E. PHILIPPINES

Contents

1. INTRODUCTION

Oil consumption has grown significantly over the years, from about 225 000 barrels per day in the 1980s to about 338 000 barrels per day in 2003. Imported oil comprises more than 90 percent of the national oil consumption. The transport sector is one of the major and growing consumers of imported oil in the country. In 2003, this sector alone accounted for 46.22 percent of the total oil consumption of the country.[132] Demand pattern indicates an average annual growth rate of 4.9 percent until 2008.[133]

At the 12th Association of South East Asian Nations (ASEAN) Summit hosted by the Philippines in January 2007, ASEAN members and their dialogue partners had adopted the Cebu Declaration on East Asian Energy Security[134] to raise consciousness and promote cooperation in ensuring a stable energy supply to power their fast-growing economies. The Cebu Declaration recognized that while fossil fuels will continue to be used for a considerable period of time, greater energy security could be attained, *inter alia*, by promoting energy efficiency, conservation and cleaner technologies, increasing capacity and reducing costs of alternative energy resources, encouraging use of biofuels, promoting free trade and harmonizing standards on biofuels. Early 2008 saw the launching of an Energy Summit in the Philippines[135] with the theme "US$ 100 a barrel: crisis or opportunity." The main thrust of the recommendations of the Summit was cushioning the blow of high oil prices through market reforms in the energy sector, and developing alternatives to oil for the generation of electricity to fuel the transport sector.

Republic Act No. 9.367, "An act to direct the use of biofuels, establishing for this purpose the Biofuel Programme, appropriating funds therefore, and for other purposes", was approved on 12 January 2007 (hereafter referred to as the Biofuels Act). The law imposes mandatory requirements to blend biofuels with gasoline and diesel in the transport sector, thus supporting the development of alternatives to fossil fuels. The law seeks to reduce dependence by the Philippines on imported oil and improve energy efficiency, while at the same time contributing to sustainable economic

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132 CESDR. 2005. pp. 7 and 8.
133 Information provided by the Department of Energy, available at www.doe.gov.ph.
134 The Text of the Declaration is available at www.aseansec.org.
135 For more information, see the summit site at www.doe.gov.ph.

growth, and protecting public health and the environment. The Biofuels Act was one of the first of its kind in Southeast Asia.[136]

The initial focus in the Philippines was primarily on biofuels sourced from energy crops. However, the Renewable Energy Act of 2008 (Republic Act 953) was passed with the objective of promoting the development of renewable sources of energy and creating a framework for their commercialization, thereby accelerating the use of other forms of bioenergy, such as landfill gas and energy from animal waste.

The use of biofuels is not a recent development in the energy sector of the country. In 1982, the Alcogas & Cocodiesel Programme was initiated in response to the oil crisis of the 1970s. Concerns about skyrocketing oil prices brought about by political instability and conflicts in the Middle East and increasing global demand for oil, spurred the Philippine Government to fast-track policies and laws to ensure energy security. The programme was shelved after a year however, when the government realized that there was no real savings because biofuels cost more to produce. This point was illustrated by the World Bank,[137] which elucidates that the domestic resource cost of ethanol production was 15–20 percent higher than the cost of importing oil and refining the equivalent volume of gasoline.

Using locally produced biofuels is also expected to generate savings in foreign exchange, given that they would replace imports of fossil fuels. The Department of Energy estimates that a 1 percent blend of coco methylester in diesel can result in savings of US$ 420 000 each year just for government vehicles using biodiesel, and up to US$ 22 million, if used nationwide. With the blending requirement of 5 percent foreseen in the Biofuels Act, the Philippines stands to save US$ 205 million at a volume of 429.4 million litres.[138] Even more substantial savings will be achieved when the mandated use of bioethanol in gasoline is implemented. For example, a diesel displacement of 40 million litres by incorporating a 1 percent blend of coco-methyl ester (CME), otherwise known as coco-biodiesel, will enable a savings of US$ 22 million; for a 2 percent blend replacing 111 million litres of diesel, a foreign exchange savings of US$ 61 million is predicted.[139] For ethanol a 5 percent blend displacing 255 million litres of gasoline will account for

[136] PNOC-AFC available at www.pnoc-afc.com.ph.
[137] World Bank.1982.
[138] See www.pnoc-afc.com.ph/faq.ph.
[139] Lotilla, R. M. 2006.

US$ 160 million, while the use of a 10 percent blend will mean 565 million litres of gasoline are displaced and US$ 354 million is potentially saved.

The growing demand for biofuels is expected to spur investments in their production. The state-owned Land Bank of the Philippines has signed an agreement to provide the Philippine National Oil Company-Alternative Fuels Corporation (PNOC-AFC) with five billion Philippine Pesos (PhP), equivalent to some US$ 125 million, to finance a jatropha development programme. The PNOC Alternative Fuels Corporation (PNOC-AFC) is a wholly-owned subsidiary of the state-owned Philippine National Oil Company (PNOC). It has been endowed the primary responsibility for this project, and the coordination of relevant agencies. The Office of the Government Corporate Counsel Opinion No. 285 of 29 December 2006 affirms PNOC-AFC's role as a direct investor. With respect to bioethanol production, the Department of Energy (DOE) estimates that the required production capacity is 25 plants, each with the annual production capacity of 30 million litres. Various figures are predicted according to the type of ethanol used. For the first and second years of implementing the E5 blend for example, 268 million litres of bioethanol will be required, necessitating an additional investment of US$ 269 million for the construction of nine new processing plants. The land required for this will be 63 810 hectares. For the E10 blend, after eight years, 171 667 hectares of land is needed to produce 721 million litres, and US$ 200 million will be required to meet these figures through the construction of new processing plants.

Following this initial overview of the energy sector and the current use and future potential of bioenergy in the Philippines, the main legal and institutional framework for bioenergy are discussed in the following section focusing on the new Biofuels Act. The chapter then outlines other relevant laws and policies and embarks on an analysis of the legal framework for bioenergy in the Philippines. Thereafter some final observations and conclusions are rendered.

