CORN ETHANOL: SETTING STRAIGHT A MISGUIDED ATTEMPT TO FREE THE UNITED STATES FROM FOREIGN OIL

> If they saw dry grains of maize scattered on the ground, they quickly gathered them up, saying "Our Sustenance suffereth, it lieth weeping. If we should not gather it up, it would accuse us before our Lord. It would say, 'O, Our Lord, this vassal picked me up not when I lay scattered upon the ground. Punish him!' Or perhaps we should starve."[1]

I. INTRODUCTION TO AMERICA'S OBSESSION WITH CORN

The sixteenth century Aztecs worshipped corn as a source of life.[2] Similarly, America's reverence for corn in the twenty-first century has reached idolatrous levels. In various forms, corn finds its way into nearly everything Americans eat.[3] Moreover, corn, in the form of ethanol, is filling the tanks of more and more American vehicles due to burgeoning American policy regarding the production of renewable fuels aimed at reducing American dependence on foreign oil, thereby increasing energy security.[4]

---

1. MICHAEL POLLAN, THE OMNIVORE'S DILEMMA: A NATURAL HISTORY OF FOUR MEALS 58 (2006).

2. *Id.*

3. *Id.* at 18. Corn feeds the livestock that Americans consume. *Id.* Corn products also comprise much of what goes into processed food like sodas, frozen yogurt, margarine, and hot dogs. *Id.* at 18–19. In fact, corn is such a staple of the American diet that "North Americans look like corn chips with legs[,]" according to a Berkeley biologist who analyzes the ratio of carbon 13 to carbon 12 in human flesh, which indicates how much corn is ingested. *Id.* at 22–23.

4. *See* Energy Policy Act of 2005 § 1501(a), 42 U.S.C. § 7545(o)(2) (Supp. V 2005) (containing schedule of renewable fuel production through 2012). On April 10, 2007, the Environmental Protection Agency implemented the Renewable Fuels Standard as authorized by the Energy Act of 2005 in keeping with President Bush's mandate to reduce dependency on foreign oil. *See* Federal Facilities Environmental Stewardship & Compliance Assistance Center, *Renewable Fuel Standard (RFS) Program Established*, FEDCENTER.GOV, Apr. 10, 2007, http://www.fedcenter.gov/Announcements/index.cfm?id=6847&pge_prg_id=20703&pge_id=1001; George W. Bush, President of U.S., State of the Union Address (Jan. 31, 2007) (transcript *available at* http://www.c-span.org/executive/transcript.asp?cat=current_event&code=bush_admin&year=2006) (stating that the policy goals of the renewable fuels program are improving the environment, evolving past a petroleum-based economy, and curbing dependence on Middle Eastern oil). Energy security is synonymous with independence from imported oil and with self-sufficiency, thereby closing off the alterative of using biofuels trade to diversify energy supply. MASAMI KOJIMA, DONALD MITCHELL & WILLIAM WARD, ENERGY SECTOR MGMT.

While the full-blown ethanol program is in its fledgling stages, ethanol is hardly new—it has been used as a gasoline additive since the 1970s.[5] Furthermore, the United States is not the first to implement such a program. Brazil has been producing ethanol since the 1970s, driven by a national program known as "Proalcool."[6] Today, Brazil is the leading producer and consumer of ethanol made from sugarcane.[7] It is nearly self-sufficient with regard to energy because of its oil and gas reserves, nuclear energy program, and alternative energy program.[8]

While there is much to be learned from the Brazilian example, what works in Brazil is not necessarily what will work in America.[9] U.S. policymakers must provide clear guidance on an integrated program. First, policymakers must reexamine the articulated goals of the ethanol program. Second, policymakers must seriously consider whether the current scheme of subsidies that includes direct income tax credits to farmers and ethanol producers and production mandates is the most efficient way to achieve those goals. Policymakers must also consider the substantial negative effects that massive federal spending has had on the federal treasury, the environment, and the world economy to determine whether the purported benefits outweigh

---

ASSISTANCE PROGRAM, CONSIDERING TRADE POLICIES FOR LIQUID BIOFUELS 67 (2007), http://siteresources.worldbank.org/INTOGMC/Resources/Considering_trade_policies_for_liquid_biofuels.pdf. This rationale should be questioned because it is unlikely that biofuels will displace consumption of petroleum fuels in any meaningful way for years to come. *Id.*

5. *See* CLARE R. SEELKE & BRENT D. YACOBUCCI, CRS REPORT FOR CONGRESS: ETHANOL AND OTHER BIOFUELS: POTENTIAL FOR U.S.—BRAZIL ENERGY COOPERATION 7 (2007), http://www.opencrs.com/rpts/RL34191_20070927.pdf (indicating that tax incentives were made available in the 1970s for production of "gasohol").

6. COUNCIL OF THE AMS. ENERGY ACTION GROUP, ENERGY IN THE AMERICAS: BUILDING A LASTING PARTNERSHIP FOR SECURITY AND PROSPERITY 15–16 (2005), http://www.as-coa.org/files/PDF/pub_148_91.pdf.

7. MARK P. SULLIVAN & CLARE M. RIBANDO, CRS REPORT FOR CONGRESS: LATIN AMERICA: ENERGY SUPPLY, POLITICAL DEVELOPMENTS, AND U.S. POLICY APPROACHES 10 (2006), http://www.ncseonline.org/NLE/CRSreports/06Nov/RL33693.pdf.

8. *Id.*

9. The Brazilian example has caught the attention of the media, and many urge the United States to emulate its successful program. *See, e.g.*, Tom Daschle & Vinod Khosla, Op. Ed., *Miles Per Cob*, N.Y. TIMES, May 8, 2006, at A21 (touting the Brazilian "energy independence miracle").

the costs of proceeding on course. Substantial subsidy reform is necessary to curb wasteful spending and achieve the purported goals of the ethanol program, namely, energy independence and reduced carbon emissions.

This Comment will explore the U.S. ethanol program in detail. First, it will explore the science of ethanol. Understanding how ethanol is produced (albeit on an elementary level) is necessary to comprehending how the government funds the program. After introducing the process of ethanol distillation, Part III of the Comment will address the history of the ethanol program both in the United States and in Brazil, including a synopsis of the current ethanol legislation in the United States. Part III will also examine whether the success of the Brazilian ethanol program could be translated to the United States. Part IV of the Comment will address the problems riddling the ethanol program in some detail regarding the current system of subsidies in their various forms. These subsidies cost the public billions of dollars every year and are set to increase dramatically in the coming years.[10] It is not unreasonable to ask if there might be a more cost-efficient method of achieving the goals articulated by Congress in recent legislation. Part IV of the paper will also explore the unintended consequences of federal funding of the ethanol program, both in the United States and abroad. The ethanol program is purportedly committed to liberating the United States from foreign oil, stimulating the agricultural market, and improving the environment.[11] Appropriate guidance is crucial to developing successful alternative sources of fuel. The U.S. government should set appropriate goals such as diversifying the energy

10. *See* DOUG KOPLOW, EARTH TRACK, INC., SUBSIDIES IN THE US ENERGY SECTOR: MAGNITUDE, CAUSES, AND OPTIONS FOR REFORM 5, 16 (2006), http://earthtrack.net/earthtrack/library/SubsidyReformOptions.pdf [hereinafter KOPLOW I](measuring the cost of federal subsidies at $49–100 billion per year and citing rising energy prices and the recent focus on energy policy as reasons for subsidies' continuing increase).

11. News Release, Envtl. Prot. Agency, EPA Proposes Strategy to Reduce Oil Dependency (Sept. 7, 2006), http://yosemite.epa.gov/opa/admpress.nsf/6427a6b7538955c585257359003f0230/852b069b559027ca852571e2004cb354!OpenDocument.

supply and establishing a level playing field on which players can compete for the best alternative fuel sources by removing market distortions.

II. THE SCIENCE OF ETHANOL

Biofuels are made by distilling agricultural commodities or other biological materials.[12] Ethanol is the most common biofuel and is produced by fermenting and distilling sugary or starchy materials like sugarcane and corn.[13] In the United States, the most popular feedstock in the ethanol process is corn.[14] By most accounts, corn ethanol production is an efficient process, meaning that its energy yield is greater than the energy required to produce it.[15] By comparison, producing ethanol from sugarcane is even more efficient than producing it from corn.[16] In addition, ethanol can be produced from biomasses containing large amounts of cellulose such as trees and grass, but large scale production using this method is currently infeasible.[17]

---

12. *See* SEELKE & YACOBUCCI, *supra* note 5, at 2.

13. *Id.*

14. HOSEIN SHAPOURI, JAMES A. DUFFIELD & MICHAEL WANG, U.S. DEP'T OF AGRIC. OFFICE OF THE CHIEF ECONOMIST, THE ENERGY BALANCE OF CORN ETHANOL: AN UPDATE iii (2002), http://www.transportation.anl.gov/pdfs/AF/265.pdf.

15. *Id.* This report indicates that the net energy value of corn ethanol is 1.34, meaning that it yields 34% more energy than is used to produce it. *Id. But see generally* Posting of Robert Rapier to the R-Squared Energy Blog, http://i-r-squared.blogspot.com (Mar. 23, 2006, 02:40 EST) (questioning the reliability of USDA studies because they are not peer reviewed); Tad W. Patzek, *Thermodynamics of the Corn-Ethanol Biofuel Cycle*, 23 CRITICAL REVIEWS IN PLANT SCI. 519, 560 (2004) (arguing that the USDA study's conclusion regarding energy-efficient yield is incorrect and that ethanol production as it stands is ultimately unsustainable).

16. Derek Bacon, *Woodstock Revisited*, TECH. Q., Mar. 10, 2007, at 10. The net energy value of sugarcane ethanol is 8.3, roughly 600 times more efficient than corn ethanol yield. *Id.*

17. *Id.* Given that mass production of cellulosic ethanol is currently impossible, one might question the wisdom of a law mandating its production on a large scale. Yet the 2007 Energy Independence and Security Act includes in the renewable fuel standard a substantial portion of cellulosic ethanol, namely, 0.6 billion gallons as early as 2009 and as much as 21 billion gallons by 2022. Energy Independence and Security Act of 2007, Pub. L. No. 110–140, § 202, 121 Stat. 1492, 1522 (2007). One critic joked: "'It's like trying to solve a traffic problem by mandatory hovercraft . . . [e]xcept we don't have the hovercraft.'" Jeff Goodell, *The Ethanol Scam*, ROLLING STONE, Aug. 9, 2007, at 52 (statement of Dave Juday). Defenders posit that the federal mandate will stimulate

Ethanol used as fuel needs to be free of water.[18] It tends to absorb water and other impurities in most conventional pipelines, so dedicated pipelines are necessary to transport anhydrous or waterless ethanol.[19] In the United States, the most commonly used method to transport ethanol is not by dedicated pipeline but by tanker truck or rail tank car.[20] The necessity of transporting ethanol in this manner has important implications for its energy efficiency. Some calculations factor in the energy cost of transporting ethanol, lowering the overall efficiency rating of ethanol, while others do not.[21]

research that will in turn make it possible to manufacture cellulosic ethanol. *See, e.g.*, Mark Cooper, A STEP TOWARD A BRIGHTER ENERGY FUTURE: POLICYMAKERS BREAK THE LOGJAM, BUT VIGOROUS IMPLEMENTATION IS CRUCIAL 6 (2007), http://www.consumerfed.org/pdfs/Brighter_Energy_Future_12-18-07.pdf; Federal Facilities Environmental Stewardship & Compliance Assistance Center, *supra* note 4.

