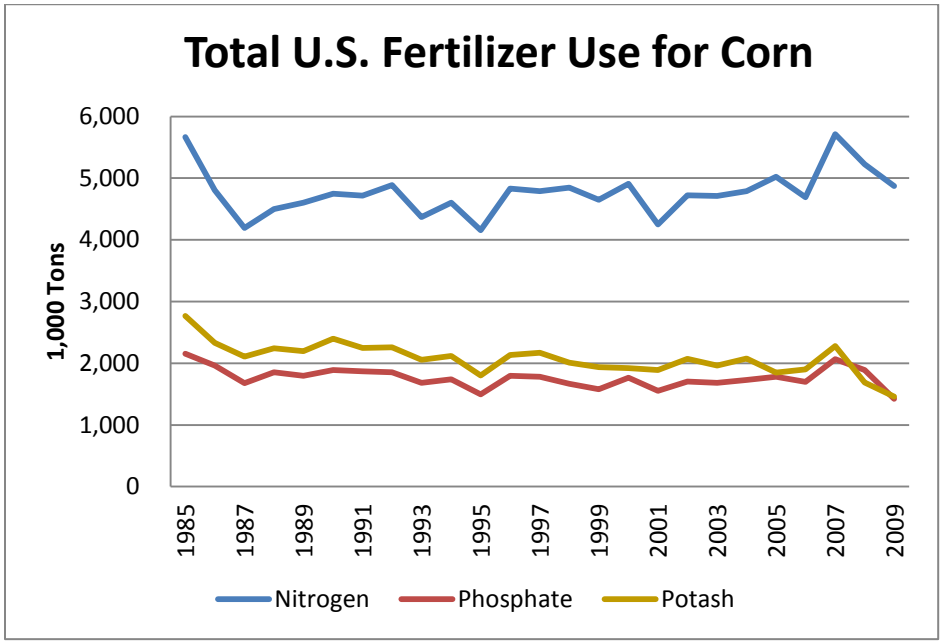
   The impact the RFS has had on grain prices and other commodities is minimal at best. While demand for ethanol production has resulted in an overall greater demand for corn, farmers have been able to meet much of this demand by producing greater yields from fewer acres, following improvements made possible because of biotechnology. This has minimized the need for crop expansion. U.S. yields of corn have risen consistently, with fewer fluctuations since introduction of biotech seed in 1995. Leading scientists have calculated, "the food-fuel dilemma could be avoided if we took full advantage of biotechnology, which would lead to increased supply and reduced agricultural commodity prices."[4]

[3] U.S. Energy Information Administration. 28 Sep. 2012. *Increases in oil prices affect broader measures of inflation.* http://www.eia.gov/todayinenergy/detail.cfm?id=8170

[4] FutureScience. Nov. 2012. *Ask the Experts: The food versus fuel debate*. Biofuels 3(6) 635-648. http://www.future-science.com/doi/abs/10.4155/bfs.12.59



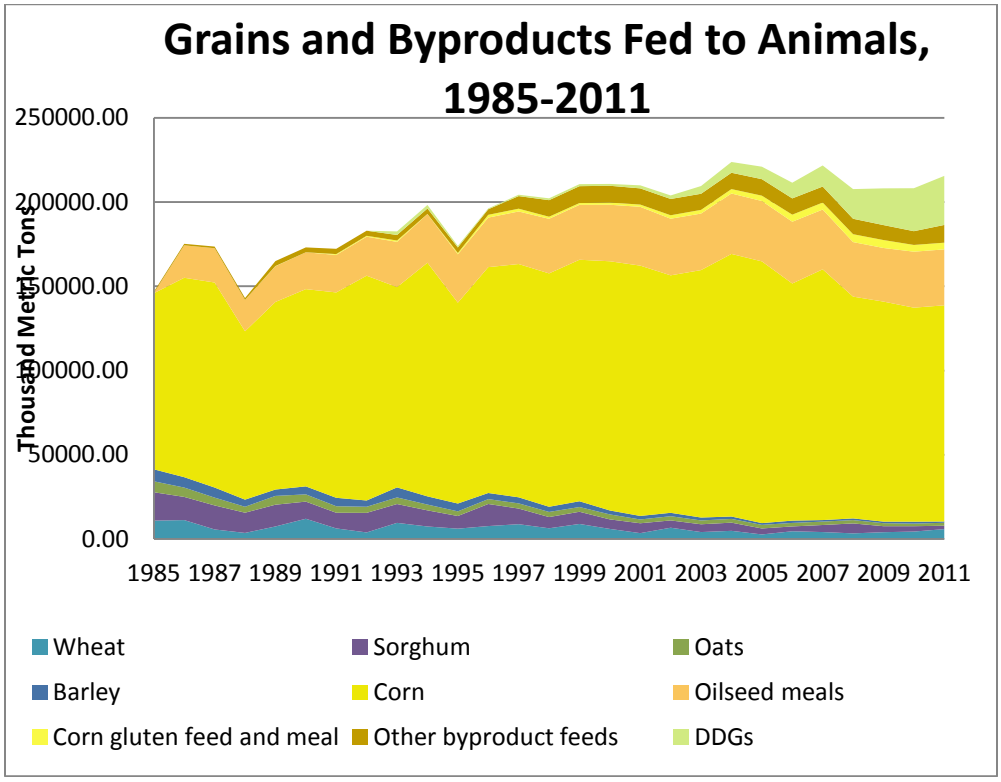
In 2012, crops improved by agricultural biotechnology were being grown in 28 countries by more than 17 million farmers, across 421 million acres. Currently, the vast majority of these crops have traits that make them resistant to destructive pests and diseases, and that enable farmers to control weeds better, using more environmentally friendly farming practices that improve carbon storage and water retention in the soil. Adoption of biotechnology enables more sustainable techniques such as no-till cultivation that further reduce the need for petroleum inputs. This is evident with fertilizer input remaining relatively constant, compared to the increase in yields, meaning they have dropped per unit of output.