2. THE MAIN LEGAL AND POLICY FRAMEWORK FOR BIOENERGY

The Biofuels Act was passed by the Senate and the House of Representatives (Thirteenth Congress, Third Regular Session) on 29 November 2006 and approved by the President on 12 January 2007. It took effect on 6 May 2007,

after the mandatory period of notice to the public through publication. The Implementing Rules and Regulations, prepared by the Department of Energy, took effect on 8 June 2007.

Under the Biofuels Act, the term biofuel is used to refer to "bioethanol and biodiesel and other fuels made from biomass and primarily used for [auto]motive, thermal power generation, with quality specifications in accordance with Philippine National Standards" (section 3(f)). The Act has been expected to have several positive impacts in the Philippines. As markets for biofuels and mandatory blending requirements are established through legislation, private sector investments in production and infrastructure support facilities for biofuels are expected to jumpstart, thereby increasing economic activity in the country and in particular, boosting rural employment. At the same time, the Biofuels Act seeks to contribute in improving air quality with the use of clean energy sources and the mitigation of greenhouse gas emissions.

2.1 Institutional framework

The principal institution responsible for the implementation of the Biofuels Act is the Department of Energy. Within three months from the entry into force of the Biofuels Act, the department was required to: formulate implementing rules for the Act; prepare the National Biofuels Programme, consistent with the Philippine Energy Plan (that also includes the establishment of support facilities to ensure the security of feedstock supply and investments in supply infrastructure); provide directions on the availability of alternative fuel technologies for vehicles, engines and parts; identification viable feedstock other than molasses, sugarcane, cassava, coconut, jatropha, sweet sorghum for the production of biofuels; define technical fuel quality standards, which comply with the Philippine National Standards; draft guidelines for the transport, storage and handling of biofuels; halt the sale of non-compliant biofuels and biofuel-blended gasoline and diesel; and organize an information campaign to promote the use of biofuels (section 7).

The Biofuels Act also establishes a National Biofuel Board (NBB) under section 8. The NBB is composed of the Secretary of the DOE as Chairman, and representatives from the: Department of Trade and Industry; Department of Science and Technology; Department of Agriculture; Department of Finance; Department of Labour and Employment; Philippine

Coconut Authority, and Sugar Regulatory Administration. The Board is assisted by a Technical Secretariat, whose powers and functions are essentially two-fold: monitoring implementation and recommending policy directions (section 9). The Board is tasked with monitoring the Biofuels Programme, and the supply, use and availability of biofuels; and making recommendations regarding adjustment of the mandatory blending requirements, the availability of alternative fuel technology, and the use of biofuels in air transport.

The various government agencies represented on the Board have been given specific mandates corresponding to the different aspects of the law's implementation (section 11). The Department of Agriculture is required to develop a National Programme for Feedstock Supply; it shall thus ensure the increased production and sustainability of supply of biofuel feedstock. Information on available areas suitable for the cultivation and production of such crops shall also be published by this department. The Sugar Regulatory Administration and the Philippine Coconut Authority are charged, *inter alia*, with developing and implementing policies in support of the Philippine Biofuel Programme. The Department of Finance, through the Bureau of Internal Revenue and the Bureau of Customs, is responsible for the monitoring of the production and importation of biofuels. The Department of Science and Technology and Department of Agriculture are tasked with identifying and developing viable feedstock for the production of biofuels. The task of developing and implementing a research and development programme on biofuel production and utilization technology is given to the Department of Science and Technology, through the Philippine Council for Industry and Energy Research and Development. With respect to labour and employment aspects of implementation of the Biofuels Act, the Department of Labour and Employment is responsible for promoting livelihood opportunities and facilitating employment. To address the various trade considerations related to the World Trade Organization and ASEAN Free Trade Area agreements, the Tariff Commission is responsible for creating and classifying a tariff line for biofuels and biofuel-blends. Local government units (provinces, cities, municipalities and barangays or villages) are mandated to assist the Department of Energy in monitoring the distribution, sale, and use of biofuels and biofuel-blends.

2.1.1 Stakeholder participation

The Philippine Constitution expressly provides for public participation at all levels of decision-making. Article XIII(16) stipulates that "The right of the people and their organizations to effective and reasonable participation at all levels of social, political, and economic decision-making shall not be abridged. The state shall, by law, facilitate the establishment of adequate consultation mechanisms." The Biofuels Act mandates that the formulation of its implementing rules and regulations must be conducted in consultation with the National Biofuels Board, stakeholders and the other concerned agencies (section 15). The Biofuels Act also provides that prior to its entry into force, the draft of the implementing rules shall be posted on the Department of Energy website[140] for at least one month and published in at least two newspapers of general circulation.

The role of the private sector is critical in the implementation of the law as the government relies on private investments to produce and market biofuels, and to invest in infrastructure support facilities. The responsibility for fuel-blending, distribution and marketing of biofuels is also vested in privately-owned oil companies. The law thus lays down incentives to encourage investments in the production, distribution and use of biofuels in section 6 (see section 2.3 below). According to the Energy Secretary,[141] as of September 2007, there are projects in the pipeline worth of approximately 12 billion Philippine Pesos to construct bioethanol production plants estimated to produce 240 million litres of bioethanol annually. This figure is considered sufficient to satisfy the estimated annual demand of 223 million litres for the 5 percent mandatory blending requirement for bioethanol by 2009.

In contrast to the recent trends in environmental legislation, there are no civil society or private sector representatives in the policy making body, the National Biofuels Board. This is a critical gap especially because the success of the law hinges entirely on private sector participation and investment in biofuel production, distribution and use.

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[140] For more information, see www.doe.gov.ph.

[141] 27 December 2007, for more information see www.gmanews.tv.

2.2 Market regulations and standards

The mandatory blending requirements for biofuels in gasoline and diesel are implemented according to the timetable (reproduced in Box 1 below) in accordance with section 5 of the Biofuels Act.

