

December 19, 2013

Celebrating Six Years of the Renewable Fuel Standard

Six years ago today, President George W. Bush signed into law the Energy Independence and Security Act of 2007 (EISA). On its way to the President’s desk, the bill had passed the Senate on a vote of 86-6 and the House on a vote of 314-100. The centerpiece of EISA was a greatly expanded Renewable Fuel Standard (RFS). The new RFS required rapid growth in the consumption of renewable fuels, culminating in 36 billion gallons in 2022. In addition, the law required renewable fuels to meet certain environmental performance thresholds and created specific categories for cellulosic and advanced biofuels.

In a signing ceremony at the Department of Energy, President Bush declared that, “Today, we make a major step with the Energy Independence and Security Act. We make a major step toward reducing our dependence on oil, confronting global climate change, expanding production of renewable fuels and giving future generations a nation that is stronger, cleaner and more secure.”

Just six years later, tremendous progress has been made toward achieving the original objectives of the expanded RFS. Renewable fuel production and consumption have grown dramatically. Dependence on petroleum—particularly imports of refined products—is down significantly. Greenhouse gas emissions from the transportation sector have fallen. The value of agricultural products is up appreciably. And communities across the country have benefited from the job creation, increased tax revenue, and heightened household income that stem from the construction and operation of a biorefinery.

Meanwhile, the doomsday outcomes threatened by opponents of the RFS simply have not materialized. Agricultural land use continues to decline, the Gulf of Mexico “dead zone” continues to contract, deforestation rates continue to fall, and food price inflation continues to follow normal historical trends.

This brief analysis examines how the world has changed since passage of the expanded RFS in 2007. And while substantial progress has been made toward accomplishing the goals of EISA, the RFS has just gotten started. More work remains to be done, especially in terms of reducing petroleum imports and lowering prices at the pump. Indeed, we’re not even halfway through the revolutionary 15-year energy plan that became law six years ago today.

RENEWABLE FUEL PRODUCTION, CO-PRODUCT OUTPUT, AND ECONOMIC ACTIVITY

	2007	2013	% Change	
Operational Corn Ethanol Plants¹	110	209	90.0%	
Corn Ethanol Production²	<i>Billion Gallons</i>	6.52	13.30	104.0%
Animal Feed Co-product Output³	<i>Million Metric Tons</i>	18.5	37.1	100.5%
Value of Ethanol Industry Output⁴	<i>Billion \$</i>	\$17.8	\$42.1	136.5%
Ethanol Industry Jobs⁵		238,541	383,260	60.7%
Domestic Advanced Biofuel Production⁶	<i>Million Gallons</i>	450	1,515	237%

AGRICULTURAL IMPACTS

		2007	2013	% Change
Corn Production ⁷	<i>Billion Bushels</i>	13.04	13.99	7.3%
Average Corn Yield ⁸	<i>Bushels/Acre</i>	150.7	160.4	6.4%
Corn Price (Season Avg.) ⁹	<i>\$/Bushel</i>	\$4.20	\$4.40	4.8%
U.S. Agricultural Land ¹⁰	<i>Million Acres</i>	402	384	-4.5%
Gross Value of Crops ¹¹	<i>Billion \$</i>	\$150.1	\$217.2	44.7%
Gross Value of Livestock ¹²	<i>Billion \$</i>	\$138.5	\$181.5	31.0%
Net Farm Income ¹³	<i>Billion \$</i>	\$70	\$131	87.1%

ENVIRONMENTAL ISSUES

		2007	2013	% Change
Size of Gulf Hypoxia Zone ¹⁴	<i>Square Miles</i>	7,903	5,800	-26.6%
Amazon Deforestation ¹⁵	<i>Square Miles</i>	4,498	1,798	-60.0%
Transportation Sector CO2 Emissions ¹⁶	<i>Million Metric Tons</i>	2,040	1,817	-10.9%
CO2e Emissions Avoided from Using Ethanol ¹⁷	<i>Million Metric Tons</i>	12.7	34.7	173.2%
Ethanol CO2e Emissions Reduction vs. Gasoline ¹⁸	<i>%</i>	~25%	34%	n/a

FUEL PRICES

		2007	2013	% Change
Oil Price ¹⁹	<i>\$/Barrel</i>	\$72.34	\$108.41	49.9%
Retail Diesel Price ²⁰	<i>\$/Gallon</i>	\$2.89	\$3.92	35.6%
Retail Gasoline Price (Regular) ²¹	<i>\$/Gallon</i>	\$2.80	\$3.50	25.2%
Wholesale (Rack) Ethanol Price ²²	<i>\$/Gallon</i>	\$2.24	\$2.47	10.3%

