

BACKGROUND

No. 2811 | JUNE 12, 2013

The Ethanol Mandate: Don't Mend It, End It

Nicolas D. Loris

Abstract

Praised as a policy that would reduce dependence on oil and reduce greenhouse gas emissions, the Renewable Fuel Standard (RFS), which requires refineries to blend ethanol into gasoline, has been fraught with unintended consequences. The RFS mandates the use of an inefficient fuel, drives up food prices, and causes adverse environmental effects. The 2012 drought and problems meeting the quotas in the RFS have put the program under the political microscope. The Heritage Foundation's Nicolas Loris explains how the only true reform to the Renewable Fuel Standard is to eliminate it, and why Congress should repeal the costly and unnecessary mandate.

House Energy and Commerce Committee Chairman Fred Upton (R-MI) and ranking member Henry Waxman (D-CA) recently launched a bipartisan review¹ of the Renewable Fuel Standard (RFS), which mandates the use of corn-based ethanol and other biofuels for transportation fuel. More commonly known as the ethanol mandate—promising less dependence on foreign oil and decreased fuel prices and greenhouse gas emissions—the mandate has been an economic and environmental boondoggle.

The 2012 drought, the failure of cellulosic ethanol, and a requirement for refiners to blend more corn-based ethanol than may be needed highlight only some of the problems with the mandate. Despite many calls to reform or temporarily waive the ethanol mandate, the only appropriate reform that protects American families from artificially higher food and energy prices is to repeal the Renewable Fuel Standard.

KEY POINTS

- Enacted in 2005 and expanded in 2007, the Renewable Fuel Standard—the “ethanol mandate”—decrees that American oil refiners must include a minimum amount of renewable fuel each year, increasing to 36 billion gallons by 2022. Fifteen billion gallons may come from corn-based ethanol; the remainder must come from other biofuels.
- Designed to reduce oil consumption and greenhouse gas emissions, the mandate has done little of either, and resulted in economic and environmental costs.
- The mandate demonstrates why the government should not set production quotas. The government has grossly underestimated the target for cellulosic (nonfood-based) ethanol, and is on the verge of requiring too much corn-based ethanol, which will further drive up energy costs.
- Economically competitive fuel does not require a policy mandating its use. Congress should repeal the Renewable Fuel Standard.

This paper, in its entirety, can be found at <http://report.heritage.org/bg2811>

Produced by the Thomas A. Roe Institute for Economic Policy Studies

The Heritage Foundation
214 Massachusetts Avenue, NE
Washington, DC 20002
(202) 546-4400 | heritage.org

Nothing written here is to be construed as necessarily reflecting the views of The Heritage Foundation or as an attempt to aid or hinder the passage of any bill before Congress.

Government Incompetence in Setting Markets

The Energy Policy Act of 2005 mandated the first requirement that renewable fuels be mixed into America's gasoline supply, and the 2007 Energy Independence and Security Act increased the quotas of the original mandate. By 2022, there must be 15 billion gallons (and no more) of corn-based ethanol and 21 billion gallons of non-corn biofuels in the nation's fuel supply. In essence, the RFS mandates a market for corn farmers and biofuel producers, gives preferential treatment to the production of corn and soybeans, and artificially eliminates the risk and competition necessary for a healthy and growing economy.

The mandate demonstrates just how bad the government is at understanding what the market can bear in terms of production and consumption. The production of cellulosic ethanol, made from non-food sources, is nowhere near to meeting its targets, while refiners may be required to blend excess corn-based ethanol as a result of increases in the mandate and decline in fuel consumption.

