Shucking Away the Husk of a Crop Gone Wrong: Why the Federal Government Needs To Replant Its Approach to Corn-Based Ethanol

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I. INTRODUCTION

Over the past three and a half decades, ethanol has become an increasingly important source of energy in the United States and abroad. The United States produces the vast majority of its ethanol from corn. While proponents of the corn industry tout this development as being environmentally preferable to oil, reducing America's dependence upon foreign sources of energy, and being a driver of job creation, it has become evident that the benefits of the industry may not outweigh the

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costs.[1] Specifically, the production of corn ethanol is energy intensive and may not create a net energy gain.[2] Additionally, the increasing popularity of corn ethanol has driven up the prices of corn feed while relying on environmentally damaging fertilizers.[3] While the United States has slowly recognized the shortcomings of corn ethanol, the industry still receives many benefits at both the federal and state level.[4]

This Comment will trace the history of ethanol in the United States, highlight problems with the process of turning corn into fuel, and discuss the current policies in effect. Finally, the Comment will propose that if America is serious about creating a green economy and reducing greenhouse gas (GHG) emissions, then artificial incentives and loopholes should be eliminated to create a level playing field and let the market dictate the future of corn ethanol. Without the current programs propping up the industry, this Comment argues that corn ethanol would fade away in favor of more efficient types of ethanol, such as switchgrass or miscanthus. Specific recommendations include amending the Clean Air Act (CAA) and the corporate average fuel economy (CAFE) standards, in addition to creating national standards through the Commerce Clause so that states cannot continue to incentivize the corn ethanol industry at the expense of the health of the nation as a whole.[5] In short, this Comment suggests that the drawbacks of the industry are so great that it would be wise to invest in other domestic sources of ethanol while abandoning hope that corn will ever become an environmentally or economically justifiable source of fuel.

II. BACKGROUND

Before discussing the legal and policy ramifications of corn ethanol, it is first important to understand what ethanol is, where it comes from, and how it is made, in addition to the historical drivers of the fuel. Ethanol is a dynamic fuel: it can be derived from many different crops and new sources are continually being discovered. As a fuel source, ethanol traces its roots back over 100 years.

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1. Roberta F. Mann & Mona L. Hymel, *Moonshine to Motorfuel: Tax Incentives for Fuel Ethanol*, 19 DUKE ENVTL. L. & POL'Y F. 43, 51 (2008).
2. *See id.* at 79.
3. *See* James A. Duffield et al., *Ethanol Policy: Past, Present, and Future*, 53 S.D. L. REV. 425, 431-32 (2008).
4. *See id.* at 434-37.
5. *See infra* Part V.A-C.

A. What Is Ethanol?

Ethanol, or ethyl alcohol, is a clear, colorless liquid that can be produced from starch-based feedstocks such as corn, sugar-based feedstocks such as sugarcane, or cellulosic feedstocks such as grass, wood, crop residues, or old newspapers.[6] Ethanol works well in internal combustion engines and is high in octane, which helps engines generate more power.[7] Because internal combustion engines almost exclusively power today's cars, many people view ethanol as an attractive alternative to gasoline.

Much of the current supply of ethanol is derived from corn and sugar cane. New sources continue to be developed, but not without difficulty. Ninety percent of the ethanol in the United States is produced from corn;[8] this is primarily because corn grows particularly well in America's heartland. Other countries with a more tropical climate, such as Brazil, produce the majority of their ethanol from sugarcane.[9] Brazil's production method has proven to be both more efficient and cost-effective, because its sugar-based ethanol yield is eight times more productive than U.S. corn-based ethanol.[10]

This has led many in the United States to advocate for second generation cellulosic ethanol, which is derived from nonfood sources such as wood waste, crop waste, and certain grasses like switchgrass and miscanthus.[11] Second generation cellulosic sources are advantageous because they do not require croplands and cellulosic sources can produce as much as five times more energy than they take to grow, harvest, and deliver.[12] Cellulose conversion technologies, however, have been elusive,

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6. *Ethanol Fuel Basics*, ALTERNATIVE FUELS & ADVANCED VEHICLES DATA CENTER, U.S. DEP'T OF ENERGY, http://www.afdc.energy.gov/afdc/fuels/ethanol_fuel_basics.html (last updated Mar. 29, 2012); *Ethanol Feedstocks*, ALTERNATIVE FUELS & ADVANCED VEHICLES DATA CENTER, U.S. DEP'T OF ENERGY, http://www.afdc.energy.gov/afdc/fuels/ethanol_feedstocks.html (last updated Mar. 30, 2012).

7. *Ethanol Fuel Basics*, *supra* note 6.

8. Mann & Hymel, *supra* note 1, at 67 (citing BRENT D. YACOBUCCI, CONG. RESEARCH SERV., RL 33290, FUEL ETHANOL: BACKGROUND AND PUBLIC POLICY ISSUES 2 (2006)).

9. *See* Sean Charles Starr, Comment, *Sweet Rewards: How U.S. Trade Liberalization and Penetration of Brazilian Ethanol into the U.S. Market Can Stimulate America's Domestic Economy and Strengthen America's International Influence*, 8 DEPAUL BUS. & COM. L.J. 275 (2010) (describing the rise of the sugar industry in Brazil while arguing for the elimination of trade barriers between the United States and Brazil).

10. *Id.* at 283 (citing Roger Cohen, Op-Ed., *Is Ethanol for Everybody?*, N.Y. TIMES, Jan. 10, 2008, at A20).

11. *See, e.g.*, *id.* at 293-94 (citations omitted).

12. *Id.* (quoting Vanessa M. Cordonnier, *Ethanol's Roots: How Brazilian Legislation Created the International Ethanol Boom*, 33 WM. & MARY ENVTL. L. & POL'Y REV. 287, 312 (2008)).

expensive, and production has not yet moved beyond the pilot stage.[13] Indeed, billionaire Vinod Khosla's Range Fuels received $6.2 million from the State of Georgia, $76 million from the United States Department of Energy (DOE), and an $80 million loan guarantee from the United States Department of Agriculture (USDA) to build the nation's first cellulosic ethanol plant.[14] After spending half of that amount, Range Fuels went bankrupt, never producing a single drop of commercially viable ethanol.[15] Irate taxpayers, who had to foot the bill, are calling the project a waste and liken the situation to the failed solar power company, Solyndra.[16]

The newest source for ethanol may come from fossil fuels. Celanese Corporation, a Texas-based company, plans to begin producing ethanol derived from natural gas in mid-2012.[17] Additionally, the company proposes to build coal-to-ethanol plants in China in 2013 and 2014.[18] The company touts these fossil fuel sources as a cheaper alternative to corn-based ethanol, stating that the price would be one-third less than from corn.[19] As with any new source of ethanol, and especially with fossil fuels, further studies will be required to investigate their efficiency and impact upon the environment.

B. A Brief History of Ethanol Policy in the United States

Although Henry Ford had considered ethanol as a fuel source in the early twentieth century,[20] it took off in earnest during the oil crisis of the 1970s.[21] Looking to reduce the country's reliance on foreign sources of energy, Congress enacted the National Energy Act of 1978.[22] The Act established the first subsidy for ethanol, giving blends of gasoline with at least 10% ethanol (by volume) a $0.40 per gallon exemption from the federal motor fuels tax.[23] While that law expired in 1984, Congress

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13. Duffield et al., *supra* note 3, at 441.

