Introduction

Biofuels for transport use is a major policy strategy to mitigate greenhouse gas emissions as well as the Philippine's over dependence on imported fossil fuel. The Philippines is implementing the National Biofuels Program that will develop and utilize biofuels as an alternative to petroleum fuels. Other activities that coincide with the said program are the establishment of support facilities to ensure security of feedstock supply and investments in supply infrastructure, directions on the availability of alternative fuel technologies for vehicles, engines and parts and potential areas.

Bioethanol is an alternative, renewable fuel mainly produced by sugar fermentation process, which serves as a substitute for fossil fuel. It is also environmentally significant because it reduces greenhouse gas emissions that contribute to climate change. In the Philippines, bioethanol is extracted from sugarcane, cassava, corn, wheat and sweet sorghum.

Bioethanol production started only when Leyte Agri Corporation and San Carlos Bioenergy, Inc. commenced their operations in February and December 2008, respectively.

Market Opportunity

Huge/Increasing Demand (Projected for 2009-2015)

YEAR	TOTAL DEMAND (in liters)
2009	208,110,000
2010	218,930,000
2011	460,630,000
2012	848,580,000
2013	509,780,000
2014	536,290,000
2015	536,290,000

- The Biofuels Act of 2006 created a guaranteed market for bioethanol because of the mandate for oil companies to blend 5% bioethanol by volume in 2009 increasing to at least 10% in 2011 on all gasoline fuel products distributed and sold in the Philippine market.
- The current capacity of the industry is only 39 million liters in contrast to the 208 million liters demand.

Demand-Supply Gap (in liters)

Year	Total Demand* (B)	Total Installed & Proposed Capacity** (A)	Surplus/[Deficit] (A-B)	Additional Processing Plant Requirement***
2009	208,110,000	58,800,000	[149,310,000]	5
2010	218,930,000	374,737,500	155,807,500	
2011	460,630,000	389,737,500	[70,892,500]	2
2012	848,580,000	399,187,500	[449,392,500]	15
2013	509,780,000	409,110,500	[100,669,500]	3
2014	536,290,000	414,468,516	[121,821,484]	4
2015	536,290,000	414,468,516	[121,821,484]	4

Note:
*Based on DOE demand estimate for bioethanol (2007-2014)
**The value for installed capacity was computed based on the submitted annual capacities of BOI and DOE-registered bioethanol companies (San Carlos Bioenergy, Inc., JG Summit Holdings Inc., Biofuels 88 Corp., Leyte Agri Corp., South Bukidnon Bioenergy Corp., Roxol Bioenergy Corp., Cavite Biofuel Producers Inc.)

*** Projected Deficit = Additional Plant Requirement
30 M li

Big Volume of Imports

- The existing bioethanol plants cannot fully supply the 5% mandate of the law; thus, Philippine oil companies resort to importation of bioethanol to meet the 2009 requirement.

Philippine Advantage

Natural Resources

- Available Land
  - 700,000 hectares of available farmland devoted solely for biofuel feedstock production which is more than the estimated 500,000 hectares of land area needed for the production of biofuel feedstock
- Major Sources of Raw Materials
  - sugarcane - ranks 5th major crop grown in the country in terms of area planted (total in 2006: 377,188 hectares)
  - sweet sorghum - a very promising feedstock for ethanol production according to the Merritt Partners 2008 report but this is not yet grown on a commercial scale in the country
  - cassava - the island of Mindanao hosts the most cassava plantations making the Autonomous Region in Muslim Mindanao (ARMM) as the top regional cassava producer in the country with 57% share

Ideal Locations

- Potential Areas for Sugarcane Cultivation

	Target Area (ha)
Lanao del Norte	38,110
South Cotabato	15,000
Saranggani	17,000
Agusan del Norte/Sur	35,000
Maguindanao	60,000
Central Palawan	29,486
Cagayan, Isabela	26,000
Sultan Kudarat/South Cotabato II	70,000
Bicol/Libanan/Sipicot	6,000
Negros Oriental	24,116
Negros Occidental	8,000
Southern Bukidnon	10,000
Total	348,712

- Potential Areas for Sweet Sorghum Cultivation

	Target Area (ha)
Ilocos	117,447
Cagayan Valley	47,517
Central Luzon	79,177
Southern Tagalog	133,736
Western Visayas	267,779
Eastern Visayas	125,214
Western Mindanao	43,265
Northern Mindanao	3,194
Southern Mindanao	26,667
Central Mindanao	54,508
ARMM	133,331
CARAGA	36,179
Total	1,088,014

- Potential Areas for Cassava Cultivation

	Target Area (ha)
Zamboanga del Norte	41,093
Pangasinan	23,490
Cagayan	36,125
Bela	65,976
Nueva Ecija	10,677
Aurora	7,461
Zambales	1,500
Bulacan	3,088
Palawan	85,822
Bukidnon	65,314
Lanao del Norte	26,011
Lanao del Sur	116,158
Total	482,716

Support Industries/Infrastructures

- Irrigation projects by the National Irrigation Administration (NIA)
- Contract growing scheme is available for those who do not want to go into plantation. It is a popular practice in the country where many farmers are willing to enter into with processors or manufacturers.