18. *See* KOJIMA ET AL., *supra* note 4, at 16.

19. *Id.*

20. *Id.*

21. *See, e.g.*, Ronald R. Cooke, *What is the Real Cost of Corn Ethanol?*, FIN. SENSE EDITORIALS, Feb. 2, 2007, http://www.financialsense.com/editorials/cooke/2007/0202.html (adding the cost of transporting ethanol to the overall cost in evaluating the efficiency).

III. HISTORY AND OVERVIEW OF ETHANOL PROGRAMS IN THE UNITED STATES AND BRAZIL

A. U.S. Ethanol Program

The U.S. ethanol program, like Brazil's, began in the 1970s in response to the Organization of Petroleum Exporting Countries ("OPEC") oil embargoes of 1973 and 1979.[22] Federal tax incentives for blended fuel encouraged adding ethanol to gasoline.[23] Additionally, the Clean Air Act Amendments of 1990 required putting additives like ethanol into gas to reduce harmful emissions.[24] The Energy Policy Act of 2005 (P.L. 109–58) established renewable fuel standards, mandating the use of ethanol in gasoline and establishing ethanol production goals of 4.0 billion gallons of renewable fuels in 2006 and 7.5 billion gallons in 2012.[25] Purportedly, corn ethanol will be used to meet these goals.[26] Ethanol is relatively expensive compared to conventional fuel. In order to make it attractive for corn farmers to divert their crop to ethanol production, Congress implemented an income tax credit of $0.51 per gallon for ethanol used for blending in gasoline.[27]

---

22. BRENT D. YACOBUCCI, CRS REPORT FOR CONGRESS: FUEL ETHANOL: BACKGROUND AND PUBLIC POLICY ISSUES 1 (2008), http://www.nationalaglawcenter.org/assets/crs/RL33290.pdf [hereinafter YACOBUCCI I].

23. *Id.*

24. *Id.* Today, 99% of fuel in the United States is comprised of up to 10% ethanol, and the other 1% is comprised of 85% ethanol ("E85"). *Id.* at 2. The dominance of ethanol as a fuel additive can be attributed to the demise of its strongest competitor, MTBE. DOUG KOPLOW, GLOBAL SUBSIDIES INITIATIVE, BIOFUELS—AT WHAT COST? GOVERNMENT SUPPORT FOR ETHANOL AND BIODIESEL IN THE UNITED STATES 14 (2006), http://www.iisd.org/pdf/2007/biofuels_subsidies_us.pdf [hereinafter KOPLOW II]. Many states, including California and New York, have banned the use of MTBE due to concerns of groundwater contamination and its carcinogenic effects. *Id.*

25. Energy Policy Act of 2005 § 1501(a), 42 U.S.C. § 7545(o)(2) (Supp. V 2005). This massive scaling up of production is intended to reduce Middle East oil imports by 75% by 2025. *See* YACOBUCCI I, *supra* note 22, at 10.

26. BRENT D. YACOBUCCI, CRS REPORT FOR CONGRESS: BIOFUELS PROVISIONS IN THE ENERGY INDEPENDENCE AND SECURITY ACT OF 2007 (P.L. 110–140), H.R. 3221, AND H.R. 6: A SIDE-BY-SIDE COMPARISON 1 (2008), http://www.nationalaglawcenter.org/assets/crs/RL34136.pdf [hereinafter YACOBUCCI II].

27. U.S. Department of Energy, Federal Biomass Policy, http://www1.eere.energy.gov/biomass/federal_biomass.html (last visited Jan. 29, 2009).*Id.* In 2007, corn prices

The Senate and House have both approved bills implementing the renewable fuels standard, House Bill 6 and House Bill 3221, respectively.[28] Both bills include provisions establishing funds for research and development of biofuels and providing grants for biofuel production and research in the amount of $25 million for fiscal years 2008 through 2010.[29] The bills also include a provision that would encourage studying the efficiency of flexible-fuel vehicles.[30] Perhaps in an effort to diversify biofuels production, the House bill would provide construction grants for cellulosic biofuels facilities established by Public Law 109–58 in the amount of $25 million for fiscal years 2008 through 2010.[31]

On December 19, 2007, President Bush approved House Bill 6, known as the Energy Independence and Security Act of 2007 (EISA).[32] Most notably, the bill increases domestic production of renewable fuels by raising the renewable fuels standard every year until it reaches 36 billion gallons of ethanol in 2022.[33]

---

reached $4.50 per bushel, a new record high. The booming market for corn is most likely due to the rising demand for ethanol. Hugh Dellios, *The Corn Supremacy*, CHI. TRIB. MAG., Sep. 9, 2007, at 16.

28. *See* YACOBUCCI II, *supra* note 26, at i. H.R. 3221 (the New Direction for Energy Independence, National Security, and Consumer Protection Act and the Renewable Energy and Energy Conservation Tax Act of 2007) garnered House approval on August 4, 2007; H.R. 6 (the Renewable Fuels, Consumer Protection, and Energy Efficiency Act of 2007) was approved by the Senate on June 21, 2007. *Id.*

29. *Id.* at 29.

30. *Id.* at 11. The Senate bill goes a step further and would require the Secretary of Transportation to create and enact a plan to put more alternative fuel vehicles on the road. *Id.* at 34. Under this bill, sales of alternative fuel vehicles should comprise at least half of all new vehicles sales by 2015. *Id.*

31. *Id.* at 28.

32. Press Release, The White House, Fact Sheet: Energy Independence and Security Act of 2007 (Dec. 19, 2007), http://www.whitehouse.gov/news/releases/2007/12/20071219-1.html.

33. Energy Independence and Security Act of 2007, Pub. L. No. 110–140, § 202, 121 Stat. 1492, 1522 (2007).

B. Brazilian Ethanol Program

1. History

As previously noted, Brazil's ethanol program has been in place since the 1970s.[34] Initially designed as a program to protect the Brazilian sugarcane industry from collapsing prices, it was later modified to respond to the OPEC oil embargo.[35] The government nurtured the program by implementing subsidies and tax breaks to encourage sugarcane farmers to plant more sugarcane and financed a large distribution network to transport ethanol to fueling stations.[36] This system kept ethanol prices artificially low to induce people to choose ethanol over conventional gasoline.[37] The government also required Petrobras, the state-owned oil company, to buy a fixed amount of ethanol.[38]

The numbers suggest that the Brazilian program is a success.[39] Currently, sugarcane ethanol represents 40% of the country's gasoline demand.[40] Indeed, Brazil produced 4.4 billion gallons of ethanol in 2006.[41] This ethanol fuel is not sitting idly by; sales of flexible-fuel vehicles that can run on E85 ethanol

34. COUNCIL OF THE AMS. ENERGY ACTION GROUP, *supra* note 6, at 15–16.

35. SEELKE & YACOBUCCI, *supra* note 5, at 7.

36. COUNCIL OF THE AMS. ENERGY ACTION GROUP, *supra* note 6, at 16.

37. *Id.*

38. SEELKE & YACOBUCCI, *supra* note 5, at 8.

39. Indeed, many in America believe the program to be successful. *See, e.g.*, Daschle & Khosla, *supra* note 9 (arguing that changes in America's ethanol policy could yield even more benefits for the country). *But see* Jack Chang, *Brazil's Ethanol Program Struggles to Make a Dent*, MERCURY NEWS, Apr. 30, 2006, http://www.hubbertpeak.com/ethanol/SJMercury20060430 (arguing that recent drops in consumption spurred by higher prices for ethanol at the pump reveal its unreliability as an energy source).

40. SULLIVAN & RIBANDO, *supra* note 7, at 10. By way of comparison, ethanol supplied a mere 3% of fuel consumed in the United States. MARCUS R. XAVIER, COMPETITIVE ENTER. INST., THE BRAZILIAN SUGARCANE ETHANOL EXPERIENCE 4 (2007), http://www.cei.org/pdf/5774.pdf.

41. SEELKE & YACOBUCCI, *supra* note 5, at 7. As a point of comparison, the United States consumed 5.4 billion gallons of ethanol during 2006. *Id.* at 6. Brazil is able to produce large amounts of ethanol due to the fact that "Brazil is the lowest cost producer of sugarcane in the world." *See* KOJIMA ET AL., *supra* note 4, at 19.

represent about 90% of new car sales.[42] The proliferation of flexible-fuel vehicles has prompted the construction of more plants that can produce ethanol or sugarcane, depending on current demand levels.[43] Investors responded to the regulations by building distilleries to convert sugarcane into ethanol, and automakers built flexible-fuel cars.[44]

Success has not always been forthcoming. Brazil's ethanol program required large government subsidies for many years before it was able to stand on its own.[45] In the late 1980s, huge deficits and inflation caused the Brazilian government to scale back ethanol production subsidies.[46] Moreover, ethanol was unable to compete with cheap gasoline in the late 1990s.[47] Today, the ethanol market remains volatile, costing Brazilians money at the pump despite the high price of gasoline.[48] Nevertheless, the increase in flexible-fuel vehicles has triggered the industry's expansion, ensuring its position as the largest producer and consumer of ethanol in the transportation sector.[49]

2. Lessons Learned from the Brazilian Experience

The success of the Brazilian program has elicited positive attention from the U.S. media. During a recent CNN broadcast, special correspondent Frank Sesno queried as to why America's ethanol program lags behind Brazil's: "I'm driving a Chevrolet in the middle of Brazil on ethanol. Pure ethanol. Not a drop of oil, imported oil, in this tank . . . I'm thinking, why can't I do this in

42. SEELKE & YACOBUCCI, *supra* note 5, at 9. This is not a new phenomenon for Brazil; flexible-fuel vehicles accounted for over 90% of car sales in the mid-1980s. *Id.*

43. *See* KOJIMA ET AL., *supra* note 4, at 19 (explaining that these distilleries, which can change the production ratio of sugar to ethanol, are needed to help assure that an ethanol shortage does not occur).