14. Dan Chapman, *Ga. Failure Not the Only Ethanol Misadventure*, ATLANTA J.-CONST. (Jan. 15, 2012, 5:00 AM), http://www.ajc.com/news/ga-failure-not-the-1302706.html.

15. *Id.*

16. *Id.*

17. Jack Kaskey, *Celanese to Make Low-Cost Ethanol from Gas if U.S. Policy Changes*, BLOOMBERG (July 21, 2011, 4:26 PM), http://www.bloomberg.com/news/2011-07-21/celanese-to-make-low-cost-ethanol-from-gas-if-u-s-policy-changes.html.

18. *Id.*

19. *Id.*

20. *Ethanol Fuel Basics*, *supra* note 6.

21. Duffield et al., *supra* note 3, at 427-28.

22. *Id.* at 428.

23. *Id.* (citing Energy Tax Act of 1978, Pub. L. No. 95-618, 92 Stat. 3174 (1978)). The Energy Tax Act contains the ethanol tax provisions of the National Energy Act of 1978. *Id.* at 428 n.25.

enacted the Energy Security Act in 1980, which offered insured loans to ethanol plants producing less than one million gallons per year.[24] This law also directed the United States to increase its total supply of ethanol to 10% of gasoline by the end of 1990.[25] 1980 also saw the enactment of the Crude Oil Windfall Profit Tax Act, which extended the ethanol motor fuel excise tax exemption until the end of 1992.[26] Since 1980, different laws have been passed that changed the level of the motor fuel tax credit, which stood at $0.51 per gallon until very recently.[27]

The oil crisis led the U.S. government to take other relevant actions as well, such as setting fuel efficiency standards for the automobile industry and requiring government motor fleets to purchase alternative-fueled vehicles.[28] While the crisis eased during the 1980s, Congress still encouraged the production of ethanol by passing the Alternative Motor Fuels Act in 1988.[29] This law enables automakers to receive credits towards meeting their CAFE standards by producing dual-fueled vehicles known as flexible fuel vehicles (FFVs).[30] As will be seen later, the intentions of this goal are laudable, but in practice, it has become abused by the automakers.

Ethanol also received a big boost with the Clean Air Act Amendments of 1990 (CAA Amendments). Provisions of the CAA Amendments—the Oxygenated Fuels Program[31] and the Reformulated Gasoline Program[32]—required gasoline to contain 2% oxygen in an effort to control carbon monoxide and ozone problems.[33] The two most commonly used oxygenates at the time were methyl tertiary butyl ether (MTBE) and ethanol.[34] During the passage of the amendments, MTBE was the preferred oxygenate, but the United States Environmental Protection Agency (EPA) has since voiced its concerns with the safety of the product. The EPA believes that MTBE is harmful in groundwater,

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24. *Id.* (citing Energy Security Act of 1980, Pub. L. No. 96-294, 94 Stat. 611 (1980)).

25. *Id.*

26. *Id.* at 428-29 (citing Crude Oil Windfall Profit Tax Act, Pub. L. No. 96-223, 94 Stat. 229 (1980)).

27. *Id.* at 429.

28. *Id.*

29. *Id.* at 430 (citing Alternative Motor Fuels Act of 1988, Pub. L. No. 100-494, 102 Stat. 2441 (1998)).

30. *Id.*

31. 42 U.S.C. § 7545(m) (2006).

32. *Id.* § 7545(k); Regulation of Fuels and Fuel Additives: Standards for Reformulated Gasoline, 56 Fed. Reg. 31,176 (July 9, 1991).

33. Duffield et al., *supra* note 3, at 431 (citing Clean Air Act Amendments of 1990, Pub. L. No. 101–549, 104 Stat. 2399 (1990) (codified as amended at 42 U.S.C. §§ 7401-7642)).

34. *Id.*

and that at high concentration levels, it can pose a public health threat.[35] However, the EPA has not banned MTBE and leaves the decision of which oxygenates to use up to the oil companies.[36] As of 2007, twenty-five states had issued either a complete or partial ban on the use of MTBE.[37] As a result, ethanol use increased because of the passage of the CAA Amendments and the subsequent discovery of safety concerns with MTBE.[38]

Ethanol production continued to grow during the 1990s, despite the relative stability of oil prices.[39] The 2000s, however, saw oil prices skyrocket, and with that came an increased focus on weaning the United States off of foreign oil once more. This era saw the advent of the farm bill as a major player in the development of biofuels and as a driver of national energy policy.

Farms bills authorize most of the programs the USDA operates and are enacted every five to seven years.[40] The 2002 Farm Bill contained the Farm Security and Rural Investment Act, authorizing the first energy title in farm bill history.[41] This created a variety of programs through 2007 that promoted bioenergy production and consumption.[42] The 2002 Farm Bill also codified the USDA's Commodity Credit Corporation Bioenergy Program, created in 2000.[43] This program provided cash payments to biofuel producers who increased their production levels above year-earlier totals.[44] The USDA freed up to $150 million each year from 2003 to 2006 for the program.[45]

The reader may be noticing that ethanol policy in the United States is driven and controlled by a host of different agencies and legislation. This trend continued through the latter half of the 2000s. In 2005, Congress passed the Energy Policy Act, which mandated a renewable

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35. EPA, EPA420-F-99-040, EMISSIONS FACTS: REFORMULATED GASOLINE 3-4 (Nov. 1999), http://www.epa.gov/otaq/f99040.pdf.

36. *Id.* at 3.

37. EPA, EPA420-B-07-013, STATE ACTIONS BANNING MTBE (STATEWIDE) (Aug. 2007), http://www.epa.gov/mtbe/420b07013.pdf.

38. *See* Eric Kelderman, *MTBE Bans Boost Ethanol*, STATELINE (June 6, 2005), http://www.stateline.org/live/ViewPage.action?siteNodeId=136&languageId=1&contentId=35692.

39. Duffield et al., *supra* note 3, at 431-32.

40. *Id.* at 433.

41. *Id.* (citing the Farm Security and Rural Investment Act of 2002, Pub. L. No. 107-171, tit. IX, 116 Stat. 134, 475 (2002)).

42. *Id.*

43. *Id.*; *see* FARM SERV. AGENCY, USDA, BIOENERGY PROGRAM (Aug. 2004), http://www.fsa.usda.gov/Internet/FSA_File/bioenergy05.pdf.

