The Biofuels Law and World Hunger

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I. BIOFUELS: AN INTRODUCTION

Biofuels are fuels derived from relatively and recently dead biological matters, which can either be plant materials or animal wastes, and are distinguished from fossil fuels such as petroleum, coal, and natural gas. They primarily consist of two different types: biodiesel and ethanol. Since such plant materials or animal wastes can be replenished when needed, biofuels are considered a source of renewable energy.

Biodiesel is a clean-burning alternative to petroleum fuel that is made from renewable resources and is usually used as an additive to petroleum fuels or used by itself in unmodified diesel engines.[1] A 1998 study sponsored by the United States of America (U.S.) Department of Energy and the U.S. Department of Agriculture concluded that biodiesel reduces net carbon dioxide emissions, a leading source of global warming, by 78% compared to petroleum diesel.[2] Thus, the use of biodiesel could possibly reduce pollutants which include hydrocarbons and carbon monoxide, as compared to emissions from ordinary diesel fuel.

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1. Enrique de Vera, *The WTO and Biofuels: The Possibility of Unilateral Sustainability Requirements*, 8 CHI. J. INT'L L. 661, 663 (2008).

2. *See* John Sheehan, et al., *Nat'l Renewable Energy Laboratory, Life Cycle Inventory of Biodiesel and Petroleum Diesel for Use in an Urban Bus* 247 (U.S. Department of Agriculture and U.S. Department of Energy, Final Report, May 1998), *available at* http://www.nrel.gov/docs/legosti/fy98/24089.pdf (last accessed Sep. 2, 2009).

Ethanol can also be used as an alternative fuel or as an additive to petroleum-derived fuel used in car gasoline engines. Similar to biodiesel, ethanol burns without particulate emissions and produces less carbon monoxide and nitrogen oxide than gasoline.[3] According to a brochure published by Argonne National Laboratories, ethanol use can reduce total greenhouse gas emissions by up to 87%.[4]

Over the past few years, petroleum prices have remained stubbornly high. Since the middle of 2005, the average price of crude oil originating from Organization of the Petroleum Exporting Countries (OPEC) countries has remained above $50 per barrel.[5] This troubling fact has increased the desirability and motivation for countries to lay the foundation for the use of biofuels in the hope that it would reduce their dependence on foreign crude oil. Moreover, car manufacturers have developed car engines to make it less costly and more adaptable to biofuels.[6] This thereby makes biofuels increasingly available and accessible to ordinary consumers around the world.

Global warming has also pressured countries to come up with solutions to reduce their emissions of greenhouse gases. Adopting biofuels technology could be one way of complying with a country's obligations and commitments under the Kyoto Protocol,[7] an international agreement linked to the United Nations Framework Convention on Climate Change.[8] The major feature of the Kyoto Protocol is that it sets binding targets for 37 industrialized countries and the European community for reducing greenhouse gas emissions between 2008 and 2012.[9]

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3. David Cohen, *Green Fuel Earns Its Stripes in 24-Hour Endurance Test*, NEW SCIENTIST, June 19, 2004, at 19.

4. U.S. DEPARTMENT OF ENERGY, ETHANOL: THE COMPLETE ENERGY LIFECYCLE PICTURE (2007).

5. *See* Energy Information Administration, OPEC Countries Spot Price FOB Weighted by Estimated Export Volume (Dollars per Barrel), *available at* http://tonto.eia.doe.gov/dnav/pet/hist/wtotopecw.htm (last accessed Sep. 2, 2009).

6. Melissa Allison, Investors Pump Up Biodiesel's Prospects, *available at* http://seattletimes.nwsource.com/html/businesstechnology/2003583131_imperium220.html (last accessed Sep. 2, 2009).

7. Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 11, 1997, 2303 U.N.T.S. 148.

8. United Nations Framework Nations on Climate Change (UNFCCC), May 9, 1992, 1771 U.N.T.S. 107.

9. *See* UNFCCC, Kyoto Protocol: An Essential Background, *available at* http://unfccc.int/kyoto_protocol/items/2830.php (last accessed Sep. 2, 2009).

