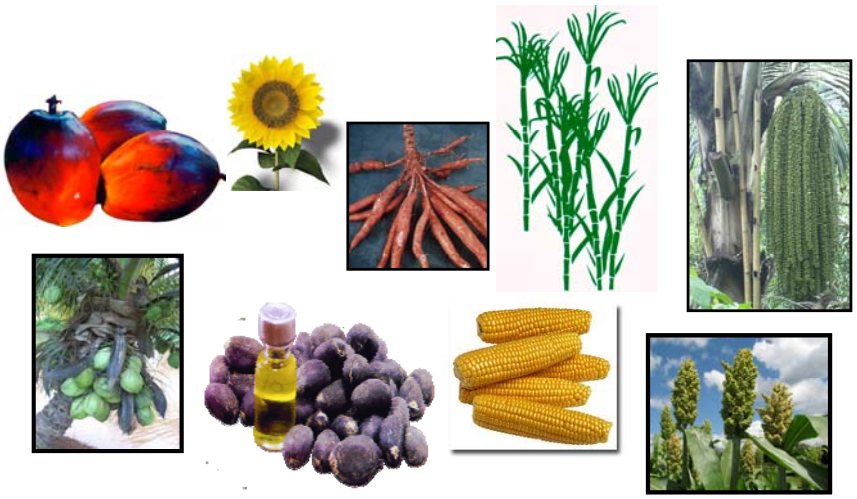
SBRC
Bioenergy Alliance
sinarmas



Challenges of Biofuel Industry in Indonesia

By : Praptiningsih G. Adinurani
Anggi Nindita
Roy Hendroko

Workshop on Renewable Energy & Sustainable Development in Indonesia
Past Experience – Future Challenges
Le Meridien Hotel, Jakarta, 19-20 January 2009

Out Line Presentation

- Why biofuel important for Indonesia ?
- Roadmap biofuel Indonesia 2005-2025
- Biofuel usage in 2007
- Mandatory biofuel
- Are we ready ?
- Biodiesel from CPO
- Suplementary feedstock :*Jatropha curcas*
- CJO for substitution kerosene
- Problem of bioethanol
- Bioetanol for substitution kerosene
- Impact of oil price decreasing

SBRC Bioenergy Alliance

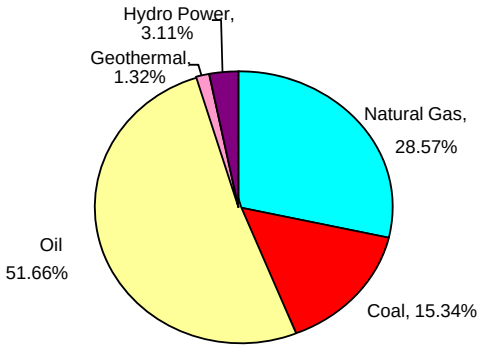
sinarmas

KADIN INDONESIA

ASOSIASI PRODUSEN BIOFUELS INDONESIA

1. Why Biofuel ?

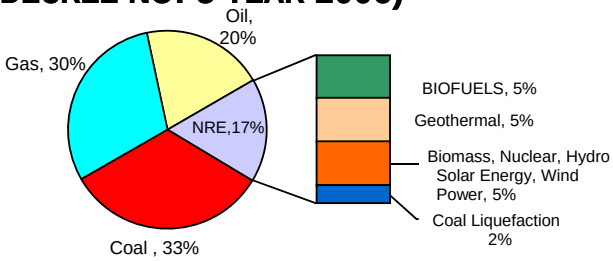
CURRENT ENERGI MIX
National (Primary) Energy Mix



Target in 2025

1. Less than 1 for energy elasticity
2. Optimized primary energy mix

NATIONAL ENERGY POLICY
(PRESIDENTIAL DECREE NO. 5 YEAR 2006)