44. Duffield et al., *supra* note 3, at 433.

45. *Id.* (citing FARM SERV. AGENCY, *supra* note 43).

fuel phase-in program known as the Renewable Fuel Standard (RFS).[46] The RFS requires U.S. fuel production to include a minimum amount of renewable fuel each year, beginning with 4 billion gallons in 2006 and reaching 7.5 billion gallons in 2012.[47] After 2012, the Act requires renewable fuel production to grow by at least the same rate as gasoline production.[48] Additionally, the Act eliminated the requirement that reformulated gasoline contain at least 2% oxygen, and instead created a trading program in which refiners and fuel blenders could purchase credits from those who use more renewable fuel than required.[49]

Importantly, the Energy Policy Act also created the Cellulosic Biomass Program (CBP) to stimulate the production of cellulosic ethanol.[50] Under the CBP, every gallon of ethanol made from cellulosic sources is credited as 2.5 gallons towards satisfying the RFS.[51] Beginning in 2013, the RFS must include at least 250 million gallons of fuel derived from cellulosic sources.[52] As mentioned before, the technology necessary for converting cellulose into ethanol has proven difficult to perfect, thus, the Act also guarantees loans of up to $250 million per production facility, and authorizes a $650 million grant program to fund research on the technology.[53]

III. THE PROBLEM WITH CORN ETHANOL

Many advocates of corn ethanol promote the industry by voicing the themes of energy independence, environmental welfare, and agricultural benefits.[54] There is, however, countervailing evidence suggesting that corn ethanol is responsible for a host of problems. Particularly, many criticize the ethanol industry for, among other things, creating a huge spike in food prices,[55] funneling colossal subsidies to large corporations, and relying so heavily upon a crop that could be wiped out by a single bad-weather event (such as a drought).[56] While those criticisms have merit, this Part will primarily focus upon the

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46. *Id.* at 435 (citing Energy Policy Act of 2005, Pub. L. No. 109-58, 119 Stat. 594 (2005)).
47. *Id.*
48. *Id.*
49. *Id.*
50. *Id.* (citing Energy Policy Act of 2005 § 932).
51. *Id.*
52. *Id.*
53. *Id.*
54. Brian R. Farrell, Note, *Fill 'Er Up with Corn: The Future of Ethanol Legislation in America*, 23 J. CORP. L. 373, 377 (1998).
55. *See* Duffield et al., *supra* note 3, at 444-45.
56. *See* Mann & Hymel, *supra* note 1, at 65-66.

environmental detriments of corn ethanol. Because the environmental consequences of ethanol are so numerous this Comment chooses to focus on three particularly relevant problems—the energy required to create ethanol, the efficiency (or lack thereof) of the fuel, and the effects corn has on land and water.

A. Net Energy Benefit

A net energy benefit (NEB) refers to whether "the energy value in the fossil fuel used to make ethanol is less than the energy value derived from the ethanol that is produced."[57] In an era of growing concern over the consequences of global warming, the NEB bears directly upon whether ethanol reduces total GHG emissions. It is far from certain that it does. Total GHG emissions from ethanol are dependent upon both the type of feedstock and the type of fossil fuel used in the ethanol manufacturing process.[58]

For a fuel that is often touted as being the greener alternative, the science is surprisingly mixed. One oft-cited study completed by Argonne National Laboratory (through the DOE) concluded in 1999 that use of E10 (10% ethanol and 90% gasoline by volume) would result in a 1% reduction in GHG emissions (per vehicle mile traveled) and that use of E85 (85% ethanol and 15% gasoline by volume) would result in a 14-19% reduction in GHG emissions (per vehicle mile traveled).[59]

The USDA has also come to similar conclusions. In its most recent update, the agency calculated the NEB by measuring all conventional fossil fuel energy used in the production of one gallon of corn ethanol.[60] The agency's findings, expressed in a ratio, is "about 2.3 BTU of ethanol for 1 BTU of energy inputs, when a portion of total energy input is allocated to byproduct and fossil fuel is used for processing energy."[61]

Studies not funded by the U.S. government have been much more critical of corn ethanol. A study done by Professors David Pimentel and Tad W. Patzek criticized the USDA's methodology for, among other

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57. *Id.* at 68 (citing MICHAEL B. MCELROY, ENERGY: PERSPECTIVES, PROBLEMS, & PROSPECTS ch. 15 (2010)).

58. *Id.* at 67.

59. M. WANG ET AL., ARGONNE NAT'L LAB., EFFECTS OF FUEL ETHANOL USE ON FUEL-CYCLE ENERGY AND GREENHOUSE GAS EMISSIONS 1 (Jan. 1999), http://www.transportation.anl.gov/pdfs/TA/58.pdf.

60. H. SHAPOURI ET AL., USDA, AGRIC. ECON. REP. NO. 846, 2008 ENERGY BALANCE FOR THE CORN-ETHANOL INDUSTRY 1 (June 2010), http://www.usda.gov/oce/reports/energy/2008 Ethanol_June_final.pdf.

61. *Id.* BTU, or British thermal unit, is the amount of energy needed to heat one pound of water one degree Fahrenheit. *Understanding the White Hang Tag*, EPA, http://www.epa.gov/burnwise/guidewhiteowhh.html (last updated Aug. 4, 2011).

things, only including corn data from several states instead of all fifty and omitting inputs such as the energy required to produce and repair farm machinery.[62] This report concludes that ethanol production using corn requires 29% more fossil energy than the ethanol fuel produces.[63]

Further inquiries evidence the relatively meager benefits (if any at all) of corn ethanol when compared to cellulosic sources of ethanol. One study reports that replacing corn with perennial cellulosic feedstocks switchgrass and miscanthus would result in GHG emissions reductions of an astounding 29% to 473%.[64]

Even those who concede that corn ethanol has a positive NEB argue that it is too small to justify corn's status as a "big winner" in the world of alternative fuels.[65] In a world growing increasingly concerned with global warming and reducing GHG emissions, corn ethanol may not deliver the results so many have promised.

B. Inefficiency

Another significant drawback of ethanol is that it produces less energy per gallon than gasoline. In fact, the most recent report from the DOE states that E85 contains about 30% less energy (BTUs) per volume than gasoline, which may result in a 25% to 30% decrease in miles driven when compared to gasoline.[66] The lower BTU measurement is simply inherent to the fuel, a built-in characteristic to whatever source the fuel originates from.[67]

Furthermore, one of ethanol's intrinsic benefits currently works against it. E85 has a high octane rating (around 110), compared to gasoline's lower rating (usually ranging from 87 to 93).[68] As previously mentioned, octane helps engines generate more power. Today's FFVs,

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62. David Pimentel & Tad W. Patzek, *Ethanol Production Using Corn, Switchgrass, and Wood; Biodiesel Production Using Soybean and Sunflower*, 14 NAT. RESOURCES RES. 65, 69 (2005) (citations omitted).

63. *Id.* at 65.

64. Sarah C. Davis et al., *Impact of Second-Generation Biofuel Agriculture on Greenhouse-Gas Emissions in the Corn-Growing Regions of the US*, 10 FRONTIERS ECOLOGY & ENV'T 69, 69 (2012), *available at* http://www.esajournals.org/doi/pdf/10.1890/110003.

65. Mann & Hymel, *supra* note 1, at 79.

66. U.S. DEP'T OF ENERGY, CLEAN CITIES ALTERNATIVE FUEL PRICE REPORT: OCTOBER 2011, at 7 (Oct. 2011), http://www.afdc.energy.gov/afdc/pdfs/afpr_oct_11.pdf.

