



The Government of the
Philippine Republic



BIOFUELS INITIATIVES IN THE PHILIPPINES

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California Biomass Collaborative 4th Annual Forum

March 27, 2007

Sacramento, California





Biofuels Policy Framework

- measure to help address energy security (especially in light of oil supply security concerns and the impact of oil price increases)
- basic policy framework
 - public policy to establish mandatory market and standards to jumpstart private sector investments in production and infrastructure support facilities
 - establish policy framework and support facilities to ensure security of feedstock supply and investments in supply infrastructure



The Biofuels Bill

signed into law on Jan 12, 2007 as RA9367

- Objectives
 - i. To reduce the Philippine's dependence on imported oil
 - ii. To increase the economic activity in the country and boost employment
 - iii. To improve energy efficiency
 - iv. To contribute in improving air quality

- Mandates minimum blend into all diesel and gasoline fuels for as follows:
 - i. 1% biodiesel within 3 months from effectivity of the Act
 - ii. 5% bioethanol within 2 years from effectivity of the Act

- Future increase in mandatory blends to be determined by the Biofuels Board



Other Features of the Biofuels Bill

● Incentives

- Zero specific tax per liter of volume capacity
- Sale of raw material exempted from VAT
- Exemption of water effluents from wastewater charges
- Government Financial Institutions to accord high priority financing for related activities



Biofuels Program Targets

- Target per major feedstock
 - 5% - 10% ethanol blend with gasoline for vehicles by 2010
 - 1% - 2% CME blend with diesel fuel for vehicles in 2010
 - viability study for jatropha curcas potential as a biodiesel



Pursuing Biofuels Use in Various Fronts

1. Transport use - Biofuels Bill is focused on motor transport sector
2. Power or Industrial Fuel use - tests are currently being done
 - DOST's Romblon CME tested at Tablas NPC Diesel Plant
 - Establishing separate standards for industrial use
 - Renewable Energy Bill is expected to encourage use of renewable energy to power generation systems
3. Alternative fuel for cooking - innovative stoves being developed locally that can use biomass residues, biogas, coal briquettes, plant oil or used cooking oil



Bioethanol Program

Actions completed/ongoing

Policy Action/Program Activities

- Technical, economic & pricing study on production and use
- Promulgation of standards and accreditation procedures (ongoing)
- Multi-sector/inter-agency linkages

Supply Infrastructure

- Bioethanol imports (encouraged by reduction in tariffs)
- Blending facilities/distribution network: use of existing downstream oil industry infrastructure
 - voluntary E10 blend available at pump since Aug 2005
 - E10 available in all 104 *Seaoil* stations nationwide and in 4 *Flying V* and 31 *Shell* stations in Metro Manila

Technology

- Laboratory and engine testing
- Availability of flexi-fuel vehicles
 - incentives: reduction in tariffs via EO
 - investments: Ford Philippines FFV plant online by 2008



Bioethanol Program

Activities needed for 5% -10% gasoline blend by 2010

Required Policy Action

- Biofuels Act signed on 12 Jan 2007

Supply Infrastructure

- Bioethanol production capacity
 - required production capacity: 25 plants of 30 million lis/yr capacity each

Blend	Bioethanol Reqts, in million li.	Addl Plants Req'd (Inv Req't)	Cane Hectarage Req'd 1/	Req'd Cane Yield Improvement 2/
E5 (Yr 1-2)	268	9 (US\$ 260 M)	63,810	17%
E10 (Yr 3)	565	9 (US\$ 260 M)	135, 000	35%
E10 (Yr 8)	721	7 (US\$ 200 M)	171,667	43%

Notes: 1/ Assuming no yield improvement. 2/ Assuming no additional area planted to sugarcane



Bioethanol Program

Activities needed for 5% -10% gasoline blend by 2010

ii. capacity currently committed

- 264 million liters per year (880,000 liters/day) committed projects; (NDC-Bronzeoak operational by end 2008 + 3 prospective investors given BOI endorsement) which is already close to meeting the mandatory E5 blend
- Petron committed to purchase 500,000 liters/day of capacity from Bronzeoak
- Conversion of existing sugarmills will take 6-8 mos; greenfield facilities to take 18- 24 mos

Ethanol Projects	Location	Capacity (liters/day)
San Carlos Bioenergy	Vis	100,000
Tamlang Valley Ethanol	Vis	200,000
First Pampanga Biofuels	Luz	200,000
Southern Bukidnon Bioenergy	Min	100,000
JG Summit Holdings Inc.	Vis	100,000
Canlaon Alcogreen Inc. Energy	Vis	60,000
Negros Green Resources Inc.	Vis	120,000



Bioethanol Program

Activities needed for 5% -10% gasoline blend by 2010

- Blending facilities and distribution network: reliance on existing downstream oil industry facilities
- Supply of feedstock, with initial focus on sugar-based ethanol
 - * For expansion: SRA surveyed areas totaling *194,596 hectares*. Independent firms surveyed areas totaling *102,000 hectares*
 - * Areas for conversion (100% shift from sugar to ethanol) as dedicated ethanol districts totaling *65,519 hectares*



Bioethanol Program

Activities needed for 5% -10% gasoline blend by 2010

Technology

- technology compatibility and further engine testing
- capacity building for vehicle maintenance and repair

Development of other bioethanol feedstock

(e.g., cassava, sweet sorghum)

- research and development for compatible technology
- promulgation of standards
- supply chain and feasibility
- additional land area required

