BIOFUELS ACT: FUELING THE PRESENT AT THE EXPENSE OF THE FUTURE — GENERATIONAL GENOCIDE IN PROGRESS?

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Is the shift to biofuels as an alternative source of energy for real, or is it simply a fad? Is it sustainable?[1]

I. INTRODUCTION

Oil is a non-renewable source of energy. This means that when fossil fuels from which oil comes are used up, they are gone forever. More than fifty years ago, King Hubert, a geologist for Shell Oil Company, posited his theory on the depletion of finite resources like fossil fuels. Now commonly known as "Hubert's Peak", his theory explains that production rates of oil and gas will likely increase to a peak and then rapidly taper off as reserves are depleted. Pessimists subscribe to more dire projections of decreasing reserves, while optimists downplay the potential crisis. The debate over how much oil is left in the world will probably continue as it has for years with no one knowing for sure just how far away Hubert's Peak really is, even as we near it.[2]

The dilemma of depleting energy sources is not a pure Filipino concern. Every nation in the world shares our pursuit for alternative renewable energy sources. However, more than any other country, the Philippines displays a bold attitude in adopting measures designed to embrace the clamor for said energy sources. There is nothing surprising about this. This is because of Philippines' dependence on imported oil as the primary source of energy for its transportation needs. At least 53% of our annual diesel fuel imports are used for transport, a percentage that is so high and unusual and unique to the Philippines.[3] Since 1994, the Philippines had imported an annual average of 120 million barrels of crude oil and petroleum products. A decade after, the importation increased to at least 126 million barrels of crude oil and petroleum products valued at $5 billion or approximately Php280 billion.[4] As a predictable effect of such importation,

[1] Transcript of Senate Proceedings (TSP), 13th CP, 2nd regular session, No. 86, May 23, 2006, page 106, Sponsorship Speech of Senator Santiago

[2] TSP, 13th CP, 2nd regular session, No. 87, June 1, 2006, at 58, Co-Sponsorship Speech of Senator Gordon.

[3] TSP, 13th CP, 2nd regular session, No. 86, May 25, 2006, at 20, Co-Sponsorship Speech of Senator Angara.

[4] *Supra* note 1, at 102.

the Philippines is placed at the losing end, thus, paying more when foreign oil prices rise.[5]

High costs, foreign events and depleting resources are not the only drawbacks of oil. Oil is also a pollutant. The process of gathering oil through combustion in order to produce energy can be harmful to the environment, releasing carbon monoxide and sulfur dioxide that may contribute to acid rain and global warming.[6] Moreover, as we all know, damage to the environment is caused by the emission of air pollutants by internal combustion engines that use conventional fuels. The higher the use of petrol, the higher the environmental damages.[7]

The demand for biofuels on the international market has spiked in the wake of industrial nations being compelled to reduce their greenhouse gas (GhG) emissions under the 1997 Kyoto Protocol[8] and a bulk of these heat-trapping gases is produced by the oil and fossil fuels used in the industrialized world to run their economies and for transport.[9] Amid current worries over global warming, scientists and entrepreneurs are seriously re-evaluating fuel alternatives.[10] Consequently, in an attempt to end the quest for alternative renewable energy sources, Congress had enacted The Biofuels Act of 2006 (Republic Act 9367). The more important question, however, is this- Will it free us from foreign fuel dependence or will merely quench our thirst for alternative renewable energy, only to thirst for more? Obviously, the answer to this question remains to be seen as the Biofuels Act is only in its early stage of its implementation.

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[5] *Supra* note 2, at 56.

[6] *Id*, at 58-59.

[7] *Supra* note 4.

[8] Kyoto Protocol, http://en.wikipedia.org/wiki/Kyoto_Protocol, (last accessed December 10, 2007), full text: "The Kyoto Protocol is a protocol to the international Framework Convention on Climate Change with the objective of reducing Greenhouse gases that cause climate change. It was agreed on 11 December 1997 at the 3rd Conference of the Parties to the treaty when they met in Kyoto, and entered into force on 16 February 2005."

[9] CLIMATE CHANGE: Biofuels Scarce on Bali Menu, http://www.ipsnews.net/news., (last accessed December 13, 2007).

[10] Shell Builds Algae Biofuel Lab, http://www.fool.com/news/associated-press/2007/12/11/shell-builds-algae-biofuel-lab.aspx (last accessed December 11, 2007).

II. BACKGROUND OF R.A. 9367

The House of Representative's version was championed by Congressman Miguel Zubiri. It then became Senate Bill 2226, which was sponsored by Senator Miriam Defensor Santiago, Chairperson of the Committee on Energy and co-sponsored by Senators Aquilino Pimentel, Pia Cayetano, Ralph Recto, Mar Roxas, Richard Gordon and Edgardo Angara. With 19 senators voting in favor, none against, and no abstention, said bill was approved on Third Reading. Both Houses of Congress ratified Republic Act 9367 otherwise known as the Biofuels Act of 2006 on November 29, 2006. President Gloria Macapagal-Arroyo signed the Bill into law on January 12, 2007.[11] It took effect on May 27, 2007.[12]

The greater a nation's dependence on foreign oil, the greater the risk that events in oil-producing countries will interfere with its supply.[13] The bill seeks to put meaning to the concept of energy independence. Energy independence does not have to be a vacuous phrase. True enough, the country may never be truly "independent" of oil—at least, not until it replaces all its petroleum-fired vehicles with something radically different.

The Biofuels Act principally aims to develop and utilize homegrown and renewable alternatives to oil. It also seeks to mitigate toxic and greenhouse gas emissions. Additionally, an important consequence of this energy reform strategy is the likelihood of increased farm output, thereby generating more rural employment and higher incomes among farmers.[14]

Pursuant to Section 15 of the Biofuels Act, the Department of Energy (DOE) issued the Rules and Regulations for the more effective implementation of the said law. The key provisions include the creation and organization structure

[11] http://www.doe.gov.ph/AF/Biofuels.html (last accessed December 20, 2007).

[12] http://pacbiofuel.blogspot.com/2007/05/ph-price-impact-of-new-law-requiring.html (last accessed January 5, 2008).

[13] *Supra* note 6, at 57.

[14] *Supra* note 4.

of the National Biofuels Board[15] and the definition of its powers and functions.[16]

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[15] IRR of R.A. 9367, §8 states that:

Section 8. Creation and Organizational Structure of the National Biofuels Board.

1.1. Pursuant to Section 8 of the Act, the National Biofuels Board (NBB) is created and shall be composed of the Secretary of DOE as Chairman and the Secretaries of the DTI, DOST, DA, DOF, DOLE and the Administrators of the PCA and SRA as members.

a. The Secretary of the DOE, as the Chairman, shall be assisted by a duly designated Undersecretary who shall act as his alternate; and

b. The member Secretaries and Administrators may assign alternate representatives who must be occupying at least the level of Assistant Secretary. *Provided*, That only the Department Secretaries/Administrators sign official documents and issuances of the NBB.