67. *See id.* Pure gasoline contains 115,400 BTU per gallon, while ethanol contains only 75,670 BTU per gallon. *Id.* at 16. Comparatively, propane contains 83,500 BTU per gallon while biodiesel contains 117,093 BTU per gallon. *Id.*

68. *The Low-Down on High Octane Gasoline*, FED. TRADE COMM'N, http://www.ftc.gov/bcp/edu/pubs/consumer/autos/aut12.shtm (last modified Apr. 24, 2009); Matthew Phenix, *Liquor Does It Quicker*, POPULAR SCI. (June 6, 2005, 2:00 AM), http://www.popsci.com/cars/article/2005-06/liquor-does-it-quicker.

however, are not built to run on the higher-octane content of ethanol, but on the lower content of gasoline.[69] This is because FFVs must retain dual-fuel capability, and thus are not able to take full advantage of the combustion characteristics of ethanol.[70] Therefore, the higher-octane content is essentially wasted, unless using an engine built for higher operating pressures. Some engineers believe that E85 fuel economy could equal that of gasoline if engines were optimized for ethanol, but this has yet to be realized and promises to be more expensive and years away from being available to consumers.[71]

Another problem with ethanol (or any alcohol-derived fuel) is that water and ethanol readily dissolve in each other, unlike pure gasoline.[72] Water can mix with the fuel in a variety of ways, including groundwater seeping into a storage tank or during refueling. This can cause "phase separation," which results in a layer of water forming beneath a layer of fuel due to the higher density of water.[73] Most engines, unfortunately, draw their fuel from the bottom of their fuel tank and will stop running if they draw in water because water does not burn.[74] This can cause not only lower fuel economies, but also damage to the engine itself.[75] Furthermore, this problem is exacerbated in smaller engines, as with lawnmowers and chainsaws, and severe damage to these engines is not uncommon.[76]

The wasteful qualities of ethanol have both environmental and economic consequences. Because E85 is less efficient than gasoline, a car running on it will require more of the fuel, which in turn means more GHG emissions. Additionally, while the average price per gallon of E85

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69. Matthew L. Wald, *When It Comes to Alternate Fuels, All Gallons Aren't Equal*, N.Y. TIMES (May 28, 2006), http://www.nytimes.com/2006/05/28/automobiles/28FUEL.html.

70. Matthew Brusstar & Marco Bakenhus, *Economical, High-Efficiency Engine Technologies for Alcohol Fuels* 2, http://www.epa.gov/otaq/presentations/epa-fev-isaf-no55.pdf (last visited Apr. 20, 2012).

71. *What Is Ethanol, and How Is It Used?*, CONSUMER REP. (Jan. 2011), http://www.consumerreports.org/cro/cars/new-cars/news/ethanol/what-is-ethanol/index.htm; *see also* Brusstar & Bakenhus, *supra* note 70 (explaining that this type of ethanol-optimized engine could produce higher fuel economies, but remains in the developmental phase).

72. David J. Kortum et al., *Fuel Economy and Engine Performance Issues*, *in* INTERAGENCY ASSESSMENT OF OXYGENATED FUELS 3-1, 3-15 (Nat'l Sci. & Tech. Council ed., June 1997), http://www.epa.gov/oms/regs/fuels/ostp-3.pdf.

73. *Id.*

74. *Id.*

75. *Id.*

76. *Id.*; *see also* M. Alex Johnson, *Mechanics See Ethanol Damaging Small Engines*, MSNBC.COM (Aug. 1, 2008, 9:44 AM), http://www.msnbc.msn.com/id/25936782/#.T1ACBSOZP80. The alcohol content in ethanol can dislodge debris, which in turn leads to sludge build-up and clogging of the engine. The same phenomenon occurs in automobile engines, but automobile engines are more sophisticated and better equipped to deal with dislodged debris. Johnson, *supra*.

is comparable to gasoline at $3.19, this figure is misleading because it does not correct for the 25% to 30% inefficiency when compared to gasoline.[77] When factoring in this inefficiency, the true price of E85 comes out to $4.51 per gallon.[78] For the consumer of E85 this obviously represents a hit to the pocketbook. For many who have already had to cut back on driving because of high gasoline prices combined with the recession, this figure provides little incentive to make the switch to E85.

C. Effects on Land and Water

The process of raising corn has serious effects upon the land on which it is grown. Most significantly, American corn production "requires more pesticides (which are made from oil) and nitrogen fertilizer (made from natural gas) than any other crop."[79] In addition to the obvious GHG emissions implications of this process, the increased pesticide and fertilizer use exacerbates runoff problems in water supplies across the United States. The effects of the runoff are felt near and far as it makes its way through Midwestern streams to the Mississippi River and eventually to the Gulf of Mexico.[80] The nitrogen-rich runoff chokes the Gulf through the process of eutrophication, causing algae blooms and eventually depriving the water of oxygen.[81] This has led to the unfortunate phenomenon in the Gulf known as the "Dead Zone," an 8000 square mile area (as of 2010) of hypoxic water that is generally not conducive to marine life and has caused massive fish kills.[82] Regrettably, this dead zone is projected to grow, as 2.39 million additional tons of nitrogen fertilizer will be needed to keep up with various mandates (discussed *infra*) by 2015.[83]

Growing corn is also a very water-intensive process. The exact amount of water needed varies by region (due to rainfall and availability of natural sources) and can range from 19 gallons per bushel of corn in Iowa, Illinois, Ohio, or Missouri to 865 gallons in North Dakota, South Dakota, Nebraska, and Kansas.[84] Areas like Nebraska, where 72% of the crop is irrigated, place a gigantic strain on already stressed groundwater

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77. U.S. DEP'T OF ENERGY, *supra* note 66, at 3 tbl.1, 7 & tbl.7.

78. *Id.* at 3 tbl.2.

79. Starr, *supra* note 9, at 294 (citing Michael Pollan, *When a Crop Becomes King*, N.Y. TIMES, July 19, 2002, at A20).

80. Renee Cho, *Ethanol's Impacts on Our Water Resources*, EARTH INST. (Mar. 21, 2011, 10:47 AM), http://blogs.ei.columbia.edu/2011/03/21/ethanol's-impacts-on-our-water-resources/.

81. *Id.*

82. *Id.*

83. *Id.*

84. *Id.*

aquifers—specifically, the Ogallala Aquifer, "which lies under the Great Plains and supplies 30% of the nation's groundwater for irrigation, [and] is in danger of running dry."[85] Moreover, processing corn into ethanol also requires substantial amounts of water. While the process is increasingly more efficient, demanding just 3 gallons of water per gallon of ethanol today, down from 6.8 gallons of water per gallon of ethanol a decade ago, it still represents a dramatic strain on an already overtaxed resource.[86]

These problems are exacerbated by the large amount of corn necessary to produce ethanol. It takes approximately 450 pounds of corn to supply just one SUV with a full tank of fuel.[87] Corn planting will cover 94 million acres in 2012, up from 91.9 million acres in 2011.[88] As a comparison, Montana, the fourth largest state in the nation, covers roughly 93 million acres.[89] One can imagine the toll the pesticides and fertilizers necessary to support that much corn take on the nation's land and water resources. The corn industry shows no signs of slowing down either, indicating that the acreage necessary to support the nation's demand for the crop will continue to grow.