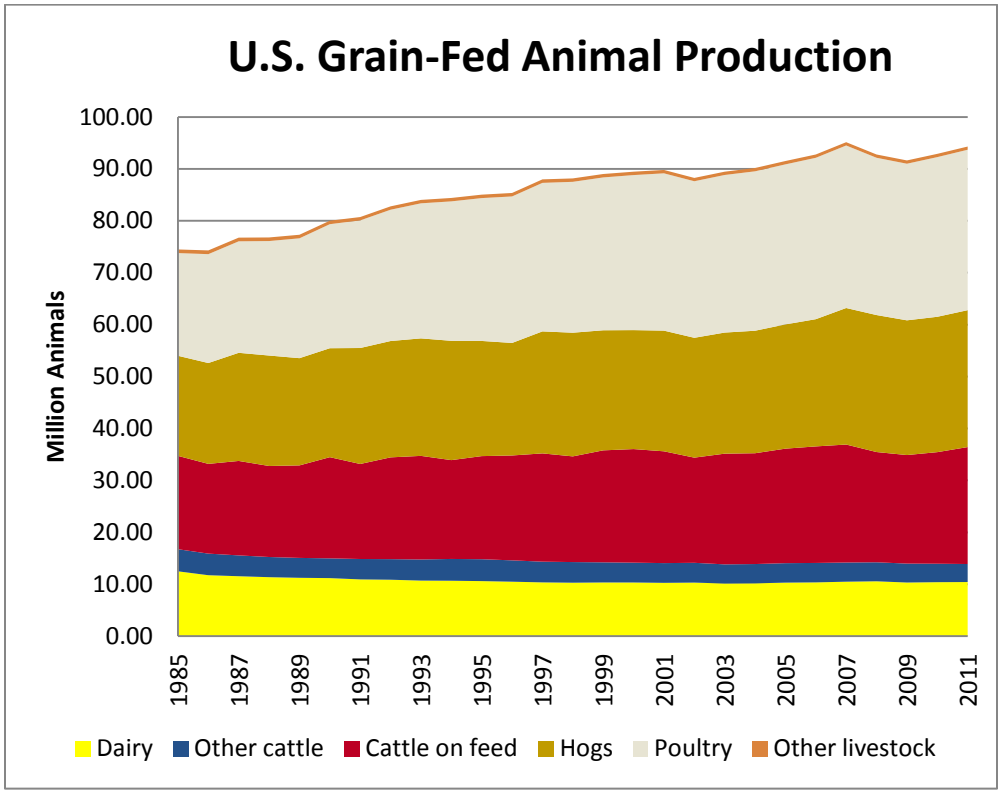


Commodity prices have also been affected by an ever-increasing global population. As world's population heads toward 9 billion people by 2050, demand for food, energy, and material resources is expected to increase at an even faster rate, due to increased demand for dietary protein and consumer goods. Feeding more livestock and poultry will require additional agricultural productivity and diversity. However, biofuel production can help toward this goal with a growth in supply of ethanol co-products to help mitigate the impact in feed prices.[5] Most notable of these co-products is distillers dried grains with soluble (DDGs), which can be used as a feed ingredient for livestock. Each 56-pound bushel of corn used in dry-mill ethanol production generates about 17.4 pounds of DDGs. In many cases, these DDGs can provide an excellent energy and protein source for livestock and provide a greater energy value than dry-rolled corn. In the example of beef cattle, using DDGs has 102 percent to 127 percent the energy value of the same amount of corn; and numerous other studies have shown DDGs can be a value added component to both poultry and swine feed. When formulated in the right amounts DDGs can help reduce feed costs, while increasing animal health, performance, and quality.[6]

The change in the use of corn *grain* for feed is similar to changes in uses of other grains in the past. Animal producers have fed fewer grains of any type. Use of biorefinery/mill byproduct feeds, such as oil seed meal and corn DDGs, has increased since the 1985, benefiting producers by giving them greater options and market flexibility.