Box 1: Timelines for mandatory blending requirements

Activity	Deadline
Phase-out of the use of harmful gasoline additives and/or oxygenates	November 2007
Mandatory minimum 1 percent biodiesel blend in all diesel engine fuels sold	August 2007
Minimum of 2 percent biodiesel blend, upon recommendation of NBB	May 2009
Minimum of 5 percent bioethanol blend in all gasoline fuel sold and distributed	May 2009
Minimum of 10 percent bioethanol blend in all gasoline fuel sold and distributed, upon the recommendation of the NBB	May 2011

The Act provides that the National Biofuel Board may adjust the blending requirements, subject to the condition that the minimum blend may be decreased only within the first four years of implementation. Thereafter, the minimum requirements of 5 percent and 2 percent for bioethanol and biodiesel respectively, shall not be decreased (section 9(c)).

Under the law, in the event of supply shortage of locally produced bioethanol within four years of implementation of the Act, oil companies are allowed to import bioethanol and benefit from a reduced tariff but only to the extent of the shortage as determined by the National Biofuel Board (Implementing Rules and Regulations, Republic Act No. 9.367, sections 5 and 6).

Any individual or entity intending to engage in the production of biofuels shall apply for accreditation as a biofuel producer with the Department of Energy. The department, in consultation with stakeholders, is mandated to issue appropriate guidelines, indicating the requirements for quality assurance, quality management system, and analogous quality production standards (Implementing Rules and Regulations, section 23.1). Moreover, all biofuels producers are required to register their distributors with the

department, as well as submit monthly reports on production, sales, inventory and weekly price of biofuels (Implementing Rules and Regulations, section 23.2).

The blending of biodiesel and bioethanol with diesel and gasoline fuels respectively, shall be the responsibility of oil companies, using appropriate blending methodologies at their respective refineries, depots or blending facilities, in accordance with duly accepted international standards as well as guidelines issued by Department of Energy, and consistent with the Philippine National Standards (Implementing Rules and Regulations, section 22.1).

2.3 Incentives

To encourage investment in the production, distribution and use of locally produced biofuels, the Biofuels Act contains several incentives detailed in section 6. These include tax exemption for the biofuel component of blended gasoline and diesel, and exemptions from wastewater charges imposed under section 13 of the Clean Water Act, Republic Act No. 9275 for water effluents from biofuels production. The sale of raw materials used in the biofuel production are exempt from the value added tax under the National Internal Revenue Code, as amended by the Expanded Value Added Tax Reform Law of 2005. Finally, government financial institutions provide high priority financing to Philippine citizens or entities engaged in production, storage, handling and transport of biofuel feedstock, and the blending of biofuels. These incentives are additional to those already provided by the Board of Investments in accordance with Omnibus Investment Code of 1987 (Executive Order No. 226).

2.4 Environmental and social guarantees under the Biofuels Act

The National Biofuel Board has declared that one of the advantages of biofuels is that they are relatively harmless to the environment if spilled. The NBB indicates that while fossil fuels contain complex and toxic compounds, biodiesel refined from pure vegetable oil contains only simple organic compounds that are non-toxic and biodegradable, making it safe to store and handle. It also estimates that using biodiesel in place of petroleum diesel

decreases carbon dioxide emissions (greenhouse gases) by nearly 80 percent.[142] The Board, however, has not identified the source of its estimates.[143]

Significantly, the Biofuels Act does not provide the Department of Environment and Natural Resources any specific mandate concerning its implementation. The law nevertheless provides that in establishing standards and guidelines for technical fuel quality of biofuels and biofuel-blended gasoline and diesel for the market, the Department of Energy must ensure that these standards comply with the Philippine National Standards for fuel and fuel-related products (section 7(c)). However, the Biofuels Act also provides that the application of water effluents in biofuel production, while exempt from waste water charges, shall conform to guidelines issued pursuant to the Philippine Clean Water Act, subject to the monitoring and evaluation of Department of Environment and Natural Resources.

With respect to the social impact of the law's implementation, the Biofuels Act lists various responsibilities for the Department of Labour and Employment to ensure certain social guarantees. With the expected investment in biofuel production, the Department of Labour and Employment is responsible for promoting livelihood opportunities and productive employment; ensuring the access by workers to productive resources and social coverage; and making recommendations for plans, policies and programmes that will enhance the positive social impacts of the National Biofuels Programme (section 11(e)).

The Biofuels Act further contains provisions on the non-forfeiture or diminution of existing benefits for sugar workers where sugarcane is used as feedstock (section 17). Under the Republic Act No. 6982, also known as the Sugar Amelioration Act of 1991, the sugar workers enjoy a form of production sharing. The Sugar Amelioration Act provides that effective from sugar crop year 1991–1992, a lien of 5 Philippine pesos per *piccolo* of sugar shall be imposed on the gross production of sugar in order to increase the income of sugar workers and also to finance social and economic programmes to improve their livelihood and well-being. This is subject to an automatic additional lien of 1 Philippine peso every two years for the following ten years (Republic Act No. 6982, section 7). According to the Biofuels Act, the NBB is responsible for establishing a similar mechanism for biofuel workers (section 17). While the labour and social guarantees to

[142] For more information see www.doe.gov.ph.
[143] For more information see www.doe.gov.ph.

sugarcane workers have been specified, it is hard to assess the adequacy of these guarantees in practice outside the black-letter law.

The law does not address the question of land rights and transparency of land agreements, for example between local or indigenous communities, with respect to the land and water resources to be used for the cultivation of energy crops.

2.5 Bioenergy research and development

Ongoing research and development on biofuel production and utilization is the responsibility of the Department of Science and Technology (DOST) which is also tasked with publishing and promoting related technologies, developed locally and abroad. DOST, through the Philippine Council for Industry and Energy Research and Development (PCIERD), has developed a roadmap for all research and development (R&D) activities for the development of biofuels. The Biofuel R&D programme that PCIERD has submitted to the Biofuels Board establishes the science and technology infrastructure support for the Biofuel Act that will cover: biofuel technology research, assessment, validation and documentation; alternative feedstock identification and development; feedstock raw material and biofuel analysis; performance testing of biofuels from different feedstocks; techno-economic viability assessment of biofuel production plants; and technology promotion and transfer.[144]

Even prior to the Biofuels Act, DOST had undertaken research projects on biofuels production. In May 2005, PCIERD formally launched the first DOST-assisted biofuel plant, with three test vehicles loaded with the first ever coco- methyl- ester (CME) produced by the newly opened CME plant, demonstrating the clean burning, non-toxic, and superior lubricity and detergent properties of CME. A one-tonne capacity CME plant called Romtron Philippines in Romblon Province was started in 2001.[145]

DOST and the Philippine Council for Agricultural Resources Research and Development have signed the Memorandum of Agreement for the Integrated Research and Development Programme dated 1 June 2007 that called for studies on jatropha for biodiesel and the utilization of sweet sorghum and cassava as feedstocks for ethanol production. The Integrated

[144] For more information see www.pcierd.dost.gov.ph.
[145] Ibid.