IV. THE CURRENT STATE OF AFFAIRS

While the corn ethanol industry still receives heavy government support, there are significant signs that this assistance is being drawn back. This Part will briefly discuss recent legal developments affecting the industry in the past few years.

A. Elimination of Subsidies and Incentives

Two major measures protecting the domestic ethanol industry up until very recently were taxes on imported ethanol. Until December 31, 2011, all ethanol imported into the United States was subject to a 2.5% ad valorem tariff, in addition to an added duty of $0.54 per gallon.[90] In a move that surprised many, Congress refused to extend these measures

85. *Id.*

86. *Id.*

87. Mann & Hymel, *supra* note 8, at 74 (citing Jeff Goodell, *The Ethanol Scam: One of America's Biggest Political Boondoggles*, ROLLING STONE, July 24, 2007, at 48, 52).

88. Luzi Ann Javier, *U.S. Farmers To Plant Most Corn Acres Since 1944, USDA Says*, BLOOMBERG (Feb. 13, 2012, 11:41 PM), http://www.bloomberg.com/news/2012-02-14/u-s-farmers-to-plant-most-corn-acres-since-1944-usda-says-1-.html.

89. *Science in Your Backyard: Montana*, U.S. GEOLOGICAL SURV., http://www.usgs.gov/state/state.asp?state=MT (last modified Oct. 2, 2009).

90. BRENT D. YACOBUCCI, CONG. RESEARCH SERV., RL 33290, FUEL ETHANOL: BACKGROUND AND PUBLIC POLICY ISSUES 22 (Apr. 24, 2008).

past 2011.[91] Furthermore, Congress also allowed the Volumetric Ethanol Excise Tax Credit (VEETC) to expire. The VEETC, created by the American Jobs Creation Act of 2004, provided blenders of ethanol with a $0.45 tax credit on each gallon of ethanol blended with their gasoline (reduced from an initial $0.51 per gallon).[92] The credit cost the federal government nearly $6 billion in 2011.[93] Perhaps recognizing the growing discontent with the heavily subsidized industry, one member of the Renewable Fuels Association said, "We may be the only industry in U.S. history that voluntarily let a subsidy expire. The marketplace has evolved. The tax incentive is less necessary now than it was just two years ago."[94] With that, VEETC also expired on December 31, 2011.[95]

As previously mentioned, the farm bill has become increasingly important in the world of renewable energy. The 2008 Farm Bill provides producers of the more-efficient cellulosic biofuels with a $1.01 tax credit per gallon produced.[96] While this is a step in the right direction, cellulosic sources of ethanol continue to be elusive (as evidenced by Khosla's Range Fuels fiasco), and it is yet to be seen whether this tax credit will provide producers enough incentive to overcome the technological hurdles that they face.

The Energy Independence and Security Act of 2007 (EISA) amended the RFS requirements created in the Energy Policy Act of 2005. The EISA expands the RFS to thirty-six billion gallons of ethanol per year by 2022, but limits corn sources to no more than fifteen billion gallons per year.[97] The EISA demands that at least sixteen billion gallons (of the total thirty-six) per year come from cellulosic sources by 2022.[98] Moreover, the Act requires new refineries producing ethanol to reduce lifecycle GHG emissions by at least twenty percent relative to gasoline, and for cellulosic biofuels to reduce lifecycle GHG emissions by at least sixty percent relative to baseline GHG emissions.[99] The EPA defines

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91. John Mathews, *The End of the U.S. Ethanol Tariff*, GLOBALIST (Jan. 6, 2012), http://www.theglobalist.com/StoryId.aspx?StoryId=9505.

92. *Federal Tax Incentives: VEETC*, RENEWABLE FUELS ASS'N, http://www.ethanolrfa.org/pages/federal-tax-incentives-veetc (last visited Feb. 16, 2012).

93. Robert Pear, *After Three Decades, Tax Credit for Ethanol Expires*, N.Y. TIMES (Jan. 1, 2012), http://www.nytimes.com/2012/01/02/business/energy-environment/after-three-decades-federal-tax-credit-for-ethanol-expires.html?_r=1&ref=farmbillus.

94. *Id.* (quoting Matthew A. Hartwig, Renewable Fuels Association).

95. *Federal Tax Incentives: VEETC*, *supra* note 92.

96. 26 U.S.C. § 40(b)(6) (Supp. 2008).

97. Energy Independence and Security Act of 2007, Pub. L. No. 110-140 § 202(a)(2), 121 Stat. 1492, 1522 (2007) (codified as amended at 42 U.S.C. § 7545(o)(2)).

98. 42 U.S.C. § 7545(o)(2)(B)(i)(II) (Supp. 2008).

99. *Id.* § 7545(o)(2)(A)(i), (o)(1)(E).

lifecycle GHG emissions as "the aggregate quantity of GHGs related to the full fuel cycle, including all stages of fuel and feedstock production and distribution, from feedstock generation and extraction through distribution and delivery and use of the finished fuel."[100] Slowly but surely, Congress is acknowledging the dangers and pitfalls of corn ethanol and is taking some steps to reduce America's dependence on corn.

It is still too early to tell what effect these measures Congress has recently taken will have on the corn industry. It is clear, however, that up until now the industry has continued to grow at a rapid rate. In 2010, ethanol production increased 23% and a record 35% of total U.S. corn production was dedicated to ethanol.[101] The USDA also projected a 9% increase in the use of corn for ethanol production in 2011.[102] It seems, therefore, that the corn ethanol industry has reached a crossroads, and with the new farm bill currently in development, there exists an excellent opportunity to definitively address the issue.

B. Lingering Loopholes

While it seems that many subsidies and tax breaks for the corn ethanol industry are being drawn back, some major loopholes still exist in the law. In 2007, the EPA granted a major exemption under the CAA to the ethanol industry.[103] Effective July 2, 2007, the EPA raised the threshold at which an ethanol plant would be considered a "major" source from 100 tons per year to 250 tons per year of any pollutant for which the local area is in attainment with the National Ambient Air Quality Standards (NAAQS).[104] The EPA justified this change by expressing "concerns that continuing to regulate the ethanol fuel industry, under the 100 [tons per year] major source threshold, regardless of the production method could stymie the growth of the industry, and hamper our nation's efforts toward energy independence."[105]

The EPA then quickly dismissed any negative environmental consequences of the rule. Specifically, the agency reasoned that raising the threshold "will likely encourage facility expansions and construction

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100. EPA, EPA-420-F-09-024, EPA LIFECYCLE ANALYSIS OF GREENHOUSE GAS EMISSIONS FROM RENEWABLE FUELS 1 (May 2009), http://www.epa.gov/otaq/renewablefuels/420f09024.pdf.

101. Rick Barrett, *Uncertainty Prevails as Harvest Nears*, J. SENTINEL (Aug. 22, 2011), http://www.jsonline.com/business/128223523.html.

102. *Id.*

103. *See* Prevention of Significant Deterioration, Nonattainment New Source Review, and Title V: Treatment of Certain Ethanol Production Facilities Under the "Major Emitting Facility" Definition, 72 Fed. Reg. 24,060 (May 1, 2007) (codified at 40 C.F.R. pts. 51, 52, 70, 71).

