

Sustainable Bioenergy and Food Security

The sustainable production and use of biofuels can increase energy security, foster economic development especially in rural areas, and reduce greenhouse gas emissions without weighing heavily on food prices.

Biofuels are only one of a number of factors contributing to rising food prices.

- Like others, we are paying close attention to the potential impact of biofuels on food prices.
- Increased biofuels production is but one contributing factor to increased food prices, and in our judgment a relatively small one. We welcome further research on the factors contributing to food price increases, but our analysis shows the factors listed below account for the vast majority of the food price increases:
 - Higher global oil and gas prices leading to higher production, storage, and transport costs;
 - Increased global food demand as living standards and diets improve.
 - Two years of bad weather and drought leading to poor harvests in some parts of the world;
 - Increased demand for U.S. agricultural exports;
 - Export restrictions in many producing countries (but not the U.S); and
 - Reduction in global agricultural R&D slowing pace of yield increases.
- The bottom line is that ethanol production is a significant contributor to increases in corn prices, but neither U.S. nor worldwide ethanol production can account for much of the rise in total food prices over the past year.

The U.S. is actively working to minimize food security concerns associated with biofuels. We are:

- **Promoting food security**, as the Energy Independence and Security Act of 2007 (EISA) mandates that an increasing share of the U.S. Renewable Fuel Standard must come from non-corn-based biofuels. By 2022, at least 58% of the 36 billion gallons of biofuels mandated under EISA must be next generation/advanced biofuels (non-food sources).

- **Developing cost-effective cellulosic biofuels** made from plant fiber (not food or feed crops) will minimize food security and environmental concerns. Our R&D efforts are intended to make this next-generation technology cost competitive by 2012.
 - **Investing heavily in second generation technologies.** Including funds requested in the FY2009 Budget, the Administration has dedicated over \$1 billion for research, development, and demonstration of cellulosic biofuels technology.
 - Working to **develop U.S. sustainability metrics.**
 - **Engaging with international partners** in the Global Bioenergy Partnership and International Biofuels Forum and bilaterally with Brazil, EU, and others in developing voluntary sustainability benchmarks and indicators for use by individual countries.

Background: There is significant international concern that biofuels are increasing food prices, although our own analysis shows the effect to be relatively small. EISA includes a number of provisions that will help support the sustainability of biofuels. We are monitoring present and estimated future impacts, to prevent unacceptable tradeoffs between biofuel production and other policy objectives. This will be accomplished by expanding use of advanced technologies, opening markets, and addressing high oil prices.

USG Biofuels Sustainability Q&A

Q. Why are you pursuing a biofuels policy when all it does is drive up food prices?

Sustainably managed, biofuels offer the potential to increase energy security, decrease greenhouse gas emissions, and increase economic development. Increased biofuels production is but one factor contributing to increased food prices, and we believe a relatively small one.

We welcome further research on the factors contributing to food price increases, with the goal of preventing or minimizing the impact on food. Next-generation technology will produce cellulosic ethanol from non-food biomass, and we are investing heavily in these new technologies. Including funds requested in the FY2009 Budget, the Administration has dedicated over \$1 billion for research, development, and demonstration of cellulosic biofuels technology.

Q. So, what has driven up global food prices?

The leading factors behind the increase in food prices include a rapid increase in fuel and fertilizer prices; unprecedented economic growth and the associated increase in food consumption worldwide; weather related poor crop harvests in Australia, Canada and Eastern Europe; export controls in many countries that reduce the world's food supply; and lower agricultural productivity growth due to reduced global agricultural R&D.

The U.S. Council of Economic Advisors estimates increased corn ethanol production had a significant effect on corn prices but accounted for only 3% of the 43% increase in global food prices over the 12 months ending in March 2008. We welcome further research on the full range of reasons for and impacts of the rise in global food prices, including the role of other biofuels.

Q. How did you determine that biofuels contribute only 3 percent to food price increases?

Analysis by President Bush's Council of Economic Advisers estimates that ethanol has accounted for only 3 percent of the overall increase in global food prices, as measured by the IMF's Global Food Index. While the rise in global

ethanol production may have increased corn prices by as much as 13 percent, corn accounts for only 30 percent of all grain, and grain is only 20 percent of all food.¹ This estimate includes an adjustment for indirect effects, such as land use change impacts on other commodity crops, and it reflects the world ethanol production over the 12 months ending in March. It does not reflect biodiesel production; we welcome further research on the effects of other forms of bioenergy on food prices.