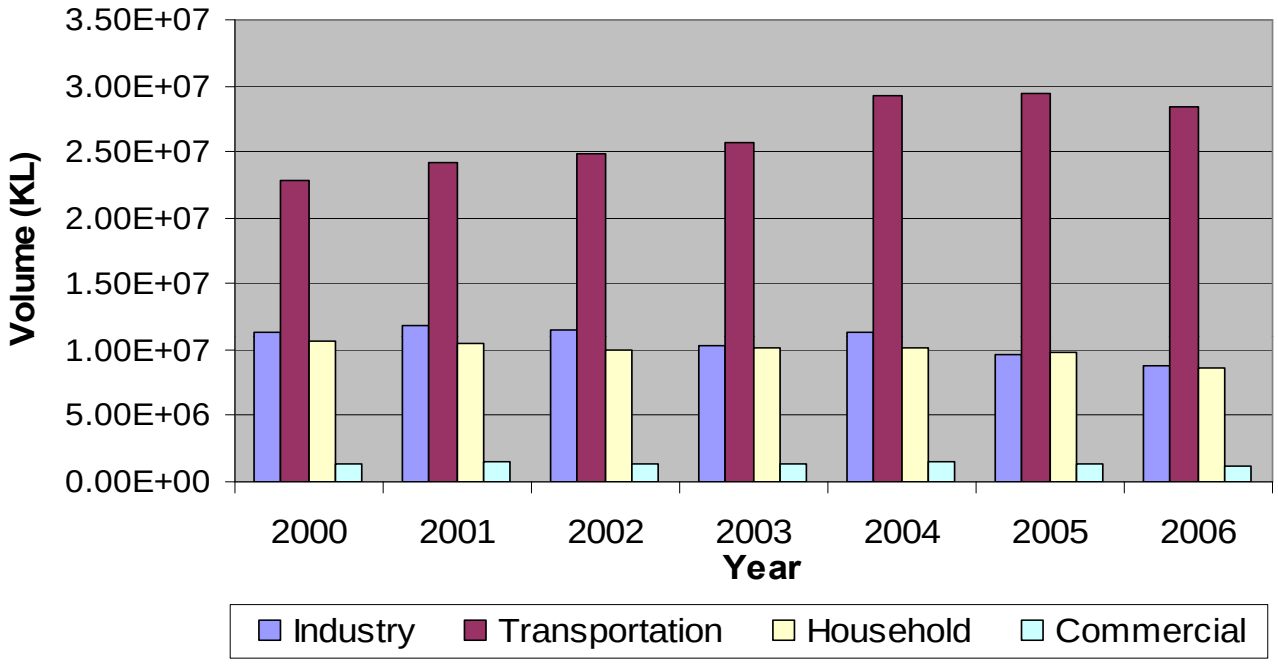


Figure 2. Consumption of Oil Fuel per sector in Indonesia , Year 2000 - 2006

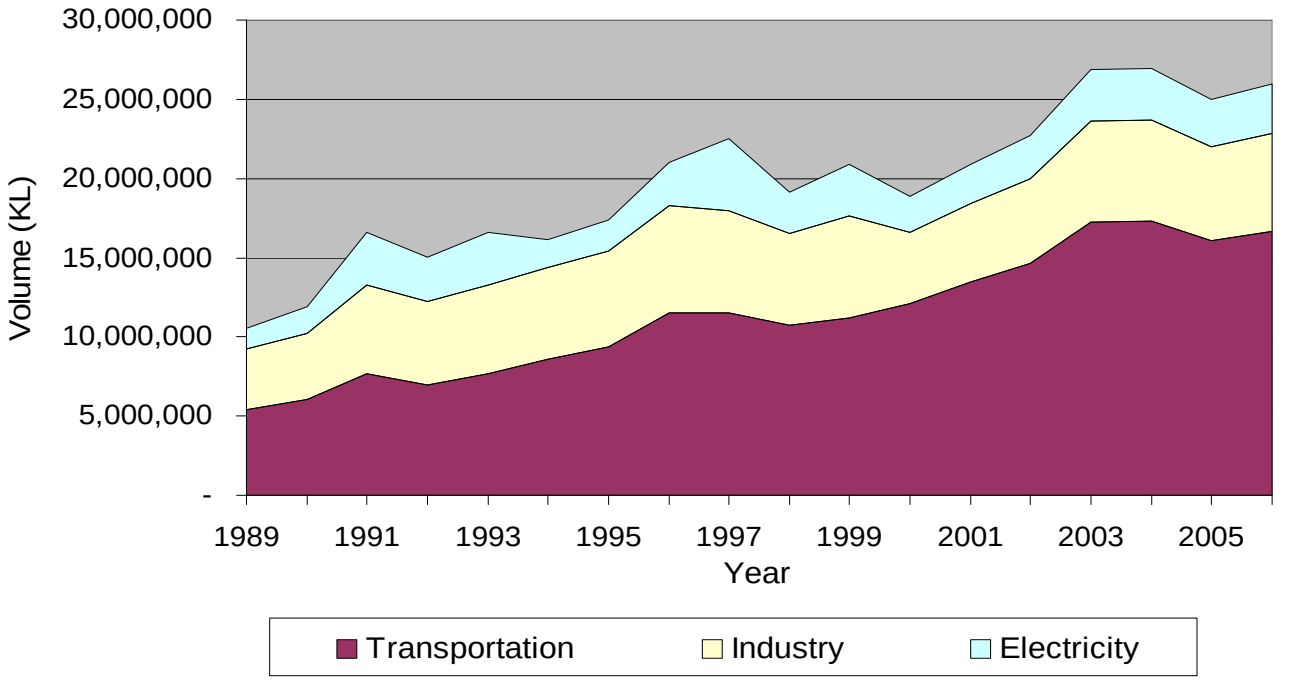


Figure 3. Consumption of Diesel Fuel Per Sector Year 1989 – 2005

sinarmas

JAKARTA,

Dipasok dari kilang mana ?

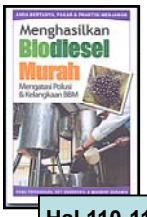
Polusi Solar

ro-2 : 500 ppm

g yang "aman"

dari 8 kilang

Hal 8-13



Hal 110-115

KILANG	PURATA S ppm	MIN S ppm	MAX S ppm
Teluk Semangka & Kalbut	3.500	2.500	5.000
Plaju	900	600	1.500
Balongan	300	200	3.500

Sumber : Swiscontact dan Lead Information Center, 2008

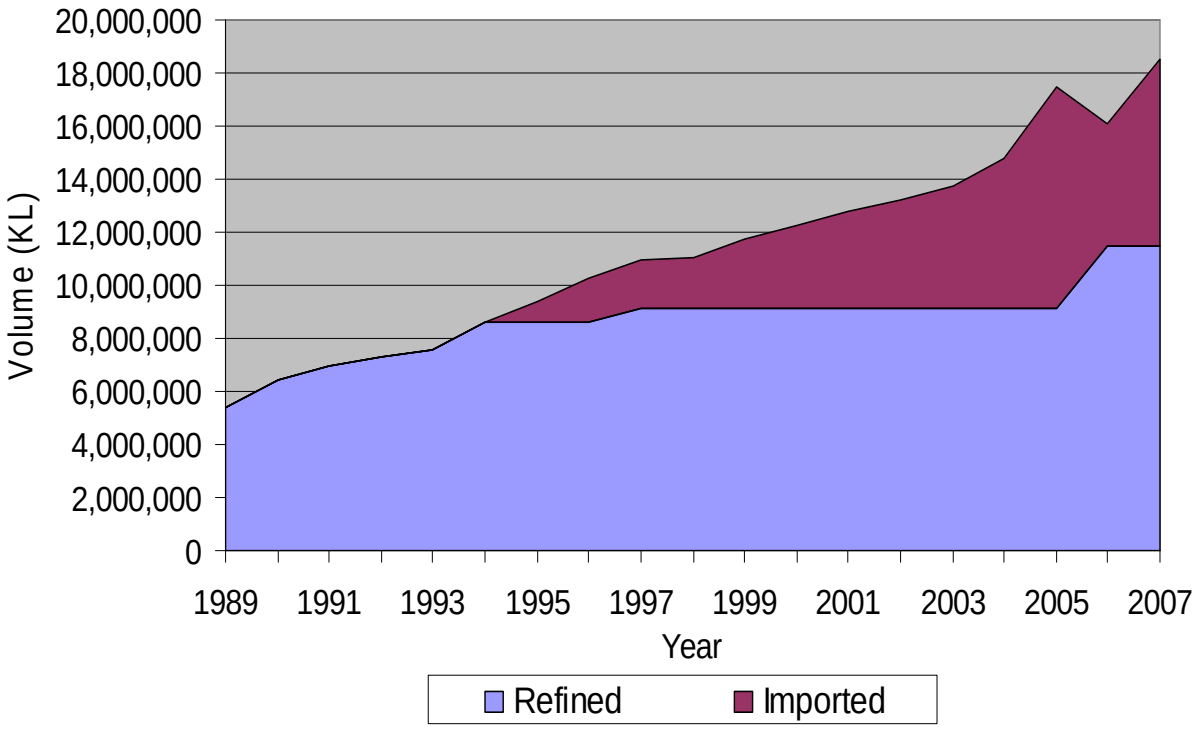


Figure 4. Premium Usage in Transportation Sector Year 1989-2007

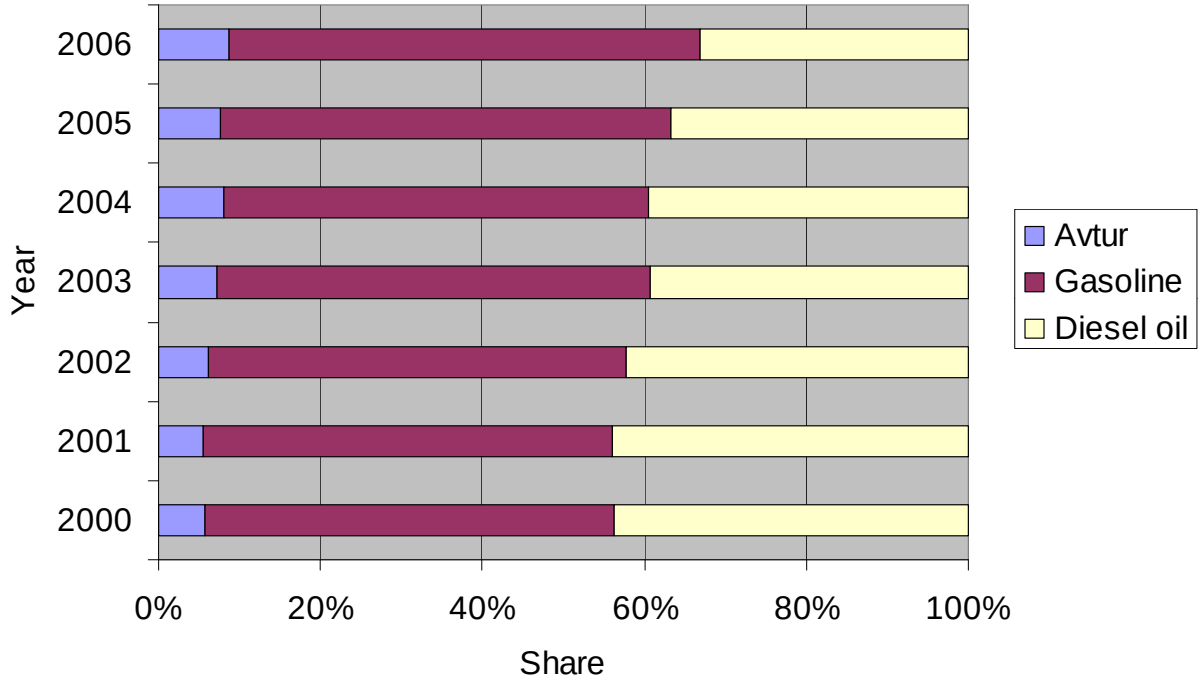


Figure 5. Premium Usage Compare to Diesel oil in Transportation Sector at The Year 2000 - 2006