104. *Id.* at 24,060-61.

105. *Id.* at 24,062.

of larger, more economically efficient plants, which in turn, will emit less emissions per gallon of ethanol produced. The 100 [tons per year] threhold [sic] on the other hand encourages the construction of more numerous, less economically efficient smaller facilities."[106] Curiously, the EPA then stated, "We acknowledge that there may be some emissions increases as a result of this rulemaking."[107] It seems, therefore, that the EPA was less concerned with the environmental consequences of the rule change than with artificially propping up a domestic industry and reducing America's dependency on foreign oil.

Another loophole exists within the CAFE standards. The so-called "Dual-Fuel Vehicle Incentive Program" was established in the late 1980s to stimulate the use of alternative fuels by encouraging automakers to produce more vehicles capable of running on alternative fuels.[108] Unfortunately, this program allows automakers to produce fleets that average 1.2 miles per gallon below the required CAFE standards as long as they sell vehicles that are capable of running on both gasoline and an alternative fuel.[109] For example, a Ford F-150 that actually gets nineteen miles per gallon is credited with achieving thirty-one miles per gallon as long as it is capable of running on an alternative fuel.[110]

While the intentions behind this program may have been noble, it has become an environmental disaster in practice. It is assumed that these vehicles will actually use alternative fuels fifty percent of the time.[111] The problem, however, is that only 1200 of the nearly 200,000 gas stations in America carry E85—and over a third of those are in the states of Minnesota and Illinois.[112] Perhaps unsurprisingly then, data showed that these vehicles used an alternative fuel less than one percent of the time.[113] The problem is compounded by the fact that most of the FFVs sold are "limited . . . to large SUVs, pickups, and sedans that get relatively poor gas mileage."[114] Thus, automakers are receiving credit for producing very fuel-efficient vehicles, when in reality they are taking advantage of the program to reach their minimum CAFE standard while

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106. *Id.* at 24,070.

107. *Id.*

108. *The Dual-Fuel Vehicle Incentive Program*, UNION CONCERNED SCIENTISTS, http://ucsusa.org/clean_vehicles/technologies_and_fuels/biofuels/the-dual-fuel-vehicle.html (last updated Apr. 2, 2008).

109. *Id.*

110. *Id.* fig.1.

111. *Id.*

112. *Id.*

113. *Id.*

114. *What Should Consumers Do?*, CONSUMER REP., http://www.consumerreports.org/cro/cars/new-cars/news/ethanol/give-yourself-a-gasoline-price-cut/index.htm (last updated Jan. 2011).

placing more inefficient vehicles, like SUVs, into service. It is reported that this program increased U.S. dependence on foreign oil by about 80,000 barrels per day in 2005 and enabled automakers to avoid up to $1.6 billion in CAFE fines as of 2008.[115]

If there is a silver lining, it is that this program is gradually being phased out by 2020. The credit of 1.2 miles per gallon will be in effect until model year 2014; thereafter, the credit will decrease by 0.2 miles per gallon until model year 2020 when the phaseout is complete.[116]

C. State Policies

Thus far, the discussion has focused on federal policies. However, many states, especially those in the Midwest, further incentivize the corn ethanol industry. States containing fertile soils for corn, such as Iowa, Nebraska, Illinois, and Minnesota, look to further prop up the corn ethanol industry. Understandably, these states do this in an effort to create jobs and support their economy, but at what expense to the environment and nation as a whole?

States have been relatively successful imposing mandates within their borders. Montana, Hawaii, and Oregon have passed measures requiring a 10% ethanol blend in their gasoline.[117] Minnesota state law also requires all gasoline in the state to contain 10% ethanol.[118] In 2005, Minnesota state legislators raised this mandate to require 20% ethanol (E20) effective 2013.[119] This mandate, however, takes effect only if approved by the EPA. The EPA is responsible for certifying the maximum allowable content of ethanol in gasoline and must grant a waiver to the CAA certifying any ethanol blend higher than 10%.[120] The waiver application must demonstrate that data exists proving that the higher blend will not cause more pollution than gasoline.[121] In 2010, the EPA approved a waiver request from a group called Growth Energy seeking a 15% ethanol blend.[122] While that decision seems to bode well for Minnesota, it is still unclear whether the EPA will grant the state's waiver request for E20.

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115. *The Dual-Fuel Vehicle Incentive Program*, *supra* note 108.

116. 49 U.S.C.A. § 32906 (Supp. 2008).

117. Duffield et al., *supra* note 3, at 437.

118. *Id.*

119. *Id.* (citing MINN. STAT. § 239.791 (2007); Margaret J. Jennings, Note, *Bioenergy: Fueling the Future?*, 12 DRAKE J. AGRIC. L. 205, 213 (2007)).

120. CHRISTINA CONNELLY & RALPH GROSCHEN, MINN. DEP'T OF AGRIC., LEGISLATIVE REPORT ON ETHANOL: REVIEW OF E20 3 (Jan. 15, 2011).

121. *Id.*

122. *Id.*

States have been less successful when attempting to provide their own ethanol producers with tax credits. In 1984, Ohio granted a tax credit against the state gasoline tax for each gallon of ethanol-blended gasoline sold, but provided that the credit would only extend to producers from states that granted a tax credit or refund similar to that of Ohio.[123] The United States Supreme Court struck down this "reciprocity" statute in *New Energy Co. v. Limbach*.[124] While the Court did not say that reciprocity was per se unreasonable, it is now clear that a "state legislature wishing to promote ethanol by using tax credits must do so by promoting the entire industry, not merely its own producers. . . . A statute providing a tax credit that does not distinguish on the basis of the ethanol's origin would presumably be safe from Commerce Clause challenges."[125] It is important to note that courts have used the Commerce Clause to prevent states from limiting interstate commerce.[126] The Commerce Clause, however, also gives Congress expansive power to regulate trade between states,[127] and could be used to limit the corn ethanol industry in the future.

V. LEGAL CONSEQUENCES OF FUTURE ACTIONS

The United States has a host of different options at its disposal in trying to reduce the country's reliance on corn ethanol. This Comment will try to focus on the legal ramifications of any option chosen, and try to avoid pure questions of policy. The author recognizes, however, that this industry is in flux and changing rapidly, thus, policy considerations are important and almost impossible to avoid.

A. Clean Air Act

The ethanol industry scored a major victory when the EPA exempted production facilities from major emitter regulations, thereby raising the pollutant threshold from 100 tons per year to 250 tons per year.[128] This exemption did not go unchallenged. In 2007, the Natural Resources Defense Council (NRDC) petitioned the EPA to reconsider

123. Farrell, *supra* note 54, at 383 (citing OHIO REV. CODE ANN. § 5735.145(B) (West 1984)).

124. 486 U.S. 269 (1988).