Q. What are you doing now to minimize food security concerns associated with biofuels?

The rise in food prices is the major food security issue we are currently confronting, and biofuels account for only minor part of the increase. Embracing advanced technologies, opening markets and addressing high energy costs will ensure that nations can meet energy security concerns without adversely impacting food supply. Under the Energy Independence and Security Act (EISA) of 2007 corn ethanol's share in meeting the overall Renewable Fuel Standard's (RFS) required volumes will decline over time and is capped at 15 billion gallons. By 2022, 58% of the 36 billion gallons of biofuels in the U.S. RFS must be next generation/advanced biofuels, which cannot include ethanol derived from corn starch.

Our R&D efforts are intended to make next-generation non-food based biofuels cost competitive by 2012.

We are investing heavily in new technologies. Including funds requested in the FY2009 Budget, the Administration has dedicated over \$1 billion for research, development, and demonstration of cellulosic biofuels technology.

Q. Some critics say biofuels are counterproductive and some go so far to say they are a crime against humanity. How do you respond?

¹ Testimony of Edward P. Lazear Chairman, Council of Economic Advisers before the Senate Foreign Relations Committee Hearing on "Responding to the Global Food Crisis," May 14, 2008. <http://www.whitehouse.gov/cea/lazear20080514.html>

The rising cost of food, whether related to biofuels or other factors, is of concern. The Administration has taken steps to address those most acutely affected domestically and internationally. We believe sustainable biofuels offer the potential to increase energy security, decrease greenhouse gas emissions, increase rural economic development and, ultimately, moderate food costs as alternative energy becomes more cost effective for farmers and fertilizer producers.

Nonetheless, diverting food crops to fuel production does reduce world food supplies and has an impact on world food prices. However, in the United States, farmers' responses to higher prices brought about by strong demand factors in 2007/08 has generated a record corn crop with record exports and record ethanol usage. In fact, removing ethanol usage from total production still leaves more corn for feed in 2007/08 than had been available on average during the previous two years. In addition, record production of distiller's dried grains (DDGs), a by-product of ethanol production, are being used for animal feed domestically and for exports in record quantities. While factors in addition to biofuels have played a larger role in increasing food prices, we are carefully monitoring present and estimated future impacts to prevent unacceptable tradeoffs between biofuel production and other policy objectives.

Q. What would be the long-term impact on food and feed of using corn for ethanol in the U.S.?

With agricultural productivity growth in the U.S. of 2.8 percent per year (1999-2005), a 15 billion gallon cap on corn based ethanol (EISA 2007), and significant investments in technology development and commercialization of cellulosic biofuels, we believe that corn ethanol production will not significantly compete with food and feed use in the medium to long term.

The United States will be able to produce enough corn to meet food, feed, export and biofuels demand.

Q. What is the U.S. Government doing to ensure biofuels sustainability?

We are promoting sustainable production and use of biofuels by:

- Limiting to 15 billion gallons, the amount of starch based (corn) ethanol that can be applied towards the RFS's required levels of renewable fuel production in part to help ensure food security. 15 billion gallons is less than double current year levels.
- Mandating that new biofuels refineries produce biofuels with "lifecycle" GHG emission reductions (compared to gasoline or diesel fuel replaced) of 20% for conventional biofuels (e.g. corn ethanol); 50% for advanced biofuels (e.g. sugar ethanol) and biomass-based diesel; and 60% for cellulosic biofuel (i.e., next generation biofuels). (Note: The majority of the 15 billion gallons of corn ethanol will be "grandfathered in" under EISA, exempting it from the 20% lifecycle emissions reduction requirement.)
- Specifying that only biofuels made from feedstocks grown on land that was previously cleared for cultivation before December 2007 can qualify as "renewable fuels" under EISA.
- Requiring EPA to conduct environmental impact assessments of biofuels production every three years, covering water, soil, air quality, biodiversity, and ecosystem health. EISA also calls for the National Academy of Sciences to examine the impact of the renewable fuel mandate on food, feed, and other industries.
- A U.S. interagency sustainability group has developed a roadmap to ensure biofuels sustainability domestically and globally.
- We are collaborating with international partners (e.g., the Global Bioenergy Partnership (GBEP), the International Biofuel Forum (IBF), and the EU) on biofuels sustainability issues.