Research and Development Programme on Biofuels aims to provide science-based production and post-production information and technology in support of an Environmental Science and Technology Agenda and the Biofuels Act.

2.6 Penalties for violations

The Biofuels Act lists several prohibited acts that are applicable to producers and distributors, but not the end users (section 12). The diversion of locally produced or imported biofuels for purposes other than those envisioned in the Act is prohibited as is the sale of biofuel-blended gasoline or diesel that fails to comply with the minimum biofuel-blend by volume in violation of the requirements. Specifically the distribution, sale and use of automotive fuel containing harmful additives such as, but not limited to, Methyl-Tertiary-Butyl-Ether at such concentrations exceeding the limits to be determined by the National Biofuels Board is outlawed. Other offences under the act include non-compliance with established guidelines by the Philippine National Standards and DOE for the implementation of the Act, and the false labelling of gasoline, diesel, biofuels and biofuel-blended gasoline and diesel.

The Biofuels Act imposes penalties of imprisonment ranging from one to five years and a fine ranging from 1 million to 5 million Philippine pesos as penalties, as well as the confiscation of non-compliant products (section 12).

3. BIOENERGY-RELATED LAWS AND POLICIES

3.1 International legal instruments

Under the Philippine Constitution, it is a declared principle that the Philippines will adopt generally accepted principles of international law as part of the law of the land (Art. II(2)). The Constitution likewise states that no treaty or international agreement is valid and effective unless concurred by at least two-thirds of all the members of the Senate (Art. VII(21)).

The Philippines is party to the following international instruments relevant to bioenergy: the United Nations Framework Convention on Climate Change (signed on 12 June 1992 and ratified on 2 August 1994); the Kyoto Protocol (signed on 15 April 1998 and ratified on 22 November 2003); the

Convention to Combat Desertification (signed on 8 December 1994 and ratified on 10 February 2000); and the Convention on Biological Diversity (signed on 6 June 1992 and ratified on 8 August 1993). The Philippines has also been a member of the World Trade Organization since 1 January 1995.

The Philippines has passed legislation aimed at addressing climate change, namely the Clean Air Act of 1999 and the Solid Waste Management Act of 2000, both of which regulate the emissions of greenhouse gases. In line with its commitments under the Convention on Biological Diversity (CBD), the Philippines passed the National Integrated Protected Areas System Act (Republic Act No. 7586) which provides a framework for setting aside portions of forestlands as protected areas and regulates activities in these areas to protect biodiversity. For example, the conversion of forests to plantations is prohibited in these areas.

The Biofuels Act paved the way for the Philippines to push for the Cebu Declaration on East Asian Energy Security, adopted by the 16 heads of state of the Association of Southeast Asian Nations (ASEAN) and its dialogue partners during the 12th ASEAN Summit held in the Philippine city of Cebu on 15 January 2007. This is a declaration of commitment by the ten ASEAN states to work closely together towards: improving efficiency and environmental performance of fossil fuels; reducing dependence on conventional fuels through intensified energy efficiency and conservation programmes, hydropower, expansion of renewable energy systems and biofuel production and utilization (and for interested parties, nuclear energy); encouraging open and competitive regional and international markets geared towards providing affordable energy at all economic levels; mitigating greenhouse gas emission through effective policies and measures; and pursuing investment on energy resource and infrastructure development through greater private sector involvement. Under this declaration, follow-up and implementation measures will be undertaken through existing regional mechanisms in close consultations with the dialogue partners, including China.

3.2 Clean Development Mechanism

The Biofuels Act explicitly provides that its provisions shall not be interpreted as prejudicial to CDM projects that reduce the emissions of carbon dioxide and other greenhouse gasses by means of biofuels use (section 18). This provision should be understood in light of the requirement adopted by the Parties to the Kyoto Protocol that CDM projects must be

"additional" to projects that would be implemented without the CDM. In other words, projects registered under the CDM must not fall under the "business as usual" scenario in the country, for instance, concerning the setting up of biofuel plants.[146] This provision in the Biofuels Act attempts to pre-empt the satisfaction of the 'additionality' criterion for qualification under the CDM (see Chapter 1.2.2 of this study), of biofuel projects in the Philippines by the CDM Executive Board. At best it clarifies that, while biofuel projects are encouraged and are becoming numerous, these projects are still not the norm in the country.

The Designated National Authority for the CDM is the Department of Environment and Natural Resources, pursuant to Executive Order No. 320 of 25 June 2004, while the Department of Energy takes the lead role in evaluating energy-related projects prior to their endorsement and registration with the CDM Executive Board. Of the 39 registered CDM projects in the Philippines a majority involve biomass energy.[147] Several projects pertain to electricity generation from methane recovered from animal wastes, the production of biogas (some will generate electricity from bagasse), while the remaining cover geothermal energy production, wind energy production and sinter cooler waste heat recovery power generation.

The San Carlos Renewable Energy Project will produce electricity from bagasse, a waste product from producing ethanol from sugarcane. Its expected annual emission reductions are estimated at 37 658 metric tonnes of carbon dioxide equivalent.[148] The facility will produce 125 000 litres of bioethanol annually, intended for blending with gasoline, in line with the Biofuel Programme under the Biofuels Act.