8.2 The NBB shall create a Technical Secretariat which shall provide for the administrative policy, and technical services of the Board.

[16] IRR of R.A. 9367, §10 states that:

Section 10. Powers and Functions of the NBB.

Pursuant to Section 9 of the Act, the NBB shall have the following powers and functions:

a) Monitor the implementation of, and evaluate for further expansion, the National Biofuels Program prepared by the DOE pursuant to Section 7(b) of the Act;

b) Monitor the supply and utilization of biofuels and biofuel-blends and recommend appropriate measures in cases of shortage of feedstock supply for approval by the Secretary of DOE. For this purpose:

i. The NBB is empowered to require all entities engages in the production, blending and distribution of biofuels to submit reports of their actual and projected sales and inventory of biofuels in a format to be prescribed for this purpose;

ii. The NBB shall determine the availability of locally-sources biofuels and recommend to the DOE the appropriate level or percentage of locally sourced biofuels to the total annual volume of gasoline and diesel sold and distributed in the country;

iii. To ensure an adequate supply of bioethanol, the NBB shall recommend to the DOE the amount of bioethanol that may be imported at any given time by DOE-certified oil companies in the event of shortage in the supply of locally-sourced bioethanol during the first four years from the effectivity of the Act;

c) Review and recommend to the DOE the adjustment in the minimum mandated biofuel blends subject to the availability of locally-sourced biofuels. *Provided*, That the minimum blend may be decreased only within the first four (4) years from the effectivity of the Act. Thereafter, the minimum blends of five percent (5%) and two percent (2%) for bioethanol

In compliance with Section 7(b) of the same law, the DOE had launched the National Biofuels Program or Philippine Biofuels Program intended to implement the mandate of the law.

What Is Biofuel?

As defined by the Biofuels Act, biofuel refers to bioethanol and biodiesel and other fuels made from biomass and primarily used for motive, thermal and power generation with quality specifications in accordance with the Philippine National Standards (PNS).[17] Bioethanol shall refer to ethanol (C25OH) produced from feedstock and other biomass.[18] Among the recognized benefits of bioethanol include but not limited to the following:

1. it improves combustion efficiency and reduces carbon monoxide and unburned hydrocarbon emissions which improves fuel economy;
2. it provides hydro-octane rating at low cost as an alternative to harmful fuel additives;
3. it is biodegradable;
4. it reduces greenhouse as emissions because it burns more efficiently, thus, significantly reducing unburned carbons; and

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and biodiesel respectively, shall not be decreased;

In determining the availability of locally-sourced biofuels, the NBB may take into account factors such as, but not limited to, shortage in the supply of biofuels and feedstock and constraints or difficulties in the distribution of biofuel blends.

d) Recommend to the DOE a program that will ensure the availability of alternative fuel technology for vehicles, engines and parts in consonance with the mandated minimum biofuel-blends and to maximize the utilization of biofuels, including other biofuels;
e) Recommend to the DOE the use of biofuel-blend in air transport taking into account and technical viability;
f) Recommend specific actions to be executed by the DOE and other appropriate government agencies concerning the implementation of the NBB, including its economic technical, environmental and social impact; and
g) Exercise such other powers and functions as may be necessary or incidental to attain the objectives of the Act.

[17] An Act to Direct the Use of Biofuels, Establishing for this Purpose the Biofuel Program, Appropriating Funds Therefore, and for Other Purposes, Republic Act No. 9367, §3 (f) (2006).

[18] R.A. 9367, §3 (c).

5. it has high volumetric efficiency, thus, burning cooler than straight gasoline helping to keep the valves cool and contributing to the increase in power.[19]

Biodiesel, on the other hand, shall refer to Fatty Acid Methyl Ester (FAME) or mono-alkyl esters derived from vegetable oils or animal fats and other biomass derived oils that shall be technically proven and approved by the Department of Energy (DOE) for use in diesel engines, with quality specifications in accordance with the Philippine National Standards (PNS).[20] For power generation, we can only use biodiesel, and electricity will become cheaper with the use of biodiesel. As a matter of fact, National Power Corporation (NAPOCOR) is using 1% blend in diesel leading to fuel savings from 2% to 8.6%.[21] Biofuel is of two kinds: bioethanol and biodiesel.

Biomass shall refer to any organic matter, particularly cellulosic or lingo-cellulosic matter, which is available on a renewable or recurring basis, including trees, crops and associated residues, plant fiber, poultry litter and other animal wastes, industrial wastes, and the biodegradable component of solid waste.[22] There are three main types of biomass raw materials:

1. sugar-bearing materials such as sugar cane, molasses, wheat, sorghum, et cetera, which contain carbohydrates in sugar form.
2. starches such as cassava, corn, bagasse, metacarp, potatoes, et cetera, which contain carbohydrates in starch form.
3. celluloses such as wood, agricultural residues, et cetera, in which have a more complex carbohydrate molecular form.[23]

Potential Sources of Biofuel – Here and Abroad

In the Philippines, according to the joint study conducted by De La Salle University and the United States Agency for International Development, entitled *"Techno Economic Assessment of Ethanol as an Alternative Transportation*

[19] TSP, 13th CP, 3rd regular session, No. 4, at 45, July 31, 2006, interpellation by Senator Enrile during the second reading.

[20] R.A. 9367, §3 (d).

[21] *Supra* note 19, at 54.

[22] R.A. 9367, §3 (g).

[23] TSP, 13th CP, 2nd regular session, No. 88, at 20-21, June 5, 2006, interpellation during the second reading.

Fuel," sugarcane, corn and cassava as feedstock for ethanol production, sugarcane and corn have the most potential for oil displacement based on feedstock availability and energy balance protection. Given the existing volume of production and considering its capability to produce its own source of energy, bagasse[24] could sustain the energy requirements of the ethanol process.[25] Nevertheless, researchers have found excitement about the potential of sweet sorghum, a drought tolerant crop widely grown for livestock feed component in the Philippines. Sweet varieties of sorghum store large quantities of energy in their stalks while also producing grain yields. The juice squeezed out from sweet sorghum stalks is said to contain 15-20% sugar that can be fermented into ethanol. Using sorghum instead of sugarcane molasses has been found cheaper as reported by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). While sugarcane can be harvested after ten months, sweet sorghum can be harvested twice within that period; from the seed crop and ratoon.[26]

However, let it not be a surprise to note that like corn, sugar cane, palm oil, soya and various kinds of grasses, algae has long been considered a candidate crop for furnishing vegetable oils which can be used as a replacement for diesel, reducing greenhouse gas emissions.[27] In Iceland, for example, ethanol and hydrogen are seen as the two most viable candidates to replace carbon-based fuels in the future. Scientists can already create these fuels with the help of bacteria but have been looking for bacteria which are capable of enduring higher temperatures, as this makes the process more efficient. Since heat-loving bacteria abound in the hot springs of said country, it was a natural choice for a bio-prospecting mission.[28]

Right now, the most promising biofuels sources of specialty chemicals are biodiesel plants, which convert soybean and rapeseed oils, or animal fats such as tallow, into transportation fuels. These facilities also produce glycerin as a

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[24] The Merriam-Webster Dictionary, 2004 Edition, page 52. Bagasse is a plant residue (as of sugarcane) left after a product (as juice) has been extracted.