II. THE U.S. AND EU EXAMPLE

At the forefront of the technological developments in the biofuels industry are the U.S. and the European Union (EU).

The biofuel industry in the U.S. was born as early as 1908.[10] The focus then was on the development of ethanol as an additive for petroleum fuel.[11] Prior to World War II, Standard Oil marketed a 25% ethanol-blend fuel on the east coast.[12] After World War II, however, the ethanol industry in the U.S. lost support because of advances in the technology and supply of petroleum.[13] The industry did not regain strength in the U.S. until the 1970's.[14]

Similarly, the biofuel industry was also present in Europe prior to World War II. In contrast, however, to the pre-World War II biofuel industry in the U.S., which focused on ethanol, Europe's biofuel industry focused on biodiesel.[15]

The U.S. Energy Policy Act of 2005 (EP Act)[16] to advance biofuels as a means to reduce oil dependence by: (1) implementing and expanding goals for a renewable fuel content in gasoline; (2) maintaining and extending financial incentives for soybean oil biodiesel and corn ethanol; and (3) by adding tax incentives to research, develop, and introduce other promising biofuels options to market.[17]

EP Act charged the Environmental Protection Agency (EPA) Administrator to "promulgate regulations to ensure that gasoline sold or introduced into commerce in the [U.S.] ... on an annual average basis, contains the applicable volume of renewable fuel."[18] The Act set an original

10. *See* Joseph DiPardo, *Outlook for Biomass Ethanol Production and Demand* (Energy, Information Administration, Analysis Paper, 2002), *available at* http://www.eia.doe.gov/oiaf/analysispaper/pdf/biomass.pdf (last accessed Sep. 2, 2009); Anthony Radich, Energy Information Administration, Biodiesel Performance, Costs, and Use, *available at* http://tonto.eia.doe.gov/FTPROOT/environment/ biodiesel.pdf (last accessed Sep. 2, 2009).
11. *Id.*
12. *Id.*
13. *Id.*
14. *Id.*
15. *Id.*
16. An Act to Ensure Jobs for our Future with Secure, Affordable, and Reliable Energy [Energy Policy Act of 2005], 42 U.S.C. 15801 (2005).
17. *Id.*
18. *Id.* § 1501 (c) (2) (A) (i).

applicable volume of 7.5 billion gallons by 2012,[19] and the EPA promulgated the Renewable Fuel Standard Program (RFS)[20] on 1 September 2007.

Moreover, EP Act also established a biofuels and bioproducts program.[21] The program is aimed towards bringing the most promising biofuels to the market by partnering "with industry and institutions of higher education"[22] to develop commercial bioenergy applications, including "integrated biorefineries that may produce biopower, biofuels, and bioproducts."[23] This program intends to advance biofuels production processes that produce fuel, electricity, and other products through the use of biomass, and avoid utilizing crops for food. By doing so, any competition between crops used for biofuels and food purposes will be minimized, if not eliminated.

In 2003, the EU passed two complimentary directives to promote and offer excise reductions for biofuels.[24] The first directive instructed all member states to formulate plans for increasing biofuels' share of total fuel consumption.[25] This directive mandated that biofuels make up two percent of fuel consumed by 2005, and 5.75% by 2010.[26] While it set out a clear benchmark for EU member states to meet, it did not specify how EU member states should achieve this goal.[27] Perhaps due to this lack of instruction, the two percent goal was not reached in 2005.[28] While some member states such as France and Germany reached the two percent goal by the end of 2006, it is not likely, given the current projections, that other member states will meet the 5.75% requirement by 2010.[29] The European Commission, however, is still pursuing compliance with this goal.[30]

19. *Id.* § 1501 (c) (2) (B) (i).

20. Environmental Protection Agency, Renewable Fuel Standard, 40 C.F.R. § 80.1100 (2007).

21. Energy Policy Act of 2005, § 932.

22. *Id.* at (c).

23. *Id.* at (b).