3.3 Renewable energy

As a long-term strategy, the Philippines is exploring and developing renewable energy sources. Based on current projections of the Department of Energy, renewable energy is estimated to meet up to 40 percent of the country's primary energy requirements over the ten-year period beginning in 2003. Although its share will decline in relation to the total figure, it is estimated to grow at an average annual rate of 2.4 percent in absolute terms. Biomass, micro-hydro, solar and wind will remain the largest contributors to

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[146] Kulheim, R. 2006.
[147] For further statistical information see www.unfccc.int.
[148] Ibid.

the total share of renewable energy in the energy mix with an average share of 27.5 percent. Meanwhile, hydro and geothermal power will contribute to the energy balance and continue to be a significant source of electric power.[149]

The Renewable Energy Act of 2008 (Republic Act No. 9531) lays down the framework for the accelerated development and advancement of renewable energy resources, through the grant of fiscal and non-fiscal incentives and the development of a strategic programme to increase its utilization. Such sources include (but are not limited to) biomass, solar, wind, hydro, geothermal and ocean energy sources and do not have an upper limit on the total quantity to be used as their renewal rate is relatively rapid over an indefinite period of time. The Act defines "biomass energy systems" as those which "use biomass resources to produce heat, steam, mechanical power or electricity through either thermochemical, biochemical or physico-chemical processes, or through such other technologies which shall comply with prescribed environmental standards pursuant to this Act." The Department of Energy in particular encourages the adoption of waste-to-energy technologies (section 30), which are systems for converting biodegradable materials such as animal manure or agricultural waste into useful energy. Waste-to-energy technologies are subject to the provisions of the Clean Air Act and the Ecological Solid Waste Management Act. The law also expressly stipulates that DOE must coordinate with the Department of Environment and Natural Resources (DENR) in application of this provision.

A Renewable Portfolio Standard (RPS) is established by the Act under which all stakeholders in the electric power industry must contribute to the growth of the renewable energy industry (section 6). The minimum percentage of electricity generation from renewable sources is to be set by a National Renewable Energy Board (NREB). A Renewable Energy Registrar is tasked with issuing renewable energy certificates corresponding to energy generated from eligible facilities; these certificates are to be used to demonstrate compliance with the RPS (section 8).

Other renewable energy strategies detailed in the statute include the 'green energy option' programme, in section 9 that allows consumers to choose renewable energy as their source of energy. Electricity providers are mandated to provide mechanisms for the physical connection and

[149] See www.doe.gov.ph.

commercial arrangements necessary to ensure the success of the programme. The Department of Energy (DOE), as the lead agency under the law, is responsible for drawing up applicable rules and regulations governing the programme. The law also indicates that electricity distribution utilities shall enter into net-metering agreements with qualified end-users who will be installing the renewable energy system (section 10) and contains provisions on electricity transmission and the development of distribution systems. Under the law the government is entitled to a one percent share of the gross income of the sale of renewable energy by resource developers, but waives this figure in the case of micro-scale projects and non-commercial operations (section 13).

The Act also creates a feed-in tariff system for electricity produced from renewable energy sources (section 7). The law entrusts the formulation of feed-in tariff system rules to the National Renewable Energy Board, including priority connections and purchases, and determinations of the fixed tariff to be paid. NREB is composed of representatives of the energy, trade, finance and environment line ministries as well as electrical supply companies (both public and private), electric cooperatives and NGOs that are endorsed by their respective industry associations. The primary tasks of this body are the recommendation of specific actions to facilitate implementation of the National Renewable Energy Programme and monitoring the utilization of the Renewable Energy Trust Fund created under the law.

Section 14 of the Act on environmental compliance stipulates that all renewable energy exploration, development, utilization and systems operations are to be conducted in compliance with environmental regulations laid down by DENR or other concerned government agency. In addition, the renewable energy developer must secure an Environmental Compliance Certificate from the corresponding regional office of DENR.

Chapter VII of the Act sets out the incentives scheme for renewable energy. Incentives are created for farmers engaged in the plantation of biomass resources (section 22). For a period of ten years following the coming to force of the Act, persons engaged in the plantation of crops used as biomass resources and is certified by the Department of Energy, are entitled to duty free importation and to be exempted from VAT on all types of agricultural inputs, equipment and machinery. Other incentives include, *inter alia*:

- tax and duty-free importation of components, parts and materials;
- tax credit on domestic capital components, parts and materials;
- tax exemption for carbon credits;
- income tax holiday and exemption for developers, manufacturers, fabricators and suppliers of locally-produced renewable energy equipment, components and materials;
- additional incentives for developers, such as special realty tax rates on equipment and machinery, accelerated depreciation, exemption from the universal charge and zero-rated value added tax; and
- access to the 'net-operating-loss carryover scheme' for renewable energy developers, where by net operating loss during the first three years of commercial operation can be carried over as a deduction from gross income for the next five consecutive taxable years following the year of such loss.

3.4 Environmental legislation

The Environmental Impact Statement System, that was passed in June 1978 through Presidential Decree No. 1586, sets the framework for environmental regulations. The decree requires all agencies of the national government as well as private corporations and entities to prepare an environmental impact assessment for every proposed project and undertaking which can significantly affect the quality of the environment (section 2). Pursuant to the decree, the President issued the Presidential Proclamation No. 2146, which declares certain areas and types of projects as environmentally critical. Heavy industries, resource intensive activities and infrastructure projects, as well as development activities on prime agricultural lands, among others, fall within the scope of the environmental impact statement system. Proponents of such projects are required to submit an environmental impact statement, after conducting an assessment, detailing the following: (i) the environment impact of the proposed action, project or undertaking; (ii) any adverse environmental effect which cannot be avoided, should the proposal be implemented; (iii) alternative to the proposed action; (iv) a determination that the short-term uses of natural resources are consistent with the maintenance and enhancement of the long-term productivity of the same; and (v) whenever a proposal involves the use of depletable or non-renewable resources, a finding must be made that such use and commitment are warranted. Before an environmental impact statement is issued by a lead agency, all agencies having jurisdiction over, or special expertise on, the subject matter involved: they

must comment on the draft environmental impact statement made by the lead agency within 30 days from receipt of the same.

In addition to the general framework law on environmental impact assessment, the Philippines passed several sector-specific laws covering clean air, clean water, solid waste management, wildlife, protected areas and hazardous wastes, among others. In relation to the implementation of the Biofuels Act, the Clean Air Act and the Clean Water Act are particularly relevant.