PETROLEUM IMPORT DEPENDENCE

		2007	2013	% Change
Crude Oil Imports, as % of U.S. Crude Oil Demand ²³	<i>%</i>	66.2%	51.0%	n/a
Total Import Dependence: Crude Oil & Petroleum Products ²⁴	<i>%</i>	58.2%	34.7%	n/a
Gasoline Imports ²⁵	<i>Billion Gals.</i>	6.331	0.690	-89.1%
Ethanol, % of Gasoline Supply ²⁶	<i>%</i>	4.6%	9.7%	n/a

FOOD PRICES

		2007	2013	% Change
World Food Prices ²⁷	<i>Index</i>	191.4	206.3	7.8%
U.S. General Inflation (Consumer Price Index, All Items) ²⁸	<i>Index</i>	210.0	233.1	11.0%
U.S. Food Prices (Consumer Price Index, Food at Home) ²⁹	<i>Index</i>	205.2	233.6	13.8%
Avg. Household Spending on Food at Home (Groceries) ³⁰	<i>\$/Household</i>	\$3,465	\$3,921	13.2%
Avg. Household Spending on Food Away from Home ³¹	<i>\$/Household</i>	\$2,668	\$2,678	0.4%
Change in U.S. Food Prices from Previous Year ³²	<i>%</i>	3.9%	2.0%	n/a
Retail Price of Milk ³³	<i>\$/Gallon</i>	\$3.87	\$3.46	-10.5%
Retail Price of Eggs, Grade A, Large ³⁴	<i>\$/Dozen</i>	\$2.10	\$1.93	-8.3%
Retail Price of Chicken Breast, Boneless ³⁵	<i>\$/Lb.</i>	\$3.38	\$3.65	8.2%
Retail Price of Pork Chops, Center Cut, Bone-In ³⁶	<i>\$/Lb.</i>	\$3.38	\$3.69	9.2%

Sources:

- ¹ RFA Annual Ethanol Industry Outlook. Ethanol plant tallies as of Jan. 1.
- ² 2007 from Energy Information Administration (EIA). 2013 projected by RFA based on EIA data.
- ³ Estimated by RFA.
- ⁴ Estimated by RFA.
- ⁵ Urbanchuk (2008), Urbanchuk (2013). Includes direct, indirect and induced jobs.
- ⁶ The National Biodiesel Board reports that 450 million gallons of biodiesel, an advanced biofuel under the RFS, were produced in 2007. EPA EMTS data show domestic production of biodiesel and other advanced biofuels is on pace for 1,515 million gallons in 2013.
- ⁷ USDA.
- ⁸ USDA.
- ⁹ USDA. 2007/08 season average compared to projected 2013/14 season average.
- ¹⁰ EPA analysis determined 402 m. acres were engaged in agricultural production in 2007. EPA's analysis for 2012 (latest available) determined agricultural land use was 384 m. acres. USDA data show that major crop acres were lower in 2013 than in 2012; thus EPA's determination of agricultural land for 2013 is likely to be lower than 384 m. acres.
- ¹¹ USDA.
- ¹² USDA.
- ¹³ USDA.
- ¹⁴ Louisiana State University and NOAA.
- ¹⁵ National Institute of Space Research, Brazil. Comparison is 2007 to 2012 (latest available).
- ¹⁶ EIA.
- ¹⁷ RFA calculations based on GREET and EIA data.
- ¹⁸ Department of Energy GREET model.
- ¹⁹ EIA (Brent crude). 2013 price from November 2013 STEO.
- ²⁰ EIA. 2013 price from November 2013 STEO.
- ²¹ EIA. 2013 price from November 2013 STEO.
- ²² Omaha rack price. Nebraska Energy Office.
- ²³ EIA. 2013 is projected based on monthly data for Jan-Oct.
- ²⁴ EIA. 2013 is projected based on monthly data for Jan-Oct.
- ²⁵ EIA. 2013 is projected based on monthly data for Jan-Oct.
- ²⁶ RFA calculation based on EIA data. 2013 is projected based on monthly data for Jan-Oct.
- ²⁷ U.N. Food and Agriculture Organization. Dec. 2007 compared to Nov. 2013.
- ²⁸ Bureau of Labor Statistics (BLS). Dec. 2007 compared to Nov. 2013.
- ²⁹ BLS. Dec. 2007 compared to Nov. 2013.
- ³⁰ BLS Consumer Expenditure Survey. Compares 2007 to 2012 (latest available).
- ³¹ BLS Consumer Expenditure Survey. Compares 2007 to 2012 (latest available).
- ³² USDA.
- ³³ BLS. Dec. 2007 compared to Nov. 2013.
- ³⁴ BLS. Dec. 2007 compared to Nov. 2013.
- ³⁵ BLS. Dec. 2007 compared to Nov. 2013.
- ³⁶ BLS. Dec. 2007 compared to Nov. 2013.