[25] *Supra* note 23.

[26] JATROPHA: focus of national biofuels program; USM implements R&D, http://www.usm.edu.ph, (last accessed December 20, 2007).

[27] *Supra* note 10.

[28] Biofuel producing bacteria discovered in Iceland, http://www.icenews.is/index.php/2007/12/12/biofuel-producing-bacteria-discovered-in-iceland/ (last accessed December 12, 2007).

byproduct, and this glycerin is piling up in quantities far beyond the ability of the chemical industry to absorb it. (Some of it is now being burned for fuel.) The chemical industry has already begun to tap some of this biodiesel glycerin, especially for the manufacture of propylene glycol, a low-toxicity antifreeze and starting point for many resins, lubricants, paints, cosmetics and detergents.

Another biodiesel glycerin derivative is epichlorohydrin, a monomer for epoxy plastics. But for biodiesel glycerin to replace petroleum as a source of specialty chemicals, manufacturers will have to overcome some initial skepticism about how fast the biodiesel industry is likely to expand, and the security of supply of raw glycerin. Another fertile source of specialty chemicals could turn out to be biofuels processes that convert cellulosic wastes (such as wood chips, corn stover, and sugarcane bagasse) into ethanol. Unlike bioconversion of corn starch to ethanol, cellulose-to-ethanol is in its infancy. For now, however, starch-to-ethanol is still dominant on the biofuels scene. This increasing diversion of starch for fermentation ethanol production has actually constrained supply and raised prices of at least one competing chemical that is also made by fermentation of starch: citric acid.[29]

Research has shown that nearly 20 to 25% of oil extracted from Jatropha[30] can be mixed with diesel. Moreover, experiments have demonstrated positive results from combining Jatropha with diesel. That is why the national government has recognized the potential of Jatropha curcas as biodiesel feedstock in the production of Jatropha Methyl Ester (JME).[31]

In the Philippines, coconut at present is the preferred feedstock used for biodiesel although there are efforts to develop other potential feedstock, such as jatropha oil.[32]

Policy of the Law

Section 2 of R.A. 9367 encapsulates the State's policy towards the

[29] Biofuel bonanza could create specialty chemical fountainhead, http://www.purchasing.com/article/(last accessed December 13, 2007).

[30] Jatropha: what the public should know, http://opinion.inquirer.net/inquireropinion/talk ofthetown/view , (last accessed December 20, 2007). Full text: "Jatropha curcas (tuba-tuba) produces golf-ball-size fruits that contain oil, can be grown in any kind of soil. And it doesn't need much water and fertilizer."

[31] *Supra* note 26.

[32] *Supra* note 23, at 58.

utilization of biofuels. It provides:

> "It is hereby declared a 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 as a measure to:
>
> (a) develop and utilize indigenous renewable and sustain ably-sourced clean energy sources to reduce dependence on imported oil;
>
> (b) mitigate toxic and greenhouse gas (GHG) emissions;
>
> (c) increase rural employment and income; and
>
> (d) ensure the availability of alternative and renewable clean energy without any detriment to the natural ecosystem; biodiversity and food reserves of the country.

The phrase "consistent with the country's sustainable economic growth" means that the State shall pursue a policy of energy independence provided it does not affect public health and environment.[33] Thus, the goals of the law are threefold: first, to achieve self-sufficiency; second, to protect our environment; and third, to improve agriculture as a consequence.[34]

Mandate of the Law

Within six months from the effectivity of the Biofuels Act, or on May, 2007, the Department of Energy (DOE), according to duly accepted international standards, shall gradually phase out the use of harmful gasoline additives such as, but not limited to Methyl Tertiary Butyl Ether (MTBE).[35] Pursuant to the above policy, it is hereby mandated that all liquid fuels for motors and engines sold in the Philippines shall contain locally-sourced biofuels components as follows:

(a) Within two years from the effectivity of this 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 of five percent (5%) bioethanol fuel by volume: Provided, that the ethanol blend

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[33] *Supra* note 19, at 43.

[34] *Supra* note 19, at 41

[35] R.A. 9367, §4.

conforms to PNS; x x x;

(c) Within three months from the affectivity of this Act, a minimum of one percent (1%) biodiesel by volume shall be blended into all diesel engine fuels sold in the country: Provided, that the biodiesel blend conforms to PNS for biodiesel. x x x[36]

The basis for the 5% minimum blend is that this is within the maximum standard set by the Worldwide Fuel Charter. The maximum for bioethanol is 10% blend. For biodiesel, it is 2% blend.[37] A 10% ethanol blend to gasoline will require 500 million liters ethanol, 7,143 million tons sugarcane and 120,000 hectares planted to sugarcane. If this ethanol is not domestically produced, necessarily to fulfill the requirements under the bill, it could result to importation.[38] In the event of supply shortage of locally produced bioethanol during the four-year period, oil companies shall be allowed to import bioethanol but only to the extent of the shortage as may be determined by the National Biofuel Board.[39] The Biofuels Act gives the said Board enough elbowroom to utilize a cheaper source of fuel should that eventually arise.[40]

III. THE GOOD SIDE OF IT

The Biofuels Act is a landmark legislation designed to liberate the country's transport sector from full dependence on imported fuel.[41] The projected decline of the country's dependence on imported fuel will likely cut down the soaring prices of gasoline and diesel. The establishment of bioethanol and biodiesel plants will generate jobs, as well. It is predicted that the construction of each plant will create about 1,000 jobs. Farmers will also find a better paying market for their sugarcane and coconut products.[42]

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[36] R.A. 9367, §5.

[37] *Supra* note 23, at 36-37, interpellation by Senator Madrigal during the second reading.

[38] *Supra* note 23, at 26 interpellation by Senator Roxas during the second reading.

[39] R.A. 9367, §5 (5.2).

[40] *Supra* note 23, at 16, interpellation during the second reading.

[41] Oil firms hailed for embracing biofuels, http://pcaagribiz.da.goc.ph/news7.htm, (last accessed May 8, 2007).

[42] Biofuel law to reduce prices of oil, provide better income to farmer, http://www.sunstar.com.ph/static/ceb/2007/01/22/bus/biofuel.law.to.reduce.prices.of.oil.provide.better.

Incentives for Biofuel Producing Firms

To encourage investments in the production, distribution and use of locally produced biofuels at and above the minimum mandated blends, and without prejudice to enjoying applicable incentives and benefits under existing laws, rules and regulations, additional incentives are given to biofuel-producing firms.