24. Council Directive 2003/30, 2003 O.J. (L 123) (EC); Council Directive 2003/96, 2003 O.J. (L 283) (EC).

25. Council Directive 2003/30, 2003 O.J. (L 123) (EC).

26. *Id.*

27. *Id.*

28. U.S. DEPARTMENT OF AGRICULTURE GAIN REPORT, EUROPEAN UNION OILSEEDS AND PRODUCTS: EUROPEAN UNION PROMOTION OF THE USE OF BIOFUELS FOR TRANSPORT 1 (2001).

29. EUROPEAN ENERGY FORUM, COMMUNICATION FROM THE COMMISSION: AN EU STRATEGY FOR BIOFUELS 34 (2006).

30. *See* Council Directive 2003/30, art. 3, 2003 O.J. (L 123) 42, 44 (EC); One-on-One: Valerie Corre, Director-General of the European Union of Alcohol Producers, EUROPE ENERGY, Apr. 22, 2005.

Accordingly, the Commission has instructed all member states to provide an estimate of the percentage of total fuel used that biofuels will account for and the way in which each state will promote biofuels.[31]

While the EU has taken steps to promote increased market share for biofuels, its approach is principally directive with very little legislation controlling its member states' treatment of the biofuel industry.[32] The EU has not passed enough incentives to encourage member states to meet the EU's mandates because of its supranational structure.[33]

III. THE PHILIPPINE BIOFUELS LAW

In 2005, President Gloria Macapagal-Arroyo released an Energy Independence Agenda that called for 60% energy self-sufficiency by 2010 and focused on addressing the nation's energy needs in three areas: energy independence, power sector reform, and energy conservation.[34]

Pursuant to the agenda, the Biofuels Act of 2006 (Biofuels Act)[35] was enacted into law in 2006. It was made the policy of the State "to reduce dependence on imported fuels with due regard to the protection of public health, the environment, and natural ecosystems consistent with the country's sustainable economic growth that would expand opportunities for livelihood by mandating the use of biofuels."[36]

Biofuels,[37] as defined by the Biofuels Act, include bioethanol, biodiesel, and other fuels made from biomass and primary used for motive, thermal power generation, with quality specifications in accordance with the Philippine National Standard consistent with the Philippine Clean Air Act of 1999.[38]

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31. *Id.*

32. Christine Benson, *Putting Your Money Where Your Mouth Is: The Varied Success of Biofuel Incentive Policies in the United States and the European Union*, 16 TRANSNAT'L L. & CONTEMP. PROBS. 633, 657 (2007).

33. *Id.*

34. Office of the Press Secretary, Strengthening Measures to Address the Extraordinary Increase in World Oil Prices, Directing the Enhanced Implementation of the Government's Energy Conservation Program, Administrative Order No. 126 (Aug. 13, 2005).

35. An Act to Direct the Use of Biofuels, Establishing for this Purpose the Biofuel Program, Appropriating Funds Therefor, and for Other Purposes [Biofuels Act of 2006], Republic Act No. 9367 (2007).

36. *Id.* § 2.

37. *Id.* § 3 (f).

38. An Act Providing for a Comprehensive Air Pollution Control Policy and for Other Purposes [Philippine Clean Air Act of 1999], Republic Act No. 8749, § 26 (1999).

The Biofuels Act mandates that within four years from enactment and upon approval of the National Biofuels Board, a blend of locally produced biofuel components shall compose 10% of all liquid fuels to be sold and used in motor vehicles.[39] In addition, a one percent biodiesel blend was imposed within three months from the law's enactment and subject to an increase to two percent after two years thereafter.[40]

Thus, the Implementing Rules and Regulations (IRR) of the Biofuels Act states the following:

> 5.1 Bioethanol
>
> 1. Within two (2) years from the effectivity of the Act, at least five percent (5%) bioethanol shall comprise the annual total volume of gasoline fuel actually sold and distributed by each and every oil company in the country, subject to the requirement that all bioethanol blended gasoline shall contain a minimum five percent (5%) bioethanol fuel by volume: *Provided,* That the bioethanol blend conforms to the PNS.
>
> 2. Within four (4) years from the effectivity of the Act, the NBB created under Section 8 of the Act is empowered to determine the feasibility and thereafter recommend to the DOE to mandate a minimum of ten percent (10%) blend of bioethanol by volume into all gasoline fuel distributed and sold by each and every oil company in the country: *Provided,* That the same conforms to the PNS.
>
> 5.2 Biodiesel
>
> 1. Within three (3) months from the effectivity of the Act, a minimum of one percent (1%) biodiesel by volume shall be blended into all diesel fuels sold in the country: *Provided,* That the biodiesel blend conforms to the PNS.
>
> 2. Within two (2) years from the effectivity of the Act, the NBB is empowered to determine the feasibility and thereafter recommend to DOE to mandate a minimum of two percent (2%) blend of biodiesel by volume which may be increased after taking into account considerations including, but not limited to, domestic supply and availability of locally-sourced biodiesel component. [41]

Among the incentives designed to encourage the production and use of biofuels is an exemption of the ethanol/biodiesel portions of fuel blends from specific taxes and an exemption from value-added taxes for biofuel raw

39. Biofuels Act of 2006, § 5.

40. *Id.*

41. Rules and Regulations Implementing the Biofuels Act of 2006 (Biofuels Act IRR), § 5 (2007).

materials.[42] There are also favorable loan policies available from banks for biofuel investors and producers.[43]

According to the recently concluded Bioenergy Forum 2008 in Bangkok, Thailand, the Philippines' enactment of the Biofuels Act is a testament that the country is at the forefront of biofuels development and use in the world.[44] The law was praised for having a decisive mandate on the use of coco-biodiesel and fuel-ethanol, specifically, by ensuring that the feedstocks needed for biofuel production will not compete with the demands for food production.[45]

Despite the worldwide hype over the use of biofuels as an alternative to petroleum, however, serious concerns over its effects on the world's food supply remain. "World agriculture has entered a new, unsustainable and politically risky period," says Joachim von Braun, the head of the International Food Policy Research Institute in Washington, D.C.[46] The impact of biofuels use on world agriculture has brought about a huge debate on whether it is indeed the solution to the world crisis or has worsened the world's diminishing food supply.

IV. A STABLE FOOD SUPPLY

"Food riots have erupted in countries all along the equator. In Haiti, protestors chanting 'We're Hungry' forced the prime minister to resign; 24 people were killed in riots in Cameroon; Egypt's president ordered the army to start baking bread; the Philippines made hoarding rice punishable by life imprisonment."[47] These events clearly demonstrate the overwhelming influence of the food supply on the political and governmental policies of developing countries. The Biofuels Act attempts to address the issue of food security by providing rules geared towards ensuring a steady domestic supply of sugar, coconut, and other raw materials to be used in producing biofuels. The Sugar Regulatory Administration (SRA) and the Philippine Coconut

42. Biofuels Act of 2006, § 6 (a) & (b).

43. *Id.* § 6 (d). *See also* Asia-Pacific Economic Cooperation (APEC), The Philippines Biofuels Activities, *available at* http://www.biofuels.apec.org/me_philippines.html (last accessed Sep. 2, 2009).

44. Abigail Ho, Philippine Biofuels Law a Model for Other Countries, PHIL. DAILY INQUIRER, May 5, 2008, *available at* http://business.inquirer.net/money/breakingnews/view/20080503-134286/Philippine-biofuels-law-a-model-for-other-countries (last accessed Sep. 2, 2009).

45. *Id.*

46. *The New Face of Hunger*, THE ECONOMIST, Apr. 19, 2008, at 30.

47. *Id.*

Authority (PCA) are tasked to monitor and regulate the exportation and importation of such goods.[48]

To ensure the stability of the domestic sugar supply, the Biofuels Act tasks the SRA to monitor the supply and price of sugar at all times.[49] To this end, the SRA shall recommend and the other government agencies shall undertake the importation of sugar whenever necessary and shall make appropriate adjustments to the minimum access volume parameters for sugar in the Tariff and Customs Code.[50] Accordingly, the SRA shall at all times ensure that the supply of sugar is sufficient to meet the domestic demand and that the price of sugar is stable.[51] Moreover, the SRA, together with other government agencies, shall implement policies supporting the National Biofuels Program and submit the same to the Secretary of the Department of Agriculture (DA) for consideration.[52]