Under the Philippine Clean Air Act of 1999 (Republic Act No. 8749), the Department of Transportation and Communication (DOTC) is responsible for implementing emission standards for motor vehicles in accordance with the aforesaid law (section 21(a)). The Department of Environment and Natural Resources, in collaboration with the DOTC and Local Government Units, will develop an action plan for the control and management of air pollution from motor vehicles consistent with the Integrated Air Quality Framework (section 21 (b)). The DOTC, together with the Department of Trade and Industry (DTI) and the DENR, will establish the procedures for the inspection of motor vehicles and the testing of their emissions for the purpose of determining the concentration and/or rate of pollutants discharged by said sources (section 21(c)). In order to ensure the substantial reduction of emissions from motor vehicles, the DTI, together with the DOTC and the DENR shall formulate and implement a national motor vehicle inspection and maintenance programme that will promote efficient and safe operation of all motor vehicles (section 21(d)). The Implementing Rules and Regulations of the Biofuels Act (section 19) reiterate this mandate as a measure to substantially reduce emissions, pursuant to the Philippine Clean Air Act of 1999.

The implementation of the Biofuels Act is necessarily linked to the provisions of the Clean Air Act. In accordance with the objective of the Clean Air Act to develop and utilize cleaner alternative fuels, a Technical Committee on Petroleum Products and Additives under the Department of Energy prepared a Philippine Coconut Oil Biodiesel Product Standard and adopted the Philippine National Standard (PNS) for Biodiesel by the Bureau of Product Standard. Manufacturers must comply with the latter to ensure its effectiveness when used either in its pure state or as a blend. Such a standard has the force of law, having been issued pursuant to powers delegated by the Congress to the concerned agencies under the law. The standard was based

in part on a study of the Department of Science and Technology, where it was stated that: that biodiesel (fatty-acid alkyl-ester) is a cleaner-burning diesel replacement fuel made from natural, renewable and biodegradable sources; it is a stable diesel substitute, which performs reliably in all diesel engines without any modification; is mixable with petroleum diesel fuel; it is easy to make and safe to handle. Biodiesel cuts emissions as it reduces particulates, unburned hydrocarbons, carbon monoxide and carbon dioxide; and it is free from lead, sulphur and halogens. Biodiesel, therefore, is considered a very promising alternative fuel that can lead to a cleaner environment. [150]

The production of biofuels has implications on water discharges and effluents, which may be a source of water pollution. As explained above, the Biofuels Act exempts biofuel investors from wastewater fees. However, they are not exempt from the obligation to secure a discharge permit. Under the Clean Water Act (Republic Act No. 9275), the DENR requires owners or operators of facilities that discharge regulated effluents to secure a permit to discharge (section 14). The discharge permit constitutes a legal authorization granted by the DENR to discharge wastewater. Moreover, the discharge permit specifies, among other things, that the quantity and quality of effluent that these facilities are allowed to discharge into a particular water body, must adhere to schedule and monitoring requirements. While biofuel plants are exempted from the discharge fees, their effluents are still subject to the standards set by the DENR, pursuant to the Clean Water Act, and further subject to its monitoring. The exemption only applies if the company meets the effluent standards. Such exemption may very well provide an incentive to biofuel producers to comply with the standards of the DENR in order to qualify and avail of such exemption from payment of wastewater fees.

With regards to the cultivation of energy crops such as sugarcane for bioethanol production or jatropha for biodiesel production, it should be noted that the Philippines has no comprehensive land-use policy or law. Land use is largely determined by local government units through local zoning ordinances within their political jurisdictions. Local government decisions on zoning are mainly concerned about tax rates and identifying areas for urban development. There are no national standards or guidelines on how decisions are to be made by either a national agency or local government on whether farmland is to be used for biofuel or food

[150] Bulan, C. (undated).

production. The Environmental Impact Statement System sets regulations on large-scale plantations (including energy crops such as jatropha) if these are located in public lands (those classified as forestlands or protected areas, regardless of its actual forested condition). Currently, there are no regulations on alien invasive species, although the Wildlife Act mandates the Department of Environment and Natural Resources to develop regulations on this.

3.5 Food and agriculture

It is estimated that the production of biofuels in the Philippines is likely to compete with food production. In terms of sugar supply, the mandate and role of the Sugar Regulatory Administration (SRA) comes into play. Under the Biofuels Act, it is specifically stated that notwithstanding any contrary provision in the Biofuels Act, 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. To this end, the SRA shall recommend (and the relevant 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 Custom Code (section 10).

The challenge for SRA is to establish mechanisms that ensure a sugar demand and supply equilibrium and also to stabilize prices at a level that is reasonable to producers and fair to consumers. As the sugar industry is expected to provide the bulk of feedstock for bio-ethanol production, the challenge is how to meet the demand through the domestic sugar industry through yield improvements and area expansion. The SRA also faces the challenge of setting up the ethanol industry without compromising the country's sugar self-sufficiency. Competition for raw material could also threaten the viability of both the sugar and ethanol industries.[151] In terms of ethanol production, the SRA estimates that of the current 385 000 hectares dedicated to sugar production, 20 000 hectares can be shifted to ethanol without compromising self-sufficiency in sugar supply.[152] Again, the Philippines does not have a comprehensive land use law or policy, which could help clarify and delineate land use for biofuel production *vis-à-vis* other land uses to obviate land use competition.

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[151] Ledesma, J. 2006.
[152] Ibid.

A newly created bicameral oversight committee will hold public hearings on the impact of biofuel farming on land use policy in order to guard against indiscriminate biofuel development.[153]

3.6 International trade

As the Philippines is a member of the World Trade Organization and the Asian Free Trade Association, the Biofuels Act mandates the Tariff Commission to take into account trade considerations in the implementation of the law (section 11(f)). With the mandated use of blended gasoline and diesel with locally produced biofuels, oil imports are expected to be reduced and possibly the country will have an opportunity to export surplus biofuels.