First is the entitlement to a zero-rate of specific tax on imported or local biofuels component. The gasoline and diesel fuel component, however, remain subject to the prevailing specific tax rates. Second, the sale of raw materials used in the production of biofuels is exempt from the value-added tax. Third, all water effluents used as liquid fertilizer and for other agricultural purposes are considered "reuse" and are therefore, exempt from wastewater charges. Fourth, government financial institutions, such as the Development Bank of the Philippines, Land Bank of the Philippines, Quedancor and other government institutions providing financial services shall accord high priority to extend financing to Filipino citizens or entities, at least sixty percent (60%) of the capital stock of which belongs to citizens of the Philippines that shall engage in activities involving production, storage, handling and transport of biofuel and biofuel feedstock, including the blending of biofuels with petroleum, as certified by the DOE.[43]

Furthermore, the biodiesel industry would be a part of the investment priority plan entitling it to receive income tax holidays. Despite the fact that 83% of all incentives granted by the Board of Investments (BOI) are redundant, said industry still has to be incentivized because, otherwise, in view of the volume of the capital requirements, the country would not be able to provide a steady supply of the fuel blends.[44] Incentives are offered in the hope that private entrepreneurs will use their own lands.[45] On plant investments, there is no tax exemption because the importer of the capital equipment and machinery, being also the producer of biofuel, is VAT zero-rated on the sale of its biofuel production, otherwise, it will result in redundancy of incentives. Hence, it could claim a credit for all its inputs to production, including the VAT on his imported capital, equipment and machinery. The excise tax is only on the ethanol. It is not

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income.to.farmers.html, (last accessed September 6, 2007).

[43] R.A. 9367, §6.

[44] *Supra* note 23, at 50-51, interpellation by Senator Recto during the second reading.

[45] *Supra* note 23, at 56.

on the blended gasoline.[46]

As to whether or not entities engaged in biofuel production for the export market should also be granted incentives, Senator Miriam Defensor Santiago, one of the principal sponsors of the law, maintained that under the existing Investment Priority Plan, an entity engaged in biofuel production, being a preferred activity, enjoys the same fiscal and non-fiscal incentives whether it produces for the local or export market. She asserted that it is unlikely that BOI incentives would create fierce competition between local consumption and the export market because if the policy is to assure supply for the local market, this could be achieved by requiring entities to satisfy local demand before providing for the export market and the BOI, on its own, could administratively impose additional conditions.[47]

However, no such provision can be found on the Act itself as well as in the Implementing Rules and Regulations of R.A. 9367, only that the appropriate government agencies were directed to issue the necessary guidelines for the availment of the incentives stated in Section 6 of the law.[48]

Being Environment-Friendly

Article II, Section 16 of the 1987 Constitution of the Philippines states that: "The State shall protect and advance the right of the people to a balanced and healthful ecology in accord with the rhythm and harmony of nature." Nature means the created world in its entirety. Such rhythm and harmony indispensably include, *inter alia*, the judicious disposition, utilization, management, renewal and conservation of the country's forest, mineral, land, waters, fisheries, wildlife, off-shore areas and other natural resources to the end that their exploration, development and utilization be equitably accessible to the present as well as future generations.[49] While the right to a balanced and healthful ecology is incorporated under the Declaration of Principles and State Policies and not under the Bill of Rights, it does not follow that it is less important than any of the civil and political rights enumerated in the latter.[50]

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[46] *Supra* note 23, at 51-52.

[47] Remarks of Senator Defensor Santiago, Committee Report No. 55 on Senate Bill No. 2226, Journal, Session No. 35, October 11, 2006, 13th Congress, 3rd Regular Session, at 540.

[48] Rules and Regulations Implementing Republic Act No. 9367, Section 7.2.

[49] *Oposa v. Factoran*, 224 SCRA 792 (1993), at 803.

[50] *Id*, at 804-805.

It is in this light that Congress seeks to provide the Filipino people an alternative to fossil fuel which will tone down, if not totally eradicate, destruction to the environment but at the same time will not compromise the population's health.

The harmful pollutants emitted by vehicles using conventional fuels adversely affect the environment. The concern over the rapid depletion of the ozone layer since the early part of the 19th century continues notwithstanding the fact that the ozone layer has long been engulfed by the countless impurities caused by humans. By adopting the law and given the upper limit regarding the mixtures either for gasoline or diesel, toxic and greenhouse effect that is currently burdening our people will be mitigated. The test conducted by the DENR Environmental Management Bureau showed that the reduction of opacity emission rating ranges from 14% to 59% with older engines getting the more dramatic reduction in black smoke.[51] It is guaranteed that the said reduction will greatly slow down the constant exhaustion of nature.

Promotion of Public Health

Today, the Philippines spends for health care an estimated US$400 million dollars a year because of pollution from using petroleum either as gasoline or as diesel fuel. The transport sector is cited as a significant contributor to health pollution. Scientists think that there is no point to search for alternative fuels if the present level of pollution from the transport sector will continue.[52] So, it is important to develop those alternative sources of energy which will not further degrade our environment or which are considered clean fuels. Congress believes that the adoption of biofuel will protect and promote the right to health of the people and instill health consciousness among them, as what Article II, Section 15 of the 1987 Constitution mandates.

Engine Efficiency and Increased Mileage

Senator Santiago believes that there will be no engine malfunction due to the required mix. The Department of Energy has already conducted tests and has even gone as far as to produce a so-called "P and S"—Philippine Standard - for the blend which is, more or less, the same as blends already approved by the

[51] *Supra* note 19, at 46.

[52] *Supra* note 19, at 41-42.

European Union and by the United States.[53]

A number of studies and tests have been conducted by reputable research institutions to assess and/or determine the technical viability of coco methyl ester (CME) or coco biodiesel, as alternative transportation fuel. The most comprehensive studies taken so far are:

1. "Analysis of coconut-derived biodiesel and conventional diesel fuel samples from the Philippines". This study was conducted by the U.S. Department of Energy National Renewable Energy Laboratory in cooperation with the DOE. This test evaluated the fuel properties of CME;
2. One study called "Using CME in diesel blend through used vehicles emissions", and another study entitled "Carbon dioxide reduction by using CME as additive to this diesel fuel" conducted by the Nihan University of Japan, College of Science and Technology in cooperation with the Technological University of the Philippines. These studies evaluated the impact of CME on engine and vehicle emissions. In the case of the Philippines, in order to assess the techno-economic viability of CME as a fuel blend for transport and to address concerns regarding engine durability, our government initiated a pilot project—the application of CME on government vehicles under Memorandum Circular No. 55 which mandates government agencies to incorporate 1% CME blend in their diesel fuel requirements. This circular has been in effect since early 2004. The Supreme Court of the Philippines has also issued a similar circular[54] directing all its judiciary branches to support this program. Various local government units in the provinces of Baguio, Isabela and Davao have issued ordinances promoting the use of CME in the diesel fuel requirements of their respective municipalities.[55]

The savings do not necessarily come from the price of the product but from the increased mileage.[56] While at this time coco-biodiesel or CME does not yet address a reduction in purchase cost, nonetheless, CME at present already addresses the performance cost substantially.[57] On the effects of biofuels

[53] *Supra* note 23, at 37.

[54] Memorandum Circular No. 07-2004, issued June 23, 2004.

[55] *Supra* note 23, at 37-39.