While the Biofuels Act does not expressly delegate the duties of the PCA, the IRR finds authority in the Revised Coconut Industry Code.[53] Thus, pursuant to Section (3) (a), Article II of the Revised Coconut Industry Code, mandating PCA to formulate and adopt a general program of development for the coconut and other palm oil industry in its all aspects, the PCA shall develop and implement policies within the coconut industry in support of the National Biofuels Program.[54]

The DA is required to comply with the directives listed under Section 11 (d) of the Biofuels Act, which includes ensuring increased productivity and the sustainable supply of biofuel feedstocks.[55] It shall also institute a program that would guarantee a sufficient and reliable supply of feedstocks for allocation in biofuel production.[56]

Reiterating the DA's mandate to address the concern over the supply of feedstocks for the production of biofuels, the IRR also states that the DA shall ensure increased productivity and sustainable supply of biofuels feedstocks.[57] Towards this end, the DA, in consultation with PCA, SRA, and other entities concerned, shall develop and implement appropriate

48. Biofuels Act of 2006, § 11.

49. *Id.* § 10.

50. *Id.*

51. Biofuels Act IRR, § 16.

52. *Id.*

53. Revising Presidential Decree Numbered Nine Hundred Sixty One, Presidential Decree No. 1468 (1978).

54. Biofuels Act IRR, § 17.

55. Biofuels Act of 2006, § 2 (d).

56. *Id.*

57. Biofuels Act IRR, § 28.

programs and guidelines in order to ensure a reliable supply of biofuel feedstocks.[58]

The question, however, remains whether the provisions in the Biofuels Act addressing sugar, coconut, and feedstock supply would be sufficient to avoid, avert, and prevent a food crisis from happening in the country. The Biofuels Act does not directly address, but instead ignores, its possible effects on the prices of basic commodities other than sugar and coconuts. It does not establish a mechanism wherein the prices of such basic commodities are monitored and regulated.

It is true that food prices have increased in response to many factors: higher energy and fertilizer prices; increased demand for biofuels, especially in the U.S. and the EU; and droughts in Australia and other countries.[59] Nevertheless, the increase in demand for biofuels is attributed to have forced global food prices up by 75% — "far more than previously estimated[,] according to a confidential World Bank report."[60]

The International Monetary Fund's (IMF) index of internationally traded food commodities prices[61] increased 130% from January 2002 to June 2008 and 56% from January 2007 to June 2008.[62]

Rice, although not used in biofuel production, has also been affected by the increase in prices of other commodities. Rice prices almost tripled from January to April 2008 despite little change in production or stocks.[63] This

58. *Id.*

59. World Bank Data and Research, High Food Prices: A Harsh New Reality, *available at* http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/0,,print:Y~isCURL:Y~contentMDK:21665883~pagePK:64165401~piPK:64165026~theSitePK:469372,00.html (last accessed Sep. 2, 2009).

60. Aditya Chakrabortty, Secret Report: Biofuel Caused Food Crisis, *available at* http://www.guardian.co.uk/environment/2008/jul/03/biofuels.renewableenergy (last accessed Sep. 2, 2009).

61. A nominal dollar index of food commodity prices using global export value weighs. *See generally* International Monetary Fund, Export and Import Price Index Manual, *available at* http://www.imf.org/external/np/sta/tegeipi/ch1.pdf (last accessed Sep. 2, 2009).

62. Donald Mitchell, *A Note on Rising Food Prices* (World Bank (WB) Development Economics Group, WB Policy Research Working Paper No. 4682, July 2008), *available at* http://ssrn.com/abstract=1233058 (last accessed Sep. 2, 2009). The increase in the prices of food commodities was led by grains whose sustained price increase began in 2005 despite an impressive 10.2% and 8.9% increase in global crop production in crop year 2004 to 2005 and 2005 to 2006, respectively. Increase in grain prices was followed by increases in the prices of fats and oil in the mid-2006 despite impressive growth in the global oilseed crop production.