2 ROADMAP FOR BIOFUELS DEVELOPMENT

Year	2005-2010	2011-2015	2016-2025
Biodiesel	Biodiesel Utilization 10% of Diesel Fuel Consumption 2.41 million kL	→ Biodiesel Utilization 15% of Diesel Fuel Consumption 4.52 million kL	→ Biodiesel Utilization 20% of Diesel Fuel Consumption 10.22 million kL
Bioethanol	Bioethanol Utilization 5% Gasoline Consumption 1.48 million kL	→ Bioethanol Utilization 10% Gasoline Consumption 2.78 million kL	→ Bioethanol Utilization 15% Gasoline Consumption 6.28 million kL
Bio-oil - Biokerosene	Biokerosene Utilization 1 million kL	→ Biokerosene Utilization 1.8 million kL	→ Biokerosene Utilization 4.07 million kL
- Pure Plantation Oil for Power Plant	PPO Utilization 0.4 million kL	→ PPO Utilization 0.74 million kL	→ PPO Utilization 1.69 million kL
BIOFUELS	BIOFUELS Utilization 2% of energy mix 5.29 million kL	→ BIOFUELS Utilization 3% of energy mix 9.84 million kL	→ BIOFUELS Utilization 5% of energy mix 22.26 million kL

3. Biofuel Usage in Indonesia 2007

Type of BBM	Domestic BBM	Domestic BBN	Percent
	Usage 2007		
Diesel PSO	10,883,740 KL	16.000 kl	0,147
Diesel Non PSO	14,649,151 KL	--------	-----

Biofuel	Feedstock avabiality	Domestic Usage	Percent
Biodiesel	Crude Palm Oil 17.5 Million Tons	16,000 Kl	0,078

Bioetanol Usage in Indonesia 2007

Discription	Feedstock Avaibility	Usage 2007	Percent
Ethanol	1,2 juta ton	1.000 kl	0,083
Premium	-PSO =17.929.843 Kl		
	-non PSO = 249.448 Kl		
	-total =18.179.291 Kl	ethanol = 1.000 kl	0,0055
Molases	800.000 ton **)	4.000 kl *)	0,5

Note: *) molases conversion 1:4, calculated 1.000 x 4 = 4.000 ton
**) molases production in Indonesia ± 1,4 milions ton/year,
600 ton used to ethanol industry,
600 ton used to MSG & feed industry, and 200 ton export

REGULATIONS related to BIOFUEL DEVELOPMENT

1. Presidential Regulation No. 5/2006 on National Energy Policy
2. Presidential Instruction No. 1/2006 on Supply and Utilization of Biofuel as Alternative Fuel
3. Presidential Decree No. 10/2006 on The Establishment of National Team for Biofuel Development
4. Estate Crop Law No. 18/2004
5. Government Regulation No. 1/2007 on Income Tax Facilities for Investment Activities in Specific Industries and/or Particular Region
6. Government Regulation No. 8/2007 on The Government Investment
7. Law No. 22/2001 on Oil and Natural Gas
8. Presidential Regulation No. 36/2004 on Oil and Natural Gas Downstream Activities

REGULATIONS related to BIOFUEL DEVELOPMENT (continu)

9. Minister of Energy and Mineral Resources Decree No. 051/2006 on Guideline and Procedure for Biofuel Businesses
10. Minister of Finance Decree No. 117/PMK.06/2006 on Credit for the Development of Biofuel Energy and Plantation Revitalization
11. National Standard (SNI) for Biodiesel No. 04 – 7182 – 2006
12. National Standard (SNI) for Bioethanol No. DT27 – 0001 – 2006
13. Director General for Oil and Gas Decree No. 3674K/24/DJM/2006 on Gasoline Specification for Domestic Market
14. Director General for Oil and Gas Decree No. 3675K/24/DJM/2006 on Diesel Fuel Specification for Domestic Market
15. Director General for Oil and Gas Decree No. 13483K/24/DJM/2006 Biodiesel Specification for Domestic Market
16. **Minister of Energy and Mineral Resources Decree No. 032/2008 on Mandatory for Biofuel**

Enclosure

4. Mandatory

DEPARTEMEN ENERGI DAN SUMBER DAYA MINERAL

LAMPIRAN PERATURAN MENTERI ESDM NO... TAHUN 2008 TENTANG PENYEDIAAN, PEMANFAATAN DAN TATA NIAGA BAHAN BAKAR NABATI (BIOFUEL) SEBAGAI BAHAN BAKAR LAIN

32/2008

PENTAHAPAN KEWAJIBAN MINIMAL PEMANFAATAN BIODIESEL

Jenis Sektor	September 2008 s.d Desember 2008	Januari 2009	Januari 2010	Januari 2015**	Januari 2020**	Januari 2025**	Keterangan
Rumah Tangga	-	-	-	-	-	-	Saat ini tidak digunakan
Transportasi PSO	1 % (excisting)	1 %	2,5 %	5 %	10 %	20 %	* Terhadap kebutuhan total
Transportasi Non PSO	-	1 %	3 %	7 %	10 %	20 %	
Industri dan Komersial	2,5 %	2,5 %	5 %	10 %	15 %	20 %	* Terhadap kebutuhan total
Pembangkit Listrik	0,1 %	0,25 %	1 %	10 %	15 %	20 %	* Terhadap kebutuhan total

** Spesifikasi disesuaikan dengan spesifikasi global dan kepentingan domestik

Enclosure

DEPARTEMEN ENERGI DAN SUMBER DAYA MINERAL

LAMPIRAN PERATURAN MENTERI ESDM NO... TAHUN 2008 TENTANG PENYEDIAAN, PEMANFAATAN DAN TATA NIAGA BAHAN BAKAR NABATI (BIOFUEL) SEBAGAI BAHAN BAKAR LAIN

PENTAHAPAN KEWAJIBAN MINIMAL PEMANFAATAN BIOETANOL

Jenis Sektor	September 2008 s.d Desember 2008	Januari 2009	Januari 2010	Januari 2015**	Januari 2020**	Januari 2025**	Keterangan
Rumah Tangga	-	-	-	-	-	-	Saat ini tidak digunakan
Transportasi PSO	3 % (excisting)	1 %	3 %	5 %	10 %	15 %	* Terhadap kebutuhan total
Transportasi Non PSO	5 % (excisting)	5 %	7 %	10 %	12 %	15 %	* Terhadap kebutuhan total
Industri dan Komersial	-	5 %	7 %	10 %	12 %	15 %	* Terhadap kebutuhan total
Pembangkit Listrik	-	-	-	-	-	-	* Terhadap kebutuhan total

** Spesifikasi disesuaikan dengan spesifikasi global dan kepentingan domestik

(5) Are We Ready ??