IEC and Market Development

- Tri-media campaign, consultations, seminars



Total Existing Plantation Hectarage

Feedstock Type	Area Planted (hectares)	Feedstock Yield (thousand metric tons)	Bioethanol Yield (million liters)	Production Cost (Php)/ MT feedstock	Equivalent Cost of Bioethanol (Php)
Sugarcane*	389,421	23,981	1636	1300-1400	33.52-35.93
Corn**	2,442,000	5,254	2102	6940-7500	39.72-41.76
Cassava	205,755	1,641	295	3000-3500	40.62-43.62
Sweet Sorghum	Under study	na			

Bureau of Agricultural Statistics – DA ; Sugar Regulatory administration – SRA ; *2003 data for sugar cane
** 2005 data for corn

Productivity assumptions:

Sugarcane: 1 ha. = 60 MT , 1 MT = 70 liters Ethanol

Corn: 1MT = 400 liters Ethanol

Cassava: 1 MT = 180 liters/ bioethanol



Biodiesel Program

- **Two possible bio-diesel feedstock**
 - **Coco-Biodiesel or Coco Methyl Ester (CME):**
1% to 2% CME blend with diesel fuel for vehicles by 2010
 - **Jatropha Methyl Ester (JME):** Targets to be set after viability and pilot study
- **CME is commercially available while JME is in its pilot testing stage**



Biodiesel Program

Completed and ongoing activities

Policy Action/Program Initiatives

- Technical, economic & pricing study on production & use
- Standards promulgation in May 2003
- Accreditation procedures in place
- MC 55 mandated use of 1% CME by Volume in the diesel requirements of government vehicles in *Feb 2004*
- LGUs, particularly, Baguio, Isabela, and Davao, issued a resolution encouraging the use of CME by all its motorists.

Technology

- Laboratory and engine testing
- Numerous studies conducted



Biodiesel Program

Completed and ongoing activities

Supply Infrastructure

- CME biodiesel supply available locally
- Refinery capacity already meets B1 reqts; excess capacity exported at the moment
- Blending facilities/ distribution network: will use existing downstream oil industry infrastructure
- voluntary B1 available in Flying V stations at pump
- available in bottles in gas stations and other dealers: blending undertaken by motorists/vehicle owners

BIODIESEL PRODUCTION CAPACITY

(million liters/year)

Accredited Biodiesel Producers

Chemrez Inc.	75.00
Senbel Fine Chemicals Inc.	72.00
Romtron Philippines	0.30
Mt. Holly Coco*	4.00
Pure Essence*	60.00
Sub-Total	211.30

Biodiesel Producers for Accreditation

Atson Coco
Lion Chemical Corp.
Freyvonne Milling Services
Green Evolution
Unistar Oleochemical

**provisional accreditation*



Biodiesel Program

Activities needed for 1% - 2% diesel blend by 2010

Required Policy Action

- Biofuels Act signed on 12 Jan 2007

Supply Infrastructure

- Biodiesel supply available locally
- Existing downstream oil industry infrastructure may be used as blending facilities/distribution network

Supply of Feedstock *(Requirement based on transport demand)*

Year	Blend	Biodiesel Requirement (million li/year)	Additional Plants Required ¹	Required Coconut Hectarage ²	% Current Coconut Oil Production ³
2007	1%	41	none	85,854	3%
2008	2%	85	none	178,083	6%
2010	5%	229	2	477,708	16%
2015	5%	277	2	577,500	20%

1/ Assuming 1 plant has capacity of 40 million liters/year

2/ 480 liters of coconut oil per hectare

3/ Current coconut oil production is 1.4 billion li/year; 80% for export, 20% local consumption



Biodiesel Program

Activities needed for 1%-2% diesel blend by 2010

Technology

- technology compatibility and further engine testing
- capacity building for vehicle maintenance and repair

Development of other possible feedstock (e.g., jatropha)

- research and development for compatible technology
- promulgation of standards
- supply chain and feasibility
- additional land area required

IEC and Market Development

- multi-media campaign, consultations, seminars



Current Developments on Jatropha

Jatropha Plantations

PNOC-EDC - established jatropha nursery 5 hectares plantation in Dacong Cogon Negros Occidental in coordination with D1 Oils (3 mos. old)

PFC - 35 has. Plantation in Fort Magsaysay Nueva Ecija in collaboration with Phil. Army (1 year old) and established nursery in Ligao Albay

Provincial Government of Camarines Sur - 10 has. plantation in collaboration with PAFC (6 mos. Old)

D1 Oils - 200 has. Plantation in Gen. Santos (3 mos. Old)

Lacto Asia - 17 has. Plantation in Camarines Sur (flowering)



Potential Fuel Displacement (For Transport Use)

• Biodiesel

Scope	Blend	Diesel Displacement (<i>million liters</i>)	FOREX Savings (<i>million US\$</i>)
Government	1%	0.98	0.54
Nationwide	1%	78 (2007)	50
	2%	173 (2010)	110
	2%	209 (2015)	133

• Bioethanol

Blend	Gasoline Displacement (<i>million liters</i>)	FOREX Savings (<i>million US\$</i>)
5%	255 (2008)	184
10%	565 (2010)	406
	721 (2015)	519

Assumptions:

Diesel price: P32/liter. Gasoline price :P36/liter

Exchange rate: P50/\$



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**Thank You
and
Mabuhay!**