Human Resources

- Availability
  - Big labor force that is highly skilled, educated, English proficient and has strong and good work ethics.
  - The country, being an agricultural country, has many readily-available farm workers who are very knowledgeable on the details and technicalities of farming in the Philippines.

Industry Potentials

Industry Players

- There are only 2 operational bioethanol plants in the industry as of 2008:
  - Leyte Agri Corporation
  - San Carlos Bioenergy, Inc.

Investments

- Based on the submitted report of Leyte Agri Corporation and San Carlos Bioenergy, Inc. to the BOI, investment cost is at 2.3 billion pesos

Installed Capacity

Company Name	Production Capacity per Annum (in liters)
Leyte Agri Corporation	9,000,000
San Carlos Bioenergy, Inc.	30,000,000

Contribution to the Economy

- Employment generation and livelihood improvements in the rural areas
- Foreign exchange savings brought about by the decrease in fuel importation

Government Support

Laws and Policies

- The Biofuels Act of 2006 (RA 9367)
  - mandated the use of biofuels to all fuel products distributed and sold by oil companies in the Philippine market
- Omnibus Investment Code (EO 226)
  - specified the granting of incentives to biofuel investment projects/activities that are included in the Investment Priorities Plan
- PEZA Law (RA 7196)
  - specified the granting of incentives to investment projects/activities that are located within economic zones

- R-VAT Law (RA 9337)
  - provided for the value added tax on the various commodities as well as the those that will be given exemptions
- JAO 2008-1
  - provided for the guidelines governing the biofuel feedstock production, and biofuels and biofuel blends production, distribution and sale

National Biofuels Board (NBB)

- Mandated by the Biofuels Act of 2006 (RA 9367), mainly to monitor the implementation of, and evaluate for further expansion, the National Biofuels Program prepared by the DOE including the following monitor the supply and utilization of biofuels and biofuel blends

Development Plans and Programs

- The program of the government for the bioethanol industry is provided for in the National Biofuels Program, 2007-2012 under the this framework:

- Feedstock development, production and extension
- Research development and deployment
- Industry development
- Policy formulation and dissemination
- Investments, incentives and promotions
- Standards and quality assurance

Market/Technical/R&D Support

- R&D Priority Areas as provided for by the National Biofuels Program are as follows:
  - S&T Services (NBB website development and hosting with GIS capability and testing facility/analytical laboratory)
  - Sugarcane (varietal improvement, dehydration process, process enhancement, performance testing and standards development)
  - Sweet Sorghum (varietal selection, crop management, demonstration/pilot plant, by-products value-added development, performance testing and standards development)
  - Cassava/Sweet Potato (agro & processing techno-economic study)

Financial Support/Guarantee

- Credit assistance provided for by the Land Bank of the Philippines and the Development Bank of the Philippines for agri-based and renewable/alternative energy sources projects

Incentives

Fiscal

- RA 9367 (The Biofuels Act of 2006)
  - zero specific tax
  - VAT exemption
  - Wastewater charges exemption
  - Financing activities by government financial institutions
- EO 226 (Omnibus Investment Code)
  - Income Tax Holiday
  - Importation of consigned equipment for 10 years
  - Zero percent duty importation of capital equipment, spare parts and other accessories
- RA 7196 (PEZA Law)
  - Income Tax Holiday
  - special 5% tax on gross income
  - tax and duty-free importation
  - exemption from export taxes, wharfage dues, impost and fees
  - exemption of payment of local government fees
  - Zero percent VAT
- RA 9337 (R-VAT Law)
  - zero rate for ethanol and biodiesel

Non-Fiscal

- EO 226 (Omnibus Investment Code)
  - Employment of foreign nationals
- RA 7196 (PEZA Law)
  - Special Investor's Visa
  - employment of foreign nationals
  - simplified import and export duties

Others

- Financial Assistance by Government Financial Institutions
- Promotions by BOI, PEZA, investment promotion agencies (i.e. Clark Development Corporation, SBMA), DOE

Costs of Doing Business

Project Cost for a Distillery Capacity of 100,000 liters per day

Related Expenses	Cost (in Million USD)	
	Adjunct	Stand Alone
Industrial		
Civil Works, Land, Buildings	2.90	6.21
Machinery	11.59	17.59
Energy System, Environmental	2.07	3.10
Agricultural (if not yet developed): 7,000 has	14.48	14.48
Total	31.04	41.38

Note: Green areas will require 20%-30% more expenses agriculturally due to clearing and more extensive pre-development operations (add USD 4.14 M).
The high investment cost will necessitate a sound overall environment, specifically addressing the cane supply issue, before any investment will be realized.

Salaries and Wages

- Minimum Daily Wage Rate (as of May 2009)

REGION	AGRICULTURAL WORKERS (in USD)	
	Plantation (in USD)	Non-Plantation (in USD)
CAR	4.84	4.84
I	4.55	4.03
II	4.53	4.53
III	5.26	5.26
IV-A	5.28	5.28
IV-B	4.18	4.18
V	4.39	3.97
VI	4.51	4.51
VII	4.66	4.66
VIII	4.53	4.53
IX	4.45	4.03
X	4.88	4.88
XI	5.28	5.28
XII	4.66	4.55
XIII	4.61	4.61
ARMM	4.35	4.35

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