[5] FAO. 2012. *Biofuel co-products as livestock feed - Opportunities and challenges,* edited by Harinder P.S. Makkar. Rome.
[6] U.S. Grains Council. 5 Oct. 2012. *A Guide to Distiller's Dried grains with Solubles (DDGS).* http://www.grains.org/index.php/2012-04-30-15-22-26/3928-usgc-releases-third-edition-of-ddgs-handbook





Source: USDA Economic Research Service

Further, focusing just on the RFS ignores the biggest factor in the cost of agricultural production: the volatility in oil and energy prices. Biofuel production helps mitigate this volatility by diversifying fuel supplies. As noted in our introduction, the greatest impact on food production is oil prices. In examining the spike in commodity prices in 2008, the Development Prospects Group at the World Bank found that despite significant spikes in some food prices, biofuels production, both domestically and internationally, only accounted for about 4 percent of the 2008 cost increase, while the rapid increase in oil prices at the same time actually accounted for a much larger portion of the spikes.[7] In the 2012 edition of the *World Energy Outlook* the International Energy Agency found that the high cost of oil is putting the brakes on worldwide economic growth, increasing production costs across all sectors, including agriculture.[8]

Because of the impacts oil prices have on food production, we should allow the RFS to continue to function as intended. Maintaining the use of existing biofuels and spurring the development of advanced biofuels will help mitigate the price impacts oil has on food production. Creating more domestic energy from renewable fuels will not only improve our energy security, but also boost the rural economy through value-added production and lower cost fuels.

2. *How much has the RFS increased agricultural output? How many jobs has it created? Have any jobs been lost? What is the net impact on the agriculture sector?*

A number of factors have led to increases in agriculture output, including biofuels. These include changes in agriculture policy, allowing farmers to make their own crop planting decisions based on the most profitable crop for a given year. Agriculture output has also benefitted from biotechnology improvements in seed varieties and fertilizers, which allow farmers to use fewer inputs such as fuel, fertilizer, and water by enabling crops to withstand pests and variations in the weather.[9]

Increases in foreign trade have also benefitted agriculture. Not only is the U.S. the world's largest corn producer, it currently exports about one-fifth of annual production. With continued population increases and consumer demand for meat products, feed grain exports could grow over the long-term.[10]

However, the RFS and biofuels as a whole have had an overall positive impact on agricultural output and the rural economy. After a decade of high costs and low returns, the return on corn production has been positive since 2007, with ethanol giving corn producers the additional markets they need to remain profitable.

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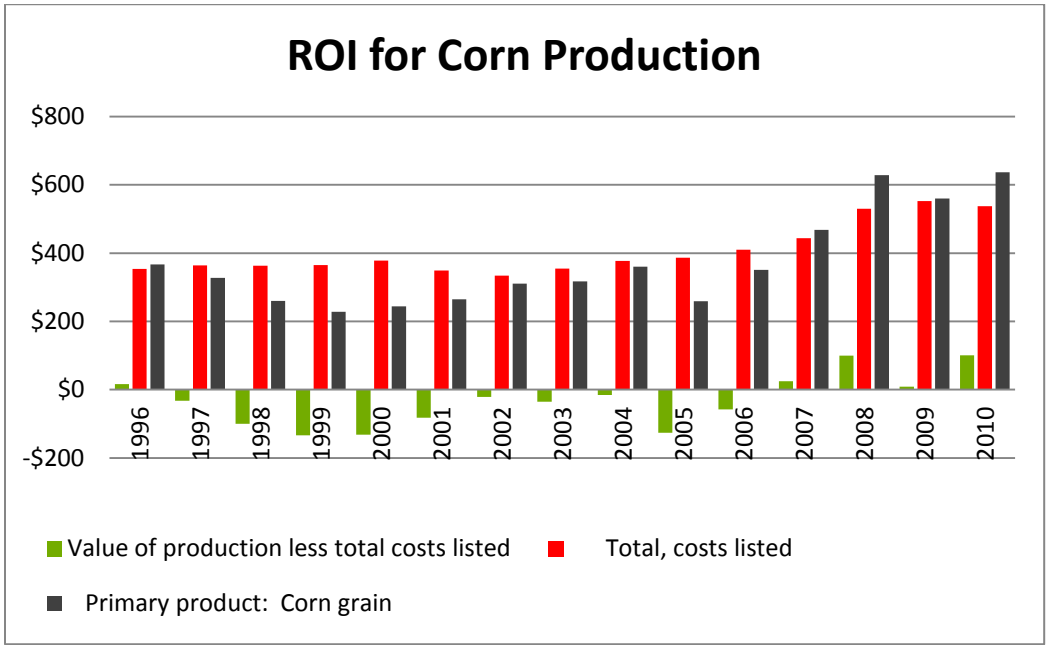
[7] The World Bank Development Prospects Group. July 2010. *Placing the 2006/08 Commodity Price Boom into Perspective.* http://www-wds.worldbank.org/external/default/WDSContentServer/IW3P/IB/2010/07/21/000158349_20100721110120/Rendered/PDF/WPS5371.pdf