TABLE 8

ASOSIASI PRODUSEN BIOFUELS INDONESIA

BIODIESEL PRODUCTION CAPACITY & LOCATION

Status : September 2008

	COMPANY	LOCATION	2008		2009	
			Capacity KL/Yr	Domestic KL/Yr	Capacity KL/Yr	Domestic KL/Yr
1	**Asian Agri Tbk**	Lubuk Gaung, Dumai	200.000	**70.000**	200.000	**80.000**
2	**Energi Alternatif IndonesiaPT**	Jakarta	300	**300**	1.000	**1.000**
3	**Eterindo Wahanatama Tbk**	Gresik & Cikupa	120.000	**120.000**	240.000	**240.000**
4	**Darmex Biofuel PT**	Bekasi	150.000	**30.000**	150.000	**60.000**
5	**Ganesha Energy Group**	Medan	3.000	**3.000**	10.000	**10.000**
6	**Indo Biofuels Energy PT.**	Merak	60.000	**60.000**	160.000	**100.000**
7	**Multikimia Intipelangi PT.**	Bekasi	5.000	**5.000**	10.000	**10.000**
8	**Musim Mas Group**	Medan	50.000	**10.000**	350.0000	**100.000**
9	**Permata Hijau Group**	Duri	200.000	**75.000**	200.000	**120.000**
10	**Sumi Asih PT.**	Bekasi & Lampung	100.000	**50.000**	200.000	**100.000**
11	**Wilmar Group**	Dumai	700.000	**300.000**	1.000.000	**300.000**
	Total		**1.588.300**	**723.300**	**2.521.000**	**1.121.000**

TABLE 12 BIOETHANOL

ASOSIASI PRODUSEN BIOFUELS INDONESIA

PRODUCTION CAPACITY & LOCATION

No.	COMPANY	LOCATION	2008		2009	
			CAPACITY (KL)	Domestic (KL)	CAPACITY (KL)	Domestic (KL)
1	**Anugrah Kurnia Abadi PT./ B2TP**	Lampung	2.500	**2.500**	2.500	**2.500**
2	**Medco Group**	Lampung	60.000		60.000	
3	**Molindo Raya Industrial**	Lawang & Lampung	12.000	**12.000**	50.000	**50.000**
4	**Sugar Group**	Lampung	70.000		100.000	
	Jumlah			**14.500**		**52.500**

sinarmas

???

6. Biodiesel from CPO

Availability of CPO

Food
Feed
Energy

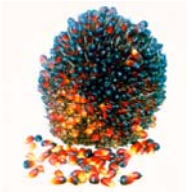


TABLE 5

Type of BBM	Domestic BBM Usage 2007	Feedstock Availability	Biofuel Usage (5%)	Percentage of Feedstock Usage
Diesel Fuel (PSO)	10,883,740 KL	17.500.000 MT ~ 20.114.943 KL	544.187 KL	2,71 %
Diesel Fuel Non Subsidy	14,649,151 KL	17.500.000 MT ~ 20.114.943 KL	732.458 KL	3,64 %

Source : Tjakrawan, 2008 (diolah kembali)

< 7%

sinarmas

SOLAR-biodiesel/POME

- CPO Production : 17,5 millions ton
- Domestic Usage : 4.5 million (26%)
- CPO Export : 13 million (74%)

6,35 :Biodiesel
25,71 : Cooking Oil
TOTAL : 32.06%

B-20 :
- 29,18 % BBN
- 25,71% C.O.

Total : 54,89%

7. Suplementary Feedstock

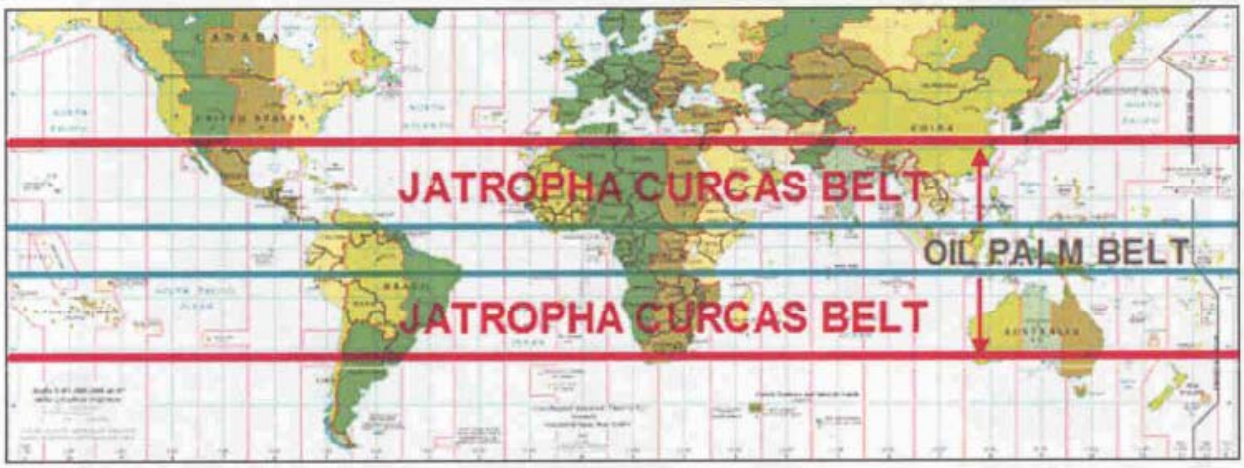


Figure 2. *Global indication of the most suitable climate conditions for the growth of Jatropha (J. curcas L.) (30° N, 35° S) and Oil palm (Elaeis guineensis Jacq.) (4° N, 8° S).*

A 50:50 blend of the oily nut from the jatropha tree and Jet A1 fuel

December 30, 2008, *11:33 am*

Air New Zealand Flies on Engine With Jatropha Biofuel Blend

By James Kanter

Air New Zealand's Capt. David Morgan with vials of jatropha oil and Air New Zealand's biofuel blend.