Q. You say biofuels reduce greenhouse gas emissions, but recent reports disagree. Can you explain the disparity?

Recent publications have highlighted potential impacts of secondary and international land use changes attributed to biofuel feedstock production. Such projections are highly speculative at this point. The U.S. Government will continue to carefully evaluate secondary land use changes when conducting life-cycle analyses of greenhouse gas emissions. Notably, EPA will account for indirect land use change emissions in establishing the greenhouse gas benefits of biofuels as part of their rulemaking in response to 2007 EISA requirements. We believe that many of the biofuel feedstocks will reach the mandated life

cycle greenhouse gas reductions; otherwise, they will not be acceptable under the EISA requirements.

Q. What is “life cycle analysis” of greenhouse gas emissions of biofuels?

Lifecycle analysis refers to the process of accounting for all greenhouse gas emissions resulting from the growth, harvesting, shipping, processing, distribution, and consumption of biofuel feedstocks and fuel. Newer methods must also account for emissions from changes in land use, both direct (i.e., conversion of a field or forest into cultivated land for biofuel feedstocks) and indirect, and for changes in energy use elsewhere in the economy induced by these policies.

Q. How does USG address the issue of deforestation and destructive land-use relating to biofuels?

EISA explicitly defines “renewable fuels”, whether produced domestically or imported, as biofuels from agricultural land cleared or cultivated before December 2007. As such the intent of EISA is to protect virgin ecosystems from exploitation, although the fungible nature of agricultural commodities and biofuels feedstocks makes it very difficult for this constraint to be binding. This requirement presents significant challenges in its implementation and enforcement, particularly abroad.

Q. Do biofuels result in net negative energy balance?

A review of six major studies suggested that all but one (Pimmentel and Patzek) showed a positive energy balance of 1.29 to 1.65 for corn ethanol.² This suggests that corn ethanol contains 29 - 65% more energy per gallon than the energy from fossil fuels used to produce it. The energy balance for next-generation cellulosic biofuels could be much greater.

² Hammerschlag, Roel. 2006. “Ethanol’s Energy Return on Investment: A Survey of the Literature 1990-Present” *Environ. Sci. Technol.* 40, 1744-1750. A summary of this work is available at www.nrdc.org/air/transportation/ethanol/ethanol.pdf

Q. What are specific examples of USG's participation in international fora on biofuels sustainability?

The USG is co-chairing the work of the Global Bioenergy Partnership (GBEP) to develop a unified methodology to measure and quantify biofuel GHG emissions. Through the International Biofuel Forum, the USG has encouraged technical experts to identify potential areas of convergence in existing biofuels standards for consideration by standards developers, in an effort to promote biofuels trade.

Q. Even if bad weather and increased demand from emerging markets are primary drivers of increased food price increases, we cannot control weather and prefer not to reverse improved diets. So from this perspective, we are choosing to fill our gas tanks rather than hungry stomachs. Why not eliminate corn ethanol production altogether and put corn back to use as nature intended – for food?

Short-sighted policies, such as export controls imposed by many countries, have contributed to grain price increases. U.S. farmers are doing their part to help satisfy world market demand for corn and other crops. U.S. corn exports actually are expected to increase in 2007/2008, reaching 2.5 billion bushels, a record. At the same time, we produced a record amount of corn ethanol. The United States has the capacity to produce sufficient corn for food, feed, and fuel to satisfy domestic consumption and international markets.

Q. From the perspective of impact on grain prices, GHG sustainability, and cost, sugar based ethanol is preferable to corn based ethanol. Why do we insist on tariffs and other measures to prevent development of that alternative?

Sugarcane is a tropical crop that does not grow in most parts of the United States. Our ultimate goal is to produce biofuels from non-food and non-feed plant materials such as switchgrass, corn stalks, and wood chips. The corn-based ethanol industry today provides the foundation on which cellulosic technologies can grow.

Ethanol is primarily made out of corn in the United States because for the time being it is what our climate and growing conditions enable us to do the most effectively on a large scale.

The U.S. import tariff on ethanol of 54 cents per gallon is set to expire December 31, 2008, and it is up to Congress to decide whether to extend it. The U.S. ethanol blender's credit (subsidy) is on track to be reduced by the Farm Bill from 51 cents to 45 cents per gallon; it is due to expire at the end of 2010 unless extended by Congress.

June, 2008

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