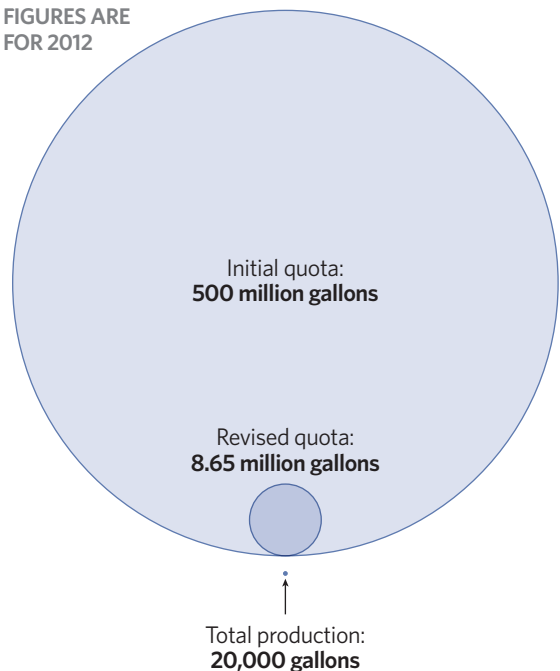
The Environmental Protection Agency (EPA) had to cut the quota for cellulosic biofuel production in 2012 from 500 million gallons to 8.65 million gallons (1.73 percent of the original target) and recently had to withdraw the 2012 quotas because there is not enough cellulosic biofuel available on the market to meet the mandate.² Until 2012, no cellulosic ethanol had been produced because it was not commercially viable. In 2012, only 20,000 gallons had been produced—far short of the 8.65 million gallon revised target. Consequently, refiners had to pay millions of dollars in waiver credits or surcharges to comply with the EPA's minimum volume requirements. Refiners pass those costs on to the consumer, further inflicting economic pain caused by the RFS. In January 2013, a Washington, D.C., Circuit Court of Appeals ruled that the EPA's target was an “unreasonable exercise of agency discretion” and vacated

CHART 1

Quotas for Cellulosic Ethanol Are Unreachable

In 2012, the Environmental Protection Agency had to drastically revise its quota for cellulosic biofuels because cellulosic ethanol has long struggled with commercial viability. Even the revised figure dwarfed actual production levels.

FIGURES ARE FOR 2012



Source: Heritage Foundation research based on data from the U.S. Environmental Protection Agency, Publications and Data, <http://www.epa.gov/otaq/fuels/publications.htm> (accessed May 14, 2013).

B 2811  heritage.org

the cellulosic ethanol requirement required by the RFS.³

Also of concern to motorists is what is known as the “blend wall.” The gas tanks in most vehicles can

1. House Committee on Energy and Commerce, “Committee Launches Bipartisan Review of Renewable Fuel Standard with White Paper Examining ‘Blend Wall’ Challenges,” March 20, 2013, <http://energycommerce.house.gov/press-release/committee-launches-bipartisan-review-renewable-fuel-standard-white-paper-examining-blend-wall-challenges> (accessed May 3, 2013).

2. Environmental Protection Agency, “2012 RFS2 Data,” May 10, 2013, <http://www.epa.gov/otaq/fuels/rfsdata/2012emts.htm> (accessed May 29, 2013).

3. United States Court of Appeals for the District of Columbia Circuit, *American Petroleum Institute vs. Environmental Protection Agency*, January 25, 2013, [http://www.cadc.uscourts.gov/internet/opinions.nsf/A57AB46B228054BD85257AFE00556B45/\\$file/12-1139-1417101.pdf](http://www.cadc.uscourts.gov/internet/opinions.nsf/A57AB46B228054BD85257AFE00556B45/$file/12-1139-1417101.pdf) (accessed May 29, 2013).

only contain gasoline blended with 10 percent ethanol (E10). Another gas blend, known as E85, allows a mixture of 85 percent ethanol, but only flex-fuel vehicles can run on this fuel and the demand for these vehicles is very low. Further, drivers who own flex-fuel vehicles often fill their tanks with E10 as opposed to E85 because the energy content in E85 is lower. The combination of the increasing mandate *and* declining fuel consumption, from a slow economy and existing increased fuel efficiency standards, means that refiners may have to blend more ethanol than consumers want, or can even safely use in their vehicles.