[8] International Energy Agency. 12 Nov. 2012. *World Energy Outlook 2012*. http://www.worldenergyoutlook.org/publications/weo-2012/#d.en.26099

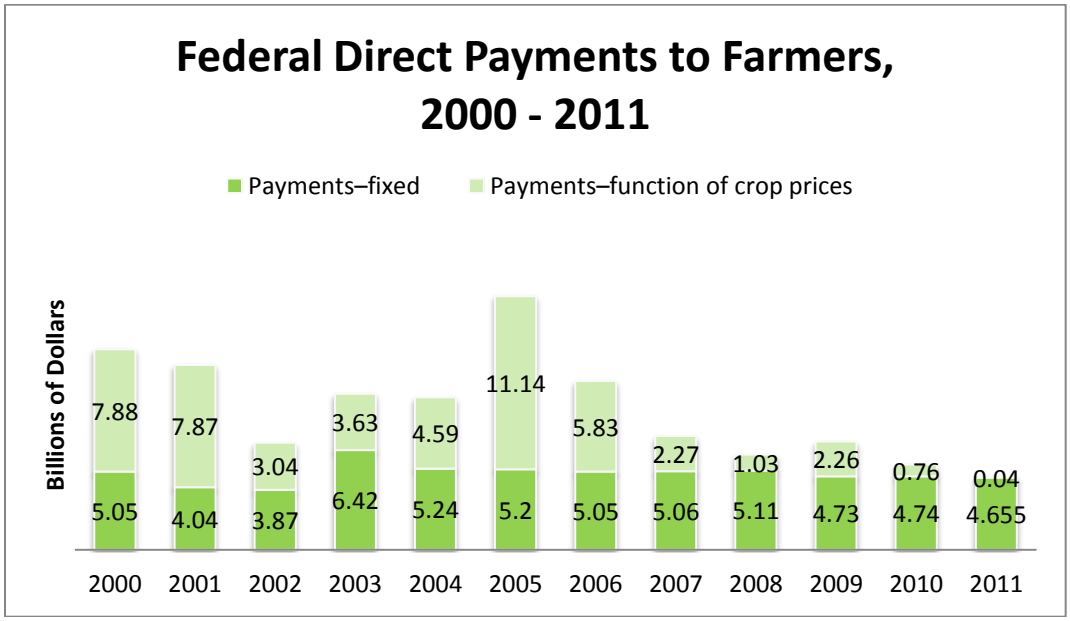
[9] USDA Economic Research Service. 16 Apr. 2013. *Corn Background*. http://www.ers.usda.gov/topics/crops/corn/background.aspx#.UXbkPKLvtBc

[10] USDA Economic Research Service. 16 Apr. 2013. *Corn Trade* http://www.ers.usda.gov/topics/crops/corn/trade.aspx#.UXfZd6LvtBc



Source: USDA Economic Research Service

At the same time, ethanol production has helped the government save money by increasing demand for corn and raising the price to an equitable market value, reducing the need for farm payments.[11]



Source: USDA NASS

[11] USDA Economic Research Service. 30 May 2012. *Farm and Commodity Policy Overview.* http://www.ers.usda.gov/topics/farm-economy/farm-commodity-policy.aspx#.UXfd7KLvtBc

In addition to grain producers, continuing to build advanced biofuels production capacity can benefit the broader rural economy, creating thousands of new jobs, contributing to U.S. economic growth and increasing energy security, according to a report by Bio Economic Research Associates (bio-era[tm]), *U.S. Economic Impact of Advanced Biofuels production: Perspectives to 2030* (Appendix I). According to the report, direct job creation from advanced biofuels production could reach 190,000 by 2022, and total job creation, accounting for economic multiplier effects, could reach 807,000 by 2022. The report found that cumulative investment in new processing facilities driven by the RFS could total more than $95 billion by 2022. At the same time, advanced biofuels production under the RFS could reduce U.S. petroleum imports by approximately $70 billion by 2022, with a cumulative total of avoided petroleum imports over the period of 2010-2022 exceeding $350 billion.