63. *Id.*

increase was mostly in response to the surge in wheat prices in 2007 (up 88% from January to December) which raised concerns about the adequacy of global grain supplies and encouraged several countries to ban rice exports to protect consumers from international price increases, and caused others to increase imports.[64]

A. Impact on the Domestic Food Supply

Although the Biofuels Act is a relatively new law, questions as to its effects on the national food supply have already been raised. Nobel Laureate for Chemistry, Dr. Hartmut Michel, warned that the Philippine Government's biofuels program could both endanger the country's food security and harm the environment instead of improving it.[65] On 16 April 2008, some senators also urged the government to consider a moratorium on the implementation of the Biofuels Act and the conversion of irrigated lands to ensure food security.[66] Senator Rodolfo Biazon, among others, said the use of food sources like corn and sugar cane for alternative fuels might have to be reassessed and it must also be ensured that the lands planted with corn, sugar cane, and Jatropha for alternative fuels were indeed not suitable for rice, the country's primary staple.[67]

The proponents of biofuel technology argue that in addition to being environmentally friendly, biofuels will speed the rate of economic development experienced by countries as biofuels will increase the demand for domestic crops and reduce oil imports.[68] The fuel needed for industrial expansion will come from domestic farmers; thus, keeping within the country money that would otherwise be used to import energy.[69]

The Philippines, however, is an archipelago with limited resources in terms of agricultural land. The law of supply and demand partly explains why prices of food commodities in the Philippines have increased. Crops used for biofuel would be competing with crops used for the country's food supply in terms of the agricultural land where such crops are to be planted.

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64. *Id.*

65. Ron Mahibir, Rethinking Biofuels in the Philippines, *available at* http://asiacleantech.wordpress.com/2008/01/24/rethinking-biofuels-in-the-phi (last accessed Sep. 2, 2009).

66. Aurea Calica, *Biazon Seeks Review of Biofuels Law Implementation*, PHILIPPINE STAR, Apr. 17, 2008, *available at* http://www.philstar.com/Article.aspx?articleId=56588 (last accessed Sep. 2, 2009).

67. *Id.*

68. Raci Spaulding, *Fuel from Vegetables? A Modern Approach to Global Climate Change,* 13 TRANSNAT'L L. & CONTEMP. PROBS. 277, 297 (2003).

69. EBAN GOODSTEIN, ECONOMICS AND THE ENVIRONMENT 478-511 (3d ed. 2002).

Thus, an increase in demand in the use of agricultural land coupled with the shift in farmers' decisions to plant biofuel related crops, which are to be relatively more lucrative instead of crops for the food market, will lead to an increase in prices of basic food commodities. As of 2008, there are currently 10 million hectares of land now devoted to agriculture and there are four million hectares of idle public land that can be planted with various crops, including biofuel crops.[70]

Several hectares of rice lands are, however, also sought to be converted for biofuel production purposes.[71] Given the fact that rice farmers only earn about ₱20,000 to ₱40,000 per hectare per cropping season, the temptation to shift to biofuel crops that can guarantee much higher incomes cannot be ignored.[72]

Foreign investors have also expressed interest in massive Jatropha planting programs, encouraging local government units to offer large tracts of land.[73] According to a Special Report on Energy in the International Herald Tribune[74] the British firm NRG Chemical Engineering (NRG Chemical) will invest $600 million in Jatropha plantations in the Philippines that will cover over a million hectares, mainly in Palawan and Mindanao.[75] "NRG Chemical has set up a joint venture with the Philippine National Oil Company (PNOC) to build a biodiesel refinery and two bioethanol distilleries. Over a million hectares will be tapped because Jatropha needs vast areas to produce a substantial amount of oil."[76]

The DA has also been approached by 15 companies interested in producing biofuel feedstock whose projects will require 725,300 hectares of land.[77]

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70. Mahibir, *supra* note 65.

71. BusinessWorld, *Ban on Riceland Conversion Feared to Hit Biofuels Development,* GMA NEWS AND PUBLIC AFFAIRS, June 10, 2008, *available at* http://www.gmanews.tv/story/100191/Ban-on-riceland-conversion-feared-to-hit-biofuels-devt (last accessed Sep. 2, 2009).