Each refiner has to meet the RFS with a percentage of domestic sales that contain blended ethanol. Refiners have an option to meet part of their requirement by buying credits rather than blending more ethanol. In order to track the renewable fuel quotas, the EPA requires a renewable identification number (RIN) to track the amount of biofuel reaching the market and to hold refiners accountable for blending enough ethanol. Refiners can hold on to these credits and meet up to 20 percent of the RFS requirement in RIN credits, or refiners can purchase RIN credits from energy traders when the refiners are failing to meet the requirement.

The RIN trading system has resulted in fraud where refineries bought fake credits with made-up RIN numbers for millions of dollars.⁴ Since refineries now face the blend wall, increased trading for RIN credits has driven up the price of the credit from pennies last year to over a dollar in March 2013. Bloomberg projects that the over-mandating—requiring the use of more ethanol than can be blended—and forcing the purchase of RINs, could cost consumers an additional \$13 billion in pain at the pump—an artificial increase of 10 cents per gallon, if RIN credit prices stay above \$1.⁵ But even if the price of RIN credits falls to 50 cents per credit, the cost to

consumers is a multibillion dollar price tag. Since the obligation for refiners is based on domestic sales, another way in which refiners can meet their obligation is to export more gasoline or reduce production altogether, further driving up domestic prices and inflicting huge costs on the American economy.⁶

RFS requires that fuel blenders use biofuels regardless of the cost. If Congress's goal is to have a commercially viable alternative to oil-based fuels, the best approach is not for the federal government to distort invention and investment by hanging its hat on a single possibility, as it has done by mandating a market space for ethanol. What if, for instance, a breakthrough in another alternative fuel or vehicle occurs and the mandate makes even less sense? If ethanol becomes an economical alternative to gasoline, it will not need a mandate to compete in the marketplace.

E15 Concerns Are a Cause of the Mandate

Proponents of the RFS argue that the blend wall will not be a problem if the percentage of ethanol in gasoline increases, but an increased percentage of ethanol blended into gasoline presents its own set of concerns. In 2010, the EPA began allowing up to 15 percent of ethanol to be blended into gasoline (E15) for cars and light-duty trucks model years 2007 or newer. A year later, the agency included model years 2001 to 2006. However, concerns abound with the use of E15.⁷

Automotive equipment manufacturers warn that the EPA's acceptance of E15 is premature, and conducted tests during which, of eight engines tested, “two popular gasoline engines used in light-duty automotive applications of vehicles from model years 2001 through 2009 failed with mechanical damage when operated on intermediate-level ethanol blends (E15 and E20).”⁸ Further, a number of car producers stated that engine-related problems

4. Ron Kotrba, “Green Diesel Offices Raided, Absolute Fuels CEO Remains in Custody,” *Biodiesel Magazine*, July 25, 2012, <http://www.biodieselmagazine.com/blog/article/2012/07/green-diesel-offices-raided-absolute-fuels-ceo-remains-in-custody> (accessed May 3, 2013).

5. Bradley Olson and Dan Murtaugh, “Ethanol Upending Refiners Pushes \$13 Billion on U.S. Drivers,” *Bloomberg*, March 19, 2013, <http://www.bloomberg.com/news/2013-03-18/refiners-pay-price-as-traders-hoard-ethanol-credits-valero-says.html> (accessed May 3, 2013).

6. NERA Consulting, “Economic Impacts Resulting from Implementation of RFS2 Program,” prepared for the American Petroleum Institute, October 2012, http://www.api.org/-/media/Files/Policy/Alternatives/13-March-RFS/NERA_economicImpactsResultingfromRFS2Implementation.pdf (accessed May 29, 2013).

7. Environmental Protection Agency, “E15 (a Blend of Gasoline and Ethanol),” <http://www.epa.gov/otaq/regs/fuels/additive/e15/> (accessed May 29, 2013).