3. Was EPA correct to deny the 2012 waiver request? Are there any lessons that can be drawn from the waiver denial?

The U.S. Environmental Protection Agency (EPA) made the correct determination last fall in its decision to deny the requests to waive the RFS made by members of *Smarter Fuel Future* and the governors of 12 states. The EPA tested 500 scenarios combining different corn, oil, and biofuel production price points.[12] In 89 percent of the scenarios, EPA found that biofuel production would remain at its current level because high oil prices drive demand for lower-cost alternatives. In the other 11 percent of scenarios where biofuel production dropped due to a waiver of the RFS, EPA emphasized that the combination of "projected fuel prices and corn yields are both unrealistically low." Gasoline prices would have to drop below $2.00 a gallon wholesale before demand for biofuel would decrease.

The conclusion reached by EPA mirrors the findings of several independent academic studies, including one by Purdue University and the Farm Foundation,[13] another by Iowa State University,[14] and a third by the University of Missouri.[15] Notably, the Purdue study found that a waiver of the RFS could not change the economic losses already caused by the drought.

4. Does the Clean Air Act provide EPA sufficient flexibility to adequately address any effects that the RFS may have on corn price spikes?

As discussed in Question 3, the EPA and a number of independent academic studies found the RFS had little to do with the spike in corn prices. As discussed in the Iowa State University paper examining the RFS waiver, "The flexibility built into the RFS allowing obligated parties to carry over Renewable Identification Number (RIN) blending credits from previous years significantly lowers the economic impacts of a short crop…relaxing the mandate further would have modest impacts on corn prices."

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[12] U.S. Environmental Protection Agency. 27 Nov. 2012. *Notice of Decision Regarding request for a Waiver of the Renewable Fuel Standard*. http://www.gpo.gov/fdsys/pkg/FR-2012-11-27/pdf/2012-28586.pdf

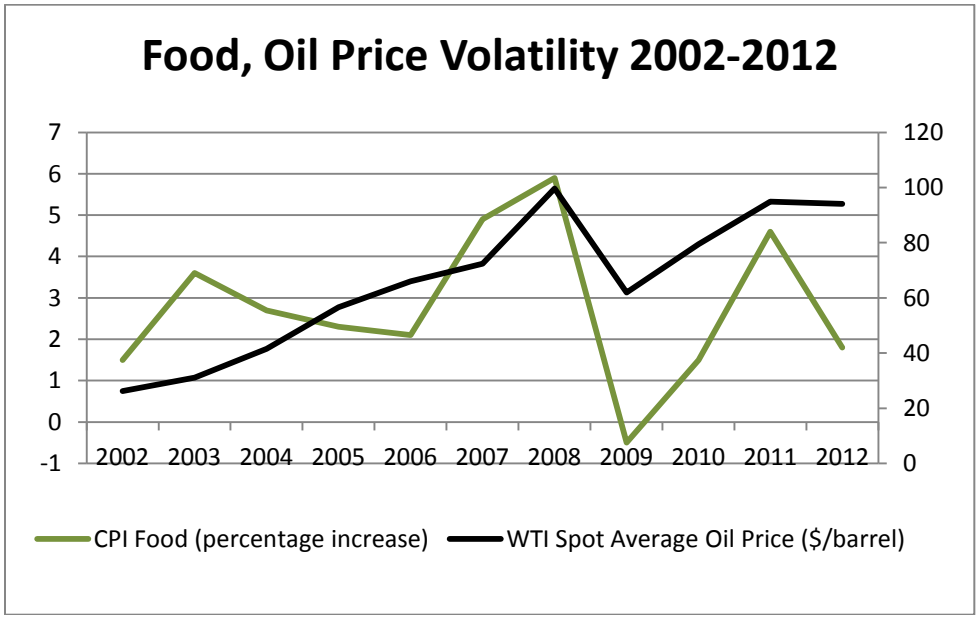
[13] Farm Foundation and Purdue University. 2012. *Potential Impact of a Partial Waiver of the Ethanol Blending Rules.* *http://www.farmfoundation.org/news/articlefiles/1841-Purdue%20paper%20final.pdf*

[14] Center for Agricultural and Rural Development, Iowa State University. Aug. 2012. *Updated Assessment of the Drought's Impact on Crop Prices and Biofuel Production*. http://www.card.iastate.edu/publications/ dbs/pdffiles/12pb8.pdf

[15] Food and Agricultural Policy Research Institute, University of Missouri. Oct. 2012. Renewable Fuel Standard Waiver Options during the Drought of 2012. http://www.fapri.missouri.edu/outreach/publications/2012/ FAPRI_MU_Report_11_12.pdf

5. What has been the impact, if any, of the RFS on food prices?

Increases in the Consumer Price Index for Food since 2002 track closely to increases in the prices of oil and gasoline. Numerous studies show that oil, weather, and the value of U.S. currency are the greatest contributors to food price volatility.