[56] *Supra* note 19, at 56.

[57] *Supra* note 19, at 59.

on equipment and machines in rural areas and warranty issues, it is alleged that oxygenated fuels like blends of unleaded gasoline ethanol may be used in motorcycles, pump boats, hand tractors and old vehicles without engine modification provided that the ethanol content is not greater than 10%.[58]

If bioethanol is compared with unleaded gasoline, it appears that the blend is superior. The high oxygen content of ethanol makes it an attractive octane enhancer. Since there is more oxygen present, complete burning of the fuel is effected, thereby reducing hydrocarbon emissions. Although there is a trade-off with producing more nitrogen oxides which result from burning under excessive oxygen conditions, the reduction of other harmful emissions using ethanol still outweighs that of using gasoline. In terms of performance, engine using pure ethanol would have lower power compared to gasoline-run engines. The ride vapor measure is a measure of the gasoline's volatility. There is an acceptable range of volatility values as these affect the car's starting, warm up and drivability performance.[59]

Over-All Economic Facelift

"Expect the country's microfinance and biofuel industries to further flourish once the various Memoranda of Agreements (MOAs) signed recently between the Philippines and Spain take effect," according to Press Secretary and Presidential Spokesperson Ignacio R. Bunye. The MOAs involve the Philippines' Department of Agriculture and Spain's Ministry of Agriculture, Fisheries and Food, the Fundacion Codespa, a Spanish non-governmental organization (NGO); and Spanish-based biodiesel leader Bionor Transformacion S.A. The MOA signed between the Philippines and the Fundacion Codespa concerns the "implementation of agricultural projects on microfinance, training and technology transfer." Once implemented, it is assured that hundreds of thousands of Filipino farmers and fishermen stand to benefit from the MOA that provides for "cooperation in the areas of microfinance for farmers and fisherfolk and transfer of Spanish agricultural technologies, among other projects." On the other hand, the agreement with Bionor Transformacion S.A. "formalizes the latter's intent to invest 10-million in the Philippines to develop at least 100,000 hectares of land into jatropha plantations that will be used as feedstock for biofuel facilities in the country."[60]

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[58] *Supra* note 47, at 541.

[59] *Supra* note 23, at 39-40.

[60] RP-Spain MOAs to boost microfinance and biofuel industries, http://biz.balita.ph/html/

Boost of Sugarcane Industry

Despite the numerous benefits of biofuels, there is an apprehension that in the short run, farmers might opt to supply bioethanol refineries rather than sugar millers thereby creating a temporary shortage in sugar. On this contention, the proponents of the law posit that the market imbalance would only be temporary as the increase in demand would create the incentive to increase sugar cane supply by tapping the appropriate technology or by increasing the land area.[61] It was noted that since crop year 2002-2003, there has been a sugar surplus production, resulting in a decrease in the price of sugar. It is further assured that several provisions of the bill ensure domestic supply requirements for the food industry and that feedstock for biofuels production would be tapped from locally grown agricultural products.[62]

During the caucus, it was also suggested that the mandate for the bioethanol blend should depend on the amount of sugar cane production in excess of food requirement. But Senator Santiago opined that while mandating the bioethanol blend might affect the requirement for food supply, basing it on incremental production might not be the most efficient way to address the matter and that market forces should be allowed to determine the optimal use of sugar cane whether as food or as biofuel feedstock. Besides, investors would not likely put up ethanol refineries in areas where there is no assurance of feedstock for ethanol production; in the same manner, farmers would not devote their sugar cane production in areas where there are no bioethanol production facilities. The market would provide for its own safeguards, so competition between sugar production and bioethanol production is unlikely.[63]

The Glory Days of Coconut Industry Are Near

Would mandating the 1% to 2% coco-biodiesel not disadvantage the coconut producers in having to sell their coconut cheaper than what they could otherwise?[64]

Admittedly, there is no supply uncertainty. One percent blend requires

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article.php?story, (last accessed December 9, 2007).

[61] *Supra* note 47.

[62] *Supra* note 19.

[63] *Supra* note 47.

[64] *Supra* note 23, at 41.

70 million hectares out of 7 billion liters demand for diesel fuel. Coconut oil export is 1 billion liters per year. Therefore, 1% coco-biodiesel will only use 70 million of coconut oil as feedstock which is only 7% of the export volume. On coco-biodiesel production, current production capacity will be an excess of 110 million per year by May 2006. This can easily address the 1% supply requirement. The demand for coco-biodiesel will not increase the cost of domestic cooking oil. The 1% coco-biodiesel will eat up only 7% of the annual export volume of coconut oil. It will not eat up the current domestic volume because the volume needed is not so substantial as to influence an increase in the price of cooking oil. Besides, the price of vegetable oil is governed by a worldwide price index for vegetable oil called "The Rotterdam Index" just as the price of petroleum fuel has a price index which is called "The Dubai Index" for crude oil.[65]

Plugging Unemployment Holes

Biofuel producing firms desiring to establish their respective plants in the country would necessarily require a huge labor force to run the operations of the factory. Employment openings may range from administrative or clerical to manual. The Biofuels Act of 2006 and its Implementing Rules and Regulations have adeptly included in its provisions the necessary assistance to the laborers who will be employed in biofuel-producing firms. Such a move is a manifestation of Congress' concern to protect the labor force of the country as a vital instrument to the nation's progress.

A Social Amelioration and Welfare Program similar to that of the Sugar Amelioration Act of 1991 or R.A. 6982, shall be developed for the following objectives:

a) promote gainful livelihood opportunities;
b) facilitate productive employment through effective employment services and regulation; and
c) ensure the access of workers to productive resources and social protection coverage.[66]

Similarly, the Department of Labor and Employment (DOLE) is mandated to:

a) promote gainful livelihood opportunities and facilitate productive

[65] Rafael Diaz and Florelo Lalindo, Asian Institute of Petroleum Studies, Inc. (AIPSI) paper, cited in note 37, at 41-43.

[66] IRR of R.A. 9367, §29.

employment through effective employment services and regulation;
b) ensure the access of workers to productive resources and social protection coverage;
c) recommend policies, plans and programs that will enhance the social impact of the National Biofuels Program; and
d) promulgate such necessary rules and regulations necessary to implement its mandate under the Act.[67]

V. THE PRICE WE HAVE TO PAY

Increased Pace of Environment Deterioration

Plants absorb atmospheric carbon dioxide regardless of whether it was derived from the burning of fossil fuels or recently formed biofuels. Plants cannot tell the difference. Carbon will be taken up by plants only when they are actively growing. Since all plants ultimately die and decay, carbon thus absorbed is returned to the atmosphere.[68] This only shows that everything discharged will ultimately return.