Republic Act No. 8178 replacing quantitative restrictions on agricultural products, came into force in 1996 to implement the tariffication of agricultural products in accordance with WTO Agreement on Agriculture. Executive Order No. 376 provided a general imports duty exemption to eligible agriculture and fisheries enterprises in order to promote and foster their efficiency and global competitiveness. Executive Order No. 449 of 22 July 2005, on the other hand, modifies the rates of import duty specifically for bioethanol fuel under section 104 of the Tariff and Customs Code of 1978. The rationale of this instrument is laid out in its preamble as being in support of a programme that promotes the blend of bioethanol with gasoline. In view of the fact that at the time, "there is currently no local producer of bioethanol fuel, a reduction in tariff [...] would assure the price competitiveness of ethanol-blended gasoline *vis-à-vis* other gasoline products." This product is subject to the Most-Favoured-Nation rate of import duty in accordance with the schedule indicated in Annex A of the Tariff and Customs Code.

The Agriculture and Fisheries Modernization Act of 1997 (Republic Act No. 8435) also exempts enterprises or persons duly certified by the Department of Agriculture in consultation with the Department of Finance and the Board of Investments (BOI) from the payment of import duties of agricultural inputs, equipment and machinery for five years (section 109).

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[153] For more information see www.senate.gov.ph.

3.7 Labour

The Philippine market for biofuels relies upon ethanol and biodiesel. Under the Biofuels Act, sources of feedstock include molasses, sugarcane and cassava for ethanol; while sources for biodiesel include coconut and jatropha, *inter alia* (sections 3(q) and 6(b)). With the mandatory blending requirements spurring investments in the production of biofuels, it is expected that economic activity will increase particularly through agricultural diversification, employment opportunities and increased income for farmers leading to increased rural development. This is in line with the 10-Point Agenda of the Executive Branch on the promotion of labour opportunities and agricultural development. Such agenda primarily lists "the creation of six million jobs in six years via more opportunities given to entrepreneurs, tripling of the amount of loans for lending to small and medium enterprises and the development of one to two million hectares of land for agricultural business."[154] Under the Labour Code of the Philippines, such agricultural workers enjoy the right to self-organization and collective bargaining. However, employment in the bioenergy sector does not only encompass agricultural workers but also includes industrial and other types of employees, for example related to processing activities. Just and humane conditions of work are also guaranteed in light of the minimum working conditions and benefits mandated by the Labour Code. The latter instrument also contains special provisions on the work rights of women and prohibits prohibition of employing minors. Its article 2 on health and safety standards empowers the Secretary of Labor and Employment through appropriate orders, to enforce mandatory occupational safety and health standards to eliminate or reduce occupational safety and health hazards in all workplaces and ensure safe and healthy working conditions in all places of employment.

4. ANALYSIS OF THE LEGAL FRAMEWORK FOR BIOENERGY IN THE PHILIPPINES

4.1 General observations on bioenergy legislation

The Biofuels Act was passed "to reduce dependence on imported fuels with due regard for the protection of public health, the environment, and natural ecosystems consistent with sustainable economic growth that would expand

[154] For more information on the 10 Point Agenda of the Philippine Executive Branch, see www.gov.ph.

opportunities for livelihood…" (section 2). The policy objective underlying the new law thus contained a desirable balance of energy security and sustainable development. The law also provides economic incentives for investment in biofuel production. A cabinet-level monitoring and advisory body, the National Biofuel Board, was created to ensure that the impacts of the biofuel policy are consistent with the goal of balanced economic growth. The law specifically targets the transport sector, which accounts for 46 percent of the country's total oil consumption, which is to use biofuels through mandatory blending requirements for ethanol and biodiesel. Mandatory blending requirements can be said to lead to an increase in investments and economic activities directly and indirectly related to biofuel production. This would likely mean more employment opportunities for farmers and production workers. Social welfare guarantees for workers involved in biofuel production are provided by the statute. The law also explicitly protects the benefits enjoyed by workers (especially in the sugar industry) under other legislation.

Biofuel production is capital intensive and entails considerable financial costs. For instance, in terms of ethanol production, the required capital for the construction of production facilities is estimated at 20–30 billion Philippine pesos (US$ 0.5 to 0.75 billion) in order to meet the 10 percent blending requirement.[155] On the other hand, with respect to biodiesel production, the financial requirements for production are estimated at 250 million Philippine Pesos (US$ 6.25 million) to produce 48 million litres of biodiesel (jatropha) by 2015. These costs are broken down as follows: plantation at 155 850 million Philippine pesos, procurement centres at 13 830 million Philippine pesos, and transesterification units at 71 000 million Philippine pesos and research and development costs at 10 000 million Philippine pesos.[156]

The incentives scheme for the production of alternative fuels under the law serves to decrease the country's dependence on imported oil, in the midst of increasing oil prices on the world market. Reduced importation also means savings in foreign exchange, which the country can instead put towards the payment of loans and for international trade in other sectors.

The government policy on biofuels may be read in the context of a broader renewable energy framework, including the Renewable Energy Act. Implicit

[155] CESDR. 2005.
[156] Kuemar, P. and Paramathma M. Undated.

in the Biofuels Law is that biofuel production must meet environmental regulations such as those on environmental impact assessments. Fuel quality standards, expressed as mandatory biofuel blends are expected to have the effect of producing cleaner emissions, compared with unblended fuels. In this way, mandatory compliance with environmental regulations (with respect to production) and the use of biofuels itself are estimated to result in environmental benefits such as cleaner air and less carbon dioxide emissions.

The state-run Philippine National Oil Company, through its subsidiary the Alternative Fuels Corporation (PNOC-AFC), negotiates with various investors concerning the planting of biofuel feedstocks and construction of biofuel refineries. Its primary mandate is to explore, develop and accelerate the utilization and commercialization of alternative fuels in the country. It is also planning to undertake an initial public offering this year. Part of the preparation for the listing of its shares in the stock exchange is to enter into various joint ventures with both local and foreign firms for the construction of biofuel plants all over the country. One such venture aimed at increasing the value of stockholders' investment in PNOC-AFC is the US$ 1.3 billion deal with a UK-based bioenergy firm to build biofuel refineries and plantations in the country.[157]

The institutional arrangements created under the law with a lead agency and multi-agency cooperation, including local government units, ensures that various interests are considered. All relevant sectors are included in the dialogue at the policy level (through the National Biofuels Board) and at the implementation level, where national agencies and local governments can easily understand and play their roles.