Yunnan Jatropha
Research Center

Shao Tu Long
Mengzi, Yunnan

Agust 16th-20th, 2008

Malaysia
Kuala Pilla

China
Honghe, Yunnan

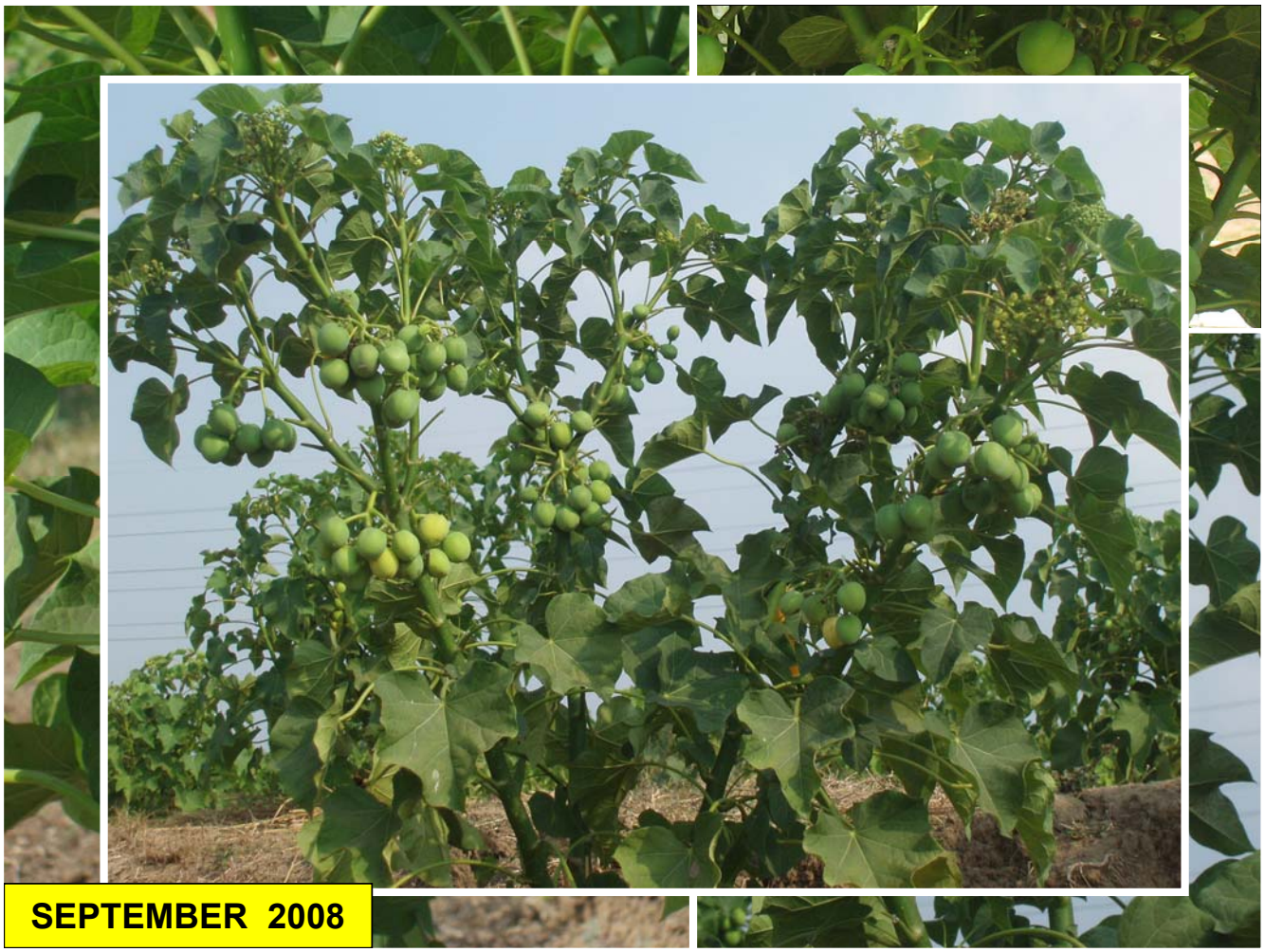
sinarmas

Tamil Nadu and Rajasthan
January 2006

India

Klon RNI - Jatitujuh
Maret 07

India



SEPTEMBER 2008

Jatropha Strains: Indonesia

The pictures below are high-yielding jatropha strains from Indonesia that we have propagated there and in our Florida nursery. These plants generate over 4kg of seeds per plant per year or over 10mt per hectare, and as noted below are fruiting after 6 months. Biogreen Oil currently operates a nursery with 10,000 of these plants created via cuttings in Florida.

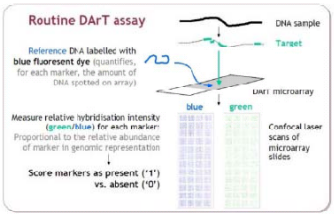
153 days
64 fruits/branch

180 days

Indonesian Jatropha Plants in Biogreen Oil's Florida Nursery

High volume genetic analysis is possible

- We can simultaneously measure 3000 markers for 96 individual plants.
- Cost. less than $100.



A molecular-based breeding program is not only possible, it is compelling.

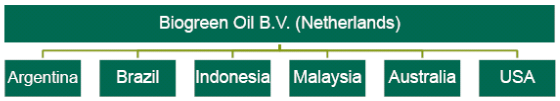
Biogreen Oil Technology

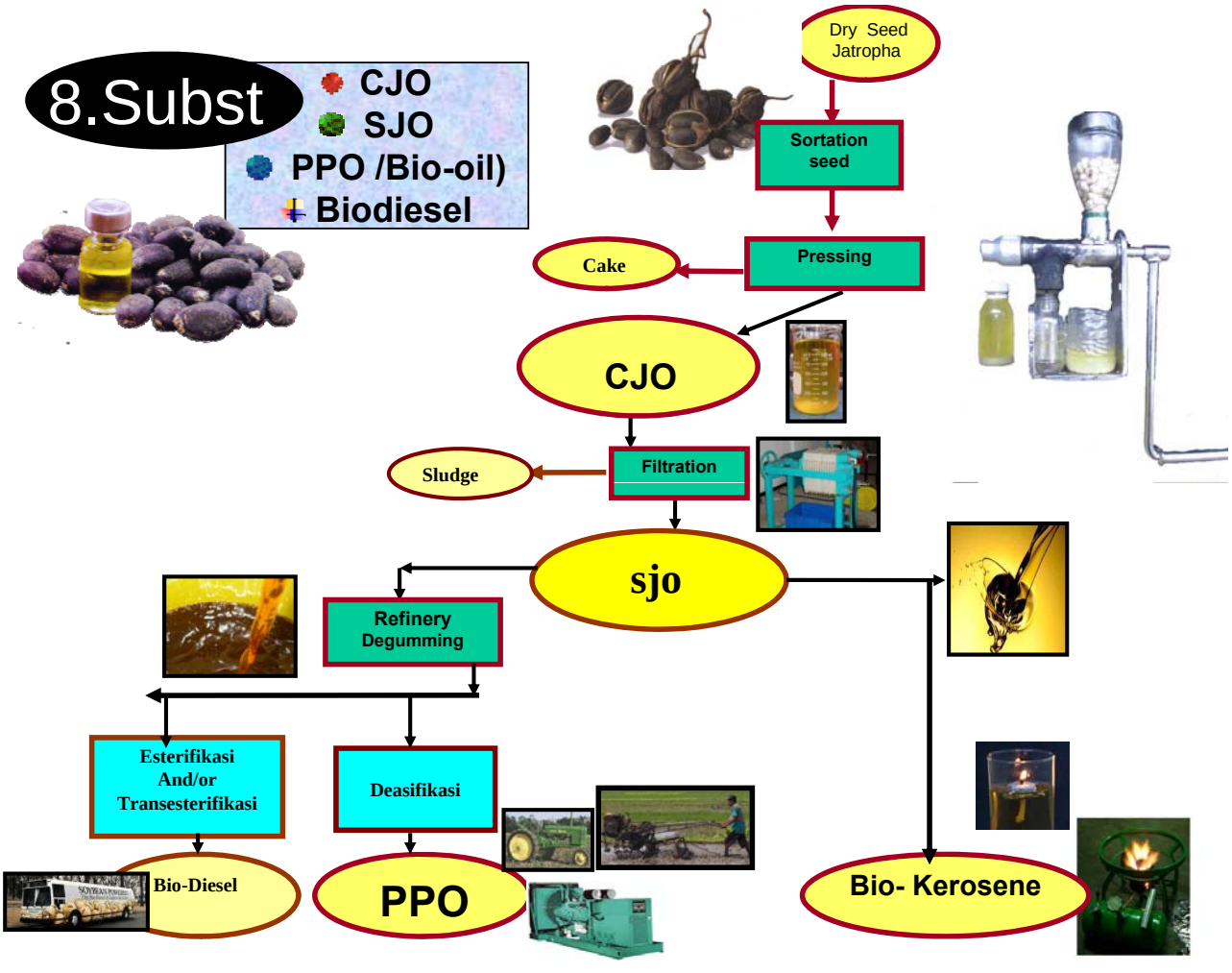
- Mechanical Seeding Developed mechanical seeding machine for jatropha.
- Plantation Organization Developed and tested unique methods of plantation organization in order to minimize harvesting expenses while maintaining production levels.
- Intercropping Tested and developed intercropping practices.
- Mechanical Harvesting Developed patent on mechanical harvesting machine.
- Jatropha Strains Identified and posses high yielding strains of Indonesian and Brazilian Jatropha curcas.
- Cloning Solution Developed a cloning solution that kick-starts plant development and also forces significant root growth.
- Tissue Culturing Have performed tissue cultured propagation of jatropha in partnership with Agristarts.
- Biomass Conversion Significant experience in biodiesel refinery process
- Processing & Refining 15 and development. Researched catalytic and fast pyrolysis biomass conversion for use in optimal extraction process.