8. Henning Kleeberg, “Intermediate-Level Ethanol Blends Engine Durability Study,” FEV, Inc., prepared for Coordinating Research Council, April 2012, <http://www.crao.com/reports/recentstudies2012/CM-136-09-1B%20Engine%20Durability/CRC%20CM-136-09-1B%20Final%20Report.pdf> (accessed May 29, 2013).

caused by or related to E15 would not be covered by their manufacturer warranties.⁹

The problem here is not in and of itself ethanol; rather it is all the problems inherent with the mandate. Congress should encourage a competitive fuel market by removing regulatory barriers that prevent alternative fuels from reaching the market. Fuel choice and a more diverse fuel market can be beneficial when driven by consumers and producers in a free market. Rob Green, executive director of the National Council of Chain Restaurants, aptly summed up the problem:

We simply believe it is time for the ethanol industry to stand on its own, as restaurant owners and operators do every day. Congress and the president should repeal the misguided Renewable Fuel Standard and allow the free market to allocate corn to its most highly valued use—not one imposed by a government that forces food to be burned for inefficient fuel.¹⁰

The problem occurs when the federal government creates artificial markets through mandates. Inevitably, such policies lead to unintended consequences. In the case of the ethanol mandate, these consequences include potential engine damage, environmental costs, food riots internationally, and higher prices.

Mandate Drives Up Costs for Americans

The 2012 summer drought in the United States ravaged crops, drove corn prices up dramatically and

heightened concerns that U.S. policy is needlessly diverting food to fuel.¹¹ Since corn is a staple ingredient for many foods and an important feedstock for animals, many in the food industry (from cattle and chicken farmers to restaurant associations) have expressed concern regarding the mandate's effect on food prices. Although the magnitude of the ethanol mandate's effect on corn prices is difficult to determine, because knowing how much ethanol would be used for fuel absent a mandate is not possible, the direction is clear: The mandate is increasing prices. In fact, The Heritage Foundation calculated that the mandate could be increasing corn prices as much as 68 percent.¹²

The Renewable Fuel Standard's effect on food prices extend beyond corn-related foods. The EPA has acknowledged that its target of 1.28 billion gallons of commercial biodiesel for 2013 will increase soybean prices.¹³ For only 2013 and just for the biodiesel component of the RFS, net costs of the rule are projected to be between \$263 million and \$425 million.¹⁴

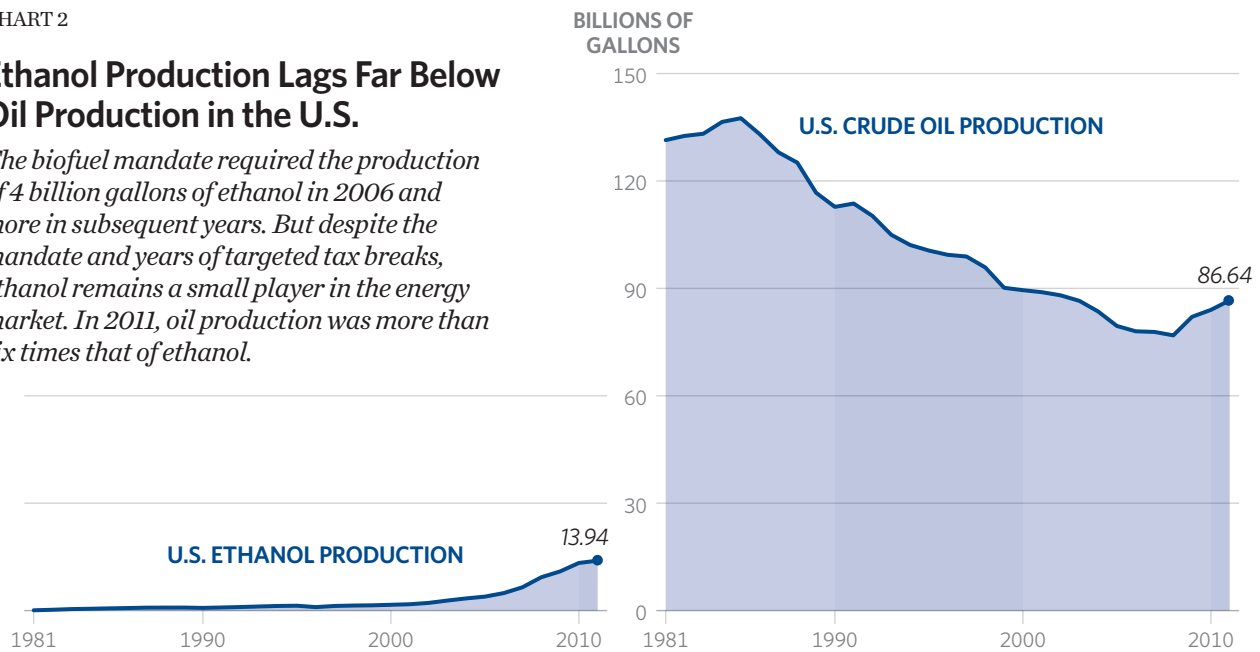
Mandated renewable fuel production is not just causing Americans pain at the grocery store but also at the pump in a number of ways. Ethanol is less efficient, ultimately costing the driver more. One gallon of E85 fuel (85 percent ethanol and 15 percent gasoline) is at best 83 percent as energy efficient as one gallon of gasoline.¹⁵ So, even if ethanol were to help decrease the price of gasoline per gallon, drivers are essentially buying watered-down gas that gets them fewer miles.¹⁶ According to the AAA Daily Fuel Gauge Report, after adjusting for the lower energy content of ethanol, E85 gasoline costs nearly 50 cents per gallon