On Biodiversity Disturbance

Underlying all of the Philippines' environmental laws is the "trust doctrine". The trust doctrine proceeds from the premise that humankind, allegedly the most intelligent being in the animal kingdom, are only the trustees of the earth's natural resources. As such species, they hold these God-given gifts in trust not only for the future generations of humankind, but also for the "lesser" forms of animals. Consequently, the misappropriation of the exclusive use and benefit of natural resources of the earth to the permanent prejudice of future generations and other life forms will breach the trust. And worse, this misappropriation, if done in bad faith and with knowledge aforethought, is tantamount to "generational swindling", i.e. swindling of future generations of what rightfully belongs to them. And because what is damaged is the very life-support system of the rightful beneficiaries, this misappropriation can even

[67] *Id*, §18.

[68] Biofuel energy no help in CO2, http://www.boston.com/bostonglobe/editorial_opinion/letters/articles/2008/01/02/biofuel_energy_no_help_on_co2/ (last accessed January 1, 2008).

result in" generational genocide", thus depriving the future generations from the enjoyment of the natural resources.[69]

Indeed, the right to a balanced and healthful ecology carries with it the correlative duty to refrain from impairing the environment.[70] Every generation has a responsibility to the next to preserve that rhythm and harmony for the full enjoyment of a balanced and healthful ecology.[71] The latter concept is the "intergenerational responsibility" enunciated in the case of *Oposa v. Factoran*[72], wherein the petitioners-minors' assertion therein of their right to a sound environment constitutes, at the same time, the performance of their obligation to ensure the protection of that right for the generations to come[73], as they seek to cancel all existing timber license agreements in the country and prevent the Secretary of Department of Environment and Natural Resources from receiving, accepting, processing, renewing or approving new timber license agreements.[74]

Forests are considered a vital component of biodiversity. Continued deforestation poses adverse and detrimental effects to ecology. The resulting distortion have caused a host of environmental tragedies, such as water shortage, salinization of water table, massive erosion and loss of soil fertility, endangering and extinction of animals, dislocation of cultural minorities, siltation of bodies of water, recurrent spells of drought, flooding of lowlands, increasing velocity of typhoon winds and climate changes.[75] Dr. Hartmut Michel, the 1998 Nobel Prize winner for chemistry, said investing in biofuel development was "counterproductive". According to him, producing biofuel would sometime entail clearing a forest, a process that destroys biodiversity and emits more carbon dioxide into the atmosphere.[76]

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[69] Antonio Oposa, Jr., Legal Marketing of Environmental Law: The Philippines Experience, http://www.inece.org/4thvol1/oposa.pdf (last accessed January 28, 2008).

[70] *Supra* note 49, at 805.

[71] *Supra* note 49.

[72] 224 SCRA 792 (1993).

[73] *Supra* note 49.

[74] *Id*, at 796-797.

[75] *Supra* note 49, at 797-798.

[76] Rethink biofuel, says Nobel laureate, http://www.haribon.org.ph (last accessed January 26, 2008).

Adopting biofuels in the country is no different from the cancellation or non-acceptance of timber license agreements, which is the subject matter in the case of *Oposa vs. Factoran*. Both concern the environment, its inhabitants and all the generations to follow. Embracing the innovativeness of biofuel should not be at the mercy of the future population who shall inherit the planet, or none at all.

On Limited Land and Water Supply

Economist Robert Samuelson points out that the new rush to biofuels can only hurt those poor countries that are not importers of grain. As richer countries buy their biofuels, the poorer ones go begging. They certainly are not going to turn from wheat or soy to even more expensive fruits and veggies. The debate over the use of the limited farmland on the planet is only just beginning. And that does not begin to look at the limited fresh water supply.[77] The adverse effects on the environment and biodiversity may not be felt by the Philippines during the initial period of implementing the law but parallel experiences of foreign countries demonstrate unrelenting disapproval against biofuels.

With the growing reports of forests being cut down to plant palm oil saplings to supply the heavy demand that the new biofuel market needs, the United Nations Environment Program (UNEP) expressed its view that agrifuels are mostly produced in large intense monocultures that heavily use agrochemicals, and an increased demand for them will expand the agricultural frontier in many countries. Some of these monocultures, like sugarcane and palm oil, require high volumes of water to be grown. These types of crops can have serious environmental impact, such as loss of biodiversity from habitat loss and fragmentation, water contamination from the use of agrochemicals, and air contamination in cases when foliage is burnt after harvest.[78]

The Philippine Clean Water Act of 2004 or Republic Act No. 9275 aims to protect the country's water bodies from pollution from land-based sources (industries and commercial establishments, agriculture and community/household activities). It provides for a comprehensive and integrated strategy to prevent and minimize pollution through a multi-sectoral and participatory

[77] Biofuel's nightmare question: food or fuel?, http://blogs.zdnet.com (last accessed December 12, 2007).

[78] http://www.unep.org/experts/Default (last accessed January 26, 2008).

approach involving all the stakeholders. Under the same law, anyone discharging wastewater into a water body will have to pay a wastewater charge.[79] However, Section 6 of The Biofuels Act of 2006 exempts from wastewater charges all water effluents, such as but not limited to distillery slops from the production of biofuels, used as liquid fertilizer and for other agricultural purposes because they are considered "reuse" under R.A. 9275. This generous exclusion of biofuel-producing firms from the payment of said wastewater charges definitely will not prevent them from disposing their wastes to water bodies, which in turn, will offset the environmental advantages claimed to be achievable by the Biofuels Act.

On Climate Change

The reduction of the earth's capacity to process carbon dioxide gases had led to dramatic climate change, the most famous of which is global warming or greenhouse effect.

Biofuels may be rising in popularity worldwide but policymakers largely reject them as a way to fight global warming, a survey said. A poll of 1000 climate change "decision makers" from 105 countries, including government and industry officials, listed solar energy as the technology with the top potential to cut carbon emissions. Wind farms also ranked highly in the World Bank-supported poll. But biofuels derived from crops, such as corn-based ethanol, placed last, with only 21% saying it was the best option when considering the side effects. Biofuel production has been on the rise in recent years as it is seen as a clean form of energy in an era of soaring oil prices and growing worries about carbon emissions blamed for global warming.[80] The Philippines is vulnerable to a rise in sea level and stronger storms as an offshoot of global warming.[81]

Professor Paul Crutzen[82] calculated the global warming effects of the

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[79] What you should know about the Clean Water Act, http://www.emb.gov.ph/eeid/cwa-english.htm (last accessed January 26, 2008).

[80] Climate survey pooh-poohs biofuels, http://www.news.com.au/heraldsun/story (last accessed December 10, 2007).

[81] *Supra* note 49, at 797-798.