Who We Are

Biogreen Oil's mission is to develop renewable and sustainable sources of biofuel to aid in the reduction of greenhouse gas emissions.

- We plan to fulfill this mission primarily by cultivating jatropha curcas, a crop with the potential to yield fuel without squeezing out food production or reducing biodiversity, and with the potential to help rural economies.
  - Biogreen Oil cultivates jatropha primarily through plantations which we directly operate.
  - Biogreen Oil actively intercrops alternative plantings for local food production and additional biofuel feedstock.
  - Biogreen Oil's extraction and production facilities provide local farmers with opportunities to use marginal lands on which to plant jatropha. Biogreen Oil will manages all downstream operations ensuring the farmer can concentrate on what they do best, growing plants.
  - In addition to Jatropha, Biogreen Oil is developing other high yielding, non food competing Biofuel energy feedstocks.
- Our team is a blend of experience from farming, finance and marketing.
- The company is a Netherlands corporation but is developing operations around the world through local subsidiaries and partnerships.



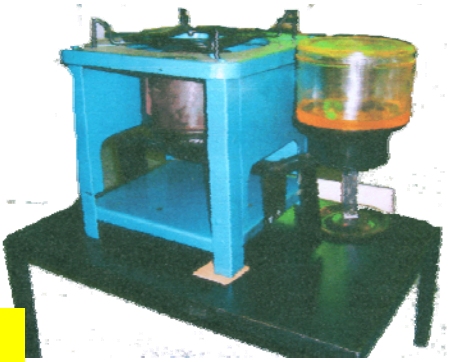


CJO STOVE

Bio Kerosene

Presure Stove

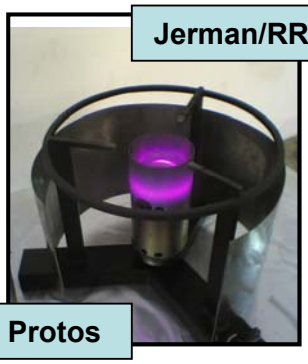
Sumber : ITB



Wick Stove

Sumber : PT KEI

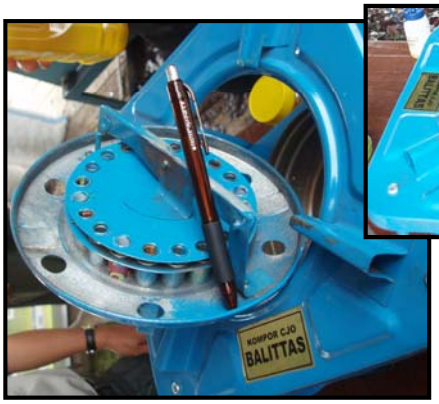
RNI



Jerman/RRC

Protos

Tracon



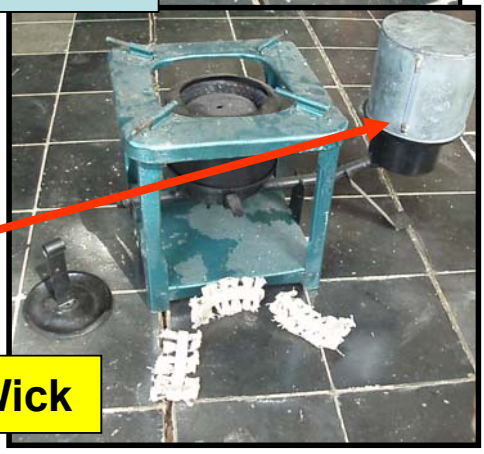
Balittas

Pura

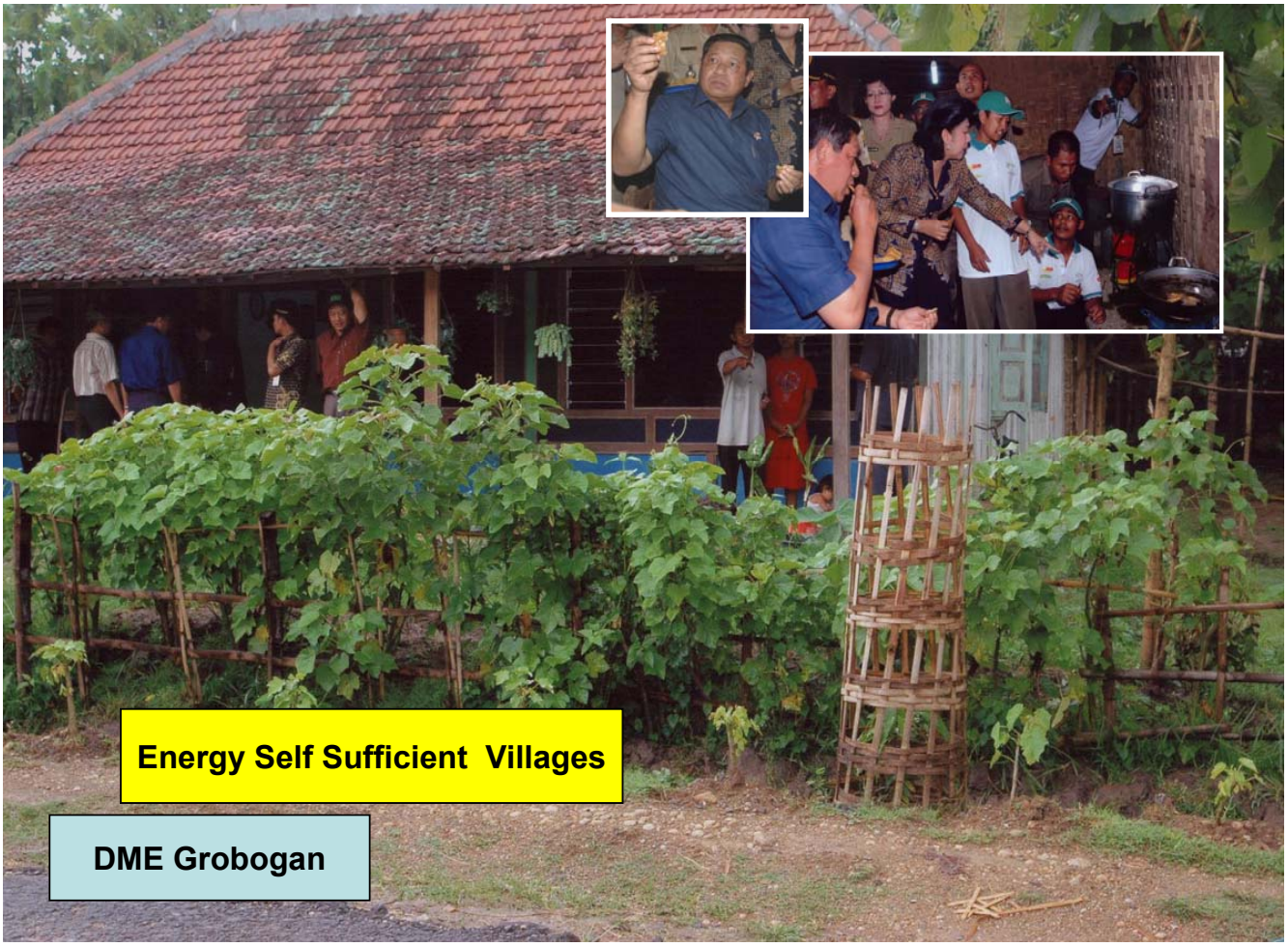
Suar

Regulated Fire

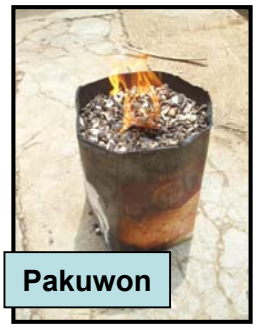
CJO with gravity



CJO Stove with Wick



Biomass Jatropha Stove

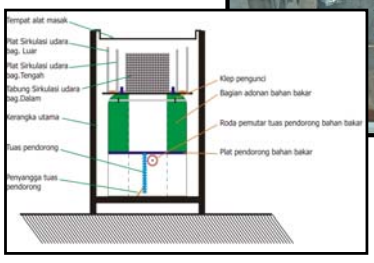

Pakuwon


Balittas


Hanjuang


Garlina

Pasta



(9) Problem of Bioetanol

Table 9.

Availability of Mo

2009 :
Premium Subsidy :
20.444 juta KL
(BPH Migas)