At the same time, while conventional biofuel production has increased rapidly since 2005, it is not strongly correlated to food price inflation.

As former-USDA Energy Advisor Sarah Bittleman noted last fall, a host of factors affect food prices, and it makes no sense to pin a rise on food prices to the RFS. Food prices are subject to commodity, labor, transportation, energy costs, processing, and marketing. She went on to note,

> USDA's Economic Research Service estimates that farmers receive about 14.1 percent of the total consumer food dollar (based on the 2010 average food dollar). This suggests that if the price of all food commodities were to double at the farm level, and other production processes were held fixed, food inflation would rise just over 14 percent.
>
> However, the chance of all other production processes, such as the cost of energy, remaining fixed, are small. That is why America must continue to invest in the homegrown renewable energy that will help balance rising energy costs. Being able to produce more domestic energy from all sources, including renewable fuels, will improve energy security, boost the rural economy and keep the cost of traditional fuels lower. For example, when Hurricane Katrina damaged oil and refining capacity

in the Gulf, the Department of Energy estimated that ethanol reduced the price of gasoline between $0.25 and $0.35 per gallon.[16]

Also, as we discussed earlier in the paper it has been demonstrated that the price of oil has the greatest impact on food inflation – and most other measures of inflation – according to the U.S. Energy Information Administration. The Development Prospects Group at the World Bank, when examining the spike in commodity prices in 2008, determined that despite the significant spike in some food prices, biofuels production, both domestically and internationally, only accounted for about 4 percent of the 2008 cost increase, while the rapid increase in oil prices at the same time actually accounted for a much larger portion of the spikes.

6. *What role could cellulosic biofuels play in mitigating the potential effects of the RFS on corn prices?*

The further development of cellulosic and other advanced biofuels will help corn producers with their greatest input cost, fuel. As discussed in *U.S. Economic Impact of Advanced Biofuels production: Perspectives to 2030*, advanced biofuels production under the RFS scenario could reduce U.S. petroleum imports by approximately $5.5 billion in 2012, $23 billion in 2016, and nearly $70 billion by 2022. The cumulative total of avoided petroleum imports over the period 2010–2022 would exceed $350 billion.

By helping to lower fuel prices by lessening dependence on foreign oil, cellulosic biofuels can help lower the cost of production on the farm, transportation, and other cost factors in grain production dependent on foreign fuels such as fertilizer and graining drying.

Cellulosic biomass is the most abundant, and potentially the lowest cost, source of renewable energy. To capitalize on this resource, the United States must develop and mature commodity markets and supply chains for growing, harvesting, and transporting cellulosic biomass or cellulosic sugars – similar to other commodity markets. Programs in the Energy Title of the Farm Bill, such as the Biomass Crop Assistance Program, are the only existing policies to support the development of these supply chains and commodity markets. Reauthorization and robust funding for the Energy Title should be considered in legislation to renew or extend the existing Farm Bill.

7. *What impact are cellulosic biofuels expected to have on rural economies as the production of such fuels ramps up?*

According to the study *U.S. Economic Impact of Advanced Biofuels production: Perspectives to 2030*, cellulosic and advanced biofuels will have a positive impact on both rural economies and the nation's economy as a whole. Key finding in the analysis yielded the following:

- Direct job creation from advanced biofuels production could reach 29,000 by 2012, rising to 94,000 by 2016 and 190,000 by 2022. Total job creation, accounting for economic multiplier effects, could reach 123,000 in 2012, 383,000 in 2016, and 807,000 by 2022.

[16] USDA Blog. 30 Nov. 2012. *Energy Advisor Says a Host of Factors Affect Food Prices*. http://blogs.usda.gov/2012/11/30/energy-advisor-says-a-host-of-factors-affect-food-prices/

- Investments in advanced biofuels processing plants alone would reach $3.2 billion in 2012, rising to $8.5 billion in 2016, and $12.2 billion by 2022. Cumulative investment in new processing facilities between 2009 and 2022 would total more than $95 billion.

- Direct economic output from the advanced biofuels industry, including capital investment, research and development, technology royalties, processing operations, feedstock production and biofuels distribution, is estimated to rise to $5.5 billion in 2012, reaching $17.4 billion in 2016, and $37 billion by 2022.

- Taking into consideration the indirect and induced economic effects resulting from direct expenditures in advanced biofuels production, the total economic output effect for the U.S. economy is estimated to be $20.2 billion in 2012, $64.2 billion in 2016, and $148.7 billion in 2022.

- Advanced biofuels production under the RFS scenario could reduce U.S. petroleum imports by approximately $5.5 billion in 2012, $23 billion in 2016, and nearly $70 billion by 2022. The cumulative total of avoided petroleum imports over the period 2010–2022 would exceed $350 billion.