[82] Nobel scientist in biofuel warning, http://www.channel4.com/news/articles/science_technology/nobel+scientist+in+biofuel+warning/1177477, (last accessed December 12, 2007), full text: "Prof Crutzen, of the Max Planck Institute for Chemistry in Mainz, Germany,

fertilizer needed to grow energy crops like biodiesel and bioethanol were even worse than has been estimated. Prof. Crutzen and his colleagues calculated the true figure was closer to 3-5% - enough to negate the savings in carbon dioxide emissions made by switching from fossil fuels. They estimated that biodiesel made from rapeseed was the least efficient biofuel, potentially having a significantly greater warming effect than fossil fuels. Only bioethanol made from sugar cane was clearly more beneficial to the fight against climate change, they found.[83]

Ethanol has fallen out of favour with many environmental campaigners after the rush for biofuels in the United States led to the conversion of farmland from food crops to biofuel crops, pushing up food prices globally.[84] The main renewable fuel in Wisconsin and other states today - ethanol derived from corn kernels – does not yield big savings in greenhouse gas emissions because so much petroleum is needed to grow corn and refine it into ethanol.[85]

Increase in Food Prices

The Asian Development Bank (ADB) warned that the rising demand for biofuels in countries like the Philippines would lead to higher food prices. Joachim von Braun, director general of the International Food Policy Research Institute projected prices of food to increase about 40 percent to 80 percent from the current levels.[86] Rony Diaz, in his column Center of Gravity in The Sunday Times, stated that there are two defects in the biofuel policy. First, it competes with food production. Ethanol and biodiesel will be produced from corn, sugarcane and coconut. Not only are these basic foods, they are cultivated on prime arable lands. Their production requires fertilizers, pesticides and other chemicals. They also need to be irrigated. If new areas such as second growth forests or uplands are to be opened for biofuel production then biodiversity is threatened. The second defect is that it increases pollution. There is no record in the debate on whether or not ethanol and biodiesel emit greenhouse and other

won the 1995 Nobel Prize for chemistry for his work on the threat to the ozone layer."

[83] *Id.*

[84] Principle Capital seeks biofuel domination with $70m fundraising, http://www.ft.com/cms/ (last accessed December 10, 2007).

[85] State seeks new breed of biofuel, By THOMAS CONTENT and JOEL DRESANG, http://www.jsonline.com/story/index. (last accessed December 9, 2007).

[86] Darwin G. Amojelar, Biofuel seen to raise food prices, http://www.manilatimes.net/nationa/2007/aug10/yehey/business/ (last accessed September 6, 2007).

noxious gases.[87]

The Perennial Oil Price Hike

Transport groups raised concerns over the possible effects of the implementation of the law on oil prices. There have been fears that oil companies may not be able to prevent prices from rising up should there be an impact on prices brought about by the implementation of the required biodiesel blend.[88] As all of our ethanol requirements at this time are imported[89], oil firms may find it challenging to maintain oil prices at a tolerable level despite grant of tariff protection to importers– end users. The stability of oil price in the current national condition is still uncertain to materialize because although we have already started to use biofuel, a large part of the country's oil demand remain to be imported from foreign sources. Stability in this sense could only be determined by time and how well the advantages of biofuel are taken. While oil price nowadays follows a pattern of increase, oil companies do not attribute such increase to the blending requirements of the law, but rather, to the increasing cost of importing petroleum.

IV. PENAL and ADMINISTRATIVE SANCTIONS

The following acts shall be prohibited:

(a) diversion of biofuels, whether locally produced or imported, to purposes other than those envisioned in this Act;
(b) sale of biofuel-blended gasoline or diesel that fails to comply with the minimum biofuel-blend by volume in violation of the requirement under Section 5 of this Act;
(c) distribution, sale and use of automotive fuel containing harmful additives such as, but not limited to, MTBE at such concentration exceeding the limits to be determined by the NBB;
(d) noncompliance with the established guidelines of the PNS and DOE adopted for the implementation of this Act; and (e) false labeling of gasoline, diesel, biofuels and biofuel-blended gasoline

[87] Defects in the biofuel policy, http://www.manilatimes.net/national/2007/jan28/yehey/opinion/(last accessed May 8, 2007).

[88] Impact of new Philippines law requiring biofuel mix unknown, http://www.allheadlinenews.com/articles/ (last accessed May 8, 2007).

[89] *Supra* note 19, at 63.

and diesel.[90]

The law has a penal complexion for it punishes the commission of a prohibited act, upon conviction thereof, with the penalty of one year to five years imprisonment and a fine ranging from a minimum of one million pesos (1,000,000.00) to five million pesos (P5,000,000.00). In addition, the DOE shall confiscate any amount of such products that fail to comply with the blending requirements of the law, and of the implementing issuances of DOE. The DOE shall determine the appropriate process and the manner of disposal and utilization of the confiscated products. The DOE is also empowered to stop and suspend the operation of businesses for refusal to comply with any order or instruction of the DOE Secretary in the exercise of his functions under the law. Any person, who willfully aids or abets in the commission of a crime prohibited by the law or who causes the commission of any such act by another shall be made liable in the same manner as the principal. In the case of association, partnership or corporations, the penalty shall be imposed on the partner, president, chief operating officer, directors or officers, responsible for the violation.[91]

Aside from the criminal and civil liabilities imposable by the law, any person who commits any of the said prohibited acts shall likewise be subject to administrative fines and penalties. Said administrative actions are separate and distinct from any criminal actions that may arise. In addition to fines and penalties, the DOE shall be authorized to confiscate any amount of such products that fail to comply with the blending requirements, determine the appropriate process and the manner of disposal and utilization of the confiscated products; and stop and suspend the operation of business for refusal to comply with any order or instruction of the DOE Secretary in the exercise of his functions under the Act.[92]

Attorney Antonio A. Oposa, Jr., in his article,[93] expresses the view that in enforcing environmental laws, voluntary compliance is socially desirable than coerced compliance. However, voluntary compliance is possible only when those whose conduct is sought to be regulated or modified fully understand the reason for the law and appreciate its value. In addition, the body politic must also participate in the making of the law. Penal sanctions are effective to modify behavior and serve as a deterrent. Based on this pronouncement, the penal, civil

[90] R.A. 9367, §12.

[91] R.A 9367, §13.

[92] IRR of R.A. 9367, §35.

[93] *Supra* note 69.

and administrative sanctions of the law may be considered effective.

VI. ADOPTING BIOFUELS ACROSS THE BORDERS

The Economist in the article, "Stirrings in the corn fields", contained in the issue of 12 May 2005 reports:

> Diesel fuel made from oilseeds, petrol replaced by ethanol made from corn, sugar or grain—or even straw. They're here and are starting to change energy markets. American output of maize-based ethanol is rising by 30% a year. Brazil, long the world leader, is pushing ahead as fast as the sugarcrop from which its ethanol is made will allow. China, though late to start, has already built the world's biggest ethanol plant, and plans another as big. Germany, the biggest producer of biodiesel, is raising output 40%-50% a year. France aims to triple output of the two fuels together by 2007. Even in backward Britain, a smallish biodiesel plant has just come on stream, and another as big as Europe's biggest is being built. And after long research a Canadian firm has plans for a full-scale ethanol plant that will replace today's grain or sugar feedstock with straw. Output is still tiny compared with that of mineral fuels. But the day of the biofuel has arrived.[94]

Today, not one country dominates the biofuels market.[95]

The Philippine Setting

Biodiesel plants are being proposed in Camarines Sur, Candelaria in Quezon Province, Ilocos Sur and in two provinces in the Zamboanga peninsula.[96] The Philippines confirms its commitments with foreign entities for biofuel-related projects. Some of which are Comoto of Spain, JGC of Japan, Bionor of Spain, Spanish Technical Cooperation Office and Abengoa Bioenergy of Spain. As will be noted, Spain invests the most, the reason being, it is the

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[94] *Supra* note 1, at 107-108.