Type of BBM	BBM Usage 2007 (kiloliter)	Biof Feeds Availability	(kiloliter)	(%)
Premium	17.929.843	***) 800.000 ton molases	896.492 equal 3.585.968 ton*	448,2
Premium Non subsidy	249.448	***) 800.000 ton molases	12.472 equal 49.888 ton**	6,2

Note: * molases conversion 1:4,, calculated 896.492 x 4 = 3.585.968 ton
** molases conversion 1:4, calculates 12.472 x 4 = 49.888 ton

*** molases production in Indonesia ± 1,4 milions ton/year,
600 ton used to ethanol industry,
600 ton used to MSG & feed industry, and 200 ton export

Ethanol Industry ??

Table 10.

Availability of Cassava as Biofuel Feedstock 5%

Type of BBM	BBM Usage 2007 (kiloliter)	Biofuel Feedstock Availability	Biofuel Usage 5% (kiloliter)	Usage of Biofuel (%)
Premium	17.929.843	19.802.508	896.492 equal 5.827.198 ton*	29,43
Premium Non subsidy	249.448	19.802.508	12.472 equal 324.272 ton**	1,65

31,08%

Keterangan: * Cassava conversion 1:6.5,calculated 896.492 x 6.5 = 5.827.198 ton
** Cassava conversion 1:6.5, calculated 12.472 x 6.6 = 324..272 ton

blending went up to became = 10% and 15%,

each will permeate produce of domestic cassava

equal to 59,67% and 89,51%.

sinarmas

TABLE 11

Variation of import tapioka year 2002-2007

Year	Tapioka	
	Vol (Ton)	Value (Thousand US$)
2002	25.977	4.833
2003	190.627	33.692
2004	56.760	10.450
2005	103.075	24.497
2006	305.309	70.372
2007	306.648	77.888

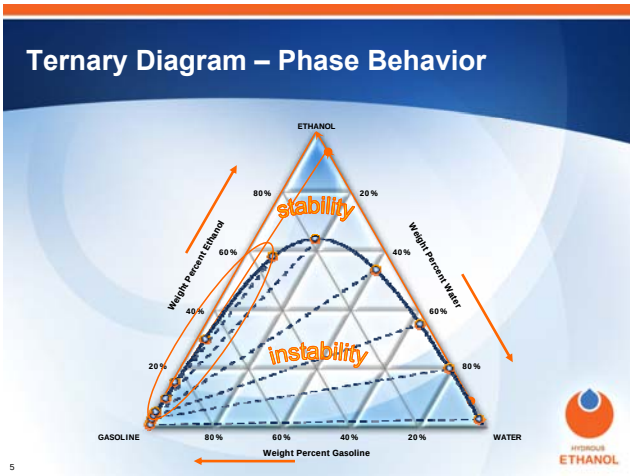
Source: Hendroko, 2008 a
(Courtesy of Ditjen Tan Pangan)

How to solve the ethanol problem?

Increase Production with

Intensification and Extensification

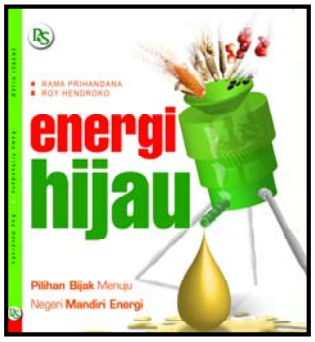
How to solve the ethanol problem?

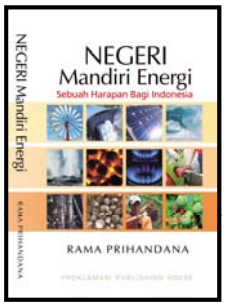


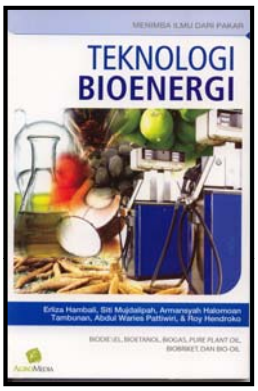
Use Hydrous Ethanol

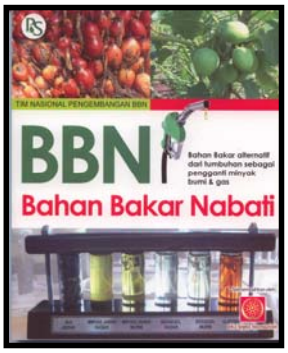
"Dog Wood"
Robert Warren

Sumbangsih pada masyarakat dan negara untuk Mandiri Energi & Membangun Ekonomi Pedesaan