The Bio-era model was also used to assess the economic implications of a scenario in which total U.S. biofuels production grows to 60 billion gallons by 2030, with 15 billion gallons of conventional biofuels production and 45 billion gallons of advanced biofuels production. This analysis concludes that:

- Approximately 400,000 jobs would be directly created in the advanced biofuels industry, with total employment creation in the U.S. economy totaling 1.9 million jobs.

- Direct economic output from advanced biofuels production would rise to $113 billion by 2030. The total economic output effect would be $300 billion.

- Biomass feedstocks in this scenario could be provided by a mix of agricultural and forest wastes and dedicated energy crops, providing a total of 470 million dry tons of biomass by 2030 using existing crop and forest land.

- The average cost of advanced biofuel production at the plant-gate in 2030 would be $1.88 including all operating costs, overhead, and capital recovery.

A recent study from Oak Ridge National Laboratories[17] reaffirmed many of these findings, showing that growth of biofuel production under the RFS could:

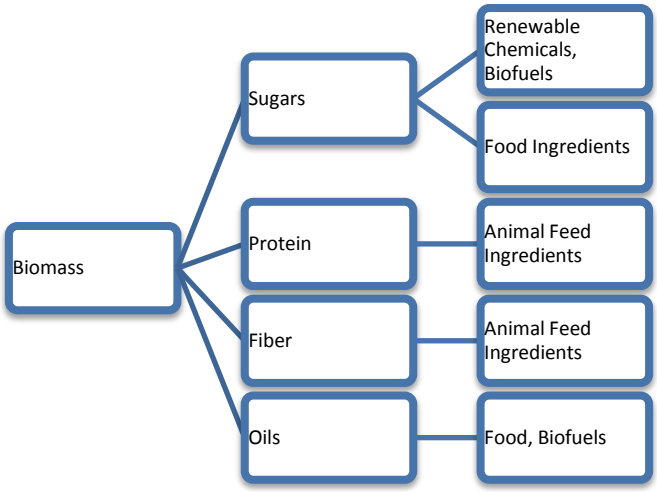
- Displace about 20 percent of oil imports by 2022;

- Reduce GHG emissions relative to oil-based fuels;

[17] Oladosu, G. et al. "Global economic effects of US biofuel policy and the potential contribution from advanced biofuels." Biofuels20123:6, 703-723

- And promote economic growth here in the United States and, to a moderate extent, around the world.

The development of biorefineries for cellulosic and advanced biofuels and renewable chemicals will also leverage increasing agricultural productivity and industrial biotechnology innovation to create a robust, sustainable bioeconomy. Integrated biorefineries make multiple products from biomass streams, much as oil refineries make multiple products from petroleum. Using biomass efficiently, reusing waste streams and increasing productivity and yields are the keys to sustainability.



8. Will the cellulosic biofuels provisions succeed in diversifying the RFS?

The cellulosic biofuels provisions will succeed in diversifying the RFS, if Congress leaves the RFS in place to function properly. The current RFS goals from the 2007 Energy Independence and Security Act have only been in place for five-years, just one-third of the Standard's 15 year ramp up. The rules for the RFS were only finalized in March 2010 and came into effect in July 2010, meaning the law has only been in effect less than three years. Unfortunately, implementation of the standard has been delayed and slowed down not just by the economic downturn beginning in 2008, but by a number of regulatory delays, including EPA's approval of new feedstocks for the cellulosic and advanced biofuels. Any changes to the RFS would create regulatory and financial uncertainty for the industry, destabilizing an industry that has spurred billions of dollars of investment and helped to create more than 400,000 jobs in the U.S. and has the potential to create up to 800,000 within 10-years.

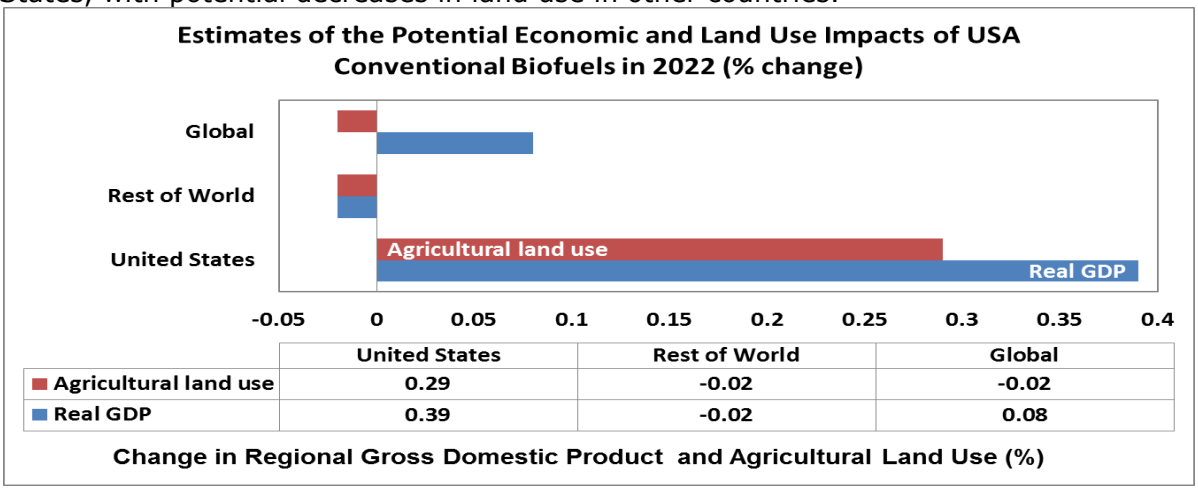
9. *What is the scale of the impact of the RFS on international agricultural production and global land use changes?*