44. COUNCIL OF THE AMS. ENERGY ACTION GROUP, *supra* note 6, at 16.

45. XAVIER, *supra* note 40, at 1.

46. *Id.* at 5.

47. *Id.* at 1.

48. *Id.*

49. *Id.* at 7.

America?"[50] Is Brazil's success translatable to U.S. soil? To answer that question, it is necessary to examine why the Brazilian ethanol program has been successful.

The success of the Brazilian ethanol program is attributable to many factors, including low production costs of sugarcane and a mature infrastructure built over the course of three decades.[51] Brazil is able to produce large amounts of ethanol because it is the lowest cost producer of sugarcane in the world.[52] Efficient manufacture of sugarcane ethanol is possible because: 1) sugarcane is a water-intensive (and therefore costly) crop to grow, but Brazilian cane fields are rain-fed and do not require costly irrigation; 2) sugarcane does not compete for land in Brazil with food crops because there is still plenty of local land not used for agriculture; 3) decades of research in Brazil have resulted in discovering and using sugarcane that is resistant to crop diseases in the region; and 4) Brazilian distilleries are capable of producing either ethanol or sugarcane, enabling owners to take advantage of rising prices for either product.[53] In addition to the suitability of ethanol production by reason of Brazil's unique environment, Brazil consumes a significantly lower amount of fuel than the United States, making it substantially more difficult for ethanol to make a dent in domestic consumption of conventional fuel as it has done in Brazil.[54] Brazil's per capita oil consumption is a mere 4.2 barrels per person compared to 27 barrels per person in the United States.[55] Additionally, the U.S. population far outnumbers Brazil's population.[56]

---

50. *CNN Live Saturday* (CNN television broadcast Mar. 18, 2006).

51. *See* XAVIER, *supra* note 40, at 8.

52. KOJIMA ET AL., *supra* note 4, at 19.

53. *Id.*

54. Posting of Robert Rapier to the R-Squared Energy Blog, http://i-r-squared.blogspot.com (June 2, 2006, 00:50 EST).

55. *Id.*

56. *Compare* CIA World Factbook: Brazil, https://www.cia.gov/library/publications/the-world-factbook/geos/br.html#Intro (estimating Brazil's 2008 population at 196,342,592), *with* CIA World Factbook: United States, https://www.cia.gov/library/publications/the-world-factbook/geos/us.html#Intro (estimating the United States' 2008 population at 303,824,640).

Raising corn and turning it into ethanol requires more input and yields less energy than its Brazilian counterpart.[57] Also, the United States consumes substantially more fuel than Brazil does due to its greater energy needs and larger population. For these reasons, it is unlikely that Brazil's success is directly translatable to the United States. However, there are some valuable lessons to be learned from the Brazilian experience.

First, the Brazilian ethanol program receives no government price support in the form of subsidy payments or indirect costs assumed by other sectors.[58] The government provides support by mandating a certain percentage of sugarcane ethanol to be included in gasoline.[59] U.S. policymakers should consider this fact in shaping the course of the U.S. ethanol program, especially with regard to building an effective infrastructure and phasing out government price support. Brazil's successful ethanol program is closely tied to the efficient nature of the production process. U.S. policymakers must seriously consider whether producing ethanol from corn will ever be a cost-effective means of displacing conventional fuel consumption as it is in Brazil. All costs associated with corn ethanol production, including direct costs such as the Volumetric Ethanol Excise Tax Credit ("VEETC") and indirect costs like rising food costs and harm to the environment, are relevant in the calculus of efficiency and should guide the decision making process.

57. *See supra* notes 15–16 and accompanying text (indicating corn has a net energy value of 1.34 while sugarcane has a net energy value of 8.3).

58. XAVIER, *supra* note 40, at 8.

59. *Id.*

IV. UNDERSTANDING THE FEDERAL SUBSIDIES IN THEIR VARIOUS FORMS — THE KEY TO MEANINGFUL REFORM

The U.S. ethanol program receives a substantial amount of support from a diverse group of constituents.[60] In fact, support for the ethanol program has been described as the "perfect storm," comprising agricultural, environmental, and national security interests.[61] Proponents of the U.S. ethanol program are quick to list the potential domestic benefits. First, the increased demand for corn provides an incentive for farmers to innovate.[62] Second, decreasing the use of fossil fuels (especially in the transportation sector) will reduce carbon emissions, benefiting the environment.[63] Third, energy independence will improve the economy because the government will neither divert U.S. taxpayer money to keep fuel supply lines secure nor will the United States be vulnerable to oil price volatility caused by supply interruptions.[64] Increasing energy needs in China and India will only exacerbate the situation, as the rapidly increasing demand for crude oil in those nations will drive up oil

60. *See* KOPLOW II, *supra* note 24, at 1–3 (stating that groups such as taxpayers, environmentalists, the federal government, and various state and local governments are among the supporters of ethanol and biodiesel production).

61. *Id.* at 61.

62. *See* NATHANAEL GREENE, NATURAL RES. DEF. COUNCIL, GROWING ENERGY: HOW BIOFUELS CAN HELP END AMERICA'S OIL DEPENDENCE 4 (2004), http://www.nrdc.org/air/energy/biofuels/biofuels.pdf. The amount of land available to grow crops like corn used in ethanol production is essentially fixed, so farmers will be forced to become more efficient, potentially by creative means. *See id.* Some estimates indicate production capacity will reach 165 billion gallons of biofuels by 2050 (taking innovation into account). *Id.*.

63. *Id.* at 8–10.

64. *Id.* at 6. It is no secret that natural disasters wreak havoc on oil prices; when refineries, storage facilities, and offshore platforms are damaged, oil prices increase and supply is interrupted. *See* MIT Sloan, Energy: A System at Risk?, http://mitsloan.mit.edu/newsroom/indepth-disasters-energy-php (last visited Feb. 1, 2009) (discussing the production impact of Hurricanes Katrina and Rita on Gulf Coast oil production). But query whether fuel ethanol will be subject to the same price volatility as conventional fuel. Natural events such as disease, drought, and pestilence subject biofuel feedstocks to periods of instability. KOPLOW II, *supra* note 24, at 52. Major droughts can drop corn production levels by 20 to 30%, reducing ethanol production by 15 to 30%. *Id.* Decreased supply due to drought could drive up prices substantially. *All Things Considered: Biofuel Rush Makes Drought a Bigger Economic Risk* (NPR radio broadcast Mar. 11, 2008).

prices by squeezing world supplies.[65] Implementing a successful ethanol program in the United States can be viewed as a form of insurance against the rising cost of fuel.[66] Policymakers commonly cite those justifications in support of the U.S. ethanol program.[67]

However, the benefits of a successful ethanol program are accompanied by substantial downsides. Many worry that diverting substantial amounts of corn to ethanol production could drive up prices of commodities such as corn, wheat, and livestock or worse, create food shortages.[68] Additionally, corn ethanol production is costly and inefficient.[69] Energy yield from

65. *See* COUNCIL OF THE AMS. ENERGY ACTION GROUP, *supra* note 6, at 4 (postulating that Asia's energy demand will double by 2030, representing a 40% increase in world consumption). China and India, in response to increased demand, are guaranteeing their own energy and supplies by producing assets or by entering into long-term contracts supplying energy. *Id.* at ii–iii. *See also* Gal Luft, Inst. for the Analysis of Global Sec., *Fueling the Dragon: China's Race into the Oil Market*, http://www.iags.org/china.htm (discussing China's recent actions with regard to securing future oil imports from places like Kazakhstan, Russia, Iran, Saudi Arabia, and Venezuela). Rising oil demands may also affect U.S. diplomatic relations with China. *See* Flynt Leverett & Jeffrey Bader, *Managing China-U.S. Energy Competition in the Middle East*, 29 WASH. Q. 187, 187–88 (2005).

66. *See* COUNCIL OF THE AMS. ENERGY ACTION GROUP, *supra* note 6, at 22. In furtherance of energy security, the Council of the Americas Energy Action Group urges cooperation in the Americas regarding energy development and production. *See id* at 20–22.

67. The United States is not alone in supporting the growth of its ethanol program. The value of support to producers comprising the Organization for Economic Cooperation and Development amounted to $280 billion in 2005. KOJIMA ET AL., *supra* note 4, at 41.

68. *Id.* at 38. Policymakers should be concerned about food price inflation because it could potentially affect a substantial portion of the population. In 1973, the domestic inflation rate for groceries caused by high food prices caused panic in the American public. *See* POLLAN, *supra* note 1, at 51. Pollan describes the chaotic situation in which housewives protested at grocery stores, farmers killed their chicks because they could not afford to feed them, and beef prices spiked, rendering prices prohibitively expensive even for the middle class. *Id.* One particularly acerbic critic quips: "[W]e could soon find ourselves forced to make a choice between feeding our SUVs and feeding children in the Third World. And we all know how that decision will go." *See* Goodell, *supra* note 17, at 53.

69. *See generally* Patzek, *supra* note 15, at 561 (arguing that producing ethanol from corn is actually inefficient due to externalities not considered in the USDA report's calculations). Commenting on the inefficiency of the process when taking into account the externalities such as the massive amount of energy required to produce nitrate fertilizer amongst others, Pollan quips: "From the standpoint of industrial efficiency, it's

corn is much lower than that from sugarcane ethanol, but the current U.S. tariff scheme does not permit importing large amounts of ethanol from Brazil and other nations, where ethanol production is cost-efficient.[70] Cellulosic ethanol offers a substantially greater energy yield, but it is currently unavailable for large-scale production.[71] Just as proponents of ethanol argue that ethanol is a boon to the environment, there are many who list the harmful environmental effects associated with ethanol production.[72] Decriers of ethanol claim that the program's costs outweigh its benefits, advocating the removal of existent corn subsidies.[73] Given that the U.S. government appears committed to fostering growth of the ethanol program, it is necessary to explore in some detail the subsidies that are currently in place to guide future action.

---

too bad we can't simply drink the petroleum directly, because there's a lot less energy in a bushel of corn (measured in calories) than there is in the half gallon or so of oil required to produce it." POLLAN, *supra* note 1, at 46.