125. Farrell, *supra* note 54, at 386.

126. *Id.*

127. *Id.*

128. Prevention of Significant Deterioration, Nonattainment New Source Review, and Title V: Treatment of Certain Ethanol Production Facilities Under the "Major Emitting Facility" Definition, *supra* note 103, at 24,061.

the new rule, arguing that the rule is arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law.[129] The NRDC did not agree with the EPA's position that the rule "is not likely to result in significant net environmental harm and [believed that the] EPA's specific reasons supporting that finding were wholly unknown during the comment period."[130]

The EPA responded, stating that the NRDC's claims were unfounded. The agency argued that the conclusions of the final rule were "consistent with and a logical outgrowth of the discussion of potential emission increases" in the proposed rule.[131] The EPA continued that it was perfectly appropriate to "further evaluate and characterize the degree of the environmental effects of the rule between promulgation of the proposed rule and the final rule without initiating a new round of public comment."[132]

Clearly, this challenge by the NRDC raises serious administrative law concerns. If challenged in court, the NRDC could face a tough time as courts are likely to defer to an administrative agency so long as its interpretation of an ambiguous statute is not unreasonable.[133] While the purpose of the CAA is to "protect and enhance the quality of the Nation's air resources," it does so only "so as to promote the public health and welfare and the *productive capacity* of its population."[134] Thus, a court might find that even though the EPA acknowledged that emissions might increase because of the rule change, to do otherwise would improperly hamper the productive capacity of the American people by restraining the development of a fledgling industry.

Assuming for a moment that the rule change was struck down, the ethanol industry would face an interesting conundrum. There are many questions which would have to be answered. Would production facilities built after the rule change be allowed to continue to operate at the 250 tons per year limit, or would they have to come into compliance at the lower 100 tons per year limit? Would this lower limit hamper the ethanol industry to the point of not building more facilities?

It is conceivable that any production facility built with the understanding that it would be allowed 250 tons per year could be grandfathered into a lower, 100 tons per year threshold. Those facilities

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129. Letter from Stephen L. Johnson, Adm'r of EPA, to John D. Walke, NRDC 1 (Mar. 27, 2008), http://www.epa.gov/NSR/documents/20080327_NRDC_Walke.pdf.

130. *Id.* at 2 (internal quotation marks omitted).

131. *Id.*

132. *Id.* at 3.

133. *See* Chevron, U.S.A., Inc. v. Natural Res. Def. Council, Inc., 467 U.S. 837 (1984).

134. 42 U.S.C. § 7401(b)(1) (2006) (emphasis added).

would be allowed to continue to operate at 250 tons per year, while new facilities would be required to operate under the 100 tons per year standard. While this seems simple and straightforward, it might prove more problematic in reality. Even if these facilities are allowed to continue to pollute at 250 tons per year, the concern then becomes whether this would take an entire region out of compliance with the NAAQS. While the farm areas of the Midwest typically do not fall into "nonattainment areas" under the NAAQS,[135] it is certainly possible that the construction of more ethanol facilities in the future could change this fact.

It also seems unlikely that the 100 tons per year standard would stunt the ethanol industry. The industry saw explosive growth under the older standard.[136] Any slowdown in the expansion of the industry in the late 2000s probably had more to do with the overall inefficiency of corn ethanol than with concern over production facilities' pollution limits. With the continued expansion of corn production in the United States, it seems unlikely that a return to the lower standard would significantly impede the ethanol industry.

B. CAFE Standards

The Dual-Fuel Vehicle Incentive Program provides a major loophole to the car and ethanol industry under the CAFE standards. Because so few E85 refueling stations exist, carmakers are reaping the benefits while the environment suffers.[137] Under this program, automakers can keep producing a fleet of vehicles that falls below the required mileage standards.[138] It would be wise to amend the program to give credit to automakers only if it can be shown that their dual-fuel vehicles are actually using alternative fuels such as E85. This could create difficult administrative and accounting problems, but there is some evidence that such a change is under consideration.[139] This type of change would give credit to automakers only for the amount of alternative fuel actually used, not give credit based on an *assumed* usage

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135. *Counties Designated "Nonattainment" for Clean Air Act's National Ambient Air Quality Standards (NAAQS)*, EPA, http://www.epa.gov/oaqps001/greenbk/mapnpoll.html (last updated Mar. 30, 2012).

136. *See* Barrett, *supra* note 101.

137. *See The Dual-Fuel Vehicle Incentive Program*, *supra* note 108.

138. *See id.*

139. *See* Csaba Csere, *The CAFE Numbers Game: Making Sense of the New Fuel-Economy Regulations*, CAR & DRIVER, Nov. 2011, *available at* http://www.caranddriver.com/features/the-cafe-numbers-game-making-sense-of-the-new-fuel-economy-regulations-feature.

level of fifty percent. As mentioned *supra*, the actual usage is less than one percent, a far cry from the assumed usage level.[140]

Any serious attempt to make this new credit effective would also require massive infrastructure improvements. While ethanol-fueling stations in the United States make up only one percent of the total fueling stations, all 35,017 fueling stations in Brazil are capable of dispensing ethanol.[141] While the United States could conceivably create a law mandating every refueling station to carry ethanol, this would be impractical for at least two reasons. First, it would be prohibitively expensive. Secondly, this program works well for Brazil only because sugarcane ethanol is much more efficient than U.S. corn ethanol.[142] Unless the oil industry fronted some of the costs to provide for ethanol fuels at their stations, and unless the fuel was created from some more efficient source than corn, this potential mandate seems both unwise and unlikely.

C. Creating an Efficiency Standard

Currently, many different regulations, mandates, and pieces of legislation govern the usage of corn ethanol in the United States. While these policies aim to decrease America's dependence on foreign oil and support a domestic industry, they are environmentally shortsighted. Using both Brazil and the CAFE standards as a model, the federal government could fix this problem by implementing a national standard that focuses on the NEB of the fuel.

Environmentally speaking, corn ethanol is simply not worth the trouble if it takes more fossil fuels to produce than it saves. Even the positive NEB reported by federal agencies is not high enough to eliminate other environmental concerns such as pesticide use and runoff.[143] Brazil has witnessed extraordinary success with the use of sugarcane ethanol, which produces 8.2 joules of energy per unit of fossil fuel input (compared to 1.5 joules for corn ethanol).[144]

While the CAFE standards regulate based on miles per gallon, a new standard could regulate ethanol based on its NEB. Similar to the

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140. *The Dual-Fuel Vehicle Incentive Program*, *supra* note 108.

141. *Ethanol Fuel in Brazil*, UN-ENERGY (Jan. 8, 2011), http://www.un-energy.org/stories/38-ethanol-fuel-in-brazil.

142. Starr, *supra* note 9, at 283.

143. *See id.* at 294; Cho, *supra* note 80.

144. Mann & Hymel, *supra* note 1, at 53 (citing DANIEL BUDNY, WOODROW WILSON INT'L CTR. FOR SCHOLARS, THE GLOBAL DYNAMICS OF BIOFUELS: POTENTIAL SUPPLY AND DEMAND FOR ETHANOL AND BIODIESEL IN THE COMING DECADE 4 (Paulo Sotero ed., Apr. 2007), http://www.wilsoncenter.org/sites/default/files/Brazil_SR_e3.pdf).