As mandated by EISA, EPA has analyzed lifecycle GHG emissions from increased renewable fuels use. EISA defines lifecycle GHG emissions as follows:

> The term 'lifecycle greenhouse gas emissions' means the aggregate quantity of greenhouse gas emissions (including direct emissions and significant indirect emissions ***such as significant emissions from land use changes***), as determined by the Administrator, related to the full fuel lifecycle, including all stages of fuel and feedstock production and distribution, from feedstock generation or extraction through the distribution and delivery and use of the finished fuel to the ultimate consumer, where the mass values for all greenhouse gases are adjusted to account for their relative global warming potential.

In its final rule implementing the RFS, *Regulation of Fuels and Fuel Additives: Change to Renewable Fuel Standard Program,* EPA's findings showed less land is needed domestically and globally for crops as biofuels expand than they had initially assumed.[18] This is possible because of the rate of improvement in crop yields through technology gains. Additional byproducts that can be developed from a biorefinery, such as DDGs can offset a decrease in grain availability.

Further, the U.S. Departments of Energy and Agriculture found that we can grow adequate biomass feedstocks to displace approximately 30 percent of current gasoline consumption by 2030 on a sustainable basis with only modest changes in land use.[19] It determined that the 1.23 billion tons of U.S. biomass feedstock is potentially available for the production of biofuels, more than enough biomass to meet the RFS. This would provide a positive economic effect on the U.S. economy with a neutral effect on global land use. The Oak Ridge study in 2013 determined that this land use change would occur within the United States, with potential decreases in land use in other countries.[20]



[18] U.S. Environmental Protection Agency. 26 Mar. 2010. *Regulation of Fuels and Fuel Additives: Change to Renewable Fuel Standard Program*. http://www.gpo.gov/fdsys/pkg/FR-2010-03-26/pdf/2010-3851.pdf

[19] U.S. Department of Energy. Apr. 2005. *Biomass as Feedstock for a Bioenergy and Bioproducts Industry: The Technical Feasibility of a Billion-Ton Annual Supply* http://www1.eere.energy.gov/biomass/pdfs/ final_billionton_vision_report2.pdf

[20] Oladosu, G. et al.

Conclusion:

As we have demonstrated throughout our response, the biggest impact to agriculture production, feed cost for livestock, and consumer food costs is the volatile price of oil. Through the mandate of the RFS and the increased use of biotechnology, we are beginning to see the rapid development of biofuels and the biobased economy, which can help mitigate the volatility energy prices cause to commodities, transportation, energy costs, and processing.

The RFS is spurring the development of biotechnology in agriculture, which can continue to increase productivity for corn and other grains without increasing fertilizer and chemical loads, which is a key to sustainably meeting demand. Grain farmers will always seek markets for grain that add the most value, and biotechnology can add value to the sugar and proteins from grains and create new markets. At the same time, biotechnology can help animal producers impacted by feed prices, since biorefineries can produce *value-added* animal feed *and* biofuels, renewable chemicals, and biobased products.

Biofuels continue to help bring stability to the fuel market. And with the RFS spurring the development of the second generation of biofuels, they will reduce the need to import foreign fuel saving the country $350 billion by 2022. At the same time, development of biorefineries for cellulosic and advanced biofuels and renewable chemicals will also leverage increasing agricultural productivity and industrial biotechnology innovation to create a robust, sustainable bioeconomy. Integrated biorefineries make multiple products from biomass streams, much as oil refineries make multiple products from petroleum. Using biomass efficiently, reusing waste streams and increasing productivity and yields are the keys to sustainability and job growth.

So in conclusion Chairman Upton and Ranking Member Waxman, we would encourage you not to look at the RFS has an impediment to agriculture, but view it as a driver of developing sustainable food, feed, fiber, biofuels, renewable chemicals, and bioproducts which can be produced in American helping rural communities grow their job base.

Thank you for your consideration.

Sincerely,

Brent Erickson
Executive Vice President
Industrial and Environmental Section
Biotechnology Industry Organization