70. *See* Bacon, *supra* note 16, at 10 (stating that the U.S. energy department sets the energy balance of ethanol made from maize at 1.3, while the International Energy Agency sets the energy balance of ethanol made from Brazilian sugarcane at 8.3); KOJIMA ET AL., *supra* note 4, at 1 (noting that tariff policies are designed to encourage biofuel production by protecting local corn producers).

71. *See* Bacon, *supra* note 16, at 10–11. Expanding production of cellulosic ethanol is also desirable because it can be produced closer to where it is consumed, reducing its cost and boosting local economies. *See* YACOBUCCI I, *supra* note 22, at 3–4. *But see* Goodell, *supra* note 17, at 53 (questioning the wisdom of implementing standards based on technology that is not yet available).

72. *See* POLLAN, *supra* note 1, at 47 (pointing out that nitrogen fertilizers used to aid in growing corn cause collateral harm to the marine ecosystem of the Gulf of Mexico, where algae growth fueled by nitrate runoff from the Mississippi River creates a "hypoxic" zone as large as the state of New Jersey).

73. *See generally* Daniel Griswold, Stephen Slivinski & Christopher Preble, *Six Reasons to Kill Farm Subsidies and Trade Barriers: A No-Nonsense Reform Strategy*, REASONONLINE (2006), http://www.reason.com/news/show/36207 (noting that federal aid to farmers unnecessarily raises the cost of food in the United States to the tune of $16.2 billion).

A. Federal Support — No Subsidy Left Behind

According to the Organization for Economic Cooperation and Development ("OECD"), a subsidy is "'a measure that keeps prices for consumers below market levels, or keeps prices for producers above market levels or that reduces costs for both producers and consumers by giving direct or indirect support.'"[74] Subsidies are powerful instruments of policy implementation that can positively contribute to the economic, environmental, and social goods, but they also create distortions that can cause unintended consequences.[75] Among the economic distortions are price and production level distortions and impediments to proper structural adjustment such as overbuilding.[76] Internationally, subsidies can distort competitiveness and trade.[77] Environmentally, subsidies may stimulate overuse of fossil fuels and other production inputs or overexploit certain resources.[78] Reducing or eliminating subsidies can level the playing field both domestically and internationally and also increase production efficiency.[79] Reigning in subsidies will also lead to substantial fiscal savings.[80]

74. Candice Stevens, *Introduction* to SUBSIDY REFORM & SUSTAINABLE DEVELOPMENT: ECONOMIC, ENVIRONMENTAL AND SOCIAL ASPECTS 7 (Org. for Econ. Cooperation & Dev. ed., 2006).

75. *Id.*

76. *Id.*

77. *Id.*

78. *Id.*

79. *Id.* at 8.

80. *Id.*

The U.S. government provides subsidies to many different types of energy programs, including oil and gas, nuclear energy, and ethanol programs.[81] Recent estimates of expenditures indicate that conventional energy receives the lion's share of government funds.[82] Ethanol lags far behind at 7.6%.[83] An analysis of all the energy subsidies is beyond the scope of this Comment, the focus of which is the ethanol program.

1. Price Support By Way of the VEETC

a. Scope of Subsidies

The U.S. government has provided support for ethanol production since the passage of the Energy Tax Act of 1978, in which Congress created a $0.40 per gallon excise tax for ethanol.[84] In 2004, the Energy Tax Act was replaced by the VEETC, providing for the $0.51 per gallon tax credit on ethanol currently in place.[85] The justification for this tax credit is that it permits ethanol, relatively expensive compared to gasoline, to be competitive with gasoline.[86] There are other tax breaks available in the stages of production, but the VEETC is by far the most generous subsidy to ethanol.[87] It is, therefore, the most costly ethanol subsidy to the public.

---

81. *See* KOPLOW I, *supra* note 10, at 4 (showing that oil and gas, nuclear, and ethanol subsidies make up a total of 72.4% of subsidies to energy in 2006).

82. *Id.* at 3–4. Fossil fuels (including oil and gas, coal, and mixed fossil fuels) garnered approximately 66.2% of federal fiscal subsidies in 2006. *Id.* at 4. These subsidies appear to be particularly wasteful in light of the fact that fuel prices have historically been high, creating a market where price alone should create a sufficient investment incentive without federal expenditures. *Id.*

83. *Id.*

84. *See* KOPLOW II, *supra* note 24, at 11.

85. *Id.*

86. *See* YACOBUCCI I, *supra* note 22, at 10. Another commonly cited justification for government subsidies is energy security. *See* KOJIMA ET AL., *supra* note 4, at 12. Indeed, this justification is prevalent in the United States. *See* Bush, *supra* note 4 (stating that the United States' goal is to make ethanol practical and competitive, which can be achieved by encouraging bold technology through tax credits to research and development). World oil prices have been rising steadily along with demand prompting a desire to be more self-sufficient with regard to energy supply by domestically producing biofuels. *See* KOJIMA ET AL., *supra* note 4, at 12.

87. *See* KOPLOW II, *supra* note 24, at 24.

Tax exemptions enacted prior to 2004 were more restrictive than the VEETC and were set up as thresholds, with varying levels of exemption from gross income for blends of at least 5.7, 7.7, 10, and 80% ethanol.[88] The value of the subsidy was lower to producers.[89] The VEETC was enacted in 2004.[90] Unlike prior tax exemptions, the VEETC is awarded without limit and without reference to the price of gasoline.[91] It applies to domestic and imported ethanol.[92] How much does the VEETC cost the federal treasury every year? One reliable way to estimate this particular expenditure is to look to the Renewable Fuels Standard ("RFS") set by Congress.

The recently passed EISA contains the new RFS, mandating that certain levels of ethanol be added to motor vehicle fuel or home heating oil and sold on an annual basis.[93] It escalates each calendar year. In 2008, 9.0 billion gallons of ethanol shall be introduced into commerce; in 2012, 15.2 billion gallons shall be introduced.[94] By 2022, Congress mandates that 36 billion gallons of ethanol be sold in the United States.[95] Assuming that corn ethanol is used to fill this tall order, the VEETC subsidy alone will amount to roughly $4.3 billion in 2008, $6.7 billion in

88. *Id.*

89. *Id.*

90. *Id.* This type of tax credit helps biofuels to compete with petroleum fuels. *See* KOJIMA ET AL., *supra* note 4, at 4. The United States is hardly alone in offering such a tax break for biofuels producers—in Europe, tax reductions have been as high as $0.84 cents per liter (compared to $0.135 per liter blended in the United States, or $0.51 per gallon). *Id.* Brazil also offers tax reduction support. *Id.*

91. *See* KOPLOW II, *supra* note 24, at 24.

92. *Id.* Tax reductions are granted to domestic and foreign ethanol alike to comply with the World Trade Organization (WTO) principles that do not permit adjusting internal taxes that would offer protection to domestic products. KOJIMA ET AL., *supra* note 4, at 5. However, import tariffs nearly equivalent in amount to the VEETC achieve the goal of protecting domestic ethanol in a permissible manner. *Id.*

93. Energy Independence and Security Act of 2007, Pub. L. No. 110–140, § 202, 121 Stat. 1492, 1522 (2007). The United States is not alone in adopting targets for inclusion of biofuels in the transportation sector—Argentina, Colombia, the European Union, India, Indonesia, Malaysia, New Zealand, the Philippines, and Thailand have adopted targets for biofuels in the transportation sector. KOJIMA ET AL., *supra* note 4, at 11.

94. § 202, 121 Stat. 1492, 1522 (2007).

95. *Id.*

2012, and $18 billion in 2022.[96] Furthermore, it is believed that most of the larger entities receiving these subsidies do not include the VEETC in their taxable income, resulting in even greater losses to the treasury.[97] These tax-exempt savings could be avoided if the federal government were to provide the funds via grants, which must be taxed as income.[98]

The VEETC is not the only federal subsidy provided to ethanol producers, though it is the most significant and costly.[99] The total value of all federal and state subsidies provided for liquid biofuels currently falls between $5.5 and $7.3 billion.[100] Supporting biofuels will cost more than $130 billion per year by 2025, according to the Energy Information Administration's estimates.[101] Given the vast amounts of funding, it is reasonable to inquire whether the goals of the ethanol program could be achieved in a less costly manner. Support to the U.S. ethanol program should be scaled back, and it should be permitted to

96. The calculations were arrived at by multiplying the applicable volume of ethanol for a given calendar year in the statute by the VEETC subsidy amount, or $0.51 per gallon. *See id.* (providing a table of applicable volumes of renewable fuel anticipated by the EISA for calendar years 2006 through 2022).

97. *See* KOPLOW II, *supra* note 24, at 25. Most excise tax credits are added to taxable income, but not the tax credits resulting from VEETC. DOUG KOPLOW, GLOBAL SUBSIDIES INITIATIVE, BIOFUELS—AT WHAT COST? GOVERNMENT SUPPORT FOR ETHANOL AND BIODIESEL IN THE UNITED STATES: 2007 UPDATE 15 (2007), http://www.globalstudies.org/files/assets/Brochure_-_US_Update.pdf [hereinafter KOPLOW III]. The subsidy resulting from this anomalous tax loophole has become the third largest subsidy to ethanol available today, costing the treasury $1.2 billion dollars (not including the direct VEETC subsidy). *Id.* Surprisingly, there have been no corrections by the IRS regarding tax treatment of VEETC tax credits, nor is any pending legislation looming that would make these funds includible in taxable income. *Id.* at 15, 43.

98. *See* KOPLOW I, *supra* note 10, at 3.

99. *See* KOPLOW II, *supra* note 24, at 24.

100. *Id.* at 56. The EIA Energy Outlook of 2008 reports that the VEETC expires in December of 2010, which will slow domestic production of ethanol in the absence of these generous government incentives. EIA—Annual Energy Outlook 2008—Legislation and Regulations, http://www.eia.doe.gov/oiaf/aeo/consumption.html (last visited Nov. 18, 2008). However, the fact that the ethanol industry has been receiving subsidies for twenty-eight years and that the pervasive sentiment in Congress is to extend them, increase them, or make them permanent does not inspire confidence in the sunset clause. *See* KOPLOW II, *supra* note 24, at 61. Pending legislation would introduce a new tax credit for producing cellulosic ethanol in the amount of $0.50 per gallon, in addition to the VEETC. *See* KOPLOW III, *supra* note 97, at 43.