72. Mahibir, *supra* note 65.

73. *Id.*

74. *See* Sonia Kolesnikov-Jessop, *Planting Seeds of Biofuel Where Little Else Grows,* NEW YORK TIMES, Oct. 29, 2007, *available at* http://www.nytimes.com/2007/10/29/business/worldbusiness/29iht-renjatro1.8104872.htm (last accessed Sep. 2, 2009) (The International Herald Tribune is the global edition of the New York Times.).

75. Mahibir, *supra* note 65.

76. *Id.*

77. *Id.*

On the opposite spectrum, the demand for fuel in general will increase yearly. Based on a study by the PCA, the country's transport-industry consumes an estimated seven billion liters of diesel per year and this amount is expected to increase over time.[78]

The supply of biofuels is so limited and its demand so great in the Philippines, that the National Biofuels Board, in January 2009, authorized the oil companies to import bioethanol. This was necessary because the supply of domestic bioethanol could not keep up with the demand as mandated by the Philippine Biofuels Act, requiring gasoline sold at the pumps to contain five percent ethanol.[79]

The Philippines will require 208 million liters of ethanol in 2009 in order to comply with the Biofuels Act.[80] As of 2009, there are only two companies in the Philippines producing bioethanol in commercial quantities. These are the San Carlos Bioenergy, Inc. and the Leyte Agri Corporation, both of which can produce only 19% of the required 208 million liters.[81]

As the biofuels industry in the Philippines grows, so is the increasing share of the supposed food production used to feed the huge mills that produce ethanol. This was precisely what happened in the U.S. As the U.S. biofuels industry grew, wheat and rice prices surged to decade highs, because even as those grains were increasingly used as a food source, farmers were allotting more acres for biofuels production and fewer acres for other crops.[82]

The poultry and swine industry could also be affected with this phenomenon. According to Vernon Eidman, Professor Emeritus of Agribusiness Management at the University of Minnesota, "higher feed costs have caused returns to fall sharply, especially in the poultry and swine sectors."[83] Thus, the continual drop in returns will result in the decline of production and ultimately the rise in the prices of chicken, pork, and their derivatives.[84]

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78. Conrad M. Cariño, *Agriculture Gears up for Massive Biofuel Production*, MANILA TIMES, Mar. 2, 2008, *available at* http://www.manilatimes.net/national/2008/mar/02/yehey/top_stories/20080302top2.html (last accessed Sep. 2, 2009).

79. Amy R. Remo, Oil Firms Told to Ship More Ethanol, *available at* http://business.inquirer.net/money/breakingnews/view/20090127-185761/Oil-firms-told-to-ship-in-more-ethanol (last accessed Sep. 2, 2009).

80. *Id.*

81. *Id.*

82. C. Ford Runge & Benjamin Senauer, *How Biofuels Could Starve the Poor*, FOREIGN AFFAIRS, May-June 2007, at 42.

83. *Id.* at 45.

84. *Id.*

An increase in food prices would certainly hurt consumers' pockets, especially those in poor developing countries including the Philippines. The World Bank, as early as 2001, has estimated that 2.7 billion people in the world were living on the equivalent of less than two dollars a day. To these people, even marginal increases in the cost of staple grains could be devastating.[85]

B. Sugar and Biofuels

Sugar is one of the primary sources of biofuel in the Philippines today. Despite the increase in food prices, Senator Juan Miguel Zubiri, the principal author of the Biofuels Act, denied that the "biofuels program is the reason behind the increase in world food prices."[86] According to him, "the increase in food prices is commensurate to the increase in the price of fuel. Producers spend more for transportation and fertilizer, which is a fossil oil by-product."[87] He further pointed out that the feedstock for bioethanol in the Philippines is sugar, a mere food additive.[88]

This assessment, however, ignores the fact that sugar is an important commodity and is a major input in food processing industries in the Philippines. In 2007, the DA reported that by 2001 about 8.5 million metric tons of sugarcane will be needed to fulfill the mandated blending of gasoline with 10% ethanol, which already represents around 37% of the total sugarcane produced in the country in 2005.[89]

Moreover, as noted by Professor U-Primo E. Rodriguez and Dr. Liborio Cabanilla, using sugarcane as a source of energy may have adverse effects.[90] Particularly, "[d]evoting sugarcane as biofuel feedstock would probably raise the average domestic prices of agricultural, fishery[,] and forest products, which in turn will make production costs higher and therefore increase prices of food products in the market."[91]

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85. *Id.* at 42.