[95] *Supra* note 3, at 22.

[96] Biofuel law to reduce prices of oil, provide better income to farmer, http://www.sunstar.com.ph/static/ceb/2007/01/22/bus/biofuel.law.to.reduce.prices.of.oil.provide.better.income.to.farmers.html, (last accessed September 6, 2007).

world's second powerhouse when it comes to renewable energy.[97] Other potential ethanol producers are: first, San Carlos Bio-Energy Inc., which is projected to produce 100,000 liters per day; second, Kanlaon Alco-Green Inc., 60,000 liters per day; third, Negros Green Resources inc., 120,000 liters per day; and fourth, JG Summit Holdings, Inc., 100,000 liters per day, making a total production of 380,000 liters a day.[98] In 2006, President Gloria Macapagal-Arroyo launched the National Bio-Ethanol Program during the inauguration of the San Carlos Bioenergy, Inc., the first bio-ethanol production plant in the country. The San Carlos Bioenergy, Inc. projects a production capacity of 100,000 liters per day or 30 million liters per year in 2008.[99] Arthur Yap, Secretary of Department of Agriculture said, that the biofuel project, at the cost of 250 million U.S. dollars, is expected to produce up to 200 million liters of bioethanol in a year. To achieve that goal, the Spanish company Abengoa Bionergy mulls a 500,000-hectare cassava plantation and has signed a Memorandum of Understanding (MOU) with the Philippine Agricultural Development and Commercial Corporation (PADCC) during Philippine President Gloria Arroyo's recent state visit to Spain.[100]

PALM, Inc. is the first establishment to put up a palm oil processing plant in Bohol. It is seriously considering to expand its operation with biofuel production in accordance with RA 9367. It has about 7,000 hectares of oil palm plantation which is just enough for its palm oil and derivatives production. The company is also willing to reforest without cost on the part of the government the Carood, Wahig and the Upper Abatan watersheds that are vital to Bohol's various irrigation and waterworks facilities. Bohol Governor Erico Aumentado has sought Department of Energy's support for biofuel from palm oil since it is an institutional agricultural industry—like the coconut industry—in the country today.[101]

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[97] Donnabelle L. Gatdula, RP eyes more investments in biofuel-related projects, http://www.abs-cbnnews.com(last accessed December 9, 2007).

[98] *Supra* note 23, at 24-25.

[99] *Supra* note 2, at 60.

[100] Spanish firm in talks with Manila for massive biofuel project, http://news.xinhuanet.com/english/2007-12/10/content_7225372.htm, (last accessed December 10, 2007).

[101] June S. Blanco, *Bohol seeks support for palm oil biofuel*, Manila Bulletin, May 27, 2007, at 22, co. 3-5.

The Global Setting

Although biofuels may seem to be very well welcomed by the Philippines, other Asian countries appear to cast doubts on its effectivity. In Kuala Lumpur Malaysia, despite the grant by the government of biofuel production licenses to numerous plants,[102] only a handful are operating[103] due to high prices of feedstock sources.[104] Thus, the Malaysian administration will take time to study more carefully the Malaysian Biofuel Policy Act of 2006 before implementing it[105] and to undertake further research and development (R&D) to promote the use of palm-based biodiesel and second-generation biofuels generated from biomass.[106] Beijing has launched an investigation into how much land it can afford to use for biofuel crops amid worries over food supply fuelled by surges in international grains prices. China, already the world's third largest ethanol producer, has already stopped building new biofuel plants, which would use food crops such as corn or wheat, in the past year.[107] Toll New Zealand began using the blend of 5% biodiesel and 95% regular diesel in the trains.[108]

VII. CONCLUSION

The fever for products like biodiesel and carburant alcohol, or ethanol,

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[102] Warning to biofuel firms, http://biz.thestar.com.my/news/story.asp?file=/2007/12/12/ (accessed December 11, 2007), full text: "To-date, a total 91 biofuel production licences have been issued, involving total investment of RM8.07bil."

[103] *Id*, full text: "However, only four biodiesel plants are currently in operation."

[104] *Id*, full text: "Chin said these plants were operating way below capacity because of the higher feedstock price."

[105] *Id*, full text: "Chin said the Government was still studying the Malaysian Biofuel Policy Act 2006, which covers among others the blending of biofuel with fossil diesel, production, storage and transport."

[106] *Id*, full text: "On another note, he said the Government would undertake further research and development (R&D) to promote the use of palm-based biodiesel and second-generation biofuels generated from biomass."

[107] China checks land for biofuel on food worries, http://www.reuters.com/article/rbssConsumerGoodsAndRetailNews/i (accessed December 13, 2007).

[108] "Trains running between Auckland, Hamilton and Tauranga have begun using a biodiesel blend using beef tallow, http://www.radionz.co.nz/news/latest/200712091240/trains_trial_beef_tallow_biofuel_blend (accessed December 9, 2007).

distilled from oleaginous crops, sugarcane and maize, is a response to the climbing prices of petroleum and to the climate changing effects associated with using fossil fuel consumption. However, what is also needed is some "stability" and balanced progress in the supply and demand in order to give credibility to alternative fuels.[109] Admittedly, biofuels are not a so-called "silver bullet" nor are they magic solution. But if it will be adopted and embraced in the Philippines, it could help reduce the country's reliance on foreign oil, improve the environment by mitigating toxic and greenhouse gas emissions, make better the lives of Filipino farmers and develop the countryside.[110] This is the challenge that the nation and its people, face today. Let this country explore the full range of startling and wonderful alternative energy technologies, from solar panels to wind power, hydropower, geothermal energy and biomass, starting with biofuels. Even in energy, the more choices that the people have, the greater is their freedom and the more that they have full command of their future.[111] 100% energy independence is not conceivable, yet. But there is hope that as the industries in this respect develop, there could be substantial reduction on oil importation.[112]

The author has high hopes in the bold implementation of the Biofuels Act of 2006. However, there is a fear that this country could trip and fall into the pit of regret once the adverse effects of biofuel are felt. This should not be a case of offsetting advantages against disadvantages. Compliance with inter-generational responsibility cannot be compromised by providing for the present generation and leaving the future to suffer. Otherwise, generational genocide will be inevitable. Still, only time can tell if biofuel is really the fuel for the future, or just a scapegoat of the present oil crisis. And only time can tell if adopting it is worth the distortion of environmental balance. However, let it not be forgotten that only time also can tell if it is too late to reverse, if not to reduce, all the harmful effects of biofuel to biodiversity.

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[109] Mario Osava, Bio-fuel market has congenital defects, http://www.energypublisher.com/article. (accessed December 9, 2007).

[110] *Supra* note 1, at 101.

[111] *Supra* note 2, at 64.

[112] *Supra* note 19, at 38.