101. *Id.* at 54.

compete in the alternative fuels market. Indeed, reducing or eliminating subsidy payments could be extraordinarily beneficial.[102]

b. Reigning in the Subsidies

Generally, subsidies distort the market, creating conditions of oversupply.[103] Generous federal subsidies such as the VEETC have undoubtedly contributed to the explosion of ethanol production facilities in the country, facilities that process the excess corn.[104] Subsidy-driven capacity expansions such as the increasing number of ethanol-producing plants can lead to a condition of overbuilding.[105] Currently, the vast majority of support is directly linked to output (*e.g.*, to RFS standards, per-gallon payments, and tax credits).[106] The cost to the public, therefore, rises with increases in ethanol output. For the time being, however, it is generally conceded that biofuels will require significant subsidies for the foreseeable future.[107] Whether they require the amount of subsidies they receive now is the issue of current concern. Certain analysts have proposed a modest solution to mounting costs to the treasury: instead of a fixed-rate federal subsidy, payments from subsidies like the VEETC should be inversely related to the price of oil , declining as oil prices rise.[108] Furthermore, as a general observation, the various federal, state, and local subsidies are not well-

102. *See* Stevens, *supra* note 74, at 8 (asserting that subsidy reform can lead to fiscal savings and enhanced efficiency and production).

103. *See* KOPLOW I, *supra* note 10, at 4.

104. *Id.*

105. *Id.*

106. *See* KOPLOW III, *supra* note 97, at 56 (noting substantial support for biofuels at both the state and federal levels, both of which have policies linked primarily to raw production).

107. *See id.* at 68. Although to the extent that ethanol is not in its infant stages (and many argue that it is not), it may be time to scale back large-scale government support. *See* TAXPAYERS FOR COMMON SENSE, THE RACE FOR ETHANOL SUBSIDIES (2006), http://www.energyjustice.net/ethanol/subsidies/race_for_ethanol_subsidies.pdf (arguing that twenty years of subsidies to the ethanol industry is enough).

108. KOPLOW II, *supra* note 24, at 56. The subsidy should only be allocated to the extent that VEETC permits ethanol to be competitive with conventional fuel, meaning that it will shrink as oil prices rise.

understood, neither individually nor as a coordinated unit.[109] In many cases, producers are able to tap into subsidies from several sources, unnecessarily draining the public funds.[110]

Some analysts are also questioning the coherence of the current system.[111] Specifically, they question the coherence of a policy that mandates both production subsidization and consumption RFS standards.[112] There may be quicker and cheaper alternatives to achieving the goals of energy independence and environmental improvement.[113] Subsidy reform will not only lead to fiscal savings, structural adjustment, and greater efficiency and productivity, but will also lower negative externalities like waste and pollution.[114] The federal government must undertake a massive effort to understand the current system of subsidies in place, including

109. *See id.* at 56 (pointing out that the various independent levels of decision making results in poorly coordinated and poorly targeted policies). While the issue of state ethanol subsidies will not be explored in great detail here, it is worth noting that the amount of money provided by state level subsidies to state level energy programs are more difficult to gauge with certainty than are federal subsidy programs. *See* KOPLOW I, *supra* note 10, at 3. It is virtually impossible to determine how much money is funneled into energy programs by state-funded programs, confounding any good faith effort to grasp the scale and scope of these subsidy programs. *Id.*

110. *See* KOPLOW II, *supra* note 24, at 56. The hundreds of programs in place support nearly every stage of the ethanol program, from growing the crops to making the vehicles that run on ethanol. *Id.* The duplicity of government aid should be of concern to policymakers. Further studies are needed to understand how these various policies work, and unnecessary or duplicative subsidies must be eliminated to preserve public funds. *See id.*

111. *Id.* at 57.

112. *Id.* The RFS mandates themselves are criticized as being arbitrary. *See* Goodell, *supra* note 17, at 48, 50, 52 (questioning the legitimacy of the 36 billion gallon mandate by 2022 and accusing the number of being either arbitrary, or "'the Goldilocks number—not too big to be impractical, but not too small to satisfy corn growers'").

113. *See* KOPLOW II, *supra* note 24, at 57. To the extent that there are cheaper ways that would not heavily subsidize the ethanol industry (and the farmers who provide the feedstocks to make it), employing them may be difficult. Any proposed action that would reduce or eliminate the vast quantities of money funneled into producers will meet with resistance. *Id.* at 61 (stating that ethanol enjoys powerful support from the agriculture industry, the national security industry, and the environmental lobby).

114. *See* Stevens, *supra* note 74, at 8.

improving methods of data collection, adopting a common reporting framework, and encouraging budget transparency and clarity.[115]

Reforming the current system of subsidies will be challenging for several reasons. First, policymakers appear to be unwilling to initiate change due to the strength of special interests keeping them in place.[116] Domestically, the corn lobby possesses such power, and it tends to accentuate the direct social benefits of the subsidy, such as regional growth and employment, thereby attenuating the economic and environmental costs of subsidies.[117] Furthermore, powerful interest groups skillfully perpetuate false perceptions and fear of change by appealing to popular mythologies to gain support for the subsidies they receive.[118] For example, domestic farmers have successfully appealed to the notion of a "right to farm," harkening back to agrarian ideals.[119] Second, the lack of transparency pervading the current subsidy system makes it difficult to initiate pressure for its reform.[120] For this reason, it is imperative to identify the size of the subsidy programs, the beneficiaries of the subsidies, and the economic, environmental, and social effects of the subsidies.[121]

Already, a better picture of the current set of ethanol subsidies is emerging in the United States. The more information policymakers have on the scale and scope of ethanol subsidies, the more likely it is that they will attempt meaningful reform. Third, long-term retention of subsidies tend to lead to a

---

115. *See id.*

116. *See* Anthony Cox, *Overview of Approaches for Assessing Subsidies*, *in* SUBSIDY REFORM AND SUSTAINABLE DEVELOPMENT: ECONOMIC, ENVIRONMENTAL AND SOCIAL ASPECTS 25, 34 (Org. for Econ. Cooperation & Dev. ed., 2006) (alleging that strong special interests are a primary cause of insufficient political will necessary to undertake reform).

117. *See id.* at 34–35 (discussing obstacles to general subsidy reform).

118. *See id.* at 35.

119. *See id.* (noting a traditional justification for subsidies which values the maintenance of "pre-industrial" farming ideals).

120. *Id.*

121. *See id.* (listing these factors as requirements for transparency in the subsidy system).

sense of entitlement to their recipients.[122] The longer the subsidies are in place, the greater the expectation that they will continue uninterrupted.[123] However, no sense of entitlement could possibly justify a set of subsidies that have failed to meet their intended objectives.[124]

These three impediments to meaningful subsidy reform are formidable, but they are not insurmountable. Policymakers must challenge the misconceptions surrounding the ethanol subsidies, including whether their conferral furthers the stated goals of the ethanol program and whether a harmful sense of entitlement is standing in the way of their removal. Most importantly, a wide range of options is available to meet the goals of the ethanol program; subsidies constitute neither the exclusive nor most efficient avenue of achieving the stated objectives of energy independence and environmental reform. Before examining alternatives to subsidies, let us turn to one of the most entrenched subsidies in place today. The history of agricultural subsidies will assist in understanding just how challenging subsidy reform will prove to be.

2. Feedstock Subsidies — Corn Growers and the Right to Farm

Corn is the primary feedstock used in ethanol production today.[125] As such, corn growers are benefiting from government subsidies to ethanol because ethanol producers are passing on the benefits to corn growers. But these farmers already receive substantial support by way of agricultural subsidies, another incoherent element of U.S. ethanol policy.

122. *Id.* at 36.

123. *Id.*

124. *See id.*

125. *See* SHAPOURI ET AL., *supra* note 14, at iii.

a. History of the Corn Subsidies

It is well-known that the government has long provided subsidies to growers of corn, beginning in the 1930s under the New Deal.[126] The policy was initiated during the Great Depression to alleviate the disastrous effects of growing too much corn, which glutted the market and sometimes collapsed prices.[127] The policy of aid to farmers has powerful rhetorical roots that posit a "right to farm," paving the way for the systematic protection of farmers.[128]

Essentially, the New Deal farm programs attempted to avoid overproduction and protect farmers by 1) establishing a target price for farm products like grain and corn based on production costs and 2) offering a choice to farmers when prices dropped below the target to take out a loan from the government and store the grains until prices returned to the target.[129] Once prices came back up, farmers could sell their stored grain and pay back their loans.[130] The policy of quelling overproduction and supporting prices of agriculture products was not popular with proponents of the free market and food processors whose profits swelled as prices decreased.[131] With the advent of the 1973 Farm Bill, a new system was born in which the government began to make direct payments to farmers, the system which is in place today.[132] These direct payments have had a profound effect on the agricultural market.

The agricultural market has been characterized by rapid technological innovation in the last century, leading to increased output.[133] Of course, increased output drives prices down. In the absence of government intervention, falling prices should drive

126. *See* POLLAN, *supra* note 1, at 49.

127. *Id.* at 48–49.

128. *See* RICHARD A. EPSTEIN, FREE MARKETS UNDER SIEGE: CARTELS, POLITICS & SOCIAL WELFARE 29 (2005). Franklin Roosevelt minted the "right to farm" phrase in his 1944 State of the Union address, laying the foundation for a very powerful farm lobby in agricultural matters. *Id.*

129. POLLAN, *supra* note 1, at 49.

130. *Id.*

131. *Id.* at 50.

132. *See id.* at 52–53.

133. *See* EPSTEIN, *supra* note 128, at 28.

some producers out of business and into more socially valued uses.[134] Instead, the subsidy that is paid to farmers encourages selling their crop at any price because the government covers the shortfall and everyone stays in business.[135] In this way, the government insulates corn farmers from the vicissitudes of the market.[136] By way of numbers, it is estimated that corn subsidies totaled close to $42 billion between 1995 and 2004.[137] The average annual subsidy payment from the years 2000 to 2004 was $4.5 billion, and it jumped to $9.4 billion in 2005.[138]

The federal government initiated ethanol subsidies as a way to increase demand for surplus crops, the surplus itself having resulted from corn subsidies.[139] Government spending on ethanol by way of corn subsidies is estimated to lie somewhere between $820 million and $1.4 billion per year.[140] Due to promulgation of the 2007 renewable fuel standard, ethanol production will claim larger portions of domestic corn crops, causing the share of corn subsidies associated with ethanol production to rise.[141] Is it possible to curb subsidy payments to corn farmers (and perhaps other agricultural producers) without incurring too high a social cost? The example of New Zealand's drastic subsidy reform proves that it is possible.

---

134. *Id.*

135. *See* POLLAN, *supra* note 1, at 52.

136. *See* EPSTEIN, *supra* note 128, at 28. The market is harsh on sellers who fail to meet the competitive price, justifying the insulation. *See id.* ("Raise prices and you lose your customer base; lower prices and you lose your profits. No wonder *everyone* wants public dispensation from competition.").