CAFE standards, the NEB-minimum could start low and gradually increase. Starting at a ratio of around 2.3:1 (the USDA's reported NEB of corn ethanol[145]), this would be raised each year at a certain level to either encourage the corn ethanol industry to find a more efficient method of production, or to begin using more efficient crops, such as switchgrass or miscanthus.

There is some precedent for creating a new standard like this. The EISA requires new ethanol plants to reduce their lifecycle GHG emissions.[146] These reductions, however, are made in comparison to gasoline. While the aim of the requirement is good—to reduce the amount of GHG emissions released during production of ethanol—the United States should strive to make the production of ethanol more efficient than importing and using gasoline, not merely be content with it being as good as gasoline. A NEB standard would comprehensively take all this information into account and produce a single ratio that would be easy for consumers to understand.

This new standard would have the added benefit of creating a single, uniform standard throughout the United States. Many states, particularly those with fertile soils for corn, continue to encourage the use of corn ethanol despite the severe negative environmental consequences inherent in its production.[147] Using its power under the Commerce Clause, Congress could direct the appropriate agency (the EPA, DOE, or even USDA) to create a national standard to ensure that individual states do not gain a competitive advantage over other states by relying on environmentally unsound practices and promoting an industry at the expense of the rest of the nation.

A regulation based on the NEB of ethanol could have a damaging effect on a number of businesses in the United States. If enacted, Brazilian ethanol could be imported in much higher quantities because it already far exceeds the proposed NEB-minimum. While this is a legitimate concern, America should not be encouraging such an environmentally unfriendly industry, especially under the guise of it being a "green" source of fuel. This new standard would instead take into account the true cost of production (in terms of GHG emissions) and regulate accordingly. Initially setting the minimum NEB at a low level would allow American businesses to improve their efficiency either

145. *See* SHAPOURI ET AL., *supra* note 60, at 1.

146. *See* 42 U.S.C. § 7545(o)(2)(a)(i) (Supp. 2008).

147. *See, e.g.*, CONNELLY & GROSCHEN, *supra* note 120, at 3 (writing in support of a minimum blend of twenty percent ethanol at Minnesota gas pumps).

through new technologies or through different types of crops without forcing them to abandon their industry completely.

D. The 2012 Farm Bill

This Comment would not be complete without a brief discussion of the upcoming farm bill. The 2012 Farm Bill may represent a shift away from the massive subsidies that some in the farm industry have become accustomed to from earlier versions of the bill.[148] In tough economic times, and during a renewed effort to cut spending across the board, the newest farm bill could look drastically different. Still, the legislation represents a unique opportunity to return the corn ethanol industry to a more level playing field.

Speaking about priorities of the 2012 Farm Bill, Secretary of Agriculture Tom Vilsack acknowledged that the domestic biofuel industry has reduced oil imports by eight percent in just a few years.[149] The Secretary, however, also hinted at reducing government support of the domestic corn ethanol industry, recognizing that "the assistance we provide to this industry will likely be more targeted and more limited in the future; but we have momentum in many areas of the country to focus on nonfood feed stocks which will allow us to expand the production of advanced biofuels."[150] While Secretary Vilsack did not explicitly condemn the corn ethanol industry, it seems to be clear that the writing is on the wall. Focusing on "nonfood feed stocks" unquestionably removes corn from the equation, and instead would include sources such as switchgrass, miscanthus, or wood waste.

The 2008 Farm Bill included incentives for producers of cellulosic ethanol,[151] and it would be wise to maintain or increase these subsidies. America will be able to compete with countries like Brazil only if more efficient domestic sources of ethanol are used. Granted, the technology has proven costly and difficult to develop,[152] but many successful technologies have taken time, energy, and money to develop. Cellulosic ethanol represents a very promising source of cheap, efficient, clean, and

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148. Mary Clare Jalonick, *Spending Cuts Trump Farm Subsidies for Many Voters*, WASH. TIMES (Feb. 15, 2012), http://www.washingtontimes.com/news/2012/feb/15/spending-cuts-trump-farm-subsidies-many-voters/.

149. Tom Vilsack, Sec'y, USDA, Agriculture Secretary Vilsack on Priorities for the 2012 Farm Bill (Oct. 24, 2011) (transcript available at http://www.usda.gov/wps/portal/usda/usdahome?contentid=2011/10/0458.xml&contentidonly=true).

150. *Id.*

151. *See* 26 U.S.C. § 40(b)(6) (Supp. 2008) (establishing a tax credit of $1.01 for each gallon of cellulosic biofuel produced).

152. *See* Chapman, *supra* note 14.

homegrown energy. Accordingly, the focus of subsidies and tax breaks in the United States should shift from corn to cellulosic ethanol.

The 2012 Farm Bill could be used as a single, comprehensive piece of legislation to implement the suggestions made in this Comment. This would benefit the biofuel industry by creating a single source of regulation for the biofuel industry in the United States. The biofuel industry, however, implicates environmental, agricultural, and energy policy. Thus, it seems likely that the USDA, the DOE, and the EPA will continue to assert some form of oversight over the industry in the future.

VI. CONCLUSION

The corn ethanol industry has come a long way in a relatively short amount of time. From its development in earnest in the 1970s to the mandatory minimum blends of today, corn ethanol has seen a prodigious rise in popularity.[153] The original intent of the subsidies, tariffs, and tax breaks—to get a young, domestic industry off the ground—no longer serve their purpose but continue to stick around. Considering both that the biofuel industry in America is now a powerful and established group of businesses and farmers and that the grievous environmental ramifications of their product are becoming clearer, it is time to end these subsidies and loopholes once and for all and return corn ethanol to the free market.

The federal government has already taken some steps to control the problem, such as eliminating VEETC and tariffs on ethanol imports. This is only a beginning, however, and the government should continue this process. This can be done through a number of different ways, including the CAA, CAFE standards, and the 2012 Farm Bill.

These solutions, however, also carry with them potential legal issues. Some of these solutions merely require amending existing regulations or legislation. For example, reducing the major emitter threshold for ethanol facilities from 250 tons per years back to 100 tons per year could create problems for those facilities built with the understanding that they would be regulated at the higher limit. Regulators would have to decide whether to grandfather these facilities into the new scheme or force them to adapt to the lower standards. This could be a potential source of litigation in the future.

Other solutions may require the creation of new policies, which would entail their own set of problems. Policies of the future, however, could eliminate some of the uncertainty of success by using existing legal

153. *See* Duffield et al., *supra* note 3, at 427-37.

mechanisms as a model. For example, adopting a new efficiency standard for ethanol based on its NEB would look to Brazil, the CAFE standards, and the lifecycle GHG requirements under EISA. Furthermore, the new farm bill will look to older versions of the bill, but should continue the trend of moving subsidies from corn to cellulose.

The United States understandably wants to create a strong, domestic biofuels industry that creates jobs and reduces dependence on foreign sources of oil. Countervailing environmental and economic considerations, however, must check this desire. Without a change, America risks relying even more heavily on foreign sources of dirty energy during the development of corn ethanol. The United States is blessed by a plentiful source of corn, but cursed with the inefficient fuel the crop produces. It is now the government's job to return the corn ethanol industry to the free market, while beginning to promote advanced sources of domestic ethanol.