It seems, however, that comprehensive and thorough studies regarding biofuel production that evaluate the impact on land use and address deforestation issues and concerns over competition with food production should be mandated by law, and precede any major biofuels undertaking. There appears to have been inadequate or no comprehensive studies on the impact of the biofuels policy on food security so far, considering that the production of energy crops may compete with food crops for farmland. The social and environmental impacts of biofuels have thus yet to be definitively ascertained. Concerns have been voiced in the Philippines, in particular at an Energy Summit in 2008, over the fact that biofuels production involves forest

[157] For more information, see www.ucap.org.ph.

clearing which releases more carbon dioxide into the atmosphere, and also entails the destruction of biodiversity and fragile ecosystems. Furthermore, lessons about the economic gains to be made in the biofuel sector should be drawn from the 1982 biofuels programme in the Philippines, which was subsequently suspended. This was prompted by a World Bank study,[158] which showed that the domestic resource costs of ethanol production was 15–20 percent higher than the cost of importing oil and refining an equivalent volume of gasoline. While some studies were conducted prior to the enactment of the Biofuels Act as well as DOE projections calculated on foreign exchange savings, clear and transparent assessments of actual savings when the law is implemented are needed.

The Biofuels Act declares as its objective the promotion of environment-friendly fuel alternatives. Interestingly however, the Department for the Environment and Natural Resources (DENR) is not given any specific mandate under the Biofuels Act. Additionally, the Biofuels Act itself is not explicit about environmental guarantees beyond a policy statement to protect the environment and natural habitats. While there are several environmental laws empowering DENR with a view to environmental protection, its absence in the National Biofuels Board, where various sectors are well-represented to ensure the balancing of various interests, could be noted with concern.

4.2 Challenges in enforcement

Several barriers to the implementation of the law have been identified in a study commissioned by the Department of Energy including: modifying engines to run on higher biofuel blends, lowering production costs of ethanol from sugarcane; implementing required infrastructure upgrades (e.g. more ports to accommodate biofuel transport); ensuring the financial viability of biofuels and the real contribution of biofuel to the overall energy mix and to foreign exchange savings. The challenges in developing ethanol-friendly technology for the future in the Philippines have also been identified to include:[159] modification of engines to run on pure ethanol; use of second-generation (cellulosic) feedstock (such as bagasse and corn stover) in ethanol production; design of specialized containers for ethanol as well as appropriate land and water vehicles; port system improvements; increase in

[158] World Bank.1982.
[159] CESDR. 2005.

flame luminosity of ethanol for added detection and control; and achievement of favourable energy balance in ethanol substitution to clinch foreign currency; savings and energy independence; development of cheaper material inputs for sugarcane production (e.g. stillage as fertilizers and pesticide substitutes); and optimization of system integration on the basis of power cogeneration using residue (bagasse) to bring down production costs.

These challenges have been recognized at least since 2005, but may not have all been taken into account in formulation of the Biofuels Act. Sources from the oil industry sector highlight difficulties relating to technical aspects of implementing the law such as blending and percentage requirements, the adequacy and steady supply of coco-methyl-esters (CMEs) in the country, ensuring no damage to vehicles occurs through the use of blended fuels and addressing liability issues where vehicles are damaged in this way.

While the biofuels sector has attracted significant investments to date and with more in the pipeline, present production and supply quantities are still not adequate to meet the ambitious blending targets under the law. Therefore, oil companies are allowed to import tariff-free biofuels, which temporarily negates the benefits expected from foreign exchange savings, increased economic activity and employment opportunities creation.

While the voluntary E10-blend has been available since August 2005, even before the enactment of the law, only a handful of gas stations sold it. It is currently not widely available outside of the greater Manila area. At the time of writing, the 1 percent biodiesel blend is still not available in all pumps all over the country. Thus far, the DOE has accredited three CME manufacturers.

5. CONCLUSIONS

In 2006, the Biofuels Act was heralded as a major step towards ensuring that the Philippines achieve energy security, with the added benefits of increase in employment, foreign exchange savings, and cleaner environment. Given the current under-supply and challenges in implementation, it appears that projections for investments and production, as well as the benefits gained under it, may have been overestimated. At the Energy Summit in January 2008, the lead author of the Biofuels Act, Senator Miriam Santiago, called for deferring the implementation of the law in the light of persistent concerns

over the impact of biofuels production on food security and the environment (land conversions). The quick strides taken towards biofuel promotion and use have been slowed to accommodate a broader perspective on renewable energy and "expand the portfolio of [energy] options."[160]

The Energy Summit in January 2008 showed the focus of stakeholders veering towards other renewable energy sources. This direction was confirmed with the passing of the Renewable Energy Act towards the end of 2008. The President of the National Academy of Science and Technology concluded at the Energy Summit that the impact of biofuels on energy security is minimal at 0.3 million tonnes of oil equivalent.[161] He added that the greatest benefit generated from the Biofuel Programme is increased employment. Faced with some criticism touched upon in the previous section and the difficulties of meeting the deadlines and mandatory blending requirements for ethanol and biodiesel, the focus is now to include other alternative renewable energy sources. While this more comprehensive strategy is likely beneficial for the country in its cautioned approach toward ambitious biofuels targets and a more holistic approach to renewable energy, it may send a negative signal to investors who are planning to invest or have already invested in the biofuels sector.

Despites the drawbacks highlighted above, the Biofuels Act is a clear legal instrument to enforce specific requirements concerning the production, distribution and use of biofuel blends in the transport sector, in a country seeking to diversify its energy sources away from fossil fuels. The detailed incentives structure of the Renewable Energy Act is further testament to the emphasis on diversification of energy sources evident in its provisions that detail mechanisms of promoting and supporting the utilization and commercialization of alternative energy sources.

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[160] The legislative energy agenda, after Davos 2008. Senator Miriam Defensor Santiago, Chair of the Senate Committee on Energy, available at www.doe.ph.
[161] Javier, E.Q. 2008.

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