137. *See* KOPLOW II, *supra* note 24, at 38.

138. *Id.* The subsidy payment in 2005 is somewhat of an anomaly due to two bumper crops and a hurricane that disrupted transportation of corn. *Id.* Other estimates place average subsidy payments for the years 2002, 2003, and 2004 at $5.3 billion, $3.7 billion, and $8.3 billion, respectively. *Id.* at 39.

139. *See id.* at 57.

140. *Id.* at 39.

141. *Id.* The lion's share of federal corn subsidies goes to states producing the most ethanol, indeed, the top ten ethanol-producing states receive more than 80% of all federal corn subsidies. *Id.* Illinois alone captures 30% more per acre than the national average, dispelling the oft-cited notion that increasing demand due to escalating ethanol production drives down corn subsidies. *See id.*

b. Arguments for Reform: The New Zealand Example

Given the sense of entitlement to subsidies felt in the agricultural community (and the myths perpetuating their existence) and the entrenched nature of the subsidies themselves, meaningful reform will indeed be difficult to achieve.[142] Barriers to reform are extremely formidable in the agricultural sector, but, as discussed previously, policymakers must challenge the misconceptions surrounding the subsidies and explore alternative solutions. New Zealand was forced to confront its own system of agricultural subsidization in the 1980s when the program became economically unsustainable.[143]

An insupportable economic situation caused New Zealand to completely eliminate subsidy payments to the agricultural sector in the mid-1980s.[144] At that time, problems riddled New Zealand's economy, including rapidly rising unemployment rate, high inflation, and a growing fiscal deficit.[145]

The agricultural sector was experiencing similar difficulties; by 1984, the production grants and subsidies provided by the government constituted 40% of farm income in the sheep sector alone.[146] The effects of heavy subsidization were predictable—as in the United States, government payments caused supply to rise even though demand remained stagnant.[147] Farmers were converting marginal lands into sheep farms because subsidies made it profitable to do so, even though such actions frustrated conservation efforts.[148]

In a massive effort to bail out a flailing economy, the government eliminated several different kinds of subsidies, including price controls on wool, beef and sheep meat, free government services for farmers, and tax concessions for

142. *See* EPSTEIN, *supra* note 128, at 29 (tracing the sense of entitlement in part to Roosevelt's State of the Union address); Vangelis Vitalis, *Subsidy Reform in the New Zealand Agricultural Sector*, *in* SUBSIDY REFORM AND SUSTAINABLE DEVELOPMENT: ECONOMIC, ENVIRONMENTAL AND SOCIAL ASPECTS 57, 65–66 (OECD ed., 2006).

143. *See generally* Vitalis, *supra* note 142, at 58.

144. *Id.* at 59.

145. *Id.* at 60.

146. *Id* at 61.

147. *Id.*

148. *See id.*

farmers.[149] The government also phased out subsidies for fertilizer and irrigation as well as credit subsidization.[150] The effects of the subsidy removal were dramatic and generally positive.[151]

Efficiency and profitability in sheep farming have increased substantially.[152] New Zealand's national flock was reduced from 70 million in the mid-1980s to roughly 40 million today and many processing plants were forced to close,[153] but this should not discourage policymakers looking to initiate subsidy reform. The industry is now better able to respond to price signals through innovation.[154] Indeed, the sheep sector actually produces more meat than it did in the 1980s—even though the size of the flock decreased by almost half—due to business decisions that the farmers themselves were able to make.[155] The social effects of subsidy reform are also worth noting.

After New Zealand's subsidy reform, about one percent of farmers left the industry.[156] Some rural towns experienced population reductions as people left to find jobs elsewhere and public services in rural areas like schools downsized.[157] Nevertheless, a large-scale collapse of rural life in New Zealand never materialized—its rural population actually rose slightly between the 1981 and 2001 censuses, despite the removal of subsidies.[158] Additionally, the environment was an accidental beneficiary of the New Zealand subsidy reforms, reducing the amount of fertilizer runoff and greenhouse gas emissions while improving water quality.[159] The New Zealand experience provides concrete evidence that subsidy reform is possible and

149. *Id.* at 62.

150. *Id.* at 61.

151. *Id.* at 62–63.

152. *See id.* at 63.

153. *Id.*

154. *See id.* at 64.

155. *See id.*

156. *Id.* at 65. Notably, the government initially predicted that 16% of farmers would exit the industry. *Id.*

157. *Id.*

158. *Id.*

159. *Id.* at 66–68.

indeed beneficial. A similar reform of U.S. agriculture subsidies could bring about much-needed revival of the agriculture industry.

There are several key lessons to bear in mind from the New Zealand experience that can guide reform of the U.S. agriculture industry. First, political support is critical to the success of reform.[160] Second, the success of the government implementing reforms must not depend on the recipients of the subsidies for support.[161] Many political leaders in the U.S. (particularly the Midwest) depend on the support of their farming constituents, so the burden will be on others to initiate the reforms. Third, subsidy reform must occur along a transparent timetable that ensures certainty and alacrity of reform.[162] Reform that is too slow is vulnerable to commandeering by special interest groups and will eventually give way to these interests.[163] But a quick transition does not have to mean a transition lacking support for those who will be affected by the reform—government should provide transitional assistance such as farm debt restructuring to move reform along smoothly.[164] Fourth, a coherent strategy that addresses the reform process holistically is necessary.[165] The New Zealand government removed subsidies before it lowered tariffs on imported inputs, delaying the transition and causing unnecessary loss of income.[166] It is critical that policymakers examine the big picture of the economic landscape, including distortions such as tariffs, before they take action.

All pertinent aspects of the economy must be accounted for in the calculus of subsidy reform. Reforming agricultural subsidies in the United States could save the U.S. taxpayers billions of dollars every year and stimulate needed reform in an industry paralyzed by government welfare. Reform is a daunting task that will encounter significant opposition due to the

160. *Id.* at 70.

161. *Id.*

162. *Id.*

163. *See id.*

164. *See id.* at 65 (noting that New Zealand still "provided some transition assistance to farmers" during the transition period).

165. *Id.* at 70.

166. *Id.*

entrenched nature of the subsidies and the idealized notion of the "right to farm."[167] But fear of resistance and unrest in the agricultural sector is no reason to avoid or delay subsidy reform. Providing information to the industry and policymakers regarding the benefits of subsidy reform and a coherent framework of support through the process will ease the transition. An integrated, coherent plan of subsidy reform involves examining other forms of government support, such as import tariffs.[168] A similar process of agricultural subsidy reform should be applied to ethanol subsidies. As in the agricultural sector, notable benefits to removing ethanol subsidies such as the VEETC would force the industry to become more efficient, and, in the process, alleviate some of the undesirable environmental effects of ethanol production.[169]

3. Tariffs — The Indirect Subsidy

a. Current Scheme of Tariffs: Protectionism at its Best

The tariff on imported ethanol is a form of government subsidy because it functions to inflate the price of an imported commodity above what it would be absent government action, thereby making the competing domestic commodity more attractive.[170] It is an inexpensive way to patrol the border and protect domestic producers and is used liberally by many governments.[171]

---

167. *See* EPSTEIN, *supra* note 128, at 29. Indeed, the removal of subsides in New Zealand was unpopular enough to instigate the largest rural sector protest march the country had ever seen. The program eventually garnered support. *See* Vitalis, *supra* note 142, at 65. The farming constituent realized that a wider reform process would actually be beneficial to the industry by, among other things, lowering the costs of production. *Id.* at 65–66.

168. *See* Vitalis, *supra* note 142, at 70 (noting that New Zealand's staggered reform of subsidies and tariffs caused more hardship than necessary in the transition period).

169. *See* Stevens, *supra* note 74, at 8; *infra* Part IV.A.

170. *See* KOPLOW II, *supra* note 24, at 19.

171. KOJIMA ET AL., *supra* note 4, at 5. The European Union levies a specific import tax of $0.26 per liter on undenatured ethanol and $0.14 per liter on denatured ethanol, though 101 developing countries can access Europe's ethanol market duty-free. *Id.* Brazil levies a 20% ad valorem import tax on ethanol. *Id.*

The tariff prevents the possibility of meaningful trade with Brazil, a major producer of ethanol from sugarcane. Brazil has the capacity to export to U.S. markets, but imports of ethanol are low due to the tariff scheme.[172] Two types of tariffs suppress the influx of foreign ethanol into the U.S. ethanol market: the 2.5% ad valorem tax and the specific-rate tariff of $0.54 per gallon on ethanol to be used as fuel.[173] Brazil bears the brunt of the specific-rate tariff on fuel ethanol, which generated tariff revenues of $53 million in 2004 and $22 million in 2005.[174] Recently, the tariff on imported ethanol has garnered criticism from members of Congress, the media, and economists.[175] One common criticism is that the tariff unjustifiably protects domestic agriculture in the interest of achieving energy independence.[176] Unjustifiable protectionism is not the only barrier to removing the tariff—liberalizing trade would have far-reaching effects felt within U.S. borders and in other world markets that should be considered.[177] Removing the tariff is an advisable course of action because it will stimulate meaningful competition for the most efficient form of ethanol and improve social welfare in various parts of the world.

---

172. *See* KOPLOW II, *supra* note 24, at 19.

173. *Id.* The latter tariff has been in effect since 1980. *Id.*

174. *Id.* at 21. The tariff is welfare enhancing but it reduces trade volume. *See* KOJIMA ET AL., *supra* note 4, at 43. Should it be removed, prices for biofuel feedstocks would fall, thereby increasing demand for biofuels. *See id.*

175. Thomas Friedman does not mince words when he asks whether the current tariff is "'just stupid or really stup*id*.'" *See* Thomas Friedman, *Dumb as We Wanna Be*, N.Y. TIMES, Sept. 20, 2006, at A27 (citing pressure from big agribusiness to keep sugarcane ethanol out of the U.S. market and impoverishing poor tropical countries in Africa and the Caribbean); *see also* Colin A. Carter & Henry I. Miller, *Why Ethanol Backfires: Politicians Love the Idea of Fuel from Corn, but it Carries the Seeds of Serious Problems*, L.A. TIMES, May 17, 2007, at A23 (questioning the rationale behind keeping the tariff in place, which, in the view of this critic, prevents the most cost-effective means of obtaining ethanol, which is to import it from Brazil). Richard Posner blames the Iowa caucuses for keeping the tariff in place. Posting of Richard Posner to the Becker-Posner blog, http://www.becker-posner-blog.com/archives/2007/10 (Oct. 28, 2007, 20:49 EST) ("We can achieve [energy independence] (at least insofar as ethanol can [contribute] to the solution) only by relaxing the tariff on imported ethanol.").