9. Michael Green, "New E15 Gasoline May Damage Vehicles and Cause Consumer Confusion," AAA NewsRoom, November 30, 2012, <http://newsroom.aaa.com/2012/11/new-e15-gasoline-may-damage-vehicles-and-cause-consumer-confusion/> (accessed May 3, 2013).
10. Rob Green, "A Mandate to Raise Food Prices," *The Wall Street Journal*, November 27, 2012, <http://online.wsj.com/article/SB10001424127887323713104578133571463805826.html?KEYWORDS=ethanol> (accessed May 3, 2013).
11. Steve Hargreaves, "Calls to Scrap Ethanol Mandate Intensify with Drought," CNNMoney, August 6, 2012, <http://money.cnn.com/2012/08/06/news/economy/ethanol-drought/index.htm> (accessed May 3, 2013).
12. David W. Kreutzer, "Renewable Fuel Standard, Ethanol use, and Corn Prices," Heritage Foundation *Backgrounder* No. 2727, September 17, 2012, <http://www.heritage.org/research/reports/2012/09/27/the-renewable-fuel-standard-ethanol-use-and-corn-prices>.
13. *Federal Register*, "Regulation of Fuels and Fuel Additives: 2013 Biomass-Based Diesel Renewable Fuel Volume," September 27, 2012, <https://www.federalregister.gov/articles/2012/09/27/2012-23344/regulation-of-fuels-and-fuel-additives-2013-biomass-based-diesel-renewable-fuel-volume> (accessed May 29, 2013).
14. Sofie Miller, "Crony Environmentalism," *Regulation*, Spring 2013, <http://www.cato.org/sites/cato.org/files/serials/files/regulation/2013/3/v36n1-14.pdf#page=1> (accessed May 29, 2013).
15. Alternative Fuels Data Center, "Fuel Properties Comparison," February 27, 2013, http://www.afdc.energy.gov/fuels/fuel_comparison_chart.pdf (accessed May 29, 2013).
16. D. K. Albino, K. Z. Bertrand, and Y. Bar-Yam, "Food for Fuel: The Price of Ethanol," New England Complex Systems Institute, October 4, 2012, <http://necsi.edu/research/social/foodprices/foodforfuel/> (accessed May 29, 2013).

CHART 2

Ethanol Production Lags Far Below Oil Production in the U.S.

The biofuel mandate required the production of 4 billion gallons of ethanol in 2006 and more in subsequent years. But despite the mandate and years of targeted tax breaks, ethanol remains a small player in the energy market. In 2011, oil production was more than six times that of ethanol.



Notes: 2011 figure for ethanol is preliminary. Oil production figures are field production.