86. Efren L. Danao, *Oil Companies Behind Smear Drive vs. Biofuels — Sen. Zubiri,* MANILA TIMES, June 28, 2008, *available at* http://www.manilatimes.net/national/2008/june/28/yehey/top_stories/20080628top6.html (last accessed Sep. 2, 2009).

87. *Id.*

88. *Id.*

89. Primo E. Rodriguez, Sugar As Biofuel In The Philippines May Not Be As "Sweet" As Promised, *available at* http://www.prlog.org/10202240-sugar-as-biofuel-in-the-philippines-may-not-be-as-sweet-as-promised.html (last accessed Sep. 2, 2009).

90 . *Id.*

91. *Id.*

According to their research simulation, using sugar for biofuel production would significantly impact the sugar industry.[92] "Initially there would be an increase of about 18.5% of sugar prices due to the stimulating demand for sugarcane. Consequently, this would induce significant increases in the value added and employment in the sugar industry."[93] The expansion of the sugar industry, however, will simulate a general expansion of the agriculture, fishery, and forestry sector.[94] As Rodriguez explained, the possible diversion of resource allocation to the expanding sugar industry will jeopardize the other agricultural industries such as corn, livestock, and poultry.[95]

V. CONCLUSION

There is no doubt that if implemented properly and effectively, the Biofuels Act would help address the Philippines' dependence on foreign oil. There is also no debate that the law is a good starting point for the country's program to become self-sufficient in energy production.

Addressing the oil crisis alone, however, could be disastrous for the country's food supply. The oil crisis as well as the food crisis must be tackled hand in hand to come up with a good and viable policy and solution. Ignoring one or the other would only raise more problems than there was to begin with.

The government, through the proper agencies, could also explore other sources of biofuels that would require the use of land otherwise unfit for agricultural purposes. Doing so could help eliminate the competition between biofuel crops and food crops and thereby mitigate any adverse effects on the prices of the basic food commodities. It has already been discovered that ethanol made entirely from cellulose (which is found in trees, grasses, and other plants) has an energy ratio between five and six and emits 82–85% less greenhouse gases than gasoline.[96] This alternative, if enhanced, could be rewarding as grasses and trees can be grown on land poorly suited for food crops or in climates hostile to the usual biofuel crops such as sugarcane, corn, and soybeans.

A promising development is the use of Molinga[97] as a source of both biofuels and food. Unlike Jatropha, all parts of the plant can be used either

92. *Id.*

93. *Id.*

94. *Id.*

95. Rodriguez, *supra* note 89.

96. Runge & Senauer, *supra* note 82, at 53.

97. Otherwise known as Malunggay. *See generally* Malunggay: The Miracle Vegetable, *available at* http://www.agribusinessweek.com/malunggay-the-miracle-vegetable (last accessed Sep. 2, 2009).

for food or for fuel.[98] The leaves of Molinga can be eaten, while oil can be drawn from the seeds to produce fuel. The Molinga seedlings will take one to two years to mature, half the time required for Jatropha. Molinga can also be grown in land not necessarily fit or devoted for agricultural purposes.[99]

Other alternatives may exist yet its discovery remains dependent on whether the government would acknowledge that local food supply is threatened by factors including the increase in demand for biofuel crops. Moreover, even if acknowledged, the solution to both the oil and food crises must take into consideration their effects on each other. Only then will the Philippines truly lead the way to ensuring sustainable food and energy supply for Filipinos.

98. Energy Current, Philippines Cultivates New Biofuel Wonder Crop, *available at* http://www.energycurrent.com/index.php?id=3&storyid=9922 (last accessed Sep. 2, 2009).

99. *Id.*