176. *See* Carter & Miller, *supra* note 175.

177. *Cf.* KOJIMA ET AL., *supra* note 4, at 44 (reviewing the potential impact of agricultural trade liberalization on welfare distribution in sub-Saharan African countries).

b. Tariff Disarmament: Arguments for Trade Liberalization

One study examining the removal of U.S. import tariffs on ethanol finds that the removal would increase world ethanol prices by 24%, increase raw sugarcane prices by 1.8% and decrease corn prices by 1.5%.[178] Ethanol prices would fall by 14% in the United States, and imports would triple.[179] The study indicates that demand for biofuels will escalate if the import tariff is removed.[180] Furthermore, rising corn prices in the United States deter removal of the tariff.[181]

Should trade be liberalized both in the United States and elsewhere, the immediate and direct effects would be twofold: 1) ethanol prices in countries with high protection such as the United States and the European Union would decrease and 2) incomes in countries that export ethanol such as Brazil would increase.[182] But the effects will not end there. The removal of distortions by liberalizing trade of ethanol is likely to affect welfare distribution throughout the world.[183] For example, in Brazil, one study found that a 10% increase in world sugarcane prices would cause an income gain of $5 billion for Brazilian workers (1.04% of the gross domestic product) and a decline in the poverty rate by 1.5%.[184] In sub-Saharan Africa, reducing tariffs constitutes an income loss to urban workers but a gain to rural farmers, and since farmers outnumber workers, the overall

178. *See id.* at 7–8. Corn prices would fall because the United States would divert less corn to ethanol production—more imported feedstocks such as sugarcane would be used to produce ethanol. *Id.*

179. *Id* at 8. Removing imports in the United States would have a far-reaching effect. In Brazil, ethanol consumption would decline by 3% while ethanol exports would increase by 64%. *Id.*

180. *Id.* Increased demand for ethanol would drive up the price of feedstocks and other agricultural commodities, benefiting farmers in third world countries. *Id.* However, net importers of food would be adversely affected because prices of food products would likely increase. *Id.* The rising cost of food will be discussed in Part IV.B.2.

181. *See id.* at 32 (noting that U.S. producers receive "about double the historical average world market price"). Historically, agricultural protectionism increases with individual incomes. *See id.* It is not surprising, then, that the highest levels of protection are found in the European Union, United States, and high-income Asia. *Id.*

182. *Id.* at 43.

183. *Id.* at 44.

184. *Id.*

effect in sub-Saharan Africa would be positive.[185] These studies seem to indicate that world agriculture markets would be stimulated by liberalizing ethanol trade policies.[186]

However, ethanol trade will not flourish merely because restrictive tariffs are removed. The proliferation of biofuel trade depends on the existence of many potential exporters.[187] For trade in biofuels to flourish, potential importers of ethanol need to be assured that purchasing ethanol does not pose the same issues of energy insecurity that purchasing oil poses—if there are only one or two countries with costs low enough to export ethanol cheaply, this may not provide the protection that potential purchasers want.[188] Until there are several large-scale ethanol suppliers, importing ethanol may be perceived to be just as risky as importing oil.[189]

Overall, the benefits of removing trade barriers appear to outweigh the costs. Most studies show that lowering trade barriers increases global welfare in the long run by increasing competition, improving efficiency, lowering ethanol costs, and enabling efficient producers like Brazil to expand their market share.[190] Even unilateral reform would achieve substantial and positive results.[191] The United States could see an increase in the amount of goods and services within its borders.[192] A more

185. *Id.*; *see also* Friedman, *supra* note 175. Liberalizing trade would indeed have a positive effect for some, but Friedman neglects the issue of the rising cost of food, which would have a negative (and potentially devastating) effect on countries that import most of their food. *See* KOJIMA ET AL., *supra* note 4, at 44.

186. *See* KOJIMA ET AL., *supra* note 4, at 44.

187. *Id.* at 58.

188. *See id.* Illustrative is the hypothetical example of Japan, a country ill-suited to produce ethanol, seeking to purchase ethanol from Brazil. *Id.* If Brazil is the only source of cheap ethanol to Japan, Japan's reliance on Brazil for its ethanol needs is perceived as compromising the security of supply. *Id.*

189. *See id.*

190. *See id.* at 74.

191. *See* EPSTEIN, *supra* note 128, at 41–42 ("The United States . . . would be far better off . . . if it scrapped [its subsidy] programs . . . . even if the rest of the world were determined to keep them . . . .").

192. *Id.* at 42.

nuanced benefit is increased demand for exports caused by the increased value of the currency in which the goods are traded.[193]

Liberalizing trade, at minimum, forces policymakers to carefully examine the objectives of the ethanol program.[194] Protecting the U.S. ethanol industry should not pass muster as a legitimate objective, given the notable benefits of liberalizing trade.

The numerous ill effects of providing the ethanol program with federal funds should be reason enough to initiate substantial subsidy reform. In light of the evidence, subsidizing the ethanol industry (and the feedstock from which it is made, corn) is wholly wasteful to taxpayers and contrary to the objectives of the program. But these subsidies harm more than just the federal treasury.

B. The Unintended Consequences of Ethanol

The U.S. ethanol program is very costly to the public. Aside from the tax dollars that the U.S. treasury places directly into the pockets of ethanol producers, there are other collateral costs of the program that are important to assess. The most substantial costs are: 1) the environmental costs of producing ethanol resulting from corn production and 2) rising food costs resulting from diverting much of the U.S. corn supply into making ethanol.

193. *See id.* When a tariff is imposed on a foreign good, the demand for the good from abroad reduces the demand for currency in which the good is sold, causing the local currency to be more expensive relative to foreign currency, effectively serving as a barrier to export. *Id.*

194. *See* KOJIMA ET AL., *supra* note 4, at 74. As the United States embarks on its mission to ramp up ethanol production and use, it is perhaps more incumbent now than ever before upon policymakers to address honestly the goals and the costs of the ethanol program. Absent this effort, the ethanol program will continue to drain the U.S. treasury of countless sums and wreak havoc on the world agricultural market. *Id.*

1. Not as "Green" As It Looks: The Environmental Effects of Ethanol

One of the espoused goals of the U.S. ethanol program is to improve emissions standards by replacing fossil fuels with biofuels.[195] Also widely cited in the case for ethanol is the contention that production of biofuels is environmentally sustainable, meaning that biofuels are produced from materials that are renewable (as opposed to conventional fuel, of which there is a limited supply).[196] Depending on the feedstock used, reports vary as to the sustainability of the production process.[197]

Farming corn on an industrial scale requires input of many factors. First, corn farmers use nitrogen fertilizer to fertilize their crops.[198] Making the fertilizer requires an immense amount of heat and pressure, supplied in great part by natural gas, a fossil fuel.[199] When all elements of the industrial process are considered, more fossil fuel energy is required to grow and harvest the corn than is actually gained from the end product

195. *See* GREENE, *supra* note 62, at 9. The environmental benefits of using low-ethanol blends in vehicles are somewhat controversial. Though ethanol is used as an additive to improve air quality, it may result in increased nitrogen oxide and volatile organic compound emissions, which contribute to smog. *Id.* at vi. Environmental benefits are more positive in higher-blend ethanol such as E85. *See id.* at 9. These biofuels produce almost no sulfur, less carbon monoxide emissions, fewer particulate emissions, and fewer toxic air pollutants than either gasoline or diesel fuel. *Id.*

196. *See, e.g.*, *id.* at v, 2–4.

197. *See* KOJIMA ET AL., *supra* note 4, at 68–70. For example, producing ethanol from sugarcane in Brazil has a positive net effect on the environment because no irrigation is necessary, assuming no change in land use. *Id.* at 68–69. But sugarcane ethanol produced in India, where water is scarce, requires substantial irrigation and would therefore have lower environmental benefits. *Id.* at 69. Hence, environmental benefits stemming from ethanol production must not be assumed. Rather, it requires close analysis on a case-by-case basis.

198. *See* POLLAN, *supra* note 1, at 46 (noting nitrogen runoff from use of fertilizer is a major culprit in groundwater pollution).

199. *Id.* at 44.

itself.[200] The ethanol production process may not be energy efficient either, though there is a heated debate regarding the methodology used to calculate efficiency.[201]

While ethanol production offers the potential environmental boon of capturing renewable energy from ethanol production, it comes with its own set of environmental concerns. First, the growing demand for corn and soybean ethanol has changed cropping patterns in the Midwest.[202] Farmers are planting corn more frequently in crop rotations, increasing corn acreage, and decreasing wheat acreage.[203]

In addition to changing the production patterns of existing farmland, ethanol production is diverting land use for the production of biofuel feedstock, potentially thwarting conservation efforts.[204] For example, Brazil's Atlantic rainforest is nearly gone due to activities such as sugarcane and coffee farming and cattle grazing.[205] Ethanol expansion in Brazil currently threatens the Brazilian savannah, a species-rich environment.[206] In the United States, lands intended as conservation regions are threatened by ethanol expansion.[207]

The issue of irrigation is related to land use. Corn is a water-intensive crop, requiring vast amounts of water to grow.[208] Irrigation of corn has risen steadily over time, from

---

200. *See id.* at 45–46; Patzek, *supra* note 15, at 1. The amount of energy used in the industrial process is comprised of the energy required to make the fertilizer and pesticides, drive the tractors, and harvest, dry, and transport the corn. POLLAN, *supra* note 1, at 45.

201. *Compare* SHAPOURI ET AL., *supra* note 14, at iii (arguing that corn ethanol production is 34% efficient), *with* Patzek, *supra* note 15, at 1 (arguing that corn ethanol production is inefficient).

202. KOPLOW II, *supra* note 24, at 59.

203. *Id.*

204. *See* Vitalis, *supra* note 142, at 61 (describing the taking of marginal lands intended for conservation for sheep farming in New Zealand).

205. *See* Friedman, *supra* note 175.