Source: U.S. Energy Information Administration, U.S. Field Production of Crude Oil, <http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pets&s=mcrfpus1&f=a> (accessed May 13, 2013), and Fuel Ethanol Overview, Table 10.3, <http://www.eia.gov/totalenergy/data/annual/showtext.cfm?t=ptb1003> (accessed May 13, 2013).

B 2811 heritage.org

more than regular gasoline, 15 cents more than premium gasoline, and 12 cents more than diesel.¹⁷

Where Are the Environmental Gains, the Reduced Dependence on Oil?

The ethanol mandate has come up empty on its goals to reduce dependence on oil and improve environmental well-being. Displacing oil with ethanol in the gasoline market may be reducing Americans' dependence on oil, but the real question is: How much reduction and at what cost? The answer is, very little reduction in oil use at a very high cost. In 2011, biofuels accounted for only 4 percent of the

transportation fuel used in the United States, and, because ethanol is less energy-dense, the displacement of oil is even less than that.¹⁸

Even this small share of the market is also due to strong political effort. In addition to the mandate, taxpayers shelled out more than \$20 billion for targeted tax credits over the span of three decades and implemented a protectionist tariff on imported ethanol.¹⁹ Researchers at the James Baker Institute of Rice University found that in order to replace 2 percent of gasoline with biofuels in 2008, taxpayers spent \$4 billion, an astounding cost of \$1.95 a gallon for each gallon that biofuel substitutes for gasoline.²⁰

17. AAA Daily Fuel Gauge Report, <http://fuelgaugereport.aaa.com/?redirectto=http://fuelgaugereport.opisnet.com/index.asp> (accessed May 29, 2013).

18. U.S. Energy Information Administration, "Use of Energy in the United States Explained: Energy Use for Transportation," June 14, 2012, http://www.eia.gov/energyexplained/index.cfm?page=us_energy_transportation (accessed May 29, 2013).

19. Robert Pear, "After Three Decades, Tax Credit for Ethanol Expires," *The New York Times*, January 1, 2012, http://www.nytimes.com/2012/01/02/business/energy-environment/after-three-decades-federal-tax-credit-for-ethanol-expires.html?_r=0 (accessed May 3, 2013).

20. "Fundamentals of a Sustainable U.S. Biofuels Policy," James A. Baker III, Institute for Public Policy, Rice University, January 2010, <http://www.bakerinstitute.org/publications/EF-pub-BioFuelsWhitePaper-010510.pdf> (accessed May 29, 2013).

The \$1.95 per gallon is merely the cost of the subsidy; the economic consequences of the mandate extend well beyond this figure.

Environmental groups that once supported the use of ethanol are now arguing that the ethanol mandate is poor environmental policy. After accounting for land-use conversion, the use of fertilizers, insecticides, and pesticides, as well as the fossil fuels used for production and distribution, biofuel production is quite carbon-intensive.²¹ To grow corn, farmers must plow more land, and more land plowed means not only less area for trees but also the release of carbon dioxide stored in trees, plants, and soil.²² The EPA also acknowledges that increases in soybean production as a result of the mandate can cause adverse effects to water quality, ecosystems, and habitats while increasing criterion pollutants, such as sulfur dioxide and nitrous oxide.²³

Mandate Feeds Corporate Welfare

The RFS comes on top of decades of preferential tax treatment for ethanol and other biofuels. While Congress let a 54 cent tariff on imported ethanol and an ethanol production tax credit expire in 2011, it reintroduced a one-year extension of a \$1.01 per-gallon tax credit for cellulosic fuel, a special accelerated depreciation schedule for new cellulosic biofuel plant property, and a \$1 per-gallon tax credit for biodiesel fuel mixtures in the last-minute fiscal cliff deal.²⁴ Though biofuels made out quite well in the fiscal cliff deal, a day after the bill was passed, the biofuels lobbyists were already asking for more: “However, by only extending [biofuel tax credits] for one year, Congress failed to provide the necessary certainty for investors and businesses to plan for the long term, which is imperative for continued stability and growth,” CEO of Growth Energy Tom Buis said in response.