10

Bioethanol

for substitution

SBRC Bioenergy Alliance

sinarmas

Bioethanol/ Spiritus Stove

100 ml = 1 jam

Kerosene 1 liter = 3-4 jam

Bahenol
Ex Agro Makmur

Panca Jaya
Raharja

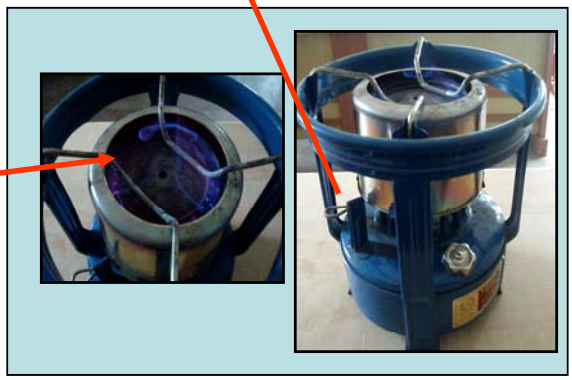
Berlian

Pressure Stove
Ex Jerman

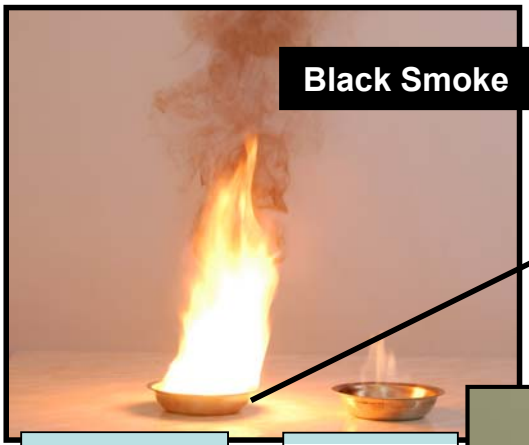
Pressure Stove
Ex Berlian

Ethanol Stove with Wick

Regulated Fire



Blue fire



Black Smoke

Bensin/ gasoline

Ethanol

Soot/ black powdery

Clean

Clean Smoke

Ethanol Stove

Ethanol Gel

Ethanol gel

- Safe
- Without Smoke
- Without Smell
- Economics
- Multi Purpose
- Long Duration

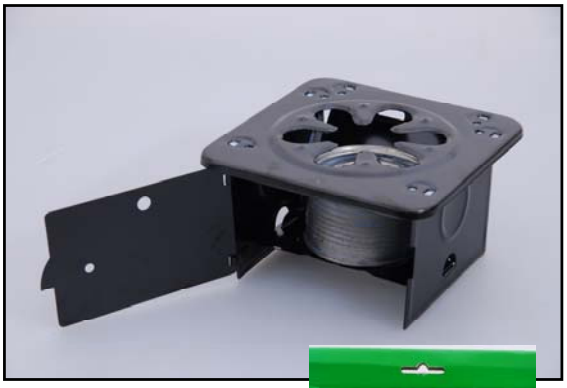
200 gr = 2 jam

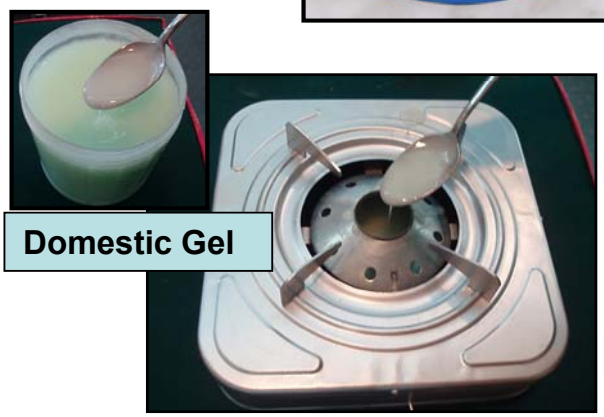
BIO LAMP

Stove
Ex South Africa

Import Gel

Ethanol Gel Stove

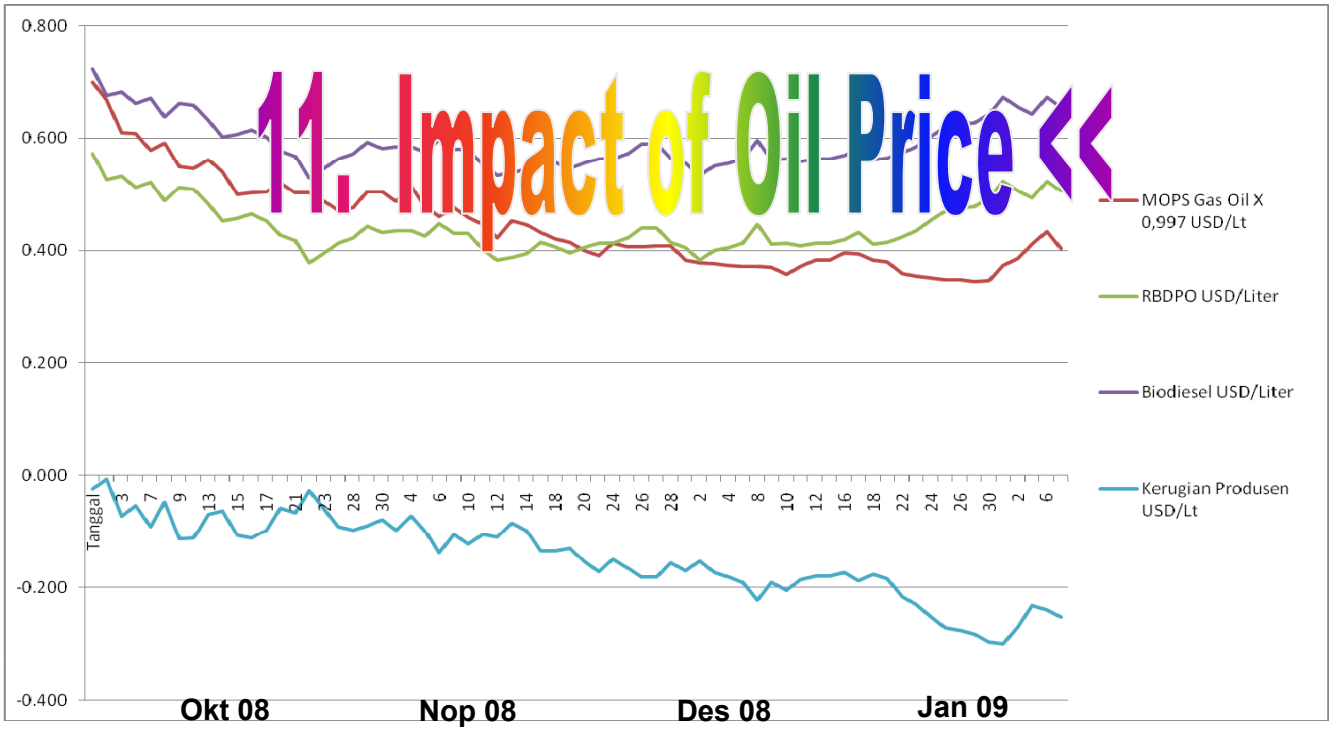




Domestic Gel

MOPS 0IL,CPO, BIODIESEL PRICE and IMPACT FOR BD PRODUCER

OCTOBER 2 Th 2008 – JANUARY 8 Th 2009



Nodan mamomamo

Teşekkür ederim

Danke schön

Obrigado

Спасибо

Thank You

Kiitos

جزاكم الله خيراً

Gum xia

धन्यवाद

Merci

Tawdi

Terima kasih

Sha sha

Gracias

Ang kêun

Maulanenga

Añachaykin

Efcharisto

Hvala

Ookini

謝謝

Dekoju

Danyavad

Spasibo

Grazie

Xie xie

Ngiyabonga

どうもありがとう。

Arigato

Giittus

Shukran

Eso

Dhannvaad

Gum xia

Qujanaq

Köszönöm

מרסי mersi

Wiyarrparlunpaju-yungu

MAY GOD BLESS US