206. *Id.*

207. David Streitfeld, *U.S. May Free Up More Land for Corn Crops*, N.Y. TIMES, June 21, 2008, at C1.

208. *See* KOPLOW II, *supra* note 24, at 42 (noting that ethanol production also requires a lot of water—anywhere from 3 to 5 gallons of water is necessary to produce a gallon of ethanol).

about 8% of the crop in 1969 to about 18% of the crop in 2002.[209] There are two principle regions in the United States where corn is grown; the largest is known as the "Heartland Region" and produces about 70% of the corn crop.[210] The second largest region ("Prairie Gateway") produces 15% of the nation's supply of corn but relies heavily on irrigation to produce its annual yield.[211] States included in the Prairie Gateway region are Kansas, parts of Texas, New Mexico, Colorado, Nebraska, and Oklahoma, together comprising 60% of irrigated corn farmlands in the United States[212] This region is located over the Ogallala Aquifer, used in large part to provide water for crop irrigation.[213] The aquifer is classified as a fossil water resource, meaning that water is withdrawn at a greater pace than the aquifer can naturally replace.[214] Irrigating the corn crops is a likely factor in the overexploitation of the aquifer.[215] Water scarcity in the region will probably play an interesting role as the states compete to supply feedstock for ethanol production.[216]

In addition to corn producers vying for water supplies amongst themselves, competition for water from urban areas is likely to increase as water becomes scarce.[217] Water shortages could be a serious constraint to ethanol production.[218]

209. *Id.* at 41.

210. *Id.*

211. *Id.*

212. *Id.* Growing corn in this region of the country reflects the current trend of expanding corn-based ethanol into the West, where irrigation is necessary. *Id.* at 59.

213. *Id.* at 41.

214. *Id.* Most countries do not value water in the same way as energy. *See* KOJIMA ET AL., *supra* note 4, at 69. This may change to the extent that water becomes a nonreplenishable resource in the wake of irrigating more and more feedstock. *See* KOPLOW II, *supra* note 24, at 41.

215. KOPLOW II, *supra* note 24, at 41.

216. *See id.*

217. *See* KOJIMA ET AL., *supra* note 4, at 69.

218. *Id.*

2. *Increases in Food Prices: Tolerable in the United States but Potentially Catastrophic for Poor Nations*

The RFS calls for increased ethanol production each year.[219] Under current conditions, corn will be used to produce the ethanol.[220] The United States accounts for about 40% of the world's supply of corn and half of the world's corn exports.[221] In 2006, increased demand for corn to be used for ethanol production caused prices of corn to rocket up from $2 to $4 a bushel in 2007.[222] In March 2007, corn futures reached $4.38 a bushel, the highest level seen in ten years.[223] The rising cost of corn affects the price of other agricultural products like oilseeds and other grains, causing them to increase.[224] The rising cost of corn also affects the price of the livestock that consumes it.[225] As it turns out, corn finds its way into virtually everything Americans eat, so the cost of many processed foods containing ingredients such as high fructose corn syrup could also increase.[226]

---

219. *See supra* Part IV.A.1.a.

220. "Current conditions" is defined as the situation in which tariffs on foreign ethanol remain effective, cellulosic ethanol is not commercially viable and current tax credits available to corn growers remain in place.

221. C. Ford Runge & Benjamin Senauer, *How Biofuels Could Starve the Poor*, 86 FOREIGN AFF. 41, 42 (2007).

222. *See* Carter & Miller, *supra* note 175.

223. *See* Runge & Senauer, *supra* note 221, at 42.

224. *Id.* The rise in prices of other grains is a matter of rational economic theory. If a wheat producer normally charges $2 a bushel, he can still undercut corn prices by charging just below $4 a bushel and will do so in a market in which high corn prices prevail.

225. *Id.* at 45. This effect results from high feed costs causing returns to diminish on products like chicken, turkey, milk, and eggs. *Id.* In order to remain in business, the producers of these products must charge higher prices. *Id.* For example, cattle prices stood at $82.50 per 100 pounds a year ago; that same amount costs $91.15 today. Michael S. Rosenwald, *The Rising Tide of Corn: Ethanol-Driven Demand Felt Across the Market*, WASH. POST, June 15, 2007, at D1. Some analysts estimate that as much as 66% of corn is consumed in processing ethanol and is no longer available for feed. *See* KOPLOW III, *supra* note 97, at 39.

226. *See* POLLAN, *supra* note 1, at 19 (stating that "corn is in the coffee whitener and Cheez Whiz, the frozen yogurt and TV dinner, the canned fruit and ketchup and candies, the soups and snacks and cake mixes, the frosting and gravy and frozen waffles, the syrups and the hot sauces, the mayonnaise and mustard, the hot dogs and the

Be that as it may, does the rising cost of food affect a nation that only spends about ten percent of its disposable income on food?[227] Some analysts and economists believe that rising corn prices, in combination with other factors such as poor weather and rising energy costs, could unsettle the food industry in a way that could affect a significant amount of Americans.[228]

More sobering than domestic rising food costs are rising food costs in the global market. As noted previously, increased trade in ethanol will lead to higher agricultural commodity prices.[229] Food prices have already increased in the wake of expanding ethanol programs in the United States and Brazil, and they show no signs of slowing.[230] Should oil prices remain high, increases in biofuel production will cause global corn prices to rise by 20% by 2010 and 41% by 2020.[231] The price of oilseeds, including soybeans, rapeseeds, and sunflower seeds will likely rise by 26% by 2010 and 76% by 2020.[232] These rising costs will have a negative effect on food security in developing countries that import most of their food.[233] The International Food Policy Research Institute predicted that the number of people lacking food security in the world would decline by 23%, to about 625 million, by 2025.[234] But, if the price of staple foods increases because of increased demand of biofuels, the number of people

---

bologna, the margarine and shortening, and salad dressings and the relishes and even the vitamins. (Yes, it's in the Twinkie, too).") Evidently, the average U.S. supermarket contains 45,000 items, more than quarter of them containing corn. *Id.*

227. *See* Rosenwald, *supra* note 225. By way of comparison, the world's poorest people spend between fifty and eighty percent of their income on food. *See* Runge & Senauer, *supra* note 221, at 51.

228. Rosenwald, *supra* note 225.

229. *See* Runge & Senauer, *supra* note 221, at 49.

230. *Id.* at 42.

231. *Id.* at 44–45.

232. *Id.* at 49. Of course, the rising costs will be mitigated by expanding crop yields or by using other raw materials to produce ethanol (such as trees and grass that are used to make cellulosic ethanol). *Id.*

233. *See* KOJIMA ET AL., *supra* note 4, at 44. Food security describes the condition when "all people at all times have physical, social, and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life. . . . [w]ith reference to the three foundational pillars of availability, access and utilization." *Id.* n.4.

234. *See* Runge & Senauer, *supra* note 221, at 50.

lacking food security would rise by over 16 million for every percentage increase in the prices of staple foods, meaning that over 1.2 billion people could be undernourished by 2025.[235] The substantially harmful collateral effects caused by using corn to make ethanol, in conjunction with the wasteful nature of the subsidies, should be sufficient to trigger a meaningful effort to dismantle the subsidies in place.

V. ECONOMIC QUAGMIRE: A WAY OUT

Given the tide of U.S. policy in the early twenty-first century, it seems likely the United States will proceed with the ethanol program regardless of ethanol's negative collateral effects. Congressional outlays of capital and countless hours in planning in the first part of the twenty-first century indicate a desire for a workable ethanol program in the United States. Before proceeding with the program, policymakers must reexamine the articulated goals of the ethanol program.

First, the goal of energy independence should be understood not as an isolationist measure severed from the rest of the world's energy future but as a collaborative effort to diversify fuel sources and supply.[236] Market forces need to redirect the energy industry and seek out the most efficient solutions to diversifying energy sources.[237] Trade in alternative fuel sources like sugarcane ethanol must be incorporated as an element of energy independence in keeping with increasing trends of globalization and rejecting isolationism.[238] Another purported goal of the ethanol program is improving the environment by reducing carbon emissions.[239] It is evident that corn ethanol does not achieve this goal at the present time, but other sources of renewable energy could do so.

---

235. *Id.* at 50–51.

236. Steve Stein, *Breaking the Oil Habit*, 138 POL'Y REV. 53, 53–54 (2006).

237. *Id.* at 55.

238. *Id.* at 64–65; *See also* Jeff Cox, *Sugar Cane Ethanol's Not-so-Sweet Future*, CNN, Aug. 7, 2007, http://money.cnn.com/2007/08/06/news/economy/sugarcane_ethanol/index.htm (last visited Feb. 1, 2009).

239. *See* GREENE, *supra* note 62, at vi.

Instead of assuming corn ethanol to be a forgone conclusion in displacing conventional fuel consumption, the federal government should aggressively invest in new technology and let all possible renewable fuel sources compete against one another. The federal government should also pursue international cooperation regarding the liberalization of biofuels trade.[240] The current system of federal subsidies given to farmers providing feedstock for ethanol as well as to producers of ethanol has been described as an attempt to "micro-manage the evolution of the market for transport fuels."[241] The market itself is better suited to decide the course of action of the ethanol program.[242] If the program is efficient, it will withstand the market's test. The establishment of market mechanisms, resembling in function the Clean Air Act's private market in sulfur emissions, could achieve many of the espoused goals of the U.S. ethanol program without the high costs of the numerous subsidies.[243] A law setting up a private market on which to trade emissions credits or energy efficiency to other energy firms could be a cheaper alternative to the current set of federal subsidies. This private market should provide appropriate incentives for participants that are geared towards goals such as discovering efficient alternative fuel sources and reducing carbon emissions. Providing abundant research and

240. Funding for ethanol research and development is legitimate and necessary because of the public good characteristics of the ethanol program. *See* KOJIMA ET AL., *supra* note 4, at 72. Because it is a public good, the ethanol program is more likely to receive the financing it requires if it is centrally financed. *Id.* The authors of the Kojima Report appear to believe that funding for research and development is the only legitimate and permissible form of government spending for ethanol. *Id.*

241. *See* KOPLOW III, *supra* note 97, at 55.

242. ABCNewsOnline, Call to Let Market Forces Dictate Ethanol Industry (Sept. 12, 2006), http://www.abc.net.au/news/newsitems/200609/s1738564.htm.

243. *See* Joseph V. Kennedy, *A Better Way to Regulate: What Government Can Learn from the Market*, 109 POL'Y REV. 57, 71 (2001) (explaining how the Clean Air Act set a ceiling on total emissions, allowing utilities to trade the rights to these emissions with each other and conservation groups to purchase and retire emission rights, effectively reducing pollution levels). Utilities have incentive to perform well because pollution reductions can be sold to others, and environmental groups can purchase cleaner air by purchasing emissions credits. *Id.*

development funds, liberalizing trade, and setting up private markets that provide incentives for firms who produce efficient alternative sources of fuel are bound to be more effective in an effort to diversify the U.S. energy supply than providing endless, wasteful subsidies.

*Natalie Jean Kurz**

* Natalie Jean Kurz, J.D. Candidate May 2009, University of Houston Law Center. The Author would like to thank Lauren Grau and Harve Truskett for their assistance in putting this Comment together.