Despite the unique and diverse mix of organizations opposed to the ethanol mandate, the strong lobbying arm, combined with the political importance of the geographic region where America produces corn, make ethanol policy the perfect example of focusing on political profit as opposed to economic progress. The mandate and economically unsound tax credits create a system in which, despite ethanol’s adverse effects on food prices, fuel prices, and the environment, politicians and producers who stand to benefit from the policies will work to keep them in place and extend them.²⁵

Regarding corn-based ethanol, former Vice President Al Gore famously said, “It’s hard once such a program is put in place to deal with the lobbies that keep it going. One of the reasons I made that mistake is that I paid particular attention to the farmers in my home state of Tennessee, and I had a certain fondness for the farmers in the state of Iowa because I was about to run for President.”²⁶ Rather than fully concentrating on lowering costs and improving efficiency to create a more competitive alternative fuel, the industry focuses more on securing its next handout. While not unique to the biofuel industry, the most effective way to reduce this problem is to reduce the government’s role in determining what type of energy Americans produce and consume.

Repeal of, Not Reform of, the Mandate

The mandate promised less dependence on foreign oil, lower fuel prices, and fewer greenhouse gas emissions. Instead of delivering on these promises, the mandate delivered concentrated benefits to politically connected producers and higher costs to America’s energy consumers. The 2012 drought and the increased prices in RIN credits have prompted calls for more flexibility in the RFS. Last year, the EPA rejected a proposal from a number of governors and federal legislators to partially waive the

21. Ibid.

22. Joseph Fargione, Jason Hill, David Tilman, Stephen Polasky, and Peter Hawthorne, “Land Clearing and the Biofuel Carbon Debt,” *Science*, Vol. 319, No. 5867 (February 2008), pp. 1235-1238.

23. *Federal Register*, “Regulation of Fuels and Fuel Additives.”

24. BloombergBNA, “Chart on American Taxpayer Relief Act of 2012,” Bureau of National Affairs, 2013, http://www.bna.com/uploadedFiles/Content/Landing_Pages/FISCAL_CLIFF/ChartonAmericanTaxpayerReliefActof2012.pdf (accessed May 3, 2013).

25. Joanna Schroeder, “Ethanol Industry Pleased with Tax Extensions,” *DomesticFuel.com*, January 2, 2013, <http://domesticfuel.com/2013/01/02/ethanol-industry-pleased-with-tax-extensions/> (accessed May 3, 2013).

26. “Al Gore’s Ethanol Epiphany,” *The Wall Street Journal*, November 27, 2010, <http://online.wsj.com/article/SB10001424052748703572404575634753486416076.html> (accessed May 3, 2013).

mandate.²⁷ Congress could force the EPA to grant the partial waiver, but loosening the strings of the mandate only fixes the failed policy temporarily. For a permanent solution to the economic and environmental problems the ethanol mandate caused, Congress should:

- **Repeal the ethanol mandate in its entirety.** Removing the mandate will spur a healthier market that promotes risk taking and entrepreneurial activity rather than government dependence for near-term survival through favorable policies and tax treatment.
- **Repeal all transportation fuel and technology subsidies.** Use the repeal of the mandate as momentum for greater reform in the energy sector that further levels the playing field for all

energy companies and technologies. Congress should remove preferential treatment for all transportation fuels and technologies.

The heart of the matter is, Congress should not be mandating how much ethanol must be in a citizen's gas tank. After eight years of failure under the ethanol mandate and billions of wasted taxpayer dollars, pressing forward with the mandate intact, or even reformed, would amount to a Pickett's Charge. The 2012 drought only highlighted the damage the mandate has done to too many over the years. It is time for Congress to cut its losses and run from the mandate or any "less bad" reform of it—now.

—*Nicolas D. Loris is Herbert and Joyce Morgan Fellow in the Thomas A. Roe Institute for Economic Policy Studies at The Heritage Foundation.*

27. Smarter Fuel Future, Directory of Petitions to the EPA, <http://smarterfuelfuture.org/resource-center/details/directory-of-petitions-to-the-epa> (